> application, the examiner has done little more than cite references to show that one or more elements or subcombinations thereof, when each is viewed in a vacuum, is known. The claimed invention, however, is clearly directed to a combination.

The same is true in the present case. Applicant here also has presented claims to a new combination of elements.

> To support the conclusion that the claimed combination is directed to obvious subject matter either the references must expressly or impliedly suggest the claimed combination or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references. … Based on the record before us, we are convinced that the artisan would not have found it obvious to selectively pick and choose elements or concepts from the various references so as to arrive at the claimed invention without using the claims as a guide. It is to be noted that simplicity and hindsight are not proper criteria for resolving the issue of obviousness. Note In re Horn, 203 USPQ 969, 971(CCPA 1979). Accordingly, we will not sustain any of the rejections presented.

As seen from the above analysis of Ichinose and Mark, there is not the remotest inference in either reference, or any other prior art known to Applicant, leading the skilled worker in this art toward the proposed combination, especially in light of the major difference in structural elements between Ichinose and Mark. The combination is obvious only in retrospect, i.e. after having looked at Applicant's specification, but it was not (would not have been) obvious to a person of normal skill

in the art at the time the present invention was made. The prior art does not provide the incentive, motive, reason, purpose, teaching or basis for the combination, and therefore the combination would not have been obvious. In the last full paragraph on page 3 of Mark, Mark teaches away from the suggested combination. Further, the cited prior art provides no teaching whatever as to where the Ichinose latch would engage the modified leg suggested by the Examiner as identified in the claims.

Further, as noted above, even if the combination were obvious, it does not produce the claimed subject matter.

Applicant submits that the invention is new and unobvious and not disclosed by the cited art. Accordingly, Applicant respectfully solicits the Examiner's early review and issuance of this application.

Respectfully submitted,

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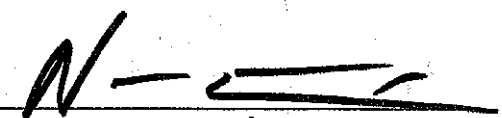
By 
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is no teaching in the cited prior art of making the modified Ichinose legs the same shape.

With regard to claim 4, the tapered parts on the Mark legs are different from one another. Accordingly, there is no teaching of the cited prior art of making the tapered parts of the modified Ichinose the same as claimed.

With regard to claims 5, 6, 8 and 10, again Mark teaches different lengths for the reinforced large diameter part on its first and second legs wherein there is no teaching in the cited prior art of making each leg of the modified Ichinose striker the same length.

The law is clear that in order to establish a proper *prima facie* case of obviousness based on a combination of references, the prior art must contain some reason, purpose, motivation, incentive or teaching of the proposed combination. One of the leading cases in this regard is *Ex parte Clapp*, 227 USPQ 972, where the Honorable Board stated:

> Presuming arguendo that the references show the elements or concepts urged by the examiner, the examiner has presented no line of reasoning, and we know of none, as to why the artisan viewing only the collective teachings of the references would have found it obvious to selectively pick and choose various elements and/or concepts from the several references relied on to arrive at the claimed invention. In the instant

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Chisum on Patents
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Chapter 18 Interpretation and Application of Claims *

5A-18 Chisum on Patents § 18.03

[5]-- Means-Plus-Function Elements

The last paragraph of *35 U.S.C. Section 112* (hereafter "Section 112/6") provides that an "element in a claim for a combination may be expressed as a means or step for performing a specified function".n1 Such elements are known as "means-plus-function" or "step-plus-function" elements.n2 The paragraph also directs that a claim with such an element "shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof."

Claim elements stated in means-plus-function language have been construed and applied in a number of cases.n3

In *Symbol Technologies, Inc. v. Opticon, Inc.* (1991),n4 the court confessed that "applying a claim drafted under § *112 P 6* to an accused structure is not a simple task."

"[T]he scope of such a claim is not limitless, but is confined to structures expressly disclosed in the specification and corresponding equivalents. ... [T]he statutory provision prevents an overly broad claim construction by requiring reference to the specification, and at the same time precludes an overly narrow construction that would restrict coverage solely to those means expressly disclosed in the specification."n5

In 1999, the PTO adopted guidelines for its examiners on the application of *35 U.S.C. Section 112*/6.n6

[a]-- Background.

Section 112/6 was enacted by Congress as "a targeted cure to a specific problem."n7

In *Valmont Industries, Inc. v. Reinke Manufacturing Co., Inc.* (1993),n8 the Federal Circuit noted that "The Patent Act provides explicit guidance for interpretation of claim elements expressed in means-plus-function terms ... *35 U.S.C. § 112,* P 6."n9

"Congress added this language to the Patent Act of 1952 to change the doctrine enunciated in *Halliburton Oil Well Cementing Co. v. Walker, 329 U.S. 1 (1946). See,* P.J. Federico, *Commentary on the New Patent Act,* Preface to *35 U.S.C.A. 25* (1954) (Commentary). In *Halliburton,* the Supreme Court prohibited use of means-plus-function language to describe the 'most crucial element' of a combination claim:

'The language of the claim thus describes this most crucial element in the 'new' combination in terms of what it will do rather than in terms of its own physical characteristics or its arrangement in the new combination apparatus. We have held that a claim with such a description of a product is invalid as a violation of [the patent statute].'

Halliburton, 329 U.S. at 9. In particular, the Supreme Court feared that means-plus-function language was overbroad and ambiguous. *Id. at 12* ('Under these circumstances the broadness, ambiguity, and overhanging threat of the functional claim of Walker becomes apparent.')

"Congress decided to permit broad means-plus-function language, but provided a standard to make the broad claim language more definite. The 1952 Patent Act included a new section 112. This new language permits a patent applicant to express an element in a combination claim as a means for performing a function. The applicant need not recite structure, material, or acts in the claim's means-plus-function limitation. With this new section, the 1952 Act rendered *Halliburton* obsolete. *Commentary* at 25. ... The second clause of the new paragraph, however, places a limiting condition on an applicant's use of means-plus-function language. ... A claim limitation described as a means for performing a function, if read literally, could encompass any conceivable means for performing the function. ... The applicant must describe in the patent specification some structure which performs the specified function. Moreover, a court must construe the functional claim language 'to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.' ..."n10

[b]-- Distinguishing Means Equivalency and Doctrine of Equivalents; Later-Developed Equivalents.

Section 112/6 refers to "equivalents." Unlike the doctrine of equivalents,n11 which compares a patent claim with an accused product or process, Section 112/6 entails a comparison of one structure, material or act (that in the specification) to another structure, material or act (that in a product or process alleged to be covered by the patent claim).n12 Court decisions stress this and other distinctions between Section 112/6 equivalency and the doctrine of equivalents,n13

Some judges, beginning with three opinions in *Dawn Equipment Co. v. Kentucky Farms, Inc.* (1998),n14 questioned whether it is proper to apply separately the doctrine of equivalents to the equivalency prong of a means clause. A subsequent line of Federal Circuit decisions, beginning with *Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc.* (1998),n15 held that the doctrine of equivalents can apply to equivalence of structure in a "means-plus-function" limitation in a patent's claim only if an allegedly equivalent accused structure entails "after-arising" technology. This holding flowed from three assumptions: (1) a means-plus-function limitation is literally met if an accused structure is equivalent to the corresponding structure for carrying out the function in the patent's specification, (2) structural equivalency for a means-plus-function limitation can extend only to structures that are equivalent under the state of technology existing at the time the patent issued, and (3) the standard of equivalency for means-plus-function limitations is the same as that under the doctrine of equivalents. Under these assumptions, if a mean-plus-function limitation is not literally met because the accused structure is not equivalent to the corresponding structure and the accused structure is "pre-existing" technology, there is no further inquiry into equivalency under the doctrine of equivalents. Further inquiry is appropriate only if the alleged equivalent involves "after-arising" technology.

In *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.* (2000),n16 the Federal Circuit held that an amendment to a claim that replaced a "means" clause with the corresponding structure narrowed the *literal* scope of the claim: "A claim element recited in means-plus-function language literally encompasses the corresponding structure and its equivalents. *Laitram Corp. v. Rexnord Inc., 939 F.2d 1533, 1536, 19 USPQ2d 1367, 1370 (Fed. Cir. 1991).* In contrast, a claim element that recites the corresponding structure does not literally encompass equivalents of that structure. ... Thus, a claim amendment that replaces means-plus-function language with language reciting the corresponding structure narrows the literal scope of the claim."n17

Underlying both Section 112/6 and the doctrine of equivalents are common problems that have not and likely cannot be definitely resolved: what is the standard of "equivalent"? what evidence should be considered in determining equivalency? what procedures are appropriate for determining equivalency? With both, the driving policy consideration is the same: achieving a fair scope of protection that is commensurate with the inventor's contribution to the art while maintaining a reasonable degree of predictability and certainty.n18

In *D.M.I., Inc. v. Deere & Co.* (1985),n19 the Federal Circuit emphasized the difference between interpretation of a Section 112/6 element and application of the judicially-developed doctrine of equivalents.

"[T]he word 'equivalent' in § 112 should not be confused ... with the 'doctrine of equivalents.' In applying the doctrine of equivalents, the fact finder must determine the range of equivalents to which the claimed invention is entitled, in light of the prosecution history, the pioneer-non-pioneer status of the invention, and the prior art. It must then be determined whether the entirety of the accused device or process is so 'substantially the same thing, used in substantially the same way, to achieve substantially the same result' as to fall within that range. ... In applying the 'means plus function' paragraph of § 112, however, the sole question is whether the single means in the accused device which performs the function stated in the claim is the same or an equivalent of the corresponding structure described in the patentee's specification as performing that function."n20

In *Palumbo v. Don-Joy Co.* (1985),n21 the Federal Circuit acknowledged that, "[a]lthough as we point out in *D.M.I., Inc. v. Deere & Co.* ... there is a difference between a doctrine-of-equivalents analysis and a literal infringement analysis involving 'equivalents' under § 112, *Graver Tank* concepts of equivalents are relevant in any 'equivalents' determination."n22 However, the district court erred in emphasizing the "crowded" nature of the prior art as a ground for giving a "narrow" range of equivalents to a means-plus-function clause. The range of equivalents is relevant to infringement under the doctrine of equivalentsn23 but not to literal infringement of a claim containing a Section 112 means-plus-function clause.n24

In *Dawn Equipment Co. v. Kentucky Farms, Inc.* (1998),n25 the Federal Circuit held that a jury verdict that a patent claim, the disputed limitation of which was in means-plus-function form, was not literally infringed but was infringed under the doctrine of equivalents must be overturned because there was insufficient evidence of equivalency. The court noted that "For purposes of our discussion, and because neither party addresses the point, we shall assume that it is legally proper to apply the doctrine of equivalents to a claim drafted in means-plus-function form."n26 Despite this conclusion that the issue was not posed in the case, all three judges wrote separate "additional views" opinions, two suggesting that there should be no separate inquiries into equivalency of means, one disputing this suggestion. Judge Plager argued that there was no clear distinction between Section 112 equivalency and doctrine of equivalents equivalency, especially after the *Warner-Jenkinson* decision prescribed that the doctrine of equivalents should be applied on a limitation-by-limitation basis and that "the practice of claiming under § 112, P 6 would be much improved if we adhered to the proposition that the 'equivalents' of 'structure, material, or acts described in the specification' are those found to be within the scope of that term as it is used in § 112, *P 6*, and not elsewhere. Accordingly, the separate judicially-created doctrine of equivalents would have no application to those aspects of limitations drawn in means-plus-function form."n27 He cautioned that "we do not have before us a case of an accused device having a function different from that specified in the claim, and thus we do not ... address the related question of whether a § 112, P 6 claim limitation is limited to the 'specified function,' or ... can also encompass an equivalent function under the doctrine of equivalents."n28

Judge Newman responded that Judge Plager's "proposal that established law should be changed, even were such change available to the judges of this court, simply moves the Federal Circuit farther from the principles of stare decisis. This already difficult area of law will not benefit from added uncertainty."n29

Judge Michel wondered "if affording the patentee additional protection under the doctrine of equivalents conflicts with the very language and intent of *35 U.S.C. § 112*(6) (1994), which covers only those 'equivalents' disclosed in the specification."n30

In *Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc.* (1998),n31 the Federal Circuit, in an opinion by Judge Lourie, noted that the equivalency tests for Section 112 "means" clauses and for the doctrine of equivalents were "closely related" but that there was an important difference: only the doctrine of equivalents can embrace "after-developed technology."

"The doctrine of equivalents is necessary because one cannot predict the future. Due to technological advances, a variant of an invention may be developed after the patent is granted, and that variant may constitute so insubstantial a change from what is claimed in the patent that it should be held to be an infringement. Such a variant, based on after-developed technology, could not have been disclosed in the patent. Even if such an element is found not to be a § 112, P 6, equivalent because it is not equivalent to the structure disclosed in the patent, this analysis should not foreclose it from being an equivalent under the doctrine of equivalents. That is not the case here, where the equivalence issue does not involve later-developed technologies, but rather involves technology that predates the invention itself. In such a case, a finding of non-equivalence for § 112, P 6, purposes should preclude a contrary finding under the doctrine of equivalents. This is because, as we have already determined, the structure of the accused device differs substantially from the disclosed structure, and given the prior knowledge of the technology asserted to be equivalent, it could readily have been disclosed in the patent. There is no policy-based reason why a patentee should get two bites at the apple. If he or she could have included in the patent what is now alleged to be equivalent, and did not, leading to a conclusion that an accused device lacks an equivalent to the disclosed structure, why should the issue of equivalence have to be litigated a second time? As indicated, this consideration does not necessarily apply regarding variants of the invention based on after-developed technologies."n32

In *WMS Gaming Inc. v. International Game Technology* (1999),n33 the court held that there was no literal infringement but infringement under the doctrine of equivalents. The accused devices escaped literal infringement

because they did not have a function identical to that specified by the patent claim's means clauses. But the devices had an equivalent function, and the difference between the claimed and accused devices was insubstantial. The court distinguished *Chiuminatta.*

"[In *Chiuminatta*, we stated] that a 'lack of equivalent structure under a means-plus-function limitation may preclude a finding of equivalence under the doctrine of equivalents.' ... We stated that such would be the case unless a variant that was accused of infringement ... but that did not literally infringe a means-plus-function limitation ... was due to technological advances developed after the patent was granted and 'constitute[d] so insubstantial a change from what [was] claimed in the patent that it should be held to be an infringement.' ...

"... [O]ur holding that the [accused device] does not literally infringe claim 1 of the ... patent is not based on a finding that the accused device lacks structure equivalent to that disclosed in the patent. On the contrary, we have sustained the district court's finding that the [accused device] has equivalent structure. However, we have reversed the district court's holding of literal infringement based on a lack of identity of function. Consequently, unlike *Chiuminatta*, the accused device in this case may still infringe under the doctrine of equivalents. *See Al-Site Corp. v. VSI Int'l, Inc.* ... (Fed. Cir. 1999) (an accused device can infringe under the doctrine of equivalents without infringing literally under *35 U.S.C. § 112,* P 6 because the doctrine only requires substantially the same function, not identicality of function as in section 112, P 6)."n34

In *Al-Site Corp. v. VSI International, Inc.* (1999),n35 a jury rendered a verdict that a patent claim with a means-plus-function limitation ("means for securing" a frame) was not literally infringed but was infringed under the doctrine of equivalents. The corresponding structure in the specification was a "button and hole fastener"; the accused device had a hole structure. The jury's verdict of no literal infringement was based on an apparently erroneous instruction by the trial court. The instruction indicated that the limitation required the specification's "button and hole fastener" arrangement rather than the button and hole fastener *or* "an equivalent thereof." The Federal Circuit held that the error in the instructions was harmless and that a judgment of literal infringement could be entered based on the jury's finding of equivalency under the doctrine of equivalents. It reasoned that the "doctrine of equivalents" converges with Section 112, paragraph 6, equivalency, when there is an identity of function between the claimed and accused structures and the accused structure does not use an "after arising equivalent."n36 Under the facts of the case, the alleged equivalent element in the accused device performed an identical function and was not later-developed technology.n37

[c]-- Identity of Function--Equivalency of Means.

Court decisions emphasize that Section 112/6 coverage depends on a showing of both identity of function and equivalency of means.n38

In *McGinley v. Franklin Sports, Inc.* (2001),n39 the Federal Circuit emphasized that "[d]rafters of means-plus-function claim limitations are statutorily guaranteed a range of equivalents extending beyond that which is explicitly disclosed in the patent document itself ... ."n40

[i]-- Identical and Equivalent Functions.

In *Pennwalt Corp. v. Durand-Wayland, Inc.* (1987),n41 the Federal Circuit, in a split in banc decision, emphasized that a patent claim with a means-plus-function limitation can be literally infringed only if the *exact* function is performed in the accused method or device.

"[S]ection 112, paragraph 6, rules out the possibility that any and every means which performs the function specified in the claim *literally* satisfies that limitation. While encompassing equivalents of those disclosed in the specification, the provision, nevertheless, acts as a restriction on the literal satisfaction of a claim limitation. ... If the required function is not performed *exactly* in the accused device, it must be borne in mind that section 112, paragraph 6 equivalency is not involved. Section 112, paragraph 6, plays no role in determining whether an equivalent function is performed by the accused device under the doctrine of equivalents.

"... To determine whether a claim limitation is met literally, where expressed as a means for performing a stated function, the court must compare the accused structure *with the disclosed structure,* and must find equivalent *structure* as well as *identity* of claimed *function* for that structure."n42

Pennwalt and other decisions suggest that there may be infringement under the doctrine of equivalents when an accused product or process lacks the identical function specified in a Section 112/6 clause but contains an equivalent function.n43

In *General Electric Co. v. Nintendo Co., Ltd.* (1999),n44 the Federal Circuit held that an accused device did not perform the identical or an equivalent function required by the patent claim's Section 112, paragraph 6, means clause. The patent claimed an electronic control circuitry for television that allows a user to switch from an antenna to a video cassette recorder (VCR). The claim required a means for performing a function of establishing a second signal path that is "disrupted."n45 The specification distinguished between the function of "disrupting", which is "establishing a high series impedance," and "bypassing," which is creating a path of lower resistance.n46 Lacking the identical function of the means clause, the accused system did not literally infringe. The court agreed that the accused system might "infringe the ... patent, under the doctrine of equivalents, if, *inter alia*, they perform an equivalent function to the disruption function claimed in the last means-plus-function limitation in Claim 12."n47 But, in this case, the function in the accused device was not equivalent: "disrupting the signal path results in an alteration of the signal path, whereas bypassing the signal path does not. We, therefore, agree with the district court, that no reasonable jury could find that an equivalent function (substantially similar or substantially the same function) is performed in the accused systems."n48

In *WMS Gaming Inc. v. International Game Technology* (1999)n49 a Federal Circuit panel affirmed a finding of infringement because the accused devices had an equivalent, not an identical function. The patent disclosed a slot machine with rotating reels having symbols indicating winning combinations. The machine decreased the probability of winning by electronically controlling the reels. The patent's claim required three "means": (1) "means for assigning a plurality of numbers" representing reel positions, the plurality of numbers exceeding the number of positions on a reel; (2) "means for randomly selecting one of said plurality of assigned numbers," and (3) "means for stopping said reel at the ... position represented by said selected number."n50 The corresponding structure for the "means for assigning" was a microprocessor programmed with the specific algorithm set forth in the patent's specification, not any programmed computer or microprocessor. The accused machine used a different algorithm. Properly interpreted, the three clauses required as the claimed functions the assigning and selecting of *single* numbers for reels. The accused machine did *not* literally infringe because it assigned and selected *combinations of numbers* rather than single numbers. But the district court did not err in finding that the difference between the claimed and accused devices was insubstantial and, therefore, that there was infringement under the doctrine of equivalents.

In *Micro Chemical, Inc. v. Great Plains Chemical Co.* (1999),n51 the Federal Circuit emphasized that "[a]n error in identification of the function can improperly alter the identification of structure in the specification corresponding to that function."n52 In *Micro Chemical*, it held that a requirement in a patent's apparatus claims of a "weighing means" is a Section 112/6 means clause and that the recited function is simply "weighing," and not, as a district court held, the "sequential and cumulative weighing" illustrated in the patent's preferred embodiment. "Because it had adopted an unnecessarily narrow function for the 'weighing means,' the district court improperly restricted its search for corresponding structure in the specification. Thus, the district court erroneously overlooked alternative embodiments of the invention."n53

[ii]-- Restriction of Means to Equivalents--Similarity to "Reverse Doctrine of Equivalents."

A "means" clause is restricted to the corresponding structure and equivalents; it does not extend to all "means" for carrying out the defined function.n54

In *Jonsson v. The Stanley Works* (1990),n55 the Federal Circuit stressed that "Paragraph 6 'operates to *cut back* on the type of *means* which could literally satisfy the claim language.' "n56

In *Johnston v. IVAC Corp.* (1989),n57 the Federal Circuit likened the Section 112/6 test of interpretation of means-plus-function limitations to the reverse doctrine of equivalents.n58

In *Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co.* (1997),n59 the Supreme Court referred to the relationship between Section 112/6 and the "reverse doctrine of equivalents": "Section 112, P 6 now expressly allows so-called 'means' claims, with the proviso that application of the broad literal language of such claims must be limited to only those means that are 'equivalent' to the actual means shown in the patent specification. This is an application of the doctrine of equivalents in a restrictive role, narrowing the application of broad literal claim elements. We recognized this type of role for the doctrine of equivalents in *Graver Tank* itself."n60

Illustrating Section 112/6's contractive effect, a district court noted the difference between a claim specifying a "means of support", which requires a showing of equivalence, and a claim specifying a "support member", which does not.n61

Similarly, in *Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries Inc.* (1998),n62 an apparatus claim in a patent, drafted in "means" form, was held to be not infringed by an accused device because the corresponding structure in the specification and the structure in the accused device were substantially different. However, use of the same accused device was held to infringe a method claim that was worded similarly to the apparatus claim.

In *IMS Technology Inc. v. Haas Automation Inc.* (2000),n63 the Federal Circuit stressed that Section 112/6's limiting effect applies to the "means" or "step" in a means-plus-function or step-plus-function clause, not to all terms in the clause.

"Section 112, P 6 does not limit all terms in a means-plus- function or step-plus-function clause to what is disclosed in the written description and equivalents thereof; § 112, P 6 applies only to interpretation of the means or step that performs a recited function when a claim recites insufficient structure or acts for performing the function. *See O.I. Corp. v. Tekmar Co., 115 F.3d 1576, 1581, 42 USPQ2d 1777, 1780 (Fed. Cir. 1997).*"n64

In *IMS Technology*, a patent concerned numerical control of a machine tool. Its claim 1 was to an apparatus; one limitation required "means to sequentially display *data block* inquiries."n65 The court held that "data block" must be construed "according to our standard claim construction methodology without application of § 112, P 6."n66

"The recited function consists of sequentially displaying data block inquiries, and the claim recites no structure supporting the means for performing that function. Therefore, in accordance with § 112, *P 6*, the means is construed to cover the disclosed structure ... and its equivalents. The 'data block' is not the means that causes the sequential display and is therefore not subject to construction under § 112, P 6."n67

[iii]-- Standard of Equivalency.

Decisions prior to the Federal Circuit in banc and Supreme Court decisions in *Warner-Jenkinson* applied a "substantial" or "significant" change standard for equivalency under Section 112/6.n68

In *Valmont Industries, Inc. v. Reinke Manufacturing Co., Inc.* (1993),n69 the Federal Circuit held that the district court erred by (1) applying the doctrine of equivalents' three-part way, function and result test to a means-plus-function limitation, and (2) failing to (a) "examine the specification to identify the disclosed means",n70 and (b) determine whether the accused device used an equivalent thereof, an equivalent "result[ing] from an insubstantial change which adds nothing of significance to the structure, material, or acts disclosed in the patent specification."n71

In *In re Hayes Microcomputer Products Inc. Patent Litigation* (1992),n72 the Federal Circuit affirmed, as supported by substantial evidence, a jury verdict finding infringement of a patent with two means-plus-function clauses, even though the patentee's expert, in testifying on infringement, "did not compare the specific structure of the [means] ... of the [accused] device to the language of the claims."n73 The expert "was able to testify that the accused device included a microprocessor [as did the patent's disclosed embodiment] and was functionally equivalent to the claimed invention. He was not required to be a patent law expert in order to so testify."n74 The court stressed that, in determining whether an accused device contains structural equivalents to a patent's claims' "means" clauses, "reasonable inferences by the fact finder are appropriate."n75

In the in banc *Hilton Davis v. Warner-Jenkinson* decision, the Federal Circuit adopted the substantial change standard as the "ultimate question" under the doctrine of equivalents.n76 It retained the traditional function-way-result (triple identity) test but noted that that test "may not invariably suffice to show the substantiality of the differences."n77 On appeal, the Supreme Court noted problems with the substantiality and triple identity tests but did not dictate what "linguistic framework" should be used to determine equivalency under the doctrine of equivalents.n78 Neither the in banc Federal Circuit majority opinion nor the Supreme Court opinion addressed the standard of equivalency under Section 112/6.

Since *Warner-Jenkinson*, a number decisions find no equivalency between the corresponding and accused structures.n79 Others find equivalency.n80 Decisions address the extent to which the "All Elements" rule under the doctrine of equivalents applies in determining equivalency of structures, particularly whether there must be a

"component-by-components" equivalency.n81 They also address whether the addition of functions to an accused element that performs the claimed function can sufficiently change the element so as to avoid Section 112/6 equivalency.n82

In *Kahn v. General Motors Corp.* (1998),n83 the Federal Circuit held that a claim containing a means-plus-function limitation was not infringed, literally or under the doctrine of equivalents, by an accused device that had "no counterpart equivalent structure" meeting the limitation: "[T]here are significant differences between the two structures."n84

In *Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc.* (1998),n85 the Federal Circuit applied an "insubstantial difference test;"n86 to hold that, as a matter of law, a corresponding structure and accused structure were not equivalent. The patent claimed an apparatus for cutting concrete and required "means" for performing the function of supporting concrete to prevent damage. The "corresponding structure" in the patent's specification was a skid plate.n87 The structure in the accused device that performed the support function, was a pair of soft, compressible round wheels that rotate over the concrete surface. That the wheels were physically exchangeable for the skid plate was not conclusive of equivalency,n88 especially when (1) the patentee did not allege that those skilled in the art would recognize the interchangeability of skid plates and wheelsn89 and (2) the patent specification discussed "drawbacks of a skid plate" but did not provide even a "hint" that a skid plate could be replaced by wheels.n90 Substitutability was not the test: "Almost by definition, two structures that perform the same function may be substituted for one another."n91

In *Mas-Hamilton Group v. LaGard, Inc.* (1998),n92 the patent concerned an electronic lock. The structure corresponding to means clauses requiring the function of moving or driving a lever was a "solenoid."n93 The accused device used a "stepper motor."n94 The Federal Circuit upheld a district court's finding that a solenoid and a stepper motor were not equivalents in performing the defined function.

"[T]he solenoid is continuously operated and hence requires considerable power. 'In contrast, the stepper motor used in the ... lock is actuated by a short electrical pulse, remains in its second state without application of power, [and] is returned manually to its original state.' In addition, the stepper motor translates its power into rotational motion, whereas the claimed solenoid uses linear motion."n95

In *Al-Site Corp. v. VSI International, Inc.* (1999),n96 a patent claim required a "fastening means," which maintained a closed loop.n97 The patent's specification disclosed rivet and button and hole structures for performing the fastening function. The accused devices used glue. The Federal Circuit held that substantial evidence in the form of expert testimony supported a jury verdict of infringement. The expert testified:

(1) "for one of ordinary skill in the art, it would be an insubstantial change 'to substitute a rivet for a staple or for glue or for any other method that's standard in the [point of purchase] industry to maintain this loop as a closed loop.' *See Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc.* ... (Fed. Cir. 1998) ('The proper test [for determining equivalence under § 112, P 6] is whether the differences between the structure in the accused device and any disclosed in the specification are insubstantial. ... The question of known interchangeability is ... an important factor in determining equivalence [under § 112, P 6].').";n98

(2) "the use of glue 'in between the two layers of the body ... is an insubstantial change from the other structure ... which was one of a rivet. People in point of purchase displays use glue or rivets or staples to accomplish the same function.' *But see Chiuminatta, 145 F.3d at 1309* ('Almost by definition, two structures that perform the same function may be substituted for one another. The question of known interchangeability is not whether both structures serve the same function, but whether it was known that one structure was an equivalent of another.').";n99 and

(3) " 'equivalent fastening means could be a rivet, glue or staple or some such similar [structure].' "n100

In *Seal-Flex, Inc. v. Athletic Track & Court Construction* (1999),n101 the patent concerned a "method for constructing an all-weather activity mat on a foundation."n102 The claim required a step of "spreading an adhesive tack coating for adhering the mat to the foundation over the foundation surface."n103 For coatings, the specification specifically mentioned "emulsified asphalt diluted 50% by water, such as SS1H, hot applied asphalt, urethanes, and modified epoxies" and stated that "other materials can serve as the tack coating if they perform the function of adhering the mat to the foundation."n104 It did not "expressly mention latex as a tack coating."n105 The accused process used latex. At trial, a jury rendered a verdict of literal infringement. The Federal Circuit affirmed the infringement judgment because substantial evidence supported the jury's verdict. Trial court correctly instructed the jury to apply a test of whether the accused materials is "insubstantially different" from the material disclosed in the specification for performing the claimed function."n106 The evidence at trial supported the insubstantiality of the difference.

"The specification ... discloses emulsified asphalt, hot applied asphalt, most urethanes, and modified epoxies as appropriate adhesive tack coating materials. ... [T]he record shows that latex is insubstantially different from the adhesive tack coatings described in the specification. For instance, the record shows comparisons of emulsified asphalt, one of the materials described in the specification, and latex. Both materials are water based, have similar viscosities, and can be applied at ambient temperature with the same spray equipment."n107

The accused infringer's president "admitted that he had used latex as a tack coat even when the specifications for a project called for asphalt emulsion," which "shows that even [he] considered latex to be equivalent to the adhesive tack coating materials disclosed in the specification."n108 The prosecution history showed that "the applicant intended to cover a broad range of adhesive tack coatings, including latex."n109 A passage from the specification that the accused infringer relied on was taken "out of context."n110

In *Odetics, Inc. v. Storage Technology Corp.* (1999),n111 a Federal Circuit panel majority attempted to clarify *Chiuminatta*'s holding on the standard of equivalency. It emphasized that *Chiuminatta* neither required "component by component" equivalence between a patent's corresponding structure and the alleged equivalent structure in an accused device nor a "deconstruction" of the specification structure into component parts to analyze equivalence. The patent concerned a robotic tape storage system. The claim required a "rotary means." The structure in the patent specification corresponding to the rotary means had rod, bin, and toothed gear components. The accused structure had rod, bin and pins (cam followers) components. The district court initially denied the accused infringer's motion to overturn the verdict but granted a renewed motion in view of the newly-decided *Chiuminatta* case. The district court interpreted *Chiuminatta* as requiring the patentee to show that each component of the corresponding structure had an equivalent component in the accused device. The Federal Circuit majority disagreed, noting that the "all elements" approach to the doctrine of equivalents does not dictate a component-by-component approach to Section 112/6. The "element" or "limitation" that must have an equivalent is the entire corresponding structure.

"[T]he crux of the district court's reading of *Chiuminatta* is that statutory equivalence under § 112, P 6 requires 'component by component' equivalence between the relevant structure identified in the patent and the portion of the accused device asserted to be structurally equivalent. ... This reading of *Chiuminatta* misapprehends § 112, P 6 infringement analysis and is therefore incorrect.

... .

"... It is of course axiomatic that '[e]ach element contained in a patent claim is deemed material to determining the scope of the patented invention.' *Warner-Jenkinson, 520 U.S. at 29, 41 USPQ2d at 1871.* Thus a claim limitation written in § 112, P 6 form, like all claim limitations, must be met, literally or equivalently, for infringement to lie. ... [S]uch a limitation is literally met by structure, materials, or acts in the accused device that perform the claimed function in substantially the same way to achieve substantially the same result. The individual components, if any, of an overall structure that corresponds to the claimed function are not claim limitations. Rather, the claim limitation is the overall structure corresponding to the claimed function. This is why structures with different numbers of parts may still be equivalent under § 112, P 6, thereby meeting the claim limitation. *See, e.g., Al-Site, 174 F.3d at 1321-22, 50 USPQ2d at 1169* (upholding jury verdict of § 112, P 6 equivalence between 'a mechanically-fastened loop ... includ[ing] either the rivet fastener or the button and hole fastener' and 'holes in the arms [of an eyeglass hanger tag]'). The appropriate degree of specificity is provided by the statute itself; the relevant structure is that which 'corresponds' to the claimed function. *See, e.g., Chiuminatta, 145 F.3d at 1308-09, 46 USPQ2d at 1756* (structure 'unrelated to the recited function' disclosed in the patent is irrelevant to § 112, P 6); *Valmont, 983 F.2d at 1044, 25 USPQ2d at 1455* (identifying structure referring to the claimed function). Further deconstruction or parsing is incorrect.

"Rather than altering this well-worn path of the law, *Chiuminatta* confirms it. After determining that the structure corresponding to the 'means ... for supporting the surface of the concrete' was a 'skid plate' or 'generally rectangular strip of metal having rounded ends between which is a flat piece,' ... the court proceeded to analyze the differences between the skid plate and the assertedly equivalent structure in the accused device, a set of soft rubber wheels. ... In finding 'not insubstantial' differences between the wheels and skid plate, the court noted that the way the structures performed the claimed function were substantially different: while the wheels roll or rotate across the surface, the skid plate 'skid[s] as the saw moves across the concrete and thus ha[s] a different impact on the concrete.' ... At no point did the *Chiuminatta* court deconstruct the skid plate structure into component parts in order to analyze equivalence. ... Instead, *Chiuminatta* simply applied the well-established law of insubstantial differences to the particular structures at issue. ... The component-by-component analysis used by the district court finds no support in the law."n112

Judge Lourie, author of the *Chiuminatta* opinion, dissented, arguing that the majority misunderstood the meaning of "structure."

"I respectfully dissent ... from the holding that an analysis of equivalent structure under § 112, P 6, does not permit dissection of the structure corresponding to a recited means ... .

"If one is to determine whether the disclosed structure of a claimed means is equivalent to the corresponding structure of an accused device, I do not see how it is possible to do so without looking at what components the structures consist of, i.e., by deconstructing or dissecting the structures. This is the only way to discern whether any significant difference in structural details exists between the claimed and accused structures. For example, in this case, structural equivalence is assessed by comparing the disclosed rotary means (the rod, bin, and the toothed gear) with the accused bin array (the rod, bin, and pins (cam followers)). The only relevant structural difference is between the toothed gear and the pins, and therefore it is the significance of this structural difference that must be assessed in determining whether the claimed means is equivalent to the bin array.

"My difference with the majority essentially arises from my belief that it misunderstands the meaning of the word 'structure.' The structure of a house consists of its components, i.e., its floor, walls, roof, etc. The structure of an automobile consists of its components, i.e., its chassis, motor, wheels, body, seats, etc. The structure of a chemical compound consists of the names of its component constituents or a pictorial representation thereof. The structure of an electronic circuit consist of transistors, resistors, capacitors, etc. Analyzing any of these structures for comparison with other structures requires analysis of their component parts. We need to focus on the real meaning of this statutory term if we are to serve our function of clarifying the law."n113

In *IMS Technology Inc. v. Haas Automation Inc.* (2000),n114 the Federal Circuit, after an extensive review of case law on the standard of equivalency under Section 112/6 and the doctrine of equivalents,n115 stressed that "the context of the invention should be considered when performing a § 112, P 6 equivalence analysis just as it is in a doctrine of equivalents determination." Thus, "two structures that are equivalent in one environment may not be equivalent in another."n116

"More particularly, when in a claimed 'means' limitation the disclosed physical structure is of little or no importance to the claimed invention, there may be a broader range of equivalent structures than if the physical characteristics of the structure are critical in performing the claimed function in the context of the claimed invention. Thus, a rigid comparison of physical structures in a vacuum may be inappropriate in a particular case. Indeed, the statute requires two structures to be equivalent, but it does not require them to be 'structurally equivalent,' i.e., it does not mandate an equivalency comparison that necessarily focuses heavily or exclusively on physical structure.

"In some cases, an analysis of insubstantial differences in the context of the invention results in a finding of equivalence under § 112, P 6 even though two structures arguably would not be considered equivalent structures in other contexts, e.g., if performing functions other than the claimed function. *See Odetics, 185 F.3d at 1269-71, 51 USPQ2d at 1231-32* (reinstating jury verdict of infringement when there was evidence that a 'bin array' with a cam and cam follower mechanism performed a rotary function in the same way as a 'rotary means' with a gear mechanism by receiving force); *Al-Site, 174 F.3d at 1315-17, 50 USPQ2d at 1164-65* (affirming jury verdict of infringement based on expert testimony of known interchangeability of glue and rivet as a 'fastening means' on hanger tag for glasses). *But see Odetics, 185 F.3d at 1277-79, 51 USPQ2d at 1237-38* (Lourie, J., dissenting) (criticizing majority for focusing exclusively on function and not on structure). In other cases, in which the specific physical features of the structure corresponding to the 'means' limitation may have more relevance to the claimed invention, a finding of noninfringement results. *See Chiuminatta, 145 F.3d at 1309-10, 46 USPQ2d at 1757* (finding wheels and skid plate not equivalent for supporting surface of concrete, particularly since there was no allegation that one skilled in the art recognized the interchangeability of structures for performing claimed function)."n117

In *IMS*, the patent at issue concerned numeric control of machine tools. The patent's claim required an "interface means" for performing two functions: *transferring* a control program and control parameters from an external medium to an alterable memory and *recording* a control parameter onto an external memory. The patent's specification disclosed a *tape cassette* for recording the control program and control parameters and transferring them to the alterable memory (random access memory ("RAM")). An accused device used a *floppy disk* drive for recording and transferring parameters. accused device used a floppy disk drive. The court held that there was a genuine fact issue as to whether the

floppy disk drive was a Section 112/6 equivalent even though there were "admittedly physical differences" between the tape record and the disk drive.

"The invention is directed to an apparatus that permits interactive programming of a machine tool. The transferring and recording functions of the claimed 'interface means' merely provide a way of storing programs created using the inventive programming apparatus and process. This does not appear to be a case in which any physical characteristics of the interface means, such as the specific format of recorded data and the mechanism for accessing data, are important to the invention. [The patent owner] has provided some evidence of structural similarities between a floppy disk drive and a tape cassette transport, and, while there are admittedly physical differences, there is at least an issue of fact as to whether those differences are substantial in light of the role played by the 'interface means' in the claimed invention. One way to address that question is to ask whether the structures perform the same function in substantially the same way to achieve substantially the same result. [The patent owner] has also supplied evidence that one of ordinary skill in the art would have recognized the interchangeability of a floppy disk drive and a tape cassette transport for performing the transferring and recording functions in the claimed invention. Such evidence should be considered in a § 112, P 6 equivalence determination."n118

Similarly, in *Caterpillar Inc. v. Deere & Co.* (2000),n119 a divided Federal Circuit panel held that a patent owner's evidence of equivalency precluded summary judgment of noninfringement despite physical differences between the claimed and accused structures. A patent's claims to a belt driven vehicle required "means" for "tensioning" a belt that wraps around the vehicle's front and rear wheels.n120 As structure corresponding to the tensioning function, the patent's written description set forth, inter alia, a hydraulic system for increasing tension by pushing the entire front axle forward. In the accused device, there was no front axle, and tensioning was accomplished by a "swing link" system that independently adjusted each front wheel. A district court granted summary judgment of noninfringement on the ground that no reasonable jury could find the swing link tensioning mechanism of the accused device equivalent to the mechanism disclosed in the patent. The court noted that the accused system "was dramatically different in structure, operated in a substantially different way, and provided a number of practical engineering advantages."n121 The Federal Circuit reversed, holding that the district court erred by "conduct[ing] an impermissible component-by-component analysis to determine that no reasonable jury could find structural equivalence," and "[i]mproperly considered potential advantages offered by the accused structure that do not relate to the disputed tensioning function."n122 The patent owner presented evidence that the accused swing link tensioning means was "a known alternative tensioning means."n123

"While there are admittedly physical differences between the accused and claimed structures, there is at least an issue of fact as to whether those differences are substantial in light of the role played by the tensioning means in the claimed invention. The expert testimony and evidence of known interchangeability were more than sufficient to create a genuine issue of material fact regarding the equivalence of the accused swing link tensioning system to the claimed tensioning means structure under § 112, P 6, which requires the issue of infringement to be submitted to a jury."n124

Judge Plager concurred but "without enthusiasm."

"If the trial judge sat as the trier of fact, I would find his assessment of the facts unimpeachable. But he does not. Instead, under the rules as we now have them, and because the patentee's lawyer did a good job of building a record of arguably disputable facts, the matter (unless settled) will now go to a jury before whom there will be a lengthy and costly contest of the experts. The jury will then pick a winner; it may be the judge's winner, or it may not. In either event, the case provides a textbook example of the insubstantial nature of the 'insubstantial differences' test, and its marginally legitimate child, 'substantially the same way to achieve substantially the same result,' on which the outcome will turn. May the best lawyer win."n125

Judge Lourie dissented, noting that that the claimed and accused structures differed in both the way and the result

"Contrary to the majority's assertion, the court did not perform a component-by-component analysis, it simply applied the well-established law of insubstantial differences to the particular structures at issue. There is no dispute that both the accused and disclosed structures perform the same function, which is to maintain the proper belt tension around the tractor wheels. However, unlike the disclosed structure, which maintains the proper belt tension by moving the entire front axle of the tractor forward or backward, the accused device maintains the proper belt tension in a substantially different way by moving the wheels individually. I also agree with the district court that the accused structure's different way of maintaining belt tension also yields a substantially different result. Mechanical forces are

distributed differently, there are fewer and smaller parts, and operator visibility is improved because there is no front axle obstructing the operator's view of the ground below. Accordingly, because both the way in which the disclosed tensioning means functions and the result thereby obtained are substantially different from [the accused infringer's] swing link system, I agree with the district court that no reasonable jury could have found them to be equivalent under the doctrine of equivalents."n126

[d]-- Aids to Interpretation: Function Definition; Corresponding Structure Identification.

The sources and guidelines for construing patent claims generally apply to the construction of Section 112/6 phrases.n127

In *Palumbo v. Don-Joy Co.* (1985),n128 the Federal Circuit noted that "[i]n construing a 'means plus function' claim, as also other types of claims, a number of factors may be considered, including the language of the claim, the patent specification, the prosecution history of the patent, other claims in the patent, and expert testimony."n129

Decisions adopt a two-step approach to interpreting means clauses.n130 The first step is to identify the function.n131 It is improper to" import functional limitations that are not recited in the claim, or structural limitations from the written description that are unnecessary to perform the claimed function."n132 Equally, it is improper to broaden the claimed function "by ignoring the clear limitations contained in the claim language."n133

The second step is identification of the corresponding structure in the specification.n134 An error in definition of the function in a means clause can lead to improper identification of the corresponding structure.n135

[i]-- Specification--Corresponding Structure.

The specification is an important tool for determining the meaning of words in any patent claim, including a Section 112/6 phrase.n136 With a Section 112/6 phrase, the specification performs an additional role in providing the description of the "corresponding structure, material, or acts", which is the measure for equivalency.n137

Adequate disclosure of a corresponding structure is critical to the validity of a claim with a means-plus-function or step-plus-function clause; without such structure, the claim will be deemed invalid for indefiniteness.n138

Determining the "corresponding" structure for carrying out the function indicated in a patent claim's Section 112/6 phrase may be a complex task when the patent's specification discloses a structure in varying levels of specificity or discloses multiple embodiments containing varying structure.n139

Federal Circuit decisions require that the specification "clearly link or associate" "definite" structure with the claimed function in order to constitute a corresponding structure.n140 One decision suggests that the clear-link-or--association requirement is not met even though an alleged alternative corresponding structure is *capable* of performing the defined function: whether a structure is capable of performing a recited function and whether there is a clear link or association between the function and the structure "are different inquiries with different consequences."n141 Another decision stressed that "[s]tructural features that do not actually perform the recited function do not constitute corresponding structure and thus do not serve as claim limitations.": "An electrical outlet enables a toaster to work, but the outlet is not for that reason considered part of the toaster. The corresponding structure to a function set forth in a means-plus-function limitation must actually perform the recited function, not merely enable the pertinent structure to operate as intended ... ."n142

In *R2 Medical Systems, Inc. v. Katecho, Inc.* (1996),n143 the Northern Illinois District Court noted:

"[A] 'means-plus-function' limitation is not limited to the equivalents of a single preferred structure. ... Rather, it is limited to the equivalents of any structures described therein necessary for carrying out the function. *See United States v. Telectronics, Inc., 857 F.2d 778, 782 (Fed. Cir. 1988), cert. denied, 490 U.S. 1046 (1989)* (defining means-plus-function limitation as including structural alternative presented in specification).

"In addition, a 'means-plus-function' limitation incorporates only the disclosed structure necessary to perform the specified function. *See General Elec. Co. v. U.S., 572 F.2d 745, 776 (Ct. Cl. 1978)* (refusing to incorporate elements into limitation from the specification not necessary for performing function); *see also Lockheed Aircraft Corp. v. U.S., 553 F.2d 69, 81 (Ct.Cl.1977)* ('a "means-plus-function" claim covers the structure necessary to perform the specified

function'). The function which defines the limitation is determined by the terms of the claim, not the specification. ..."n144

In *Sofamor Danek Group, Inc. v. DePuy-Motech, Inc.* (1996),n145 the patent at issue concerned a human spine deformity surgical implant device. The claim required a "body attaching means" for attaching the implant to a rod. The Federal Circuit held that the district court properly limited the claim to devices without a bulky locking screw but improperly limited it to devices that "use less than three parts to attach the rod to the spine."n146 The accused device had a locking screw and more than two parts.

"A resort to the ... specification discloses several disadvantages of the prior art of spine reformation technology. For example, the prior art included a 'multiplicity and complexity of the elements' resulting in 'awkward bulkiness'. ... To overcome these disadvantages, the ... patent disclosed only a threaded plug screwed into a 'female thread formed in the inner walls of the two side branches' of the attaching means. This simple structure ensured that the implant has 'minimum bulk.' ... This structure also had the virtue of reducing the parts compared to an implant 'provided with a plug and a separate locking screw.' ... Thus, the specification expressly excluded from the meaning of 'body attaching means' a structure with a separate locking screw. ... This description in the specification provides the structure to define the limits of 'body attaching means' in the patent."n147

In *Micro Chemical, Inc. v. Great Plains Chemical Co., Inc.* (1997),n148 the patented invention was a machine for adding "microingredients" to a liquid carrier to form a slurry to be sprayed on livestock or poultry feed. It included elements for isolating the sensitive weighing mechanism from vibrations caused by the mixing process. The patent's claim 1 required "isolating means for isolating said weighing means from influences affecting the weighing function of said weighing means so accurate weight determinations are obtained."n149 The patent's specification disclosed "three primary structures for achieving isolation of the weighing system: rubber base plates, a 'weigh frame' separate from the main frame, and an antisway bar attached to the weighing hopper for dampening transverse motions."n150 The accused device isolated "its weighing system by using a rigid mainframe rather than rubber base plates, silicon sealants rather than a separate 'weigh frame,' and compression mounting of the weighing hopper rather than antisway bars."n151 The patentee cited other structures that were present both in the specification and in the accused device but failed to prove that these structures performed the identical function (isolation) recited in the mean-plus-function claim limitation. The Federal Circuit rejected the patentee's argument "that the district court erred in requiring equivalents for all three primary disclosed structures in order to meet the isolating means limitation."n152

"According to [the patentee], the disclosed structures are alternatives; therefore an equivalent to any one of the structures is sufficient to meet the claim limitation. ... The district court analyzed all three accused structures, finding that none of them was equivalent to those disclosed in the patent. In particular, the district court stated, with our emphasis added, that '[n]one of these structures, either alone or in combination, can properly be considered "equivalent" under § 112(6).' The court thus found that the accused machines failed to contain an equivalent to any of the disclosed structures."n153

In *Fonar Corp. v. General Electric Co.* (1997),n154 the patent concerned magnetic resonance imaging (MRI) machines with multi-angle oblique ("MAO") imaging. The accused infringer argued that its accused scanner did not contain equivalent structure because it did not use a generic gradient waveform. The Federal Circuit held that the corresponding structure in the specification was a generic gradient waveform: although the specification stated that "other wave forms may be used, it fail[ed] to specifically identify those wave forms."n155 "An apparatus claim requires definite structure in the specification to support the function in a means clause."n156 Nevertheless, it affirmed a jury verdict that the accused device did contain equivalent structure and therefore infringed.

In *Ishida Co., Ltd. v. Taylor* (2000),n157 a Federal Circuit panel reviewed the issue of multiple embodiments as corresponding structure. It held that, when a patent's claim has a means-plus-function clause, the patent's specification sets forth multiple embodiments for carrying out the function, and some embodiments have "a basic structural element" that is missing from other embodiments, a court need not articulate a single claim interpretation that covers the multiple embodiments. In *Ishida*, the patent at issue concerned a food product packaging machine. The claim required "sealing and stripping" means. The patent specification set forth two alternative embodiments as structures for performing the sealing and stripping function. Both embodiments had sealing and stripping components mounted on an arm that rotated around a fixed axis. One had a cam track; the other did not. An accused device also had sealing and stripping components mounted on an arm, but it used computer control to change the axis of rotation and vary the trajectory. A district court granted summary judgment against infringement. The Federal Circuit affirmed, holding that the use of variability of movement instead of rotation around a fixed axis was not an insubstantial change. It rejected the patentee's

argument that "the district court should have crafted a single claim construction that would encompass all the embodiments of the invention as shown in the specification."

"After identifying the function of the claim element as 'stripping and sealing,' the district court consulted the specification to find the corresponding structure. The specification depicted two separate embodiments that performed the claimed function, and the two embodiments were structurally very different. The district court did not attempt to craft a single claim construction to cover both embodiments. The impossibility of such a task is exemplified by this technology, in which embodiment 1 of the ... patent features cam tracks, while embodiment 2 has no cam tracks. A single claim construction that would encompass all the illustrated embodiments of the invention would have had to be so broad as to describe systems both with and without such a basic structural element as a cam track. Thus, a rule requiring the district court to formulate a single claim interpretation in this case would defeat the notice function of claims, since a skilled artisan attempting, e.g., to design around the patent would have no way to know whether a single claim interpretation that encompassed both embodiments would include cam tracks or not. Thus, the claims would give no notice of their limits.

"This court has encountered means-plus-function elements in other patents that disclosed alternative structures for accomplishing the claimed function. *See Serrano v. Telular Corp., 111 F.3d 1578, 42 USPQ2d 1538 (Fed. Cir. 1997).* In *Serrano*, this court determined that the district court had erroneously limited the structure corresponding to the claimed function to only one of the alternative structures in the specification. *Serrano* states that proper application of § *112 P 6* generally reads the claim element to embrace distinct and alternative described structures for performing the claimed function. Specifically, '[d]isclosed structure includes that which is described in a patent specification, including any alternative structures identified.' *Id.* at 1583; *see also Micro Chem., Inc. v. Great Plains Chem. Co., 194 F.3d 1250, 1258-1259, 52 USPQ2d 1258, 1264 (Fed. Cir. 1999).* Neither *Serrano* nor *Micro Chemical* requires the district court to formulate a single claim interpretation to cover multiple embodiments. Rather, § *112 P 6* requires only identification of the structure, or structures, in the specification that perform the recited function... .

"The trial court did not err by declining the invitation to articulate a single claim interpretation consonant with all structures in the specification corresponding to claimed functions. The district court properly identified 'the corresponding structure[s]' for each embodiment as required by § *112 P 6* by repeating in words the structures that the patentee had himself already defined in words and pictures."n158

In *Ethicon, Inc. v. United States Surgical Corp.* (1998),n159 the court held that an omitted inventor made an inventive contribution to one claim in a patent obtained by another inventor. The claim contained a "means-plus-function" limitation, and the omitted inventor contributed one of two alternative structures disclosed in the specification for performing the claimed function: "[A]pplying section 112, paragraph 6 to interpret this claim, the language adopted the two structures in the specification to define the means for detaining. ... The contributor of any disclosed means of a means-plus-function claim element is a joint inventor as to that claim, unless one asserting sole inventorship can show that the contribution of that means was simply a reduction to practice of the sole inventor's broader concept. *See Sewall, 21 F.3d at 416* (holding that the designer of one disclosed means was not a joint inventor)."n160

In *Dawn Equipment Co. v. Kentucky Farms, Inc.* (1998),n161 the court found it unnecessary to resolve a dispute concerning which features in a patent's specification corresponded to a "means" clause. The parties disputed whether the corresponding specification structure for a claim clause requiring "means for locking ... and for selectively releasing" included a handle as well a rotatable shaft, pin and slot. The court held that even if, as the patentee contended and the district court held, the corresponding structure included only the shaft, pin, and slot, the accused device cannot not infringe under the doctrine of equivalents, as the jury found, because the specification and accused devices are "structurally quite different" and "operate quite differently" and there is "damning evidence" in the specification that suggests that the accused device is not equivalent because it does not overcome the problems of prior art devices. Including the handle in the means would only provide an additional reason for noninfringement.n162

In *Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc.* (1998),n163 the Federal Circuit held that, for a patent claim to an apparatus for cutting concrete that required "means" for performing the function of supporting the concrete to prevent damage, the "corresponding structure" in the patent's specification was not its reference to a "support surface or plate", which described the function in question, but rather a skid plate, which was the only embodiment of the "support surface" described in the specification. On the other hand, the corresponding structure did not include "the details of the preferred skid plate, more particularly defining the structure in ways unrelated to the recited function. These additional structural aspects are not what the statute contemplates as structure corresponding to the recited function."n164

In *Signtech USA, Ltd. v. Vutek, Inc.* (1999),n165 the court held that a patent claim with a means clause limited its scope to the structure of the preferred embodiment, which contained both of two novel features.n166 The patent concerned an ink jet printer sprayhead. It disclosed two novel features for the sprayhead: dual-sided mirror printing, and dual air sources for continuously cleaning the sprayhead during printing.n167 The claim required an "ink delivery means."n168 An accused infringer's printer used one of the novel features but not the other, having dual-sided mirror printing but only a single air source, the latter being as disclosed in the accused infringer's own prior patent. The corresponding structure performing the function of the means clause, i.e., ink delivery, was the dual air source structure of the patent's preferred embodiment. Accordingly, the court held that the claim was limited to devices contained dual air sources as well as the dual-sided mirror printing and, therefore, was not infringed by the accused device. That the claimed "means" was limited to dual air source ink delivery was supported not only by the preferred embodiment but also by the patent's "background" and "summary of invention" sections, which emphasized that two air source could prevent ink clogging, unlike a prior art patent that described the accused structure.n169 The patentee pointed to an alternative embodiment in the specification that lacked the dual air source feature, but that alternative was significantly different from the accused printer.n170 The prosecution history did not "redeem" the patentee's choice of claim language.n171 The court, in effect, acknowledged that its claim construction provided the patentee with coverage of less than it had invented: "[T]his decision, like many others emanating from this court, *see Sage*, ... emphasizes the importance of careful language choices in the specification and, particularly, in the claims. To avoid having its claims limited to exclude the embodiments disclaimed in the specification, the claim drafter for this patent might have chosen language to avoid application of *35 U.S.C. § 112,* P 6. Otherwise, assuming that no intervening statutory bars had arisen, [the patentee] could have filed a new application directed toward the ... invention without limitation in the specification or claims to the dual air sources."n172

In *Smiths Industries Medical Systems, Inc. v. Vital Signs, Inc.* (1999),n173 the patent concerned a manual resuscitator with three main elements, a mask, a directional valve, and a squeezebag for directing air to and from a patient. The resuscitator operated in three modes (force inhalation, exhalation, and spontaneous breathing). The claims required "means for *supplying gas* having a hollow interior and first and second openings at opposite ends thereof."n174 A majority of a Federal Circuit panel, held that a district court correctly identified the corresponding structure for the means clause. The corresponding structure was the "squeezebag"--not a "generic" squeezebag, but rather the specific "double-entry" squeeze bag set forth in the detailed description of the invention. But the district court misconstrued the function in the disputed "means" clause, erroneously reading in a limitation (supplying gas "under pressure" rather than merely supplying gas). Because of this error, the case must be remanded for a new determination of equivalency. The majority noted that the specification described the squeezebag as having three characteristics, which "inform how [it] is a 'means for supplying gas' ":n175 as a flexible bag that can be squeezed to provide pressure, as a hollow structure for passing gas to a patient, and as a reservoir for collecting gas. Dissenting, Judge Lourie agreed that the district court had erred in construing the claimed function but argued that a noninfringement judgment should be affirmed without a remand because the subject matter was "readily understandable" and there clearly was no equivalent structure performing the function in any of the three accused devices.n176 Judge Lourie disagreed with the majority's focus on the corresponding structure's "characteristics": "all three 'characteristics' relate to but one structure: the squeeze bag disclosed in the patent. Section 112, P 6, directs consideration to whether an element of an accused device is the same or structurally equivalent to the disclosed *structure* which corresponds to the claimed function, not to the *operative characteristics* of the disclosed structure. [The patentee] should not be able to ignore the structural characteristics of the squeeze bag and focus on its function."n177

In *Odetics, Inc. v. Storage Technology Corp.* (1999),n178 a Federal Circuit panel majority held that Section 112/6 equivalency is to be determined by reference to the corresponding structure "as a whole" and not on a "component-by-component" basis.

"The individual components, if any, of an overall structure that corresponds to the claimed function are not claim limitations. Rather, the claim limitation is the overall structure corresponding to the claimed function. This is why structures with different numbers of parts may still be equivalent under § 112, P 6, thereby meeting the claim limitation. *See, e.g., Al-Site, 174 F.3d at 1321-22, 50 USPQ2d at 1169* (upholding jury verdict of § 112, P 6 equivalence between 'a mechanically-fastened loop ... includ[ing] either the rivet fastener or the button and hole fastener' and 'holes in the arms [of an eyeglass banger tag]'). The appropriate degree of specificity is provided by the statute itself; the relevant structure is that which 'corresponds' to the claimed function. *See, e.g., Chiuminatta, 145 F.3d at 1308-09, 46 USPQ2d at 1756* (structure 'unrelated to the recited function' disclosed in the patent is irrelevant to § 112, P 6); *Valmont, 983 F.2d at 1044, 25 USPQ2d at 1455* (identifying structure referring to the claimed function). Further deconstruction or parsing is incorrect."n179

In *WMS Gaming Inc. v. International Game Technology* (1999),n180 the Federal Circuit noted that "[i]n a means-plus-function claim in which the disclosed structure is a computer, or microprocessor, programmed to carry out an algorithm, the disclosed structure is not the general purpose computer, but rather the special purpose computer programmed to perform the disclosed algorithm."n181

"The structure of a microprocessor programmed to carry out an algorithm is limited by the disclosed algorithm. A general purpose computer, or microprocessor, programmed to carry out an algorithm creates 'a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software.' *In re Alappat, 33 F.3d 1526, 1545, 31 USPQ2d 1545, 1558 (Fed. Cir.1994)* (en banc); *see In re Bernhart, ... 417 F.2d 1395, 1399-1400, 163 USPQ 611, 615-16 (CCPA 1969)* ('[I]f a machine is programmed in a certain new and unobvious way, it is physically different from the machine without that program; its memory elements are differently arranged.'). The instructions of the software program that carry out the algorithm electrically change the general purpose computer by creating electrical paths within the device. These electrical paths create a special purpose machine for carrying out the particular algorithm."n182

In *Kemco Sales, Inc. v. Control Papers Company, Inc.* (2000),n183 the patent at issue concerned a plastic security envelope that is "tamper-evident", that is, it indicates whether someone has opened and resealed the envelope. The envelope used two sealing means, a primary closer and a tamper indicator. The asserted claims (1 and 19) required a "plastic envelope closing means." An accused envelope used two sealing means as with the patented invention but had two flaps ("lips") that sealed together with an internal adhesive rather than a flap that folded over the opening. A district court granted summary judgment of noninfringment, finding that (1) "the structure associated with the closing means is a flap that folds over the opening and is secured to one or more of the outside panels of the envelope,"n184 and (2) "no reasonable jury could find that the [accused device] literally infringes [the] claim ... as the dual-lip structure that closes the [accused device] is not identical to, or an equivalent of, a fold-over flap."n185 On appeal, the patent's owner argued that the district court misconstrued the claim because (1) the function is simply closing and does not include folding over, and (2) "the corresponding structure is simply a plastic flap extending beyond the side seals of the envelope pocket to which it is attached."n186 The Federal Circuit disagreed. "Closing" had its common meaning of sealing. In the specification, a fold-over flap structure was shown in both principal embodiments and in an alternative embodiment.

[ii]-- Other Claims--Claim Differentiation.

Decisions address the extent to which a non-means limitation in a claim, which is dependent on an independent claim with a means limitation, and which specifically defines the class of structures corresponding to the "means," can support a broadening construction of the "means" in the independent claim.n187

A simple example illustrates the issue. Assume that a patent's claim 1 is to a "means" for fastening. Claim 2 states that "said means" comprises a nail. The patent's specification discloses a nail as the corresponding structure for carrying out the fastening function. The patent's owner may argue that the "means" in claim 1 must extend beyond a nail or an equivalent of a nail because, otherwise, claim 1 and claim 2 would be identical in scope, which would violate the doctrine of claim differentiation.

In *Laitram Corp. v. Rexnord, Inc.* (1991),n188 the court held that Section 112(6)'s interpretation rule that "means" be limited to equivalents of specification-disclosed corresponding structure overrides claim differentiation. The patent claimed a conveyer belt consisting of plastic modules pivotally connected at their link ends, which "allows smooth transfer of containers to and from the head and tail ends of a conveyor via a transfer comb."n189 The claim required, inter alia:

Subparagraph 1: "a plurality of like modules", each including "first and second like *pluralities of link ends* of substantially identical width", each end circumscribing "a pivotal hole through said width" (Emphasis added); and

Subparagraph 2: "*means for joining said pluralities* to one another so that the axes of said holes of said first plurality are arranged coaxially, the axes of said holes of said second plurality are arranged coaxially and the axes of respective holes of both pluralities of link ends are substantially parallel." (Emphasis added.)n190

The patent's specification described the link end joining means as follows: "All of the link-like elements of a module are joined as a unit by at least one and preferably a pair of *spaced cross-members* ... formed integrally with connection sections ... to form a rigid structure."n191 The illustrated structure formed an "H-shaped" grid. The accused structure had a "V-shape" or squared zig-zag configuration and lacked a cross member joining the link ends. The district court

found infringement. The patentee argued that claim differentiation prevented limiting the claimed "means" to cross members because claim 24, which is dependent upon the claim in suit, specifically required a cross member.n192 The court disagreed.

"... [T]he interpretation of the 'means for joining' to include a cross member comes from the specification via section 112(6), not from claim 24. Thus, the prohibition against reading limitations from a dependent claim into the independent claim is not violated ... . [T]he judicially developed guide to claim interpretation known as 'claim differentiation' cannot override the statute. A means-plus-function limitation is not made open-ended by the presence of another claim specifically claiming the disclosed structure which underlies the means clause or an equivalent of that structure ... . The patentee's argument, if adopted, would provide a convenient way of avoiding the express mandate of section 112(6) ... . [O]ne cannot escape that mandate by merely adding a claim or claims specifically reciting such structure or structures."n193

Further, applying the Section 112 equivalency test to claim 21 did not give claims 21 and 24 "exactly the same scope and, thus, claim differentiation is maintained.": "Claim 21 remains broader than claim 24. *Literally*, claim 21 covers the structure described in the specification *and equivalents* thereof ... . Dependent claim 24 does not *literally* cover equivalents of cross members."n194

In *IMS Technology Inc. v. Haas Automation Inc.* (2000),n195 the Federal Circuit rejected a patent owner's attempt to use claim differentiation to broaden a means-plus-function clause in a patent's claim 1 by limiting the recited functions and corresponding structures. The patent concerned numerical control of a machine tool, which cuts material from a workpiece. In the prior art, programmers worked in a location remote from a machine tool and created a program by using blueprints of objects. The invention disclosed in the patent permitted interactive programming of the machine tool by an operator on a machine shop floor. The patent's claims required an "interface means" for performing two functions: *transferring* a control program and control parameters from an external medium to an alterable memory and *recording* a control parameter onto an external memory. The patent's specification disclosed a *tape cassette* for recording the control program and control parameters and transferring them to the alterable memory (random access memory ("RAM")). An accused device used a *floppy disk* drive for recording and transferring parameters. The court held that, properly interpreted, the structure corresponding to the "means" for performing the two functions in the patent's specification was a PIA (peripheral interface adapter) *and* the tape cassette transport. The specification associated *both* the PIA and cassette transport with the functions. Thus, the corresponding structure was not, as the patentee argued, only the PIA interface, of which, as an accused infringer conceded, an accused device had an equivalent. The court rejected the patent owner's "argument that the doctrine of claim differentiation requires that the corresponding structure of the interface means of claim 1 be limited to the disclosed PIA."n196 The patent owner relied on dependent claims 2 and 3, noting that (1) "the interface means [in claim 1] cannot be limited to a means for 'reading' and 'writing' because claim 2, which depends from claim 1, places that additional limitation on the interface means: 'said interface means includes means for reading from and writing onto a magnetic stored information input',"n197 and (2) "the 'interface means' cannot be limited to a tape cassette transport because claim 3, which depends from claim 2, specifically claims a tape cassette transport as the means for reading and writing."n198 The court noted that dependent claims 2 and 3 were narrower in scope than claim 1 and, in any event, that it was possible that the claims, properly interpreted under Section 112/6, have "similar scope."

"The scope of claim 3 is clearly narrower than that of claim 1 because claim 3 covers only a tape cassette transport, whereas claim 1 covers a tape cassette transport and its equivalents in accordance with § 112, *P 6. See Laitram Corp. v. Rexnord, Inc., 939 F.2d 1533, 1538, 19 USPQ2d 1367, 1371 (Fed. Cir. 1991)* (holding that claim differentiation is maintained when the disclosed structure corresponding to an independent § 112, P 6 claim is recited in a dependent claim). The scope of claim 2 is also narrower than that of claim 1, at least because it limits the external medium to a magnetic stored information input.

"Furthermore, the proper claim construction does not give the same meaning to 'recording' in claim 1 and to 'writing' in claim 2 as [the patentee] contends. Rather, the 'reading' and 'writing' functions in claim 2 are the parts of the 'transferring' and 'recording' functions of the 'interface means' that are performed by the disclosed tape cassette transport, rather than the PIA. In any event, it is permissible for claim 1 and claim 2 to have similar scope after each is correctly construed in light of the structures disclosed in the written description, because the judicially-created doctrine of claim differentiation cannot override the statutory mandate of § 112, P 6. *See* [*Laitram Corp. v. Rexnord, Inc., 939 F.2d 1533, 1538, 19 USPQ2d 1367, 1371 (Fed. Cir. 1991)]* (noting that claim differentiation is a guide, not a rigid rule)."n199

In *Wenger Manufacturing, Inc. v. Coating Machinery Systems, Inc.* (2001),n200 the court distinguished *Laitram*, noting that "the examination of other claims in a patent may provide guidance and context for interpreting a disputed means-plus-function limitation, especially if they recite additional functions."n201

"Although the judicially created doctrine of claim differentiation cannot override the statutory requirements of § 112, P 6, *Laitram Corp. v. Rexnord, Inc., 939 F.2d 1533, 1538, 19 USPQ2d 1367, 1371 (Fed. Cir. 1991),* it does not necessarily follow that means-plus-function limitations must be interpreted without regard to other claims. ... *Laitram* held that the stringencies of a means-plus-function limitation are not to be avoided by the mere addition of a dependent claim that recites the corresponding structure disclosed in the specification, [but] *Laitram* does not stand for the broader proposition suggested by [the accused infringer], *viz.*, that a means-plus-function limitation must be interpreted without regard to other claims."n202

In *Wenger*, the patent at issue concerned an apparatus for drying and coating food products.n203 The patent's independent claim 1 required, inter alia, "air circulating means associated with [a] dryer housing for circulating air through [a] reel, the air circulating means including means for drawing air from the interior of the reel into said housing in order to provide positive air flow through the apparatus." Dependent claim 3 provided for "means for exhausting a first portion of said air ... and *recirculated* a second portion of said air." The Federal Circuit held that, properly interpreted, "circulating" in claim 1 does not require that air be recirculated through the reel. The ordinary meaning of "circulate" does not require recirculation. The patent's specification indicates that recirculating the air is a function in addition to that of circulating and is a feature of the preferred embodiment. This interpretation was further supported by a consideration of the dependent claim 3 under the doctrine of claim differentiation: "Because claim 3 recites a separate and distinct function (*i.e.*, 'recirculating'), one that is not recited in claim 1, the doctrine of claim differentiation indicates that these claims are presumptively different in scope."n204

[iii]-- Prosecution History.

A patent's prosecution history "is relevant to the construction of a claim written in means-plus-function form."n205

In *Biodex Corp. v. Loredan Biomedical, Inc.* (1991),n206 the Federal Circuit held that the district court did not commit reversible error in refusing to give the following instruction on infringement of a patent claim containing a means-plus-function limitation: "However, you should note that the doctrine of prosecution history estoppel has no applicability whatsoever if the plain language of the claims reads on an accused device for then infringement exists."n207

"... In the context of the defense in this case, the proposed jury instruction would have been misleading ... .

"... [T]his Court has specifically cautioned against reading means-plus-function limitations to cover all possible means that perform the recited function. ... A 'literal' construction of such a limitation may encompass only the disclosed structure and its equivalents. Thus, the 'plain meaning' of such a claim, without resort to limiting features contained in the specification, the prosecution history, and a factual inquiry into equivalents, might create an erroneously broad scope."n208

In *Alpex Computer Corp. v. Nintendo Co. Ltd.* (1996),n209 the Federal Circuit discussed the role of prosecution history in interpreting means clauses and determining the scope of equivalence, emphasizing that "[j]ust as prosecution history estoppel may act to estop an equivalence argument under the doctrine of equivalents, positions taken before the PTO may bar an inconsistent position on claim construction under § 112, P 6."n210 It held that a patentee's statements during prosecution distinguishing the system disclosed in its patent specification from that of a prior art reference precluded a finding that the accused system is an equivalent of that disclosed in the patent for purposes of applying a "means-plus-function" limitation in the patent claim in suit, even though the patentee's statements were directed to other claims.n211

[iv]-- Prior Art.

The prior art may serve as a tool for determining the meaning of words in a patent claim,n212 and there is no reason why prior art should not perform the same role in interpreting language in a Section 112/6 phrase.

The prior art also operates a restraint on the scope of protection under the doctrine of equivalents. In *Intel Corp. v. U.S. Int'l Trade Comm'n* (1991),n213 the court stressed that with Section 112 means equivalency, unlike the doctrine of equivalents,n214 "it is not necessary to consider the prior art in applying section 112, P 6."n215

"... Even if the prior art discloses the same or an equivalent structure, the claim will not be limited in scope thereby. It is only necessary to determine what is an equivalent to the structure disclosed in the specification which is performing the function at issue ... . Claim limitations may, and often do, read on the prior art, particularly in combination patents ... .

"... [U]nder § 112, P 6, the aids for determining a structural equivalent to the structure disclosed in the patent specification are the same as those used in interpreting any other type of claim language, namely, the specification, the prosecution history, other claims in the patent, and expert testimony."n216

In *Clearstream Wastewater Systems Inc. v. Hydro-Action Inc.* (2000),n217 the Federal Circuit stressed that a structure described in a patent's specification as prior art can, despite that description, constitute structure corresponding to a means clause. The means clause at issue was not the only "point of novelty" in the claim, which was to a combination, and the specification did not indicate that the prior art structure was inoperable or should not be used in the claimed invention. The patent at issue, U.S. Pat. No. 5,221,470, concerned a wastewater treatment system. The patent's claims 1 and 4 required "means" for "injecting air" or "aerating." The patent's specification disclosed, as one novel feature, a "flexible air hose" structure for carrying out the injecting and aerating functions; it also disclosed a "rigid-conduit" structure, which was used in the prior art.n218 The specification also disclosed a novel filtering system. The accused device used the prior art "rigid-conduit" structure. Granting summary judgment of noninfringement, a district court held that "because the patent discloses the disadvantages of the prior art, rigid-conduit structure and reveals inventive features, such as the flexible-hose, that are meant to overcome those disadvantages, then the prior art structure could not be considered a supporting structure or its equivalent for purposes of *35 U.S.C. § 112,* P 6 (1994)."n219 It "concluded that because the ... patent teaches away from the rigid-conduit structure of the prior art in favor of the flexible-hose configuration, [the] accused plant, which uses the prior art structure, does not contain all the elements of claims 1, 3, 4, or 7, or their equivalents."n220 The Federal Circuit reversed, holding that the district court's claim construction of the means clause was erroneous. The corresponding structure included *both* the flexible hose structure and the rigid conduit structure. It stressed that the claims at issue were "combination claims."

"It is not disputed that both corresponding structures are adequately described in the written description. The only issue in dispute is whether, for purposes of claim construction, both structures should be considered corresponding structures for the disputed means-plus-function language.

"In construing the disputed claim limitations, it must be kept in mind that the claims at issue in this case are combination claims. Combination claims can consist of new combinations of old elements or combinations of new and old elements. *See Intel Corp. v. U.S. Int'l Trade Comm., 946 F.2d 821, 842, 20 USPQ2d 1161, 1179 (Fed. Cir. 1991); Panduit Corp. v. Dennison Mfg., 810 F.2d 1561, 1575, 1 USPQ2d 1593, 1603 (Fed. Cir. 1987).* Because old elements are part of these combination claims, claim limitations may, and often do, read on the prior art. ...

"Clearly, the written description does point out the disadvantages of the rigid-conduit system and the advantages of the flexible-hose system. However, the written description does not require that only the new, flexible-hose system, but not the old, rigid-conduit system, could be used in the claimed wastewater treatment plant. It is well established in patent law that a claim may consist of all old elements, such as the rigid-conduit system, for it may be that the combination of the old elements is novel and patentable. Similarly, it is well established that a claim may consist of all old elements and one new element, thereby being patentable."n221

The Federal Circuit noted that "[t]here are certain situations in which a means-plus-function limitation in a combination claim will be construed to cover only new elements,"n222 but, unlike decisions such as *Signtech v. Vutek* (1999)n223 and *Sofarmore Danek v. DePuy-Motech* (1996),n224 this was not such a situation.

"[The accused infringer] argued and the district court concluded that this was ... a case in which claim limitations could not read on the prior art because the written description taught away from the prior art. In reaching its conclusion, the district court relied on several cases that so hold, but that are distinguishable in important respects. ... In *Signtech*, a specific prior art structure was described in the written description as 'incapable' of performing the function of the means-plus-function element. Thus, the claim was construed so that it did not cover that specific prior art structure.

However, the *Signtech* court noted that the claim could indeed cover alternative embodiments described in the written description, just not the particular prior art structure that was 'incapable' of performing the appropriate function.

"In the case at hand, nothing in the written description indicates that the rigid-conduit system cannot perform the functions of 'injecting air' or 'aerating.' In fact, the written description explains that the rigid-conduit system is the typical manner in which 'injecting air' or 'aerating' is accomplished. Thus, *Signtech* does not support a reading that the disputed means-plus-function clause necessarily excludes prior art since the prior art was described as being capable of performing the function of the means-plus- function limitation.

"Similarly, another case upon which the district court and [the accused infringer] rely, *Sofamor Danek ...* , does not support that the disputed means limitations do not cover the prior art, rigid-conduit structure. In *Sofamor*, the means-plus-function element was the only new element in the claim for a non-novel combination. Because the combination was not novel and none of the other elements of the claim were novel, it was proper for the claim to be construed such that the means-plus-function element covered only the novel corresponding structure in the written description.

"In contrast, in the case at hand, the means-plus-function elements for the aerating system are not the only points of novelty. The new filtering system is also novel. In fact, all the asserted claims contain an element covering the new filtering system. Essentially, when read in their entirety, claims 1 and 4 cover a wastewater treatment plant that has a new filtering system and that may or may not have the new, flexible-hose system. Thus, it was error for the district court to conclude that the means limitations for the aerating system could only cover new elements of the preferred embodiment. *See Micro Chemical, Inc. v. Great Plains, 194 F.3d 1250, 52 USPQ2d 1258 (Fed. Cir. 1999)* (holding district court erroneously overlooked alternative embodiments of the invention when it concluded that the means-plus function clause could only cover the structure of the preferred embodiment).

"Other cases cited by the district court and [the accused infringer] are inapposite because they deal almost exclusively with the doctrine of equivalents, not with means-plus-function equivalency. In summary, the cases cited by [the accused infringer] to support a limited reading of the means-plus-function claim are either distinguishable or inapposite."n225

Including both structures was supported by claim differentiation: "While claim 4 does not specify what type of aerating system is to be used, claim 5, which is dependent on claim 4, specifies that flexible-hoses be used inside the rigid-conduits. Under the doctrine of claim differentiation, the flexible-tube limitation of claim 5 should not be read into claim 4."n226 Such inclusion was also supported by the prosecution: "The communications between the patent attorney and the PTO indicate that the point of novelty for claims 1 and 4 was the new filtering system."n227

[e]-- Expressions Subject to Section 112.

Court decisions address the issue of what claim language evokes the statutory equivalency construction rule.n228 The decisions suggest that, on the one hand, not all phrases using the word "means" are governed by Section 112/6 but, on the other hand, phrases other than "means" may be so governed.

A line of Federal Circuit decisions recognizes twin presumptions on Section 112/6's applicability.n229 They recognize a rebuttable presumption that Section 112/6 applies to a phrase that uses the word "means"; the presumption is rebutted if the claim phrase sufficiently recites definite structure for performing the functionn230 or recites no function.n231 The decisions also recognize a rebuttable presumption that Section 112/6 does not apply to a phrase that does not use the word "means"; the presumption is rebutted if the claim phrase is functional, does not have a "reasonably well understood meaning in the art," and does not recite sufficient structure for performing the structure.n232

[i]-- Recitation of Additional Structure.

In *Laitram Corp. v. Rexnord, Inc.* (1991),n233 the court held that Section 112(6)'s interpretation rule that "means" be limited to equivalents of specification-disclosed corresponding structure applies to means-plus-function clauses that recite some structure. The patent claimed a conveyer belt consisting of plastic modules pivotally connected at their link ends, which "allows smooth transfer of containers to and from the head and tail ends of a conveyor via a transfer comb."n234 The claim required, inter alia:

Subparagraph 1: "a plurality of like modules", each including "first and second like *pluralities of link ends* of substantially identical width", each end circumscribing "a pivotal hole through said width" (Emphasis added); and

Subparagraph 2: "*means for joining said pluralities* to one another so that the axes of said holes of said first plurality are arranged coaxially, the axes of said holes of said second plurality are arranged coaxially and the axes of respective holes of both pluralities of link ends are substantially parallel." (Emphasis added.)n235

The patent's specification described the link end joining means as follows: "All of the link-like elements of a module are joined as a unit by at least one and preferably a pair of *spaced cross-members* ... formed integrally with connection sections ... to form a rigid structure."n236 The illustrated structure formed an "H-shaped" grid. The accused structure had a "V-shape" or squared zig-zag configuration and lacks a cross member joining the link ends. The district court found infringement. The Federal Circuit reversed, holding that "The district court ... erred, as a matter of law, by not interpreting subparagraph 2 of claim 21 in accordance with section 112(6) and in holding that this limitation was met merely because there was some means in the accused device that performed the stated function."n237

"The recitation of some structure in a means plus function element does not preclude the applicability of section 112(6). For example, in this case, the structural description in the joining means clause merely serves to further specify the function of that means. The recited structure tells only what the means-for-joining does, not what it is structurally."n238

[ii]-- Presence or Absence of the Word "Means."

In *Greenberg v. Ethicon Endo-Surgery, Inc.* (1996),n239 the Federal Circuit held that the phrase "detent mechanism" in a patent claim was not a Section 112 "means-plus-function" limitation.n240

Reversing, the Federal Circuit held that neither factor justified "treating the claim language at issue in this case as falling within the purview of section 112(6)." First, "that a particular mechanism--here 'detent mechanism'--is defined in functional terms is not sufficient to convert a claim element containing that term into a 'means for performing a specified function' within the meaning of section 112(6)."n241

"The question whether a claim element triggers section 112(6) is ordinarily not a difficult one. Claim drafters conventionally use the preface 'means for' (or 'step for') when they intend to invoke section 112(6), and there is therefore seldom any confusion about whether section 112(6) applies to a particular element. In this case, the pertinent claim language ('detent mechanism defining the conjoint rotation of said shafts ...') is not in 'means plus function' form. ...

. ...

"... Section 112(6) provides that an element in a claim for a combination 'may be expressed' as a means for performing a function, which indicates that the patentee is afforded the option of using the means-plus-function format. The question then is whether, in the selection of claim language, the patentee must be taken to have exercised that option.

. ...

"We do not mean to suggest that section 112(6) is triggered only if the claim uses the word 'means.' The Patent and Trademark Office has rejected the argument that only the term 'means' will invoke section 112(6), *see 1162 O.G. 59 n. 2* (May 17, 1994), and we agree, *see Raytheon Co. v. Roper Corp., 724 F.2d 951, 957, 220 USPQ 592, 597 (Fed. Cir. 1983)* ... (construing functional language introduced by 'so that' to be equivalent to 'means for' claim language). Nonetheless, the use of the term 'means' has come to be so closely associated with 'means-plus-function' claiming that it is fair to say that the use of the term 'means' (particularly as used in the phrase 'means for') generally invokes section 112(6) and that the use of a different formulation generally does not."n242

Two 1996 Federal Circuit decisions reached opposing conclusions on whether use of the word "means" creates a "presumption" that the claim phrase is a "means-plus-function" claim.n243 In *York Products, Inc. v. Central Tractor Farm & Family Center* (1996),n244 the court held that a claim phrase that uses "means" but does not link the "means" to function but, rather, recites structure, is construed "without reference to section 112, P 6."

"In determining whether to apply the statutory procedures of section 112, P 6, the use of the word 'means' triggers a presumption that the inventor used this term advisedly to invoke the statutory mandates for means-plus-function clauses. *35 U.S.C. § 112,* P 6 (1994); *see Greenberg v. Ethicon Endo-Surgery, Inc.* ... (Fed. Cir. 1996). Nonetheless, mere incantation of the word 'means' in a clause reciting predominantly structure cannot evoke section 112, P 6. *See, e.g., AMP Inc. v. Fujitsu Microelectronics Inc., 853 F. Supp. 808, 820-21, 31 USPQ2d 1705, 1712 (M.D. Pa. 1994)* (despite use of the term 'means,' claims were not means-plus-function); *Waterloo Furniture Components, Ltd. v. Haworth, Inc., 798 F. Supp. 489, 494, 25 USPQ2d 1138, 1142 (N.D. Ill. 1992)* (holding 'that the use of the word "means" in a claim does not as a matter of law refer to an element expressed in means-plus-function form'). Conversely, '[t]he recitation of some structure in a means plus function element does not preclude the applicability of section 112(6).' *Laitram Corp. v. Rexnord, Inc.* ... (Fed. Cir. 1991)."n245

In *Cole v. Kimberly-Clark Corp.* (1996),n246 the court held that a "means" phrase that recited function as well as structure was nonetheless not subject to Section 112 because it recited "definite structure."

"To invoke this statute, the alleged means-plus-function claim element must not recite a definite structure which performs the described function. Patent drafters conventionally achieved this by using only the words 'means for' followed by a recitation of the function performed. Merely because a named element of a patent claim is followed by the word 'means,' however, does not automatically make that element a 'means-plus- function' element under *35 U.S.C. § 112,* P 6. *Laitram Corp. v. Rexnord, Inc.* ... creates no presumption to the contrary. The converse is also true; merely because an element does not include the word 'means' does not automatically prevent that element from being construed as a means-plus-function element. *See, e.g., Raytheon Co. v. Roper Corp., 724 F.2d 951, 957, 220 USPQ 592, 597 (Fed. Cir. 1983)* (construing functional language introduced by 'so that' to be equivalent to 'means for' claim language) ...; *1162 O.G. 59, 59 (17 May 1994)* (examination guidelines stating that the term 'means' is not required to invoke § 112, P 6). We decide on an element-by-element basis, based upon the patent and its prosecution history, whether § 112, P 6 applies. *See Palumbo, 762 F.2d at 975, 226 USPQ at 8 (Fed. Cir. 1985)* (courts should consider prosecution history when construing 'means-plus-function' claims)."n247

In *Cole*, Judge Rader, author of the *York Products* opinion, dissented, arguing that the *Cole* majority failed to give credence to the presumption, suggested in *Laitram* and reiterated in *York Products*, that a recitation of "means" evokes Section 112.n248

Subsequent Federal Circuit decisions confirmed that use (or nonuse) of the word "means" in a claim phrase creates a rebuttable presumption that the phrase is (or is not) subject to Section 112/6.n249

In *Sage Products, Inc. v. Devon Industries, Inc.* (1997),n250 the court held that means phrases in two claims--"closure means" and "movable closure means"--invoked "means-plus-function treatment."

"The use of the word 'means,' which is part of the classic template for functional claim elements, gives rise to 'a presumption that the inventor used the term advisedly to invoke the statutory mandates for means-plus-function clauses.' *York Prods.* ...; *see also Greenberg v. Ethicon Endo-Surgery, Inc.* ... (Fed. Cir. 1996). ... [T]he presumption is not conclusive. For example, where a claim uses the word 'means,' but specifies no corresponding function for the 'means,' it does not implicate section 112. *See, e.g., York Prods.* ... (construing 'means' in claim without reference to section 112, paragraph 6). Likewise, where a claim recites a function, but then goes on to elaborate sufficient structure, material, or acts within the claim itself to perform entirely the recited function, the claim is not in means-plus-function format. *See, e.g., Cole v. Kimberly-Clark Corp.* ... (Fed. Cir. 1996). ...

"In the present case, the 'closure means' of claim 1 and the 'movable closure means' of claim 10 use the word 'means' and, thereby, presumptively implicate section 112, paragraph 6. Both claims recite a function for the 'means'--that is, closing the slot means. They also require that the closure means perform the additional functions of 'controlling access' to the slot (claim 1) or being 'selectively movable between an open access and closed access position' (claim 10). Neither claim explicitly recites the structure, material, or acts needed to perform these functions. Thus, the means-plus-function limitations invoke the interpretation regimens of section 112, paragraph 6."n251

In *Mas-Hamilton Group v. LaGard, Inc.* (1998),n252 the court held that two phrases in claims in a patent concerning an electronic lock--"lever moving element" and "movable link member for holding ... and for releasing"--were subject to Section 112, paragraph's restriction to equivalency even though neither phrase used the word "means." The claims containing the two phrases were not infringed, literally or under the doctrine of equivalents, because the

structure in the accused device, a stepper motor, was not structurally equivalent to, and did not perform in the same way as, the corresponding structure in the patent's specification, a solenoid.

With regard to the "lever moving element" phrase, the patentee relied on *Greenberg* and *Ethicon Endo-Surgery, Inc.* "for the proposition that if the claim does not use 'means for' followed by a statement of function, one should presume that the claim does not invoke section 112, P 6"n253 and argued that "a 'lever moving element' is a known structure in the lock art. ..."n254 The court disagreed. The presumption "is helpful in beginning the claim construction analysis, [but] it is not the end of the inquiry."n255 The recited language "does not provide any structure. The limitation is drafted as a function to be performed rather than definite structure or materials."n256

"If we accepted [the patentee's] argument that we should not apply section 112, P 6, a 'moving element' could be any device that can cause the lever to move. [The patentee's] claim, however, cannot be construed so broadly to cover every conceivable way or means to perform the function of moving a lever, and there is no structure recited in the limitation that would save it from application of section 112, P 6. *See Cole* ... (reaffirming that an element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof)."n257

The district court correctly found that "a 'lever moving element' had not been shown to have a generally understood structural meaning in the art. ..."n258 The patentee "has not directed this court to any evidence demonstrating that the district court erred in determining that the term 'lever moving element' lacks a reasonably well understood meaning in the relevant lock art."n259

With regard to "movable link member for holding ... and for releasing," the phrase invoked section 112, paragraph 6, not, as the district court held, because of the word "movable" alone, but because of the subsequent functional language, which "is precisely what was intended by the statutory phrase in section 112, P 6 requiring that means-plus-function limitations provide 'a specified function,' " and "the remaining terms in the claim limitation other than those defining the two functions, i.e., 'a movable link member,' [do not] provide any structure as necessary to remove this limitation from the ambit of section 112, P 6."n260

In *Personalized Media Communications, LLC v. U.S. Int'l Trade Comm'n* (1998),n261 the court held that the phrase "digital detector" in the claims of a patent, which concerned a television broadcasting system,n262 recited "sufficiently definite structure," did "not come within the ambit of § 112, P 6," and, therefore, was not fatally indefinite because of the failure of the patent's specification to set forth structure corresponding to the digital detector.n263 Because the "digital detector" limitation, did not use the word "means," the limitation was presumed not to invoke Section 112, paragraph 6.n264 The intrinsic and extrinsic evidence did not rebut the presumption. "Detector" was neither a generic structural term nor a coined wordn265 but rather, as shown by dictionary definitions, had a well-known meaning to persons skilled in the art "connotative of structure, including a rectifier or demodulator."n266 "Detector" recited definite structure even though it was defined in terms of function and a variety of structure rather than a precise structure.n267 The adjectival qualification "digital" did not make the "detector" structure less sufficient but rather made the term narrower and more definite by placing "an additional functional constraint ... on a structure ... otherwise adequately defined."n268

Similarly, in *Al-Site Corp. v. VSI International, Inc.* (1999),n269 the Federal Circuit held that a district court erred by construing phrases in three patents as mean-plus-function phrases subject to the Section 112, paragraph 6, equivalency construction rule. The patents concerned "technology for displaying eyeglasses on racks. The claimed inventions allow consumers to try on eyeglasses and return them to the rack without removing them from their display hangers." The three phrases were: an "eyeglass hanger member for mounting a pair of eyeglasses," an "attaching portion attachable to a portion of said frame of said pair of eyeglasses," and an "eyeglass contacting member." Under the "established analytical framework" for determining whether a clause falls under Section 112, paragraph 6,n270 none of the clauses so fell. The clauses did not use the word "means" and recited "sufficient structural limitations for performing" the recited functions.n271 "Because, properly construed, these claims do not call for interpretation under § 112, P 6, the district court's reading unnecessarily limited their scope. This court has cautioned against incorporating unwarranted functional or structural limitations from the specification into the claims."n272

In a concurring opinion in *Seal-Flex, Inc. v. Athletic Track & Court Construction* (1999),n273 Judge Rader suggested that a presumption that Section 112, paragraph 6, is invoked should arise from use of the phrase "*means for*" but not from "*means of*": "using 'of' in an apparatus claim would probably be understood to introduce structure or

materials rather than a function (i.e., 'by means *of--a stick*');"n274 "Unlike 'of,' the preposition 'for' colloquially signals the recitation of a function."n275 Judge Rader also noted that "[i]f the language of the claim element does not expressly state its function, the function of that element may nonetheless be discernible from the context of the overall claim and the disclosure in the specification."n276

In *Signtech USA, Ltd. v. Vutek, Inc.* (1999),n277 the court held that, in a patent concerning an ink printer sprayhead, "ink delivery means" in the claim was subject to the Section 112, paragraph 6, equivalency construction rule, even though it did not use the form "means for."n278 The clause's language was purely function and contained no "disqualifying structure."n279

In *Rodime PLC v. Seagate Technology, Inc.* (1999),n280 the court held that a "means" clause was not subject to Section 112, paragraph 6, because it recited sufficient structure to carry out the recited function, the function being given an appropriately limited interpretation. The patent concerned computer disk drive miniaturization.n281 The patent set forth solutions to a number of problems.n282 To solve one problem--how to correctly position the transducer when temperature changes cause components made of two different materials (steel and aluminum) to expand at different rates--the patent disclosed a thermal compensation scheme that included a "positioning mechanism" made of a third material.n283 The claims at issue required that there be "positioning means for moving" the transducer between tracks.n284 The accused disk drives used thermal compensation materials but also relied on a " 'thermal pin' which works in conjunction with the selection of materials to provide thermal compensation."n285 The district court rejected the patentee's argument that the "positioning means" limitations were not means clauses subject to Section 112, paragraph 6. It determined that "the patent required the claimed thermal compensation function to be performed solely by the arrangement, geometry, and selection of materials."n286 The accused drive "did not literally infringe because it used additional structure, the thermal pin, to perform thermal compensation."n287 Reversing, the Federal Circuit held that the claimed function did *not* include the thermal compensation scheme disclosed in the patent, as the district court held, but rather, in view of the claims' language, the patent's specification, and its prosecution history, was limited to the moving function literally recited in the claims: "A claim need not claim every function of a working device. Rather, a claim may specify improvements in one function without claiming the entire machine with its many functions."n288 The positioning and thermal compensation functions were not "inextricably intertwined." It held that Section 112, paragraph 6, "presumptively applies to the 'positioning means' in the asserted claims because that element employs traditional 'means,' "n289 Further, "the claim language links the means with a function, namely, moving the transducer between tracks on the hard-disk."n290 However, the presumption was overcome because the claims "recite sufficient structure to perform the entire claimed function," that is, the moving function.n291 Following the means and function phrase, the claims set forth a list of the structure of sub-elements and the specific location and interconnection of the sub-elements. Federal Circuit precedent "does not require ... an exhaustive recitation [of every last detail disclosed in the specification for performing the claimed function] to avoid § 112, P 6."n292

"The district court thus erred in interpreting the claims at issue to require the function of thermal compensation and further erred in using § 112, P 6 to read the structure for performing thermal compensation into the claims. ... [T]he 'positioning means' in [the] claims ... does not require the function of thermally compensating and recites sufficient structure to fall outside the limits of § 112, P 6."n293

In *Kemco Sales, Inc. v. Control Papers Company, Inc.* (2000),n294 a patent concerned a plastic security envelope that is "tamper-evident", that is, it indicates whether someone has opened and resealed the envelope. The envelope used two sealing means, a primary closer and a tamper indicator. The claim required a "plastic envelope closing means."n295

" 'A tamper-evident sealing system for an envelope made at least partially of plastic material comprising:

[an] envelope pocket having an opening therein through which contents can be placed into the pocket before the opening is closed;

[a] plastic envelope closing means secured to the plastic envelope material to close the opening and to form a closed pocket, the closing means having at least one transverse edge;

[a] first, adhesive, sealing means between the closing means and plastic envelope material for sealing the closing means to the plastic envelope material; and

[a] second, tamper-evident, sealing means secured to both the closing means and the envelope extending substantially along the length of and over the transverse edge which becomes visibly distorted, broken apart, or of disrupted continuity if attempts are made to reopen the second, tamper-evident, sealing means whereby tamper-

evidency is provided even if the first, adhesive, sealing means can be reopened and reclosed without visual detection thereof.'

... (emphasis and paragraphing added)."n296

The Federal Circuit held that the use of the word "means" created a presumption that the requirement was a means clause and that the claim did not recite sufficient structure to rebut this presumption.

In *Watts v. XL Systems, Inc.* (2000),n297 the Federal Circuit held that a "sealingly connected" limitation in two patents concerning a "connection for joints of oilwell tubing" was *not* a Section 112/6 means-plus-function clause. The limitation recited:

"... each joints [sic] of pipe having a first end with no increase in wall thickness relative to the average pipe wall thickness and formed with tapered internal threads; the joints each having a second end formed with tapered external threads *dimensioned such that* one such joint may be *sealingly connected* directly with another such joint."n298

In the patent specifications, the structure for performing the sealing function is performed by "misaligned taper angles." In an infringement suit, the patent owner and an accused infringer stipulated that the accused structure did not use "misaligned taper angles" or any structure that is "insubstantially different" from such angles. A district court interpreted the limitation as a Section 112/6 means-plus-function clause. This was error. "First, the presumption applies that because the limitation does not recite the word 'means' it is not a means-plus-function limitation."n299 Second, the presumption was not rebutted. The claim recited internal and external "threads" that performed the sealing function. The threads "clearly have reasonable well understood meanings in the art as names for structure." Contrary to an accused infringer's argument, the threads are the "sole structural configuration effecting the seal" and "are not mere indicators of the location of the seal."n300

[iii]-- Method Claims--"Step-Plus-Function."

Section 112, paragraph six, refers to expressing a claim combination element as a "step for performing a specified function with the recital of ... acts in support thereof."n301

Despite the large body of case law on "means" clauses, there were virtually no court decisions addressing "step" clauses until the late 1990's.n302

In *Caterpillar Inc. v. Detroit Diesel Corp.* (1996),n303 the Northern Indiana District Court concluded that "§ 112 applies to functional methods claims where the element at issue sets forth a step for reaching a particular result, but not the specific technique or procedure used to achieve the result."n304 It held that the particular method claim before it did not evoke Section 112(6) because the actions called for by the claim did "not merely describe [an] achieved result, but are specific acts in themselves": "The acts are 'functional' only in the manner in which all acts are functional, and nothing before the court suggests that the acts set forth in the claim lack a 'reasonably well understood meaning the art.' "n305

In *Fonar Corp. v. General Electric Co.* (1997),n306 a patent concerned magnetic resonance imaging (MRI) machines with multi-angle oblique ("MAO") imaging. The patent's specification disclosed use of a "generic gradient waveform generator." The patentee asserted both apparatus claims, which contained "means" limitations, and method claims against the accused infringer. The accused machines did not use a generic gradient waveform generator. The accused infringer argued that "each asserted method claim invokes section 112, P 6, because it was drafted 'functionally in a resnlt-oriented way' by reciting that the pulse sequences must be applied in a manner to encode spatial information without reciting structure or acts that would enable such a result." The Federal Circuit found it unnecessary to "address the question whether section 112, P 6, applies to these claims ... because we agree with [the patentee] that the method claims looked at with or without the section 112, P 6 limitation are not limited to use of a generic gradient waveform."n307

"Although the '966 specification discloses a 'generic gradient waveform generator' (20) in Figure 7, along with a corresponding description, it states that the 'generator 20 also stores the phase encoding waveform, as illustrated in FIG. 2, in digital form. Preferably, the generator 20 stores these particular waveforms; but, may store others that suffice for purposes of the present invention.' ... The claim language in question, applying pulses in a manner to encode spatial

information, does not recite use of generic gradient waveforms; it tracks the specification which states that other waveforms may be used."n308

In *Serrano v. Telular Corp.* (1997),n309 the Federal Circuit held that the phrase "determining ... the last-digit" in a patent, which concerned a system for interfacing a standard rotary or touch-tone telephone with a cellular telephone, and which claimed a method, was *not* a "step plus function" limitation subject to Section 112, paragraph 6, despite its close similarity to an apparatus claim in a related patent, which recited "determination-means ... for ... determining the last digit."n310 The method patent's claim "includes a determining step rather than a determination means, but it is not drafted in 'step plus function' form. That is because it does not recite a function. *See 35 U.S.C. § 112,* P 6 (1994). Rather, it recites only the act of determining a last-dialed digit. Therefore, we must simply apply the claim language to the accused devices free from the limiting requirements of section 112, P 6."n311

In *O.I. Corp. v. Tekmar Co., Inc.* (1997),n312 the Federal Circuit addressed "the application of section 112, P 6, generally to method claims. Appellant asserts, as have other parties, that we have not done so previously."n313

"Section 112, P 6, provides that:

'An element in a claim for a combination may be expressed as a means or step*for performing a specified function without the recital of structure, material,* or acts *in support thereof,* and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.'

35 U.S.C. § 112, P 6 (1994) (emphasis added).

"This statutory provision clearly applies to claims for a combination. It is well-established of course that, in combinations that are apparatus claims, means for performing a specified function are subject to this paragraph when they lack recital of definite structure or material. Logically, structure and material make up the various means of apparatus. However, '[t]he word "combination" in this paragraph includes "not only a combination of mechanical elements, but also a combination of substances in a composition claim, *or steps in a process claim.*' " *In re Fuetterer, ... 319 F.2d 259, 264, 138 USPQ 217, 222 (CCPA 1963)* (*quoting* P.J. Federico, Commentary on the New Patent Act, 35 U.S.C.A. Vol. 1, p. 25 (1954), reprinted in, 75 J. Pat. & Trademark Off. Soc'y 161, 186 (Mar. 1993)) (emphasis added).

"The statute of course uses terms that might be viewed as having a similar meaning, namely, steps and acts. It refers to means and steps, which must be supported by structure, material, or acts. It does not state which goes with which. The word 'means' clearly refers to the generic description of an apparatus element, and the implementation of such a concept is obviously by structure or material. We interpret the term 'steps' to refer to the generic description of elements of a process, and the term 'acts' to refer to the implementation of such steps. This interpretation is consistent with the established correlation between means and structure. In this paragraph, structure and material go with means, acts go with steps.

"Of course, as we have indicated, section 112, *P 6,* is implicated only when means plus function without definite structure are present, and that is similarly true with respect to steps, that the paragraph is implicated only when steps plus function without acts are present. The statute thus in effect provides that an element in a combination method or process claim may be recited as a step for performing a specified function without the recital of acts in support of the function. Being drafted with the permissive 'may,' the statute does not require that steps in a method claim be drafted in step-plus-function form but rather allows for that form."n314

The court cautioned against construing all process claims with "steps described by an 'ing' verb."

"If we were to construe every process claim containing steps described by an 'ing' verb, such as passing, heating, reacting, transferring, etc. into a step-plus-function limitation, we would be limiting process claims in a manner never intended by Congress. ... Section 112, P 6, as is well-documented, was intended to permit use of means expressions without recitation of all the possible means that might be used in a claimed apparatus. *See* Federico, *supra,* at 25 (stating that the statute authorizes greater liberality in the use of functional expressions in combination claims than had been permitted by some court decisions such as *Halliburton Oil Well Cementing Co. v. Walker, 329 U.S. 1 ...* (1946)). ... The price that must be paid for use of that convenience is limitation of the claim to the means specified in the written description and equivalents thereof. ... Similarly, a step for accomplishing a particular function in a process claim may also be claimed without specificity subject to the same price. But claiming a step by itself, or even a series of steps, does

not implicate section 112, P 6. Merely claiming a step without recital of a function is not analogous to a means plus a function."

"... [T]he *Halliburton* case concerned an apparatus claim, not a process claim, and we must be careful not to extend the language of this provision to situations not contemplated by Congress."n315

The court noted that "a statement in a preamble of a result that necessarily follows from performing a series of steps does not convert each of those steps into step-plus-function clauses."n316 Finally, it stressed that it is improper to construe methods claims as subject to Section 112, paragraph 6, merely because the method claims "parallel" related apparatus claims that contain Section 112, paragraph 6, means-plus-plus clauses.n317 "Each claim must be independently reviewed in order to determine if it is subject to the requirements of section 112, P 6. Interpretation of claims would be confusing indeed if claims that are not means-or step-plus-function claims were to be interpreted as if they were, only because they use language similar to that used in other claims that are subject to this provision."n318

In *O.I. Corp.*, the patent concerned removing water vapor from a sample to be analyzed in a gas chromatograph. The patents' specification illustrated an apparatus in which an inert gas stream is bubbled through a sample in a sparge vessel, which purges the contaminant and water vapor. The gas, contaminant and water stream ("analyte slug") exits the vessel and flows through temperature-controlled passage in a water management device to a heat trap. A gas stream flows through the trap in the opposite direction "desorbing" the concentrated contaminants. "The stream then flows back through the temperature-controlled passage at a second, lower temperature to the gas chromatograph ... for measurement of the contaminants."n319 In the illustrated embodiment, the temperature-controlled passage "is internally threaded, which causes a swirling of the analyte slug for assisting in the removal of water vapor." The patent contained claims both to an apparatusn320 and to a method.n321 The accused device contained a "smooth-walled coiled tubing." In finding noninfringement, the district court construed the "passage" limitation in both the apparatus and method claims as controlled by section 112, paragraph 6, which confined "passage" to the structure in the specification and equivalents thereof.

The Federal Circuit held that the district court erred in treating the word "passage" in the apparatus claims as subject to Section 112, paragraph 6. The claim was subject to Section 112/6 because it contained a "means" clause--"means for passing the ... slug through a passage"--but "passage" was "the place where the function occurs, not the structure that accomplishes it."n322 The district court also erred in construing a method patent claim's phrase "the steps of ... passing the ... slug through a passage" as a step-plus-function clause subject to Section 112, paragraph 6 because the passing steps were "not individually associated in the claim with functions performed by the steps of passing."n323 The patentee argued "the court erred in relying upon the broad recital of a purpose in a claim preamble as a function that requires application of section 112, P 6, to a series of process steps. It asserts that section 112, P 6, only applies to steps having an individually associated function, and to steps without recited acts in support thereof."n324

"The district court considered the statement which appears in the preamble, 'removing water vapor from an analyte slug,' as a function which invokes application of section 112, P 6. We do not agree. The preamble statement of the purpose of the overall process does not constitute an associated function for the two 'passing' steps of claim 9. Performing a series of steps inherently produces a result, in this case the removal of water vapor from the analyte slug, but a statement in a preamble of a result that necessarily follows from performing a series of steps does not convert each of those steps into step-plus-function clauses. The steps of 'passing' are not individually associated in the claim with functions performed by the steps of passing."n325

The accused infringer's contrary argument based on the similarity between the apparatus and method claims was not persuasive.

"[The accused infringers argue] that because the method claims 'parallel' the apparatus claims, they must be construed consistently with the apparatus claims. Assuming that the limitations of the apparatus claim are subject to the limitations of section 112, P 6, [it] thus reasons that the steps of the method claim must likewise be subject to those limitations. Moreover, it argues that [the patentee] made no distinction between the method and apparatus claims during the prosecution of the patents and that, accordingly, they must be construed consistently with each other.

"We understand that the steps in the method claim are essentially in the same language as the limitations in the apparatus claim, albeit without the 'means for' qualification. However, even if we were to hold that the word 'passage' in

the apparatus claims meets the section 112, P 6, tests, we would not agree with [the accused infringer] that the 'parallelism' of the claims means that the method claims should be subject to the requirements of section 112, P 6."n326

In *O.I. Corp.*, the court affirmed the judgment of noninfringement despite the district court's errors because the word "passage", properly interpreted, did not encompass a completely cylindrical, smooth-walled structure.n327

In *Seal-Flex, Inc. v. Athletic Track & Court Construction* (1999),n328 a patentee and an accused infringer agreed that a claim phrase was governed by Section 112, paragraph 6, but evidenced confusion on whether the phrase was a "means" element or a "step-plus-function element." The claim was to a method (process), but the disputed limitation in the claim concerned the material to be used in the process.n329 The claim required a "coating," and the specification set forth examples of suitable coatings. The accused process used as a coating a material not specifically mentioned in the specification. Given the parties' agreement, the majority refused to review whether the claim phrase was properly interpreted as subject to Section 112 or whether it was a "means" or a "step" clause.n330 It did note that the trial court's instructions to the jury were "more consistent with an assumption that the claim element is in means-plus-function form than an assumption that it is in step-plus-function form."n331 It affirmed a judgment based on a jury verdict of infringement because there was substantial evidence of the equivalence of the material in the accused process and the materials disclosed in the patent's specification.n332

In an extensive concurring opinion, Judge Rader argued that the court should independently determine whether the claim was subject to § 112/6 without regard to the parties' agreement.n333 Judge Rader set forth an analysis of "step" clauses. He suggested that (1) there is a "strong correlation between means and step-plus-function claim elements,"n334 (2) a "similar analysis" should apply to the "means," including parallel presumptions, that is, a presumption that phrases with "step for" should presumptively evoke Section 112, paragraph 6, and phrases without "step for" should presumptively not evoke Section 112, paragraph 6,n335 (3) identifying "step" clauses is "inherently more problematic" than identifying "means" clauses because of the "difficulty of distinguishing acts from functions":n336 (4) because of this difficulty, only "step for", and not "step" alone or "step of," should invoke the presumption,n337 (5) even when a presumption arises from the use of "step for", the presumption is rebutted if the claim recites "sufficient acts for performing the recited function;"n338 and (6) even when a claim does not use "step for," it may be subject to Section 112, paragraph 6 if it merely claims "the underlying function without recitation of acts for performing that function."n339 Judge Rader noted that "method claim elements often recite phrases susceptible to interpretation as either a function or as an act for performing a function."n340

"Both acts and functions are often stated using verbs ending in 'ing.' For instance, if the method claim element at issue in this case had merely recited the 'step of' 'spreading an adhesive tack coating,' it would not have been clear solely from this hypothetical claim language whether 'spreading' was a function or an act. In such circumstances, claim interpretation requires careful analysis of the limitation in the context of the overall claim and the specification.

"In general terms, the 'underlying function' of a method claim element corresponds to *what* that element ultimately accomplishes in relationship to what the other elements of the claim and the claim as a whole accomplish. 'Acts,' on the other hand, correspond to *how* the function is accomplished. Therefore, claim interpretation focuses on what the claim limitation accomplishes, i.e., it's underlying function, in relation to what is accomplished by the other limitations and the claim as a whole. If a claim element recites only an underlying function without acts for performing it, then § 112, P 6 applies even without express step-plus-function language."n341

Judge Rader concluded that the trial court erred by treating the "coating" requirement as governed by Section 112, paragraph 6: "because [the] claim limitation [at issue in this case] is not in explicit step-plus-function form and specifies an act associated with the underlying function, the claim drafter did not invoke § 112, P 6."n342 However, the error was harmless because "[w]ithout the limiting strictures of § 112, P 6, the claim term 'adhesive tack coating' would theoretically enjoy a broader application."n343

In a separate opinion, Judge Bryson stressed that the step-plus-function issue addressed by Judge Rader was "not properly before this court." The issue "is a difficult one," and Judge Rader's analysis, "some of which breaks new ground," "may be correct," but "I would feel more comfortable embracing it if it had been the subject of a decision below and had been tested by briefing and argument before us, rather than emerging for the first time in the course of our disposition of the appeal."n344

In *Micro Chemical, Inc. v. Great Plains Chemical Co.* (1999),n345 the Federal Circuit found it unnecessary to decide whether a patent's method claims were in "step-plus-function" form. The patent concerned "machines and

methods for weighing, dispensing, and delivering microingredients into livestock feed."n346 The patent's preferred embodiment used a "cumulative weigh" method in which multiple microingredients are weighed in a compartmented hopper and then dispensed into the liquid. The patent's specification described alternative embodiments. One alternative embodiment uses a "loss of weight" method, which eliminates the need for a hopper by dispensing "each microingredient into the liquid carrier directly from the storage bins."n347 The accused infringer originally sold machines that used a cumulative weigh method similar to the patent's preferred embodiment. After the patent issued, it stopped doing so and adapted its machine to a "type two" configuration. The type two configuration used "a weigh dump" method that was disclosed in a prior art reference. A district court found neither the apparatus nor the method claims of the patent infringed because they did not use the "cumulative" weighing method disclosed as the preferred embodiment. The Federal Circuit reversed. After holding infringed the patent's apparatus claims, which used a means-plus-function element ("weighing means") to denote the weighing feature of the invention, it turned to the method claims. An illustrative claim was to a method "comprising *the steps* ...", one step being "dispensing predetermined weights of selected said additive concentrates into a liquid carrier with no substantial intermixing of the additive concentrates before they enter the liquid carrier."n348 The Federal Circuit did not "address whether the district court was correct in finding the method claims not in step-plus-function form." If the "dispensing" element was a Section 112/6 element, the method claims were infringed. The "acts corresponding to the step-plus-function element which are necessary to perform the recited function" included the alternative embodiments as well as the preferred embodiment.n349 The alternative embodiments include the "weight dump" method...even though it was a method disclosed in the prior art.n350 If the "dispensing" element was *not* a Section 112/6 element, the claims were even more clearly infringed: "Claim treatment outside of the requirements of § 112, P 6 generally gives the claims a broader scope. If the meaning of these claim elements is not limited to the specific acts described in the specification and their equivalents through operation of § 112, P 6, then they will be given their ordinarily understood meanings in the art."n351 The ordinary meaning of the dispensing weights limitation encompassed the step used by the accused infringer.n352

[f]-- Claims with Multiple Means Clauses--Cumulative Effect of Differences: The "Portable Calculator" Case.

In *Texas Instruments, Inc. v. U.S. Int'l Trade Comm'n* (1986),n353 the Federal Circuit stressed that "where all of the claimed functions are performed in the accused devices by subsequently developed or improved means, [it is not appropriate] to view each such change as if it were the only change from the disclosed embodiments of the invention. It is the entirety of the technology embodied in the accused devices that must be compared with the patent disclosure."n354

The patent in suit in *Texas Instruments* disclosed the pioneer invention of the portable electronic calculator.n355 Claim 1 of the patent, which the court treated as representative of the other claims, contained three "means-plus-function" elements: (1) input means including a keyboard with a single set of number keys, (2) electronic memory, arithmetic and transfer means, and (3) display means.n356

The patent owner petitioned the United States International Trade Commission to exclude certain pocket calculators made in other countries from importation into the United States on the ground that such calculators infringed the patent.n357 The accused pocket calculators unquestionably coutained means that performed each of the functions specified in the claim. However, as to each element, the accused devices performed the specified function by means that differed from the corresponding means in the patent specification and that embodied subsequently developed or improved technology. As to the input keyboard means, the accused devices used a scanning matrix encoder instead of the conductive strips disclosed in the specification. As to arithmetic, memory and transfer means, the accused devices used metal oxide semiconductors instead of the bipolar semiconductors disclosed in the specification. As to the display means, the accused devices used a liquid crystal display instead of the thermal printer disclosed in the specification.

The Administrative Law Judge (ALJ), in findings and conclusions adopted by the Commission, found that the claims as construed in light of the specification were not infringed literally or through application of the doctrine of equivalents. The ALJ reasoned that the functions of the three clauses of the claim were performed in the accused devices by means that were not described in the specification and that were not equivalent to the means so described.

The Federal Circuit affirmed. It did find that there was no substantial evidence to support the ALJ's "determination of nonequivalence as to each claim clause considered separately." Furthermore, it concluded that the ALJ had "interpreted the claims too narrowly when he, in effect, limited each means to the embodiment shown in the

specification."n358 Therefore the court agreed with the patent owner that "when each changed means is considered separately, as part of the overall device as described by the inventors, substantial evidence may not support the finding that the resultant device is not an infringement. ..."n359 Nevertheless, the court found an absence of literal infringement when the claimed subject matter as a whole is compared with the accused devices as a whole.

"Mindful of the admonition so often urged by us, it is the claimed invention as a whole that must be considered in determining whether there is infringement by the accused devices also considered as a whole. It is not appropriate in this case, where all of the claimed functions are performed in the accused devices by subsequently developed or improved means, to view each such change as if it were the only change from the disclosed embodiments of the invention. It is the entirety of the technology embodied in the accused devices that must be compared with the patent disclosure. ... Any other view distorts both the correct interpretation of the claims and their application to the accused devices."n360

Construction of claims drafted in the means-plus-function form permitted by Section 112 is to be guided by equitable considerations in a fashion similar to the application of the doctrine of equivalents.

"While the scope of patent claims under section 112 paragraph 6, is a legal determination, it is not devoid of equitable considerations, particularly when determining the breadth of 'means' claims on complex and rapidly-evolving technologies. ... However, this does not mean that there is no limit on changed means of performing a claimed function, such that literal infringement can never be avoided. There must be outer boundaries to the scope of these rules, as for most rules, when the factual situation strains their rote application and requires a fresh look at the rules in the new context in which they are presented. There is no abstract guide to determining when a modified device crosses the boundary with respect to the reasonable scope of patent claims. Indeed, the determination of infringement is not made in the abstract, but in the context of the claimed invention and the accused devices."n361

As to literal infringement, the court concluded that "[t]aken together, [the] accumulated differences distinguish the accused calculators from that contemplated in the ... patent and transcend a fair range of equivalents of the ... invention."n362

Having found an absence of literal infringement, the court considered separately the argument that the accused calculators infringed under the doctrine of equivalents: "When literal infringement under section 112 paragraph 6 is not present the doctrine of equivalents may nevertheless apply, and thereby secure to the patentee the fair scope of the patent."n363 However, since "the claimed functions are all performed in the accused devices," the considerations that preclude a finding of literal infringement also preclude a finding of infringement under the doctrine of equivalents.

"In the case of literal infringement of a claim containing a 'means' clause in terms of section 112 paragraph 6, the accused structure, composition, or process is compared with that described in the specification for performing the claimed function. In the case of infringement under the doctrine of equivalents, the accused structure, composition, or process is compared with the claimed invention as a whole.

"... [T]he extensive technological advances in all of the claimed functions support the ALJ's finding that the accused devices are not equivalent to the claimed invention, applying the criteria of *Graver Tank*."n364
FOOTNOTES:

(n541) Footnote 1. *35 U.S.C. § 112.*

See generally Casey, "Means Plus Function Claims After *Markman*: Is Claim Construction Under *35 U.S.C. § 112,* P 6 A Question Of Fact Or An Issue Of Law?" 79 J. Pat. & Trademark Off. Soc'y 841 (1997); Clinton, "Infringement and Software Claimed under *35 U.S.C. § 112,* P 6: Software Function Is the Important Part," Va. J.L. & Tech. 4 (2000); Janis, "Who's Afraid of Functional Claims? Reforming the Patent Law's § 112, P 6 Jurisprudence," 15 Santa Clara Computer & High Tech. L.J. 231 (1999); Maier & Lytle, "The Strategic Use Of Means-Plus-Function Claims," 80 J. Pat. & Trademark Off. Soc'y 241 (1998); Hofmann & Heller III, "The Rosetta Stone for the Doctrines of Means-Plus-Function Patent Claims," *23 Rutgers Computer & Tech. L.J. 227 (1997);* Lee & Paige, "Means Plus And Step Plus Function Claims: Do We Only Know Them When We See Them?" 80 J. Pat. & Trademark Off. Soc'y 251 (1998); Moy, "The Interpretation of Means Expressions During Prosecution," 68 J. Pat. & Trademark Off. Soc'y 246 (1986); Manzo, " 'Means' Claims in Patent Infringement Litigation," 68 J. Pat. & Trademark Off. Soc'y 97 (1986); Janicke, "Litigation Impact of the Prosecution Attorney's Section 112 Decisions," *6 APLA Q.J. 206 (1978);* Note, "Interpretation Of Patent Process Claims In Light Of The Narrowing Effect Of *35 U.S.C. § 112*(6)," *31 Ind. L. Rev. 1133 (1998);* Note, "Federal

Circuit Divided Over Distinction Between Equivalence Under Section 112, Paragraph 6, And Under Doctrine Of Equivalents," 10 J. Proprietary Rts. 14 (1998); Note, "Bringing Theory Into Practice: Predictable Scope for Functional Patent Claims," *42 UCLA L. Rev. 221 (1994);* Note, "Patent Law--Means Plus Function Claims in Computer Program Related Patents," 1 U. Balt. Intell. Prop. L. J. 106 (1992).

(n542) Footnote 2. See, e g., *IMS Technology Inc. v. Haas Automation Inc., 206 F.3d 1422, 1429-30, 54 USPQ2d 1129, 1133 (Fed. Cir. 2000), cert. dismissed, 530 U.S. 1299 (2000)* ("An infringement analysis of a claim with limitations drafted pursuant to *35 U.S.C. § 112,* P 6 (1994), involves ... two steps--claim construction and a comparison of the accused device or method with the properly construed claims. Limitations contemplated by § 112, P 6, often referred to as means-plus-function or step-plus-function limitations, recite a specified function to be performed rather than the structure, material, or acts for performing that function.").

(n543) Footnote 3. E.g., *Bendix Corp. v. United States, 199 USPQ 203, 222 (Ct. Cl. Trial Div. 1978), aff'd, 600 F.2d 1364, 204 USPQ 617 (Ct. Cl. 1979), later appeal, 676 F.2d 606 (Ct. Cl. 1982)* ("Definition of an element of a combination claim by use of the term 'means,' without recital of structure, material, or acts in support thereof, is a common staple of patent claim terminology.").

See also *Cybor Corp. v. FAS Technologies, Inc., 138 F.3d 1448, 46 USPQ2d 1169 (Fed. Cir. 1998)* (in banc), discussed at *§ 18.06[2][a][vi][B], § 18.07[4][c]*; *In re Donaldson Company, Inc., 16 F.3d 1189, 29 USPQ2d 1845 (Fed. Cir. 1994)* (in banc), discussed at *§ 11.03[1]*; *Atmel Corp. v. Information Storage Devices, Inc., 198 F.3d 1374, 53 USPQ2d 1225 (Fed. Cir. 1999); Micro Chemical, Inc. v. Great Plains Chemical Co., 194 F.3d 1250, 52 USPQ2d 1258 (Fed. Cir. 1999); Dawn Equipment Co. v. Kentucky Farms, Inc., 140 F.3d 1009, 46 USPQ2d 1109 (Fed. Cir. 1998),* discussed at § 18.03[5][b], § 18.03[5][d][i]; *Kahn v. General Motors Corp., 135 F.3d 1472, 45 USPQ2d 1608 (Fed. Cir. 1998), cert. denied, 525 U.S. 875 (1998),* discussed at *§ 18.07[6][d]*; *Ethicon, Inc. v. United States Surgical Corp., 135 F.3d 1456, 45 USPQ2d 1545 (Fed. Cir. 1998), cert. denied, 525 U.S. 923 (1998); Multiform Desiccants, Inc. v. Medzam, Ltd., 133 F.3d 1473, 45 USPQ2d 1429 (Fed. Cir. 1998),* discussed at *§ 18.07[3][d]*; *Carroll Touch, Inc. v. Electro Mechanical Systems, Inc., 15 F.3d 1573, 27 USPQ2d 1836 (Fed. Cir. 1993),* discussed at *§ 18.07[4][c]*; *In re Hayes Microcomputer Products Inc. Patent Litigation, 982 F.2d 1527, 25 USPQ2d 1241 (Fed. Cir. 1992); Biodex Corp. v. Loredan Biomedical, Inc., 946 F.2d 850, 862, 20 USPQ2d 1252, 1262 (Fed. Cir. 1991), cert. denied, 504 U.S. 980 (1992); Carl Zeiss Stiftung v. Renishaw PLC, 945 F.2d 1173, 1178, 20 USPQ2d 109, 1099 (Fed. Cir. 1991),* discussed at § 18.03[2][c][iv] ("In the case of claims with a means plus function element, ... the element is met literally when an accused device embodies 'the corresponding structure, material, or acts described in the specification *and equivalents thereof.*' " (emphasis in original); *King Instrument Corp. v. Otari Corp., 767 F.2d 853, 226 USPQ 402, 408 (Fed. Cir. 1985), cert. denied, 475 U.S. 1016 (Fed. Cir. 1987); Velo-Bind, Inc. v. Minnesota Mining & Mfg. Co., 647 F.2d 965, 968, 211 USPQ 926, 930 (9th Cir. 1981), cert. denied, 454 U.S. 1093 (1981)* (section 112 "requires only that ... 'means' be construed in light of the '*corresponding* structure, material or acts' in the specifications; it does not require that the claim be further limited to the description in the specifications."); *Marino Sys., Inc. v. J. Cowhey & Sons, Inc., 631 F.2d 313, 207 USPQ 1065 (4th Cir. 1980); Mendenhall v. Astec Industries Inc., 13 USPQ2d 1913, 1922 (E.D. Tenn. 1988), aff'd, 887 F.2d 1094, 13 USPQ2d 1956 (Fed. Cir. 1989)* ("Under *35 U.S.C. § 112,* patent language 'means ... for performing a specified function' must be interpreted to cover a means which possesses a presently existing function or which possesses a presently existing capability of performing a function."); *Syntex (U.S.A.) Inc. v. Paragon Optical Inc., 7 USPQ2d 1001 (D. Ariz. 1987); Rite-Hite Corp. v. Kelley Co., 231 USPQ 161 (E.D. Wis. 1986), aff'd, 819 F.2d 1120, 2 USPQ2d 1915 (Fed. Cir. 1987); Newell Co., Inc. v. Kenney Mfg. Co., 606 F. Supp. 1282, 226 USPQ 157 (D. R.I. 1985), aff'd, 864 F.2d 757, 9 USPQ2d 1417 (Fed. Cir. 1988), cert. denied, 493 U.S. 814 (1989); Toro Co. v. L. R. Nelson Corp., 524 F. Supp. 586, 213 USPQ 207 (C.D. Ill. 1981), rev'd, 727 F.2d 1113 (7th Cir. 1984)* (unpublished); *Bepex Corp. v. Black Clawson Co., 208 USPQ 109, 117-119 (S.D. Ohio 1980), aff'd, 713 F.2d 202, 220 USPQ 207 (6th Cir. 1983); Courtesy Communications Corp. v. C-Five, Inc., 455 F. Supp. 1183, 203 USPQ 276 (N.D. Tex. 1978).*

(n544) Footnote 4. *Symbol Technologies, Inc. v. Opticon, Inc., 935 F.2d 1569, 19 USPQ2d 1241 (Fed. Cir. 1991).*

(n545) Footnote 5. *935 F.2d at 1575, 19 USPQ2d at 1245.*

For a discussion of whether application of a Section 112/6 is a question of law or fact, see *§ 18.06[2][d].*

(n546) Footnote 6. See § 11.03(1)(c)(v).

(n547) Footnote 7. *Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co., 520 U.S. 17, 28, 41 USPQ2d 1865, 1871 (1997), on remand, 114 F.3d 1161, 43 USPQ2d 1152 (Fed. Cir. 1997),* discussed at *§ 18.02[5].*

For a discussion of the background and purpose of the last paragraph of Section 112, see *§ 8.04[2].*

(n548) Footnote 8. *Valmont Industries, Inc. v. Reinke Manufacturing Co., Inc., 983 F.2d 1039, 25 USPQ2d 1451 (Fed. Cir. 1993),* discussed § 18.03(5)(c)(iii).

(n549) Footnote 9. *983 F.2d at 1041-1042, 25 USPQ2d at 1453.*

(n550) Footnote 10. *983 F.2d at 1041-42, 25 USPQ2d at 1453-54.*

(n551) Footnote 11. For discussion of the doctrine of equivalents, see *§ 18.04.*

(n552) Footnote 12. Compare *Dawn Equipment Co. v. Kentucky Farms, Inc., 140 F.3d 1009, 1019, 46 USPQ2d 1109, 1116 (Fed. Cir. 1998),* discussed *infra* (PLAGER, additional views, noting that "whether considering infringement under § 112, P 6 or the doctrine of equivalents, a comparison must be made to the described structure corresponding to the § 112, P 6 claim limitation.").

(n553) Footnote 13. *Alpex Computer Corp. v. Nintendo Co. Ltd., 102 F.3d 1214, 1222, 40 USPQ2d 1667, 1673-74 (Fed. Cir. 1996), cert. denied, 521 U.S. 1104 (1997),* discussed at § 18.03[5][d][iii]; *Valmont Industries, Inc. v. Reinke Manufacturing Co., Inc., 983 F.2d 1039, 1043-44, 25 USPQ2d 1451, 1455 (Fed. Cir. 1993),* discussed § 18.03[5][c][iii]; *Laitram Corp. v. Rexnord, Inc., 939 F.2d 1533, 1539, 19 USPQ2d 1367, 1372 (Fed. Cir. 1991),* discussed at § 18.03[5][d][ii], § 18.03[5][e][i]; *Sun Studs, Inc. v. ATA Equipment Leasing, Inc., 872 F.2d 978, 10 USPQ2d 1338, 1347 (Fed. Cir. 1989), modified, 872 F.2d 978, 11 USPQ2d 1479 (Fed. Cir. 1989),* discussed at *§ 18.05[3][b][ii]; D.M.I., Inc. v. Deere & Co., 755 F.2d 1570, 225 USPQ 236 (Fed. Cir. 1985); Pirelli Cable Corp. v. Ciena Corp., 988 F. Supp. 424, 447 (D. Del. 1997)* ("The 'equivalent' in § 112 is vastly different [from] the 'doctrine of equivalents.' ").

(n554) Footnote 14. *Dawn Equipment Co. v. Kentucky Farms, Inc., 140 F.3d 1009, 46 USPQ2d 1109 (Fed. Cir. 1998),* discussed *infra* (PLAGER, additional views; MICHEL, additional views).

Compare *Cybor Corp. v. FAS Technologies, Inc., 138 F.3d 1448, 1457-1458, 46 USPQ2d 1169, 1184-1185 (Fed. Cir. 1998)* (in banc), discussed at *§ 18.06[2][a][vi][B], § 18.07[4][c]* (MAYER, concurring; "[B]ecause they have separate origins, purposes, and applications, determining equivalence under paragraph 112(6) requires an analysis different from that used to determine equivalence under the doctrine of equivalents."; "After the judge construes the means-plus-function limitations identifying structures, materials, or acts described in the patent's specification, and their equivalents as determined by the fact finder (step one, described above), the judge gives the construed claims to the fact finder, in this case a jury, for a determination of infringement. ... For literal infringement, the fact finder must determine whether the accused device performs an identical function to the one recited in the means-plus-function clause. ... If the identical function is performed, the fact finder must then determine whether the accused device utilizes the same structure or materials as described in the specification, or their equivalents."; "Just as the fact finder's infringement analysis differs between equivalence under paragraph 112(6) and the doctrine of equivalents, so too differs the analytical effect of statements made during the prosecution of the patent on construction of the claims. Under paragraph 112(6), a statement made during prosecution may confine the range of equivalent structures, materials, or acts that are directly claimed by the patent. However, in the context of a doctrine of equivalents analysis, the patentee seeks protection beyond that claimed by the patent directly. As such, the judge's construction of the claims--which includes the interpretation of claim terms--may not be sufficient to remove from the jury's consideration all subject matter that was disclaimed during prosecution."; "Prosecution history estoppel addresses this problem by excluding equivalents surrendered during prosecution. Under this doctrine, statements made to overcome rejections based, as here, on prior art estop the patentee from extending its right to exclude others from making, using, or selling subject matter known to be insubstantially different from, or interchangeable with, claimed elements at the time of the alleged infringement. ... Although both forms of equivalence require the district court to examine the prosecution history as part of its construction of the claims, under the doctrine of equivalents, the judge gives the claim, properly construed to exclude disclaimed subject matter, to the jury and then, where appropriate, also instructs the jury on the possible range of equivalents that it may or may not consider due to prosecution history estoppel.").

(n555) Footnote 15. *Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc., 145 F.3d 1303, 46 USPQ2d 1752 (Fed. Cir. 1998),* discussed *infra.* See also *§ 18.04[3].*

(n556) Footnote 16. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 234 F.3d 558, 56 USPQ2d 1865 (Fed. Cir. 2000)* (en banc), *rev'd on other grounds, 535 U.S. 722, 62 USPQ2d 1705 (2002), on remand, 304 F.3d 1289, 64 USPQ2d 1698 (Fed. Cir. 2002).*

(n557) Footnote 17. *234 F.3d at 589, 56 USPQ2d at 1888.*

(n558) Footnote 18. See *Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co., 520 U.S. 17, 41 USPQ2d 1865 (1997), on remand, 114 F.3d 1161, 43 USPQ2d 1152 (Fed. Cir. 1997),* discussed at *§ 18.02[5].*

See also *IMS Technology Inc. v. Haas Automation Inc., 206 F.3d 1422, 1435, 54 USPQ2d 1129, 1138 (Fed. Cir. 2000), cert. dismissed, 530 U.S. 1299 (2000),* discussed at § 18.03[5][c][iii] (plenary discussion of the "several occasions" on which the Federal Circuit "compared statutory equivalence under § 112, P 6 and the judicial doctrine of equivalents"); *Mas-Hamilton Group v. LaGard, Inc., 156 F.3d 1206, 1215-16, 48 USPQ2d 1010, 1018 (Fed. Cir. 1998)* (because a function required by a patent claim's means-plus-function limitation was "entirely missing from the structure ... in the accused device," the accused device does not infringe under the doctrine of equivalents); Endress + *Hauser, Inc. v. Hawk Measurement Systems Pty. Ltd., 122 F.3d 1040, 1043, 43 USPQ2d 1849, 1852 (Fed. Cir. 1997),* discussed at *§ 18.07[6][a]* ("Though it is well understood that 'equivalents' under § *112 P 6* is a different concept from 'equivalents' under the judicially created doctrine of equivalents, the district judge correctly recognized that the statutorily required construction under § *112 P 6* must proceed on a limitation-by-limitation basis, not dissimilar to the analysis under the doctrine of equivalents. *See Warner-Jenkinson Co. v. Hilton Davis Chem. Co.* ... (1997).").

(n559) Footnote 19. *D.M.I., Inc. v. Deere & Co., 755 F.2d 1570, 225 USPQ 236 (Fed. Cir. 1985).*

(n560) Footnote 20. *755 F.2d at 1575, 225 USPQ at 239.*

See also *In re Donaldson Company, Inc., 16 F.3d 1189, 1195 n.8, 29 USPQ2d 1845, 1850 n.8 (Fed. Cir. 1994)* (in banc) ("The word 'equivalent' in *35 U.S.C. 112,* paragraph 6, should not be confused with the doctrine of equivalents."); *Kahn v. General Motors Corp., 135 F.3d 1472, 45 USPQ2d 1608 (Fed. Cir. 1998), cert. denied, 525 U.S. 875 (1998),* discussed at *§ 18.07[6][d]* (separately analyzing equivalency under Section 112 and doctrine of equivalents); *Alpex Computer Corp. v. Nintendo Co. Ltd., 102 F.3d 1214, 1222, 40 USPQ2d 1667, 1673-74 (Fed. Cir. 1996), cert. denied, 521 U.S. 1104 (1997),* discussed at § 18.03[5][d][iii] ("While equivalency under the doctrine of equivalents and equivalency under § 112, P 6, both relate to insubstantial changes, each has a separate origin, purpose and application. ... Under § 112, the concern is whether the accused device, which performs the claimed function, has the same or an equivalent structure as the structure described in the specification corresponding to the claim's means. ... Under the doctrine of equivalents, on the other hand, the question is whether the accused device is only insubstantially different [from] the claimed device. *Hilton Davis Chem. Co. v. Warner-Jenkinson Co.* ... The latter question often turns on whether the accused device performs substantially the same function in substantially the same way to achieve substantially the same result."); *Valmont Industries, Inc. v. Reinke Manufacturing Co., Inc., 983 F.2d 1039, 1043-44, 25 USPQ2d 1451, 1455 (Fed. Cir. 1993),* discussed *infra* ("[S]ection 112, P 6, and the doctrine of equivalents have separate origins and purposes. Section 112, P 6, limits the broad language of means-plus-function limitations in combination claims to equivalents of the structures, materials, or acts in the specification. The doctrine of equivalents equitably expands exclusive patent rights."); *Laitram Corp. v. Rexnord, Inc., 939 F.2d 1533, 1539, 19 USPQ2d 1367, 1372 (Fed. Cir. 1991),* discussed at § 18.03[5][d][ii], 18.03[5][e][i] (the doctrine of equivalents "inquiry of equivalency" to the "means" in a patent claim's means-plus-function limitation "may not be as limited as under section 112(6)", but a patentee cannot establish infringement with "conclusory assertions of infringement under the doctrine."); *Sun Studs, Inc. v. ATA Equipment Leasing, Inc., 872 F.2d 978, 10 USPQ2d 1338, 1347 (Fed. Cir. 1989), modified, 872 F.2d 978, 11 USPQ2d 1479 (Fed. Cir. 1989)* (it is error to apply to the doctrine of equivalents the more limited scope of the literal infringement provisions of *35 U.S.C. § 112* P 6); *Alpex Computer Corp. v. Nintendo Co., 34 USPQ2d 1167, 1177 (S.D. N.Y. 1994), aff'd in part & rev'd in part, 102 F.3d 1214, 40 USPQ2d 1667 (Fed. Cir. 1996), cert. denied, 521 U.S. 1104 (1997),* discussed at § 18.03[5][d][iii] ("Decisional law suggests two distinctions between 'equivalents' under section 112(6) and 'equivalents' under the doctrine of equivalence. First, under section 112(6), equivalents are identified by reference to the structure disclosed in the specification. These equivalents literally meet the claim and actually mark the bounds of the claims. By contrast, equivalents under the doctrine of equivalence are measured by reference to the structure disclosed in the claims. These equivalents fall outside the literal bounds of the claimed invention, and serve to extend the coverage of the patent beyond the literal claims. ... The second distinction between section 112(6) and the doctrine of equivalence is that section 112(6) requires an identity of function between the claimed invention and the accused device. ... Equivalence analysis under section 112(6), therefore, is limited to comparison of the structures at issue. ... By contrast, the doctrine of equivalence involves an equitable tri-partite test ... The doctrine of equivalence therefore contemplates equivalents of the claimed invention that differ, albeit unsubstantially, with respect to function and result, as well as with respect to the structure or way in which the device operates. In sum, the distinctions between section 112(6) and the doctrine of equivalence outlined above suggest that the doctrine of equivalence is a somewhat broader concept."); *Zygo Corp. v. Wyko Corp., 29 USPQ2d 1161 (D. Ariz. 1993), aff'd in part, rev'd in part & remanded, 79 F.3d 1563, 38 USPQ2d 1281 (Fed. Cir. 1996); Laitram Corp. v. Hewlett-Packard Co., Inc., 806 F. Supp.*

1286, 1293, n.7, 25 USPQ2d 1827, 1833, n.7 (E.D. La. 1992) ("Whether the [accused infringer] came to [its] system independently or by copying [the patentee's embodiment] is ... irrelevant if the ... system is a § 112 equivalent. ... It is relevant, however, under the doctrine of equivalents."); *Carl Zeiss Stiftung v. Renishaw plc, 740 F. Supp. 1038, 1045, 18 USPQ2d 1817, 1822 (S.D. N.Y. 1990), rev'd in part, vacated in part, 945 F.2d 1173, 20 USPQ2d 1094 (Fed. Cir. 1991),* discussed at § 18.03[2][c][iv] ("One oddity of patent law is that literal infringement can be on a type of equivalence, which is held to be different from the 'doctrine of equivalents' previously mentioned.").

(n561) Footnote 21. *Palumbo v. Don-Joy Co., 762 F.2d 969, 226 USPQ 5 (Fed. Cir. 1985).*

(n562) Footnote 22. *762 F.2d at 975 n.4, 226 USPQ at 8 n.4.*

See § 18.03[5][c][iii].

Cf. *Caterpillar Inc. v. Deere & Co., 224 F.3d 1374, 1379, 56 USPQ2d 1305, 1310 (Fed. Cir. 2000)* (REDUCED VERSION OF TRIPARTITE TEST; "The tests for equivalence under § 112, P 6 and the doctrine of equivalents are closely related, and involve 'similar analyses of insubstantiality of differences.' ... . A reduced version of the well-known tripartite test for the doctrine of equivalents has been applied in the § 112, P 6 context to determine if the differences are insubstantial; an accused device is equivalent when it performs the identical function in substantially the same way to achieve substantially the same result."); *Ishida Co., Ltd. v. Taylor, 221 F.3d 1310, 1317, 55 USPQ2d 1449, 1453 (Fed. Cir. 2000)* (quoting *Odetics*; "The 'insubstantial difference' analysis requires a determination of 'whether the "way" the accused structure performs the claimed function, and the "result" of that performance, are substantially different from the "way" the claimed function is performed by the "corresponding structure ... described in the specification," or its "result." ' "); *Kemco Sales, Inc. v. Control Papers Company, Inc., 208 F.3d 1352, 1364, 54 USPQ2d 1308, 1315 (Fed. Cir. 2000)* ("Under a modified version of the function-way-result methodology described in *Graver Tank & Manufacturing Co. v. Linde Air Products Co., 339 U.S. 605, 608, 85 USPQ 328, 330 (1950),* two structures may be 'equivalent' for purposes of section 112, paragraph 6 if they perform the identical function, in substantially the same way, with substantially the same result. *See Odetics, 185 F.3d at 1267, 51 USPQ2d at 1229-30* (setting forth a modified function-way-result analysis, acknowledging that 'this tripartite test developed for the doctrine of equivalents is not wholly transferable to the § 112, P 6 statutory equivalence context' due to the functional identity requirement)."); *Odetics, Inc. v. Storage Technology Corp., 185 F.3d 1259, 1267, 51 USPQ2d 1225, 1229-30 (Fed. Cir. 1999)* ("Structural equivalence under § 112, P 6 is, as noted by the Supreme Court, 'an application of the doctrine of equivalents ... in a restrictive role.' *Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 28, 41 ...* (1997). As such, 'their tests for equivalence are closely related,' ... involving 'similar analyses of insubstantiality of differences.' ... In the doctrine of equivalents context, the following test is often used: if the 'function, way, or result' of the assertedly substitute structure is substantially different from that described by the claim limitation, equivalence is not established. ... [T]his tripartite test developed for the doctrine of equivalents is not wholly transferable to the § 112, P 6 statutory equivalence context. ... Instead, the statutory equivalence analysis, while rooted in similar concepts of insubstantial differences as its doctrine of equivalents counterpart, is narrower. ... This is because, under § 112, P 6 equivalence, functional identity is required; thus the equivalence (indeed, identity) of the 'function' of the assertedly substitute structure, material, or acts must be first established in order to reach the statutory equivalence analysis. ... The content of the test for insubstantial differences under § 112, P 6 thus reduces to 'way' and 'result.' That is, the statutory equivalence analysis requires a determination of whether the 'way' the assertedly substitute structure performs the claimed function, and the 'result' of that performance, is substantially different from the 'way' the claimed function is performed by the 'corresponding structure, acts, or materials described in the specification,' or its 'result.' Structural equivalence under § 112, P 6 is met only if the differences are insubstantial, ... ; that is, if the assertedly equivalent structure performs the claimed function in substantially the same way to achieve substantially the same result as the corresponding structure described in the specification."); *Al-Site Corp. v. VSI International, Inc., 174 F.3d 1308, 1321, 50 USPQ2d 1161, 1169 (Fed. Cir. 1999)* ("[T]he doctrine of equivalents and structural equivalents under § 112, P 6, though different in purpose and administration, can at times render the same result."); *Valmont Industries, Inc. v. Reinke Manufacturing Co., Inc., 983 F.2d 1039, 1043, 25 USPQ2d 1451, 1455 (Fed. Cir. 1993),* discussed at § 18.03[5][c][iii] ("Section 112 and the doctrine of equivalents have something in common. The word 'equivalent' in section 112 invokes the familiar concept of an insubstantial change which adds nothing of significance. In the context of section 112, however, an equivalent results from an insubstantial change which adds nothing of significance to the structure, material, or acts disclosed in the patent specification. A determination of section 112 equivalence does not involve the equitable tripartite test of the doctrine of equivalents.").

Compare *Hilton Davis Chemical Co. v. Warner-Jenkinson Co., Inc., 62 F.3d 1512, 1562, n.11, 1563, 35 USPQ2d 1641, 1683, n.11 (Fed. Cir. 1995)* (in banc), *rev'd & remanded for further proceedings consistent with this opinion, 520*

U.S. 17, 41 USPQ2d 1865 (1997), on remand, 114 F.3d 1161, 43 USPQ2d 1152 (Fed. Cir. 1997) (NIES, dissenting: "I leave open the question whether infringement can extend to a later developed substituent under § 112, P 6. If so, there should be some restraint, such as, that one of skill in the art would find it obvious to make the change. This is not part of the *Graver II* test which limited legal equivalents to pre-issuance knowledge of equivalency."; "in *Hughes*, we engrafted the doctrine upon claims drafted in accordance with § 112, *P 6* leading to a bizarre interpretation of the statute. We now have literal equivalents and nonliteral equivalents of claim elements.").

(n563) Footnote 23. See § 18.04(2).

(n564) Footnote 24. See also *In re Hayes Microcomputer Products Inc. Patent Litigation, 982 F.2d 1527, 1542, 25 USPQ2d 1241, 1253 (Fed. Cir. 1992); Intel Corp. v. U.S. Int'l Trade Comm'n, 946 F.2d 821, 20 USPQ2d 1161 (Fed. Cir. 1991),* discussed at *§ 18.07[6][b][ii]*.

(n565) Footnote 25. *Dawn Equipment Co. v. Kentucky Farms, Inc., 140 F.3d 1009, 46 USPQ2d 1109 (Fed. Cir. 1998),* discussed at § 18.03(5)(d)(i).

See generally Note, "Federal Circuit Divided Over Distinction Between Equivalence Under Section 112, Paragraph 6, And Under Doctrine Of Equivalents," 10 J. Proprietary Rts. 14 (1998).

(n566) Footnote 26. *140 F.3d 1015 n.2, 46 USPQ2d at 1113 n.2.*

(n567) Footnote 27. *140 F.3d at 1021-1022, 46 USPQ2d at 1118.*

Judge Plager noted that two Federal Circuit decisions, *Valmont Industries* and *Alpex Computer*, attempted to distinguish the two, but "one problem with this approach is that it assumes that there are clearly defined operational differences between these two notions of equivalents, and that triers of fact (usually, whether judge or jury, persons unfamiliar in the first instance with the technology at issue, much less the legal conceptualizations) can readily differentiate between them." *140 F.3d at 1018, 46 USPQ2d at 1115. Vamont Industries* and *Alpex Computer* "cast the differences in terms of separate origins and purposes, and that the different equivalents have different 'application.' " but agreed that "the term 'equivalent' in both statute and doctrine, to employ the phrase used in *Valmont*, 'invokes the familiar concept of an insubstantial change which adds nothing of significance.' ... This suggests at the least that the tests for equivalence under the statute and the doctrine are quite similar, if not the same." *140 F.3d at 1018, 46 USPQ2d at 1115.*

The distinctions identified in *Valmont* and *Alpex* "appear to be either nonexistent or without significance, or are at least beyond what we can reasonably expect the triers of fact to sensibly discern." First, *Alpex* noted that "under the statute the accused product is compared to the structure disclosed in the specification corresponding to the means-plus-function claim limitation, whereas under the doctrine the accused product is compared to the claim limitation," *140 F.3d at 1018, 46 USPQ2d at 1115,* but "whether considering infringement under § 112, P 6 or the doctrine of equivalents, a comparison must be made to the described structure corresponding to the § 112, P 6 claim limitation." *140 F.3d at 1019, 46 USPQ2d at 1116.*

"[T]he comparison, for purposes of the doctrine of equivalents, of an accused product to a claim limitation drafted pursuant to § 112, *P 6* necessarily involves a comparison to the corresponding structure described in the specification. This is because § 112, P 6 mandates that such limitations are to be construed to cover the described corresponding structures (and their equivalents). Indeed, if the comparison under the doctrine is merely to the language in the claim, the comparison cannot be meaningfully made because, by definition, the § 112, *P 6* claim limitation recites no structure, material or acts."

"Considered another way, without reference to the corresponding structures described in the specification, any and all structures which perform the specified function would satisfy the claim limitation under the doctrine. That is clearly not the law of this court. For example, in *Valmont*, in applying the function-way-result test for purposes of the doctrine of equivalents, the court determined that there was not infringement, under the doctrine, of a claim drafted pursuant to § 112, *P 6* because the accused device was very different from that described in the patent." *140 F.3d at 1019, 46 USPQ2d at 1116.*

Valmont also stated "that a statutory equivalent under § 112, P 6 'does not involve the equitable tripartite test of the doctrine of equivalents,' i.e., the so-called function-way-result test. ... This was thought to follow from the fact that 'the sole question' under § 112, P 6 involves comparison of the structure in the accused product to the structure in the specification." *140 F.3d at 1018-1019, 46 USPQ2d at 1115-1116.* But this notion does not survive *Warner-Jenkinson.*

"[I]t is not readily apparent why use of the 'way' and 'result' parts of the tripartite test, to the extent that test is useful at all, would not also be helpful in the § 112, P 6 context. (With regard to the 'function' part of the test, the statute already carries with it a requirement that the specified function be the same.). Indeed, in a case decided prior to *Valmont*, this court opined that the same tripartite test does apply to determining equivalence under the statute:

'Whether the issue is equivalency of a means that is described in the specification to perform a function in a 'means' clause of a combination claim (i.e., literal infringement), or equivalency to the claimed invention as a whole (i.e., infringement by the doctrine of equivalents), the test is the same three-part test of history: does the asserted equivalent perform substantially the same function in substantially the same way to accomplish substantially the same result. (In the case of "means" clauses, of course, the function is that stated in the claim.)'

Texas Instruments, Inc. v. United States Int'l Trade Comm'n ... (Fed. Cir. 1986)."

"Contrary to the references to equivalency 'to the claimed invention as a whole' in *Texas Instruments* ... and *Valmont*, ... equivalents under the statute and doctrine can no longer be distinguished by the proposition that equivalence under the doctrine can apply to the claimed invention as a whole. The Supreme Court eliminated that possible distinction by requiring equivalence under the doctrine on a limitation-by-limitation basis. *See Warner-Jenkinson Co.* ... .

"... "[G]iven the statements in *Valmont* and *Alpex* that under both statute and doctrine the issue is insubstantial changes and, given this court's more-recent statement that the question of insubstantial differences under the doctrine may be satisfied by way of the tripartite test, *see Hilton Davis Chem. Co. v. Warner-Jenkinson Co.* ... (Fed. Cir. 1995) (in banc), *rev'd on other grounds* ... (1997), it is difficult to understand why the tripartite test would not also be available to resolve the question of insubstantial changes under the statute." *140 F.3d at 1019-1020, 46 USPQ2d at 1116.*

Judge Plager noted that "[t]here are no doubt other application details under the statute and doctrine that have developed in the case law over the years" and that "[o]ne could attempt to distinguish the tests for equivalence based on such details" but "such an analysis begs the ultimate questions: What if any difference is there between the scope of protection provided? Can triers of fact sensibly discern any such difference? Given the substantial risk of confusion, should there be two notions of equivalents?"

"To date, the descriptions offered of the differences between equivalents under the statute and under the doctrine, though they may accurately capture the two ways in which the notion of equivalents has developed and is thought to function, provide little of real guidance to a trier of fact called upon to distinguish the scope of one kind of equivalent from the other. ... [T]he existence of two 'different' notions of equivalents cannot help but add a further source of confusion, especially when submitted to a jury for decision based on the kinds of explanatory material available in the cases."

"In the case before us, the jury was charged to answer whether the claim at issue was literally infringed. The jury's response was 'No.' ... Because the claim consisted solely of means-plus-function limitations, literal infringement required a finding that the accused device performed the specified functions recited in the means-plus-function limitations with structure the same as or equivalent to the corresponding structure described in the specification. *See, e.g., Valmont* ... (setting forth the test for literal satisfaction of a means-plus-function limitation). There appears to be no genuine issue with regard to the specified functions; the accused device appears to perform the functions recited in the means-plus-function claim limitations (and I assume such to be the case). Thus, as a matter of statutory construction and controlling precedent, the jury verdict on literal infringement means that, in the jury's view, the accused device had neither the corresponding structure described in the specification nor equivalents thereof. But the jury was further charged to answer whether the claim at issue was infringed under the doctrine of equivalents. To this question the jury answered 'Yes.' What could that mean? The jury, by its vote on literal infringement, had already ruled out infringement based on the corresponding structure, and, as a matter of established law, it had also ruled out infringement based on equivalent structure, because that also would have been properly classified as 'literal' infringement.

"Given that, a finding of infringement under the doctrine of equivalents could only mean that there is something perceivably different between an equivalent under the doctrine and the equivalent, or lack thereof, under the statutory test. What this could possibly be escapes me. Beyond that, is it possible that the jury thought there was something called an equivalent of an equivalent, and that is what the jury found to exist?" *140 F.3d at 1020, 46 USPQ2d at 1116.*

Judge Plager noted that equivalency has a single meaning however described.

"However many variations there are in the words we use to describe the criteria by which to determine when something in fact is the 'equivalent' of something else, *see, e.g., Hilton Davis* ... (defining equivalence as 'insubstantial differences' and mentioning that that test may be satisfied where the function, way and result are substantially the same), the basic notion of equivalence does not vary. An equivalent is something that is 'equal in force or amount,' 'like in signification or import,' 'synonymous,' etc. Webster's Third New International Dictionary 769 (1986). If B is not the equivalent of A, using one understanding of equivalent, can it be said that B is the equivalent of A, using a second undefined or similarly understood meaning of equivalent? Worse yet, can it be said that B is the equivalent of the (unknown) equivalent of A? Stating a rule of law to permit that manner of thinking is simply an invitation to confused thinking. It certainly invites results that defy understanding." *140 F.3d at 1020, 46 USPQ2d at 1117.*

Finally, Judge Plager argued that maintaining two equivalency standards was inconsistent with the legislative purpose of Section 112.

"§ 112, P 6 was a legislative solution to a problem in claiming--broadly stated claims using means-plus-function language were too vague to be judicially enforced. *See Valmont* ... (noting that § 112, P 6 was enacted in response to the Supreme Court prohibiting certain use of means-plus-function language in *Halliburton Oil Well Cementing Co. v. Walker, 329 U.S. 1* ... (1946)). The purpose of § 112, P 6 was to provide clear parameters within which means-plus-function claims could be drawn and sensibly construed. Speaking in terms of dual and competing notions of equivalents seems to me to be wholly inconsistent with that legislative purpose. Furthermore, the doctrine of equivalents is a judge-made solution to a concern about overly-literal infringers. Congress having expressly provided against an overly-literal reading of § 112, P 6 claims by allowing for equivalents, there would seem to be no justification for intrusion by the courts to duplicate or differ from the legislative solution." *140 F.3d at 1021, 46 USPQ2d at 1118.*

(n568) Footnote 28. *140 F.3d at 1022 n.5, 46 USPQ2d at 1118 n.8.*

(n569) Footnote 29. *140 F.3d at 1022, 46 USPQ2d at 1118.*

"The distinction between the doctrine of equivalents and section 112 equivalents, if confusing to jurors, has long been understood by practitioners of patent law. These different rules serve different purposes. Other than further to restrict the doctrine of equivalents, I know of no policy reason for eliminating access to the doctrine of equivalents with respect to the claimed function when claims are written in 'means-plus-function' form. The style of claims is not the *sine qua non* of the patent right, and the equitable purposes of the doctrine of equivalents do not rise and fall with whether the patentee used the claim form authorized in section 112 paragraph 6.

"Precedent has often explained and implemented the distinct purposes of these two practices. *E.g., Pennwalt Corp. v. Durand-Wayland, Inc.* ... (Fed. Cir. 1987) (*en banc*) ('Section 112, paragraph 6, plays no role in determining whether an equivalent function is performed by the accused device under the doctrine of equivalents.'); *Alpex Computer Corp. v. Nintendo Co.* ... (Fed. Cir. 1996) ('While equivalency under the doctrine of equivalents and equivalency under § 112, P 6, both relate to insubstantial changes, each has a separate origin, purpose and application.'); *Valmont Industries Inc. v. Reinke Manufacturing Co.* ... (Fed. Cir. 1993) ('The doctrine of equivalents has a different purpose and application than section 112.'). ...

"Although laypersons may have trouble understanding this distinction, that can be said of many areas of law. Indeed, the jury problem that Judge Plager identifies in this case could have been easily avoided by presenting more explicit special verdicts. ...

"The proposed elimination of recourse to the doctrine of equivalents for claim elements described in means-plus-function form would markedly diminish the scope of the doctrine. This step has no support in precedent. Whether or not further restriction on the doctrine of equivalents will be warranted as, in the fullness of time, more is learned of its role in the larger system of national innovation policy, it is inappropriate for this court to undertake such a major step sua sponte. Judge Plager's suggestion that the law is wrong will send a sure signal to litigants, opening every district court to the argument. This can not add stability to patent law, or certainty to those seeking to conduct their business in reliance on law."

140 F.3d at 1022, 46 USPQ2d at 1119.

(n570) Footnote 30. *140 F.3d at 1023, 46 USPQ2d at 1119.*

"Congress thus provided the patentee with two benefits from section 112(6): first, it need not claim structure but can simply rely on the written description and drawings to obtain protection for all of its disclosed structures; and

second, it gets protection of all equivalents of whatever structures it has disclosed in its specification. Did Congress intend that the price for those benefits was foregoing coverage of even broader equivalents under the doctrine?"

"Is it contrary to section 112(6) to expand the protection for inventions claimed partly in means-plus-function format by also applying the doctrine of equivalents to limitations claimed in that format, when protection for some but not all equivalents has already been incorporated into the statute itself and when doing so further diminishes the notice function of the patent? Or, did Congress intend the courts to apply the doctrine of equivalents to the means-plus-function format just as we apply the doctrine to structural formats?" *140 F.3d at 1023, 46 USPQ2d at 1119.*

(n571) Footnote 31. *Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc., 145 F.3d 1303, 46 USPQ2d 1752 (Fed. Cir. 1998).*

Accord: *Interactive Pictures Corp. v. Infinite Pictures, Inc., 274 F.3d 1371, 1381, 61 USPQ2d 1152 (Fed. Cir. 2001), cert. denied, 123 S. Ct. 112 (2002)* (*Chiuminatta* "held that a finding that a component of an accused product is not a structure 'equivalent' to the corresponding structure of a means-plus-function limitation for purposes of literal infringement analysis precludes a finding that the same *structure* is equivalent for purposes of the doctrine of equivalents, unless the component constitutes technology arising after the issuance of the patent."); *Ballard Medical Products v. Allegiance Healthcare Corp., 268 F.3d 1352, 1363, 60 USPQ2d 1493 (Fed. Cir. 2001)* (citing *Chiuminatta*: "[W]here the claim of infringement under section 112 paragraph 6 fails on the ground that the accused device is not equivalent to the structure disclosed in the specification, the doctrine of equivalents is available only if, unlike in this case, the accused device represents new technology developed after the issuance of the patent. *Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc., 145 F.3d 1303, 1311, 46 USPQ2d 1752, 1758 (Fed. Cir. 1998).*"); *Al-Site Corp. v. VSI International, Inc., 174 F.3d 1308, 1320, 50 USPQ2d 1161, 1168 (Fed. Cir. 1999)* ("an equivalent structure or act under § 112 for literal infringement must have been available at the time of patent issuance while an equivalent under the doctrine of equivalents may arise after patent issuance and before the time of infringement. ... An 'after-arising' technology could thus infringe under the doctrine of equivalents without infringing literally as a § 112, P 6 equivalent.").

See also *Kudlacek v. DBC, Inc., 115 F. Supp.2d 996, 1052 (N.D. Iowa 2000), aff'd, 25 Fed. Appx. 837 (Fed. Cir. 2001)* (nonprecedential) ("when a means-plus-function claim limitation is at issue, there is a 'pre-existing technology' limitation"); *IPPV Enterprises, LLC v. Echostar Communications Corp., 106 F. Supp.2d 595, 606 (D. Del. 2000)* ("although later-developed technologies may infringe a patent under the doctrine of equivalents, such technologies cannot constitute an 'equivalent' as would fall within the literal scope of a patent under § 112, P 6."); *Transclean Corp. v. Bridgewood Services, Inc., 77 F. Supp.2d 1045, 1085-86 (D. Minn. 1999), aff'd in part, vacated in part, 290 F.3d 1364, 62 USPQ2d 1865 (Fed. Cir. 2002)* ("Where there is functional identity, but not structural identity, between the accused device and the patent claim, the statutory 'means plus function' test measures the possible equivalence between the structures in an analytical framework that is 'closely related' to the doctrine of equivalents."; "Recent decisions from the Federal Circuit hold that, if the proposed structural equivalent arose before the date of patent issuance, then the analysis of the ostensibly equivalent structure collapses into the Section 112, paragraph 6 analysis, and the patent holder is not entitled to rely upon the doctrine of equivalents."); *McGinley v. Franklin Sports, Inc., 75 F. Supp.2d 1218, 1225 n.5 (D. Kan. 1999), rev'd in part, aff'd in part, 262 F.3d 1339, 60 USPQ2d 1001 (Fed. Cir. 2001)* ("the line separating the two infringement inquiries has become somewhat blurred as a result of the *Chiuminatta* decision. There, the court held that, absent a technological advance leading to the difference between the patented product and the accused device, a failure to find literal infringement under § 112, P 6 may preclude a finding of infringement under the doctrine of equivalents. ... This holding appears to, for all practical purposes, transform the two infringement analyses into a singular, collective inquiry."); *Envirco Corp. v. Clestra Cleanroom Inc., 49 USPQ2d 1838, 1843 (N.D. N.Y. 1999), vacated in part & remanded, 209 F.3d 1360, 54 USPQ2d 1449 (Fed. Cir. 2000)* (alleged equivalent means was not a Section 112/6 equivalent and was "technology that predates the ... patent, and *not* a later-developed technology."); *Tech-Wear, Inc. v. Acme Laundry Products, Inc., 38 F. Supp.2d 1147, 1155 (C.D. Calif. 1998)* ("the difference between equivalence analysis under Section 112, paragraph 6 and under the doctrine of equivalence, the latter allows for technological advances not readily foreseen when the patentee applied for the patent."); *Odetics Inc. v. Storage Technology Corp., 14 F. Supp.2d 807, 814, 47 USPQ2d 1923, 1929 (E.D. Va. 1998), aff'd in part, rev'd in part, 185 F.3d 1259, 51 USPQ2d 1225 (Fed. Cir. 1999)* (LOURIE, dissenting) ("*Chiuminatta* holds that, in the general case, when there is no equivalence under § 112, P 6, there is also no equivalence under the doctrine of equivalents. ... The only exception to this rule is for an accused device that uses technology that was developed after the patent issued.").

Compare *C.R. Bard, Inc. v. M3 Systems, Inc., 157 F.3d 1340, 1363, 48 USPQ2d 1225, 1241 (Fed. Cir. 1998), reh'g denied & suggestion for reh'g in banc declined, 161 F.3d 1380, 49 USPQ2d 1219 (Fed. Cir. 1998), cert. denied, 526 U.S. 1130 (1999)* ("The accused equivalent structure need not have been known at the time the patented invention was made. *See Texas Instruments, 805 F.2d at 1563-64, 231 USPQ at 834-35* ('It is not required that those skilled in the art knew, at the time the patent application was filed, of the asserted equivalent means of performing the claimed functions ... .')").

See generally Note, "Chiuminatta Concrete Concepts Inc. v. Cardinal Industries, Inc. & Dawn Equipment Co. v. Kentucky Farms, Inc.," *14 Berkeley Tech. L.j. 173 (1999).*

(n572) Footnote 32. *145 F.3d at 1310-11, 46 USPQ2d at 1758.*

See also *Kraft Foods Inc. v. International Trading Co., 203 F.3d 1362, 1372, 53 USPQ2d 1814, 1822 (Fed. Cir. 2000),* discussed at *§ 18.04[3]* ("*Chiuminatta*'s preclusion of a finding of infringement under the doctrine of equivalents for pre-existing technology after an adverse holding of no literal infringement for the same technology applies only to means-plus-function claim limitations."); *Rackman v. Microsoft Corp., 102 F. Supp.2d 113, 130 (E.D. N.Y. 2000)* ("In a case where the technology at issue has developed over time, the date at which a statutory equivalent is determined can be important. The Court of Appeals for the Federal Circuit has recently clarified that: '[A] structural equivalent under § 112 must have been available at the time of the issuance of the claim. An equivalent structure or act under § 112 cannot embrace technology developed after the issuance of the patent because the literal meaning of a claim is fixed upon its issuance. An 'after arising equivalent' infringes, if at all, under the doctrine of equivalents.' *Al-Site Corp. v. VSI In'tl Inc., 174 F.3d 1308, 1320 (Fed. Cir. 1999)* (citations omitted).' Like all other aspects of claim construction, the Court views the question of statutory equivalence through the eyes of one skilled in the art at the time of the invention.").

(n573) Footnote 33. *WMS Gaming Inc. v. International Game Technology, 184 F.3d 1339, 51 USPQ2d 1385 (Fed. Cir. 1999).*

See also *Interactive Pictures Corp. v. Infinite Pictures, Inc., 274 F.3d 1371, 1381-82, 61 USPQ2d 1152 (Fed. Cir. 2001), cert. denied, 123 S. Ct. 112 (2002)* (*WMS Gaming* held that "when a finding of noninfringement under *35 U.S.C. § 112,* paragraph 6, is premised on an absence of identical *function,* then infringement under the doctrine of equivalents is not thereby automatically precluded."); *Schawbel Corp. v. Conair Corp., 122 F. Supp.2d 71 (D. Mass. 2000), aff'd, 15 Fed. Appx. 800 (Fed. Cir. 2001)* (nonprecedential); *Sunrise Medical MHHG, Inc. v. AirSep Corp., 95 F. Supp.2d 348 (W.D. Pa. 2000).*

(n574) Footnote 34. *184 F.3d at 1353, 51 USPQ2d at 1395.*

(n575) Footnote 35. *Al-Site Corp. v. VSI International, Inc., 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).*

See also *Ishida Co., Ltd. v. Taylor, 221 F.3d 1310, 1317, 55 USPQ2d 1449, 1453 (Fed. Cir. 2000)* (citing *Al-Site*; "The doctrine of equivalents might come into play to determine infringement of a means-plus-function claim element if the accused device features technology that has arisen since the time of patent issuance... . In that instance, the insubstantial difference analysis once again determines infringement, and again requires comparison of the structure corresponding to the function--the literal meaning of the claim element--with the accused structure."); *Kemco Sales, Inc. v. Control Papers Company, Inc., 208 F.3d 1352, 1364, 54 USPQ2d 1308, 1316 (Fed. Cir. 2000)* ("Because the 'way' and 'result' prongs are the same under both the section 112, paragraph 6 and doctrine of equivalents tests, a structure failing the section 112, paragraph 6 test under either or both prongs must fail the doctrine of equivalents test for the same reason(s). That was the case in *Chiuminatta,* in which the 'way' was determined to be substantially different under a section 112, paragraph 6 analysis."); *Kudlacek v. DBC, Inc., 115 F. Supp.2d 996, 1053 (N.D. Iowa 2000), aff'd, 25 Fed. Appx. 837 (Fed. Cir. 2001)* (nonprecedential) ("if the court determines, in its § 112, P 6 literal infringement analysis, that the accused device performs the identical function in a substantially different way, or with a substantially different result, it must also conclude that there is no infringement of the means-plus-function element under the doctrine of equivalents for the same reason or reasons."; "No party contends that the [the accused product] uses only pre-existing technology ... .").

(n576) Footnote 36. The court noted:

"The jury's finding of infringement of claim 1 of the '345 patent under the doctrine of equivalents indicates that the jury found every element of the claim literally or equivalently present in the accused device. The question before this court, therefore, is whether the jury's finding that the accused structure was equivalent to the 'means for securing' element under the doctrine of equivalents, also indicates that it is equivalent structure under § 112, P 6.

"This court has on several occasions explicated the distinctions between the term 'equivalents' found in § 112, *P 6* and the doctrine of equivalents. *See, e.g., Valmont Indus., Inc. v. Reinke Mfg. Co.* ... (Fed. Cir. 1993); *Chiuminatta* [*Concrete Concepts, Inc. v. Cardinal Indus., Inc.* (Fed. Cir. 1998)]; *Alpex Computer Corp. v. Nintendo Co.* ... (Fed. Cir. 1996); *Dawn Equip. Co. v. Kentucky Farms Inc.* ... (Fed. Cir. 1998) (Plager, J., additional views) (Newman, J., additional views) (Michel, J., additional views). Indeed, the Supreme Court recently acknowledged distinctions between equivalents as used in § 112, *P 6* and the doctrine of equivalents. *See Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17,* ... (1997) ('[Equivalents under § 112, P 6] is an application of the doctrine of equivalents in a restrictive role, narrowing the application of broad literal claim elements. [Section 112, P 6] was enacted as a targeted cure to a specific problem. ... The added provision, however, is silent on the doctrine of equivalents as applied where there is no literal infringement.').

"Section 112, P 6 recites a mandatory procedure for interpreting the meaning of a means-or step-plus-function claim element. ... § 112, P 6 procedures restrict a functional claim element's 'broad literal language ... to those means that are 'equivalent' to the actual means shown in the patent specification.' *Warner-Jenkinson, 117 S. Ct. at 1048.* Section 112, P 6 restricts the scope of a functional claim limitation as part of a literal infringement analysis. *See Pennwalt Corp. v. Durand-Wayland, Inc.* ... (Fed. Cir. 1987). Thus, an equivalent under § 112, P 6 informs the claim meaning for a literal infringement analysis.

"The doctrine of equivalents, on the other hand, extends enforcement of claim terms beyond their literal reach in the event 'there is "equivalence" between the elements of the accused product or process and the claimed elements of the patented invention.' *Warner-Jenkinson.* ... One important difference between § 112, P 6 and the doctrine of equivalents involves the timing of the separate analyses for an 'insubstantial change.' As this court has recently clarified, a structural equivalent under § 112 must have been available at the time of the issuance of the claim. *See Chiuminatta.* ... An equivalent structure or act under § 112 cannot embrace technology developed after the issuance of the patent because the literal meaning of a claim is fixed upon its issuance. An 'after arising equivalent' infringes, if at all, under the doctrine of equivalents. *See Warner-Jenkinson* ... ; *Hughes Aircraft Co. v. U.S.* ... (Fed. Cir. 1998).

"Thus, the temporal difference between patent issuance and infringement distinguish an equivalent under § 112 from an equivalent under the doctrine of equivalents. ...

"These principles, as explained in *Chiuminatta Concrete Concepts* ... suggest that title 35 will not produce an 'equivalent of an equivalent' by applying both § 112, P 6 and the doctrine of equivalents to the structure of a given claim element. A proposed equivalent must have arisen at a definite period in time, i.e., either before or after patent issuance. If before, a § 112, P 6 structural equivalents analysis applies and any analysis for equivalent structure under the doctrine of equivalents collapses into the § 112, P 6 analysis. If after, a non-textual infringement analysis proceeds under the doctrine of equivalents.

"Patent policy supports application of the doctrine of equivalents to a claim element expressed in means-plus-function form in the case of 'after-arising' technology because a patent draftsman has no way to anticipate and account for later developed substitutes for a claim element. Therefore, the doctrine of equivalents appropriately allows marginally broader coverage than § 112, P 6."

174 F.3d at 1319-21, n.2, 50 USPQ2d at 1167-68, n.2.

(n577) Footnote 37. "Because the functions are identical and the holes are not an after-arising technology, the jury's finding of infringement under the doctrine of equivalents indicates that the jury found insubstantial structural differences between the holes in the arms of the (accused) hanger tag and the loop of the '345 patent claim element. That finding is also sufficient to support the inference that the jury considered these to be structural equivalents under § 112, P 6." *174 F.3d at 1322, 50 USPQ2d at 1169.*

(n578) Footnote 38. E.g., *Lockheed Martin Corp. v. Space Systems/Loral, Inc., 249 F.3d 1314, 1325, 58 USPQ2d 1671 (Fed. Cir. 2001), vacated & remanded for further consideration in light of Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722 (2002), 122 S. Ct. 2349 (2002), on remand, 43 Fed. Appx. 372 (Fed. Cir. 2002)* (nonprecedential) ("Literal infringement of a § *112 P 6* claim requires that the relevant structure in the accused device perform the identical function recited in the claim and be identical or equivalent to the corresponding structure in the specification."); *Telemac Cellular Corp. v. Topp Telecom, Inc., 247 F.3d 1316, 1332, 58 USPQ2d 1545 (Fed. Cir. 2001)* ("To find literal infringement of claim limitations written in means-plus-function form, a court must find, at a minimum, identity of function between the claimed function and that of the accused device. ... Next, the court must satisfy itself that the accused device incorporates the same or equivalent structure to that described in the specification

as performing that function."); *Wenger Manufacturing, Inc. v. Coating Machinery Systems, Inc., 239 F.3d 1225, 1238, 57 USPQ2d 1679 (Fed. Cir. 2001)* ("Literal infringement of a means-plus-function claim requires that the accused device have structure for performing the identical function recited in the claim. ... In addition, the structure in the accused device must be either identical or equivalent to the corresponding structure in the specification."); *Ishida Co., Ltd. v. Taylor, 221 F.3d 1310, 1316-17, 55 USPQ2d 1449, 1453 (Fed. Cir. 2000)* ("Literal infringement of a claim with a means-plus-function clause requires that the accused device perform a function identical to that identified in the means clause... . If it performs the identical function, an accused device literally infringes a claim element under § *112 P 6* only if it is insubstantially different from the corresponding structure in the patent specification."); *Kemco Sales, Inc. v. Control Papers Company, Inc., 208 F.3d 1352, 1364, 54 USPQ2d 1308, 1315 (Fed. Cir. 2000)* ("In order for an accused structure to literally meet a section 112, paragraph 6 means-plus-function limitation, the accused structure must either be the same as the disclosed structure or be a section 112, paragraph 6 'equivalent,' i.e., (1) perform the identical function and (2) be otherwise insubstantially different with respect to structure. *See Odetics, Inc. v. Storage Tech. Corp., 185 F.3d 1259, 1267, 51 USPQ2d 1225, 1229 (Fed. Cir. 1999); Pennwalt Corp. v. Durand-Wayland, Inc., 833 F.2d 931, 934, 4 USPQ2d 1737, 1739 (Fed. Cir. 1987)* (en banc)."); *IMS Technology Inc. v. Haas Automation Inc., 206 F.3d 1422, 1430, 54 USPQ2d 1129, 1133 (Fed. Cir. 2000), cert. dismissed, 530 U.S. 1299 (2000)* ("For literal infringement of a § 112, P 6 limitation, the second step of an infringement analysis begins with determining whether the accused device or method performs an identical function to the one recited in the claim. ... If the identical function is performed, the next step is to determine whether the accused device uses the same structure, materials, or acts found in the specification, or their equivalents."); *Cortland Line Co., Inc. v. Orvis Co., Inc., 203 F.3d 1351, 1358, 53 USPQ2d 1734, 1738 (Fed. Cir. 2000)* ("An accused device satisfies a means-plus-function element literally if it performs the identical function recited in the claim, and incorporates the structure disclosed in the specification or an equivalent thereof."); *WMS Gaming Inc. v. International Game Technology, 184 F.3d 1339, 1350, 51 USPQ2d 1385, 1392-93 (Fed. Cir. 1999)* ("in order to establish literal infringement of a means-plus-function claim, the patentee must establish that the accused device employs structure identical or equivalent to the structure disclosed in the patent and that the accused device performs the identical function specified in the claim."); *Odetics, Inc. v. Storage Technology Corp., 185 F.3d 1259, 1267, 51 USPQ2d 1225, 1229 (Fed. Cir. 1999)* ("Literal infringement of a § 112, P 6 limitation requires that the relevant structure in the accused device perform the identical function recited in the claim and be identical or equivalent to the corresponding structure in the specification. ... Functional identity and either structural identity or equivalence are both necessary."); *Smiths Industries Medical Systems, Inc. v. Vital Signs, Inc., 50 USPQ2d 1641 (Fed. Cir. 1999), superseded on reh'g, 183 F.3d 1347, 1357, 51 USPQ2d 1415 (Fed. Cir. 1999)* ("For a claim drafted as a means-plus-function limitation under *35 U.S.C. § 112,* P 6, a court must first look to the patent specification to determine the 'corresponding structure' that performs the claimed function; the claim is then construed to cover that corresponding structure as well as 'equivalents thereof.' " "For an accused structure to be an equivalent under section 112, P 6, however, it must both have an equivalent structure and also perform the identical function as that recited in the claim language."); *Voice Technologies Group, Inc. v. VMC Systems, Inc., 164 F.3d 605, 612, 49 USPQ2d 1333, 1338 (Fed. Cir. 1999)* (a claim "whose clauses are written in means-plus-function form, ... covers the structures shown in the specification and equivalents thereof. The usage 'means for' signals recourse to the specification for the recited structure, and that the claimed functions may be performed by equivalents of the recited structures."); *C.R. Bard, Inc. v. M3 Systems, Inc., 157 F.3d 1340, 1363, 1361, 48 USPQ2d 1225, 1241, 1239 (Fed. Cir. 1998), reh'g denied & suggestion for reh'g in banc declined, 161 F.3d 1380, 49 USPQ2d 1219 (Fed. Cir. 1998), cert. denied, 526 U.S. 1130 (1999)* ("claims written in the form authorized by section 112 paragraph 6 are limited by the structure described and equivalents of that structure. Performance of the same function does not of itself establish infringement."; "[I]t is incorrect to construe terms in means-plus-function form as disembodied from the structure in the specification."); *Mas-Hamilton Group v. LaGard, Inc., 156 F.3d 1206, 1211-12, 48 USPQ2d 1010, 1015 (Fed. Cir. 1998)* ("For literal infringement of a section 112, P 6 limitation, the fact-finder must determine whether the accused device performs an identical function to the one recited in the means-plus-function clause... . If the identical function is performed, the fact-finder must then determine whether the accused device utilizes the same structure or materials as described in the specification, or their equivalents."); *Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc., 145 F.3d 1303, 1307-08, 46 USPQ2d 1752, 1755 (Fed. Cir. 1998)* ("A means-plus-function limitation contemplated by *35 U.S.C. § 112,* P 6 (1994) recites a function to be performed rather than definite structure or materials for performing that function. Such a limitation must be construed 'to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.' ... 'To determine whether a claim limitation is met literally, where expressed as a means for performing a stated function, the court must compare the accused structure *with the disclosed structure,* and must find equivalent *structure* as well as *identity* of claimed *function* for that structure.' *Pennwalt Corp. v. Durand-Wayland, Inc.* ... (Fed. Cir. 1987) (in banc) (emphasis in original)."); *Micro Chemical, Inc. v. Great Plains Chemical Co., Inc., 103 F.3d 1538, 1547, 41*

USPQ2d 1238, 1245-1246 (Fed. Cir. 1997), cert. denied, 521 U.S. 1122 (1997), further appeal, 194 F.3d 1250, 52 USPQ2d 1258 (Fed. Cir. 1999), discussed § 18.03[5][d][i] ("Literal infringement of a claim containing a means clause requires that the accused device perform the identical function as that identified in the means clause and do so with structure which is the same as or equivalent to that disclosed in the specification."); *King Instruments Corp. v. Perego, 65 F.3d 941, 945, 36 USPQ2d 1129, 1131-32 (Fed. Cir. 1995), reh'g denied, suggestion for reh'g in banc declined, 72 F.3d 855 (Fed. Cir. 1995), cert. denied, 517 U.S. 1188 (1996)* ("for a means-plus-function limitation to read on an accused device, the accused device must employ means identical or equivalent to the structures, material, or acts described in the patent specification. The accused device must also perform the identical function as specified in the claims."); *Valmont Industries, Inc. v. Reinke Manufacturing Co., Inc., 983 F.2d 1039, 1042, 25 USPQ2d 1451, 1454 (Fed. Cir. 1993),* discussed § 18.03[5][c][iii] ("In sum, for a means-plus-function limitation to read on an accused device, the accused device must employ means identical to or the equivalent of the structures, material, or acts described in the patent specification. The accused device must also perform the identical function as specified in the claims."); *Intellicall, Inc. v. Phonometrics, Inc., 952 F.2d 1384, 1389, 21 USPQ2d 1383, 1387 (Fed. Cir. 1992),* discussed at § 18.03[3][c] ("Under *35 U.S.C. § 112,* P 6, to satisfy a means-plus-function limitation literally, the accused device must perform the identical function required by the limitation and must incorporate the structure disclosed in the specification, or its substantial structural equivalent, as the means for performing that function."); *Intel Corp. v. U.S. Int'l Trade Comm'n, 946 F.2d 821, 841, 20 USPQ2d 1161, 1178 (Fed. Cir. 1991),* discussed at *§ 18.07[6][b][ii]* ("To meet a means-plus-function limitation literally, an accused device must (1) perform the identical function claimed for the means element, and (2) perform that function using the structure disclosed in the specification or an equivalent structure."); *Spindelfabrik Suessen-Schurr v. Schubert & Salzer Maschinenfabrik AG, 829 F.2d 1075, 1085, 4 USPQ2d 1044, 1052 (Fed. Cir. 1987), cert. denied, 484 U.S. 1063 (1988)* ("A finding of literal infringement of a claim expressed in terms of a series of means for performing particular functions ... involves interpreting the claim to define the recited function. If, as a threshold matter, the recited functions are not performed by the accused device, there can be no literal infringement. On the other hand, if an accused device is found to perform the recited functions, one must determine under § 112 para. 6 whether the means by which the accused device performs each function is the same as or equivalent to the means disclosed in the specification for performing each function.").

See also *Micro Chemical, Inc. v. Great Plains Chemical Co., 194 F.3d 1250, 1257-58, 52 USPQ2d 1258, 1263 (Fed. Cir. 1999)* ("Application of § 112, P 6 requires identification of the structure in the specification which performs the recited function. ... Therefore, § 112, P 6 requires both identification of the claimed function and identification of the structure in the written description necessary to perform that function. The statute does not permit limitation of a means-plus-function claim by adopting a function different from that explicitly recited in the claim. Nor does the statute permit incorporation of structure from the written description beyond that necessary to perform the claimed function.").

(n579) Footnote 39. *McGinley v. Franklin Sports, Inc., 262 F.3d 1339, 60 USPQ2d 1001 (Fed. Cir. 2001).*

(n580) Footnote 40. *262 F.3d at 1347.*

See also *Vulcan Engineering Co., Inc. v. Fata Aluminium, Inc., 278 F.3d 1366, 1376, 61 USPQ2d 1545 (Fed. Cir. 2002), cert. denied,* _ U.S. _ (2002), *123 S. Ct. 81* ("When the claims include means-plus-function terms in accordance with § 112 *P 6*, claim scope necessarily is not limited to the preferred embodiments, but includes equivalents thereof.").

(n581) Footnote 41. *Pennwalt Corp. v. Durand-Wayland, Inc., 833 F.2d 931, 4 USPQ2d 1737 (Fed. Cir. 1987), cert. denied, 485 U.S. 961, 1009 (1988),* discussed at *§ 18.04[1][a][iii][E].*

(n582) Footnote 42. *833 F.2d at 934, 4 USPQ2d at 1739.*

See also *Multiform Desiccants, Inc. v. Medzam, Ltd., 133 F.3d 1473, 1479, 45 USPQ2d 1429, 1434 (Fed. Cir. 1998),* discussed at *§ 18.07[3][d]* ("claims written in the means-for form of § *112 P 6* do not, by virtue of this form, acquire a scope as to the function beyond that which is supported in the specification"); *Carroll Touch, Inc. v. Electro Mechanical Systems, Inc., 15 F.3d 1573, 1576, 27 USPQ2d 1836, 1841 (Fed. Cir. 1993),* discussed at *§ 18.07[4][c]* (claim required means for mounting a structure with two surfaces "spaced apart"; in the accused structure, the surfaces were partially spaced apart but intersected to some extent; properly interpreted, the "function" portion of the means-plus-function limitation required that the two surfaces be spaced apart for the entirety of their surfaces; "The structures disclosed in the specification by which that function is achieved all have ... surfaces that do not intersect. Thus, the accused devices, by having ... surfaces that intersect, do not perform the identical function stated in the means limitation ... and do not use a structure taught in the specification or an equivalent structure."); *Intellicall, Inc. v. Phonometrics, Inc., 952 F.2d 1384, 1389, 21 USPQ2d 1383, 1387 (Fed. Cir. 1992),* discussed at § 18.03[3][c] (properly interpreted, the patent claim in question required a function not performed by the accused devices. "As a matter of law, under the

proper claim interpretation, there is no literal infringement."); *Minnesota Mining & Manufacturing Co. v. North American Science Associates Inc., 55 USPQ2d 1348, 1354 (D. Minn. 2000)* ("to fall within a means-plus-function limitation, an accused device must employ an identical or equivalent structure and that structure must perform the identical function as recited in the means-plus-function limitation."); *Riggs Marketing Inc. v. Mitchell, 993 F. Supp. 1301, 1314, 45 USPQ2d 1247, 1258 (D. Nev. 1997)* ("A claim for literal infringement always requires the accused product to perform the identical function as the patented claim.").

Compare *Micro Chemical, Inc. v. Great Plains Chemical Co., 194 F.3d 1250, 1258, 52 USPQ2d 1258, 1263 (Fed. Cir. 1999)* (a district court "erroneously restricted the functions" of means-plus-function elements); *Smiths Industries Medical Systems, Inc. v. Vital Signs, Inc., 50 USPQ2d 1641 (Fed. Cir. 1999)* (district court erred by reading limitation into recited function), *superseded on reh'g, 183 F.3d 1347, 51 USPQ2d 1415 (Fed. Cir. 1999).*

(n583) Footnote 43. E.g., *B. Braun Medical Inc. v. Abbott Laboratories, 32 USPQ2d 1211, 1214 (E.D. Pa. 1994)* ("Failure to show that the accused device does not perform the required function exactly, although negating *35 U.S.C. § 112,* paragraph 6 equivalency, does not prevent a finding of equivalency under the doctrine of equivalents."); *Schawbel Corp. v. Conair Corp., 122 F. Supp.2d 71, 77 (D. Mass. 2000), aff'd, 15 Fed. Appx. 800 (Fed. Cir. 2001)* (nonprecedential) ("The key distinguishing feature between the traditional equivalence analysis and the means-plus-function equivalence analysis is that § 112, P 6 equivalents must perform the *identical* function of the disclosed structure, whereas traditional equivalence analysis requires the equivalent structure to perform *substantially the same* function."); *Sunrise Medical MHHG, Inc. v. AirSep Corp., 95 F. Supp.2d 348, 441-42 (W.D. Pa. 2000)* ("an accused device that does not literally infringe under § *112 P 6,* because no identity of function exists, can infringe under the doctrine of equivalents, where substantially the same function is performed."); *Faroudja Laboratories, Inc. v. Dwin Electronics, Inc., 83 F. Supp.2d 1119, 1125 (N.D. Calif. 2000)* ("an accused device which does not literally infringe under *35 U.S.C. § 112,* P 6 may nonetheless infringe under the doctrine of equivalents because the equivalents doctrine only requires that the accused device perform substantially the same function, not the identical function, as the patented claims."); *Rain Bird Sprinkler Mfg. Corp. v. Toro Co., 28 USPQ2d 1448, 1456 (C.D. Calif. 1993), aff'd, 26 F.3d 141 (Fed. Cir. 1994)* (unpublished) ("Where the accused device does not literally meet the patent claims under § 112, it may still infringe under the doctrine of equivalents.").

Compare *Unidynamics Corp. v. Automatic Products International, Ltd., 157 F.3d 1311, 48 USPQ2d 1099 (Fed. Cir. 1998)* (in a patent claiming a vending machine with a door, the claim requiring "spring means tending to keep the door closed," the claimed function required a "closing action in addition to keeping the door closed once it is in a closed position," and, consequently, the claim was not infringed literally by a machine that had a padded bracket in one version, and a magnet in another version, to keep its door closed; "We find that as a matter of law neither version of the [accused] machines has any structure that performs substantially the same function of 'tending to keep the door closed.' No reasonable jury could find that maintaining the can loading door in a closed position is substantially the same function as tending to keep the door closed regardless of the position it is in. Therefore, neither version of the [accused] machines infringes the ... patent under the doctrine of equivalents.").

(n584) Footnote 44. *General Electric Co. v. Nintendo Co., Ltd., 179 F.3d 1350, 50 USPQ2d 1910 (Fed. Cir. 1999).*

Accord: *Senior Technologies, Inc. v. R.F. Technologies, Inc., 58 F. Supp.2d 1076, 1090, 1091 (D. Neb. 1999)* ("the patented and accused products are literally different. This conclusion is consistent with *General Elec. Co. v. Nintendo Co., Ltd., 179 F.3d 1350, 1353-56 (Fed. Cir. 1999),* in which the court, interpreting a means-plus-function claim, found that disruption of a signal path in the patented invention was not the same as bypassing the signal path, as in the accused system. In the [patent-in-suit], the signal path is electronically disrupted by the door switch. In the accused products, the microprocessor switches signals from one path to another. As in *General Electric,* identical functions are not performed."; "[A]s in *General Elec. Co. v. Nintendo Co., Ltd.,* the receiving circuit and microprocessor do not perform equivalent functions.").

(n585) Footnote 45. The claim at issue provides:

" Video record player apparatus comprising:

player RF signal input terminal;

a player RF signal output terminal;

a player power supply developing supply potentials when selectively enabled;

means, rendered operative in response to supply potential development by said power supply, for forming a player output signal inclusive of picture carrier frequency oscillations and sound carrier frequency oscillations;

means, responsive to supply potential development by said player power supply, for establishing a first signal path between said output signal forming means and said player RF signal output terminal; first signal path being disrupted in the absence of supply potential development by said player power supply; and

means, responsive to the absence of supply potential development by said player power supply, for establishing a second signal path between said player RF signal input terminal and said player RF signal output terminal; said second signal path being disrupted in the presence of supply potential development by said player power supply.' "

(Emphasis added.) *179 F.3d at 1353-54, 50 USPQ2d at 1913.*

(n586) Footnote 46. In the patent's specification, "the path between the antenna and the television contains an electromagnetic relay in series, and between the antenna and relay is a diode, which is shunted to ground. When the video record player is turned off, the relay is closed, the diode is nonconductive, and the signal flows from the antenna to the television. When the video record player is turned on, the relay is open, the diode is conductive, and the signal path from the antenna to the television is bypassed and disrupted." *179 F.3d at 1354, 50 USPQ2d at 1913.*

The accused systems "do not disrupt the signal path. The accused systems control the signal flow through three transistors. When the ... systems are turned on, the transistors enter saturation, passing the signal from the antenna to ground. When the ... systems are turned off, the transistors leave saturation, and the signal passes from the antenna, past the transistors, to the television." *179 F.3d at 1354, 50 USPQ2d at 1913.*

The accused infringer pointed "to language in the written description that differentiates between the functions of disrupting (i.e., establishing a high series impedance), and bypassing (i.e., by creating a path of lower resistance). *See* ... pat. ... ('the first signal path is disrupted by the relay opening' as compared to being 'bypassed by the second conducting diode'); *see also* ... pat. ... ('the extremely low impedance shunt path formed by conducting PIN diode 66, ... and by virtue of the high series impedance established by opening of relay 50.')." *179 F.3d at 1355, 50 USPQ2d at 1914.*

The court agreed that "the written description of the '899 patent clearly distinguishes between the functions of disrupting and bypassing."

"We conclude, moreover, that the claim language 'said second signal path being disrupted' means to establish a high series impedance in said signal path. ... [A] reasonable jury could only find that the [accused] systems do not disrupt the signal path between the antenna and the television. Therefore, because the [accused] systems bypass the signal path between the antenna and the television, establishing an alternative path of lower resistance allowing the antenna signal to flow to ground rather than to the television, the [accused] systems do not perform the identical function recited in means-plus-function language in the last limitation of Claim 12. In short, they do not disrupt the signal path."

179 F.3d at 1355-56, 50 USPQ2d at 1914.

(n587) Footnote 47. *170 F.3d at 1356, 50 USPQ2d at 1914.*

(n588) Footnote 48. *170 F.3d at 1356, 50 USPQ2d at 1914.*

(n589) Footnote 49. *WMS Gaming Inc. v. International Game Technology, 184 F.3d 1339, 51 USPQ2d 1385 (Fed. Cir. 1999).*

(n590) Footnote 50. The claim required:

" '1. A game apparatus, comprising:

a reel mounted for rotation about an axis through a predetermined number of radial positions;

means to start rotation of said reel about said axis;

indicia fixed to said reel to indicate the angular rotational position of said reel;

means for assigning a plurality of numbers representing said angular positions of said reel, said plurality of numbers exceeding said predetermined number of radial positions such that some rotational positions are represented by a plurality of numbers;

means for randomly selecting one of said plurality of assigned numbers; and

means for stopping said reel at the angular position represented by said selected number.' "

184 F.3d at 1346-47, 51 USPQ2d at 1390.

(n591) Footnote 51. *Micro Chemical, Inc. v. Great Plains Chemical Co., 194 F.3d 1250, 52 USPQ2d 1258 (Fed. Cir. 1999).*

(n592) Footnote 52. *194 F.3d at 1258, 52 USPQ2d at 1263.*

(n593) Footnote 53. *194 F.3d at 1258, 52 USPQ2d at 1263.*

(n594) Footnote 54. E.g., *J & M Corp. v. Harley-Davidson, Inc., 269 F.3d 1360, 1367, 60 USPQ2d 1746 (Fed. Cir. 2001)* ("The literal scope of a properly construed means-plus-function limitation does not extend to all means for performing a certain function. Rather, the scope of such claim language is sharply limited to the structure disclosed in the specification and its equivalents. Moreover, the extent of equivalents must be interpreted in light of the disclosure of the invention in the specification, as a whole, as well as the prosecution history. *Biodex Corp. v. Loredan Biomedical, Inc., 946 F.2d 850, 863, 20 USPQ2d 1252, 1262 (Fed. Cir. 1991); Medtronic Inc. v. Intermedics, Inc., 799 F.2d 734, 742, 230 USPQ 641, 645 (Fed. Cir. 1986); Alpex Computer Corp. v. Nintendo Co., 102 F.3d 1214, 1220, 40 USPQ2d 1667, 1673 (Fed. Cir. 1996)* (holding that the prosecution history is relevant to determining the meaning of means-plus-function limitations); *Signtech USA v. Vutek, Inc., 174 F.3d 1352, 1357, 50 USPQ2d 1372, 1375 (Fed. Cir. 1999)* (holding that a means-plus-function limitation did not cover structure disclaimed in the specification)."); *Biodex Corp. v. Loredan Biomedical, Inc., 946 F.2d 850, 863, 20 USPQ2d 1252, 1262 (Fed. Cir. 1991), cert. denied, 504 U.S. 980 (1992)* ("this Court has specifically cautioned against reading means-plus-function limitations to cover all possible means that perform the recited function."); *Bell Communications Research, Inc. v. FORE Systems, Inc., 113 F. Supp.2d 635, 648 (D. Del. 2000)* ("Although use of means-plus-function language in a claim is permissible, a means clause does not encompass every means for performing the specified function.").

Cf. *Laitram Corp. v. Rexnord, Inc., 939 F.2d 1533, 1536, 19 USPQ2d 1367, 1369-70 (Fed. Cir. 1991),* discussed at § 18.03[5][d][ii], § 18.03[5][e][i] ("Absent section 112(6), claim language which requires only a means for performing a function might be indefinite ... . While the use of means-plus-function language in a claim is clearly permissible by reason of section 112(6), a means clause does not cover every means for performing the specified function ... . The means-plus-function language must not only read on the accused device, but also, if the accused structure is different from that described in the patent, the patentee must prove, for literal infringement, that the means in the accused device is structurally equivalent to the means described in the specification.").

Compare *Level One Communications, Inc. v. Seeq Technology, Inc., 987 F. Supp. 1191, 1200 (N.D. Calif. 1997)* ("while a patentee must disclose some structure for all means recited in the claims, it need not disclose every means for implementing the function in question.").

(n595) Footnote 55. *Jonsson v. The Stanley Works, 903 F.2d 812, 819, 14 USPQ2d 1863, 1869 (Fed. Cir. 1990),* discussed at § 18.03(2)(e)(v), § 18.05(2)(d), § 18.05(3)(b).

(n596) Footnote 56. *903 F.2d at 819, 14 USPQ2d at 1869* (Emphasis in original).

See also *Micro Chemical, Inc. v. Great Plains Chemical Co., 194 F.3d 1250, 1260, 52 USPQ2d 1258, 1265 (Fed. Cir. 1999)* ("Claim treatment outside of the requirements of § 112, P 6 generally gives the claims a broader scope."); *Rain Bird Sprinkler Mfg. Corp. v. Toro Co., 28 USPQ2d 1448, 1456 (C.D. Calif. 1993), aff'd, 26 F.3d 141 (Fed. Cir. 1994)* (unpublished) ("The concept of equivalency, as set forth in § 112, does not expand the scope of the patent claim. ... Rather, § 112 operates to cut back on the type of means which can literally satisfy the claim language."); *Interspiro USA Inc. v. Figgie International Inc., 815 F. Supp. 1488, 1504, 27 USPQ2d 1321, 1329 (D. Del. 1993), aff'd, 18 F.3d 927, 30 USPQ2d 1070 (Fed. Cir. 1994)* ("Section 112 is not designed ... to expand the coverage of means-plus-function language, but rather to restrict its coverage to truly identical means and functions."); *B.F. Goodrich FlightSystems Inc. v. Insight Instruments Corp., 22 USPQ2d 1832, 1836 (S.D. Ohio 1992), aff'd, 991 F.2d 810 (Fed. Cir. 1993)* (unpublished) ("Despite the literal breadth of the statute, ... means plus function language is not a talisman for limitless protection of the concept the claim purports to protect."); *Jennmar Corp. v. Pattin Manufacturing Co., 20 USPQ2d 1721, 1725 (S.D. Ohio 1991)* ("§ *112 P 6* operates to 'cut back' on the types of means which could literally satisfy the claim language.").

(n597) Footnote 57. *Johnston v. IVAC Corp., 885 F.2d 1574, 12 USPQ2d 1382 (Fed. Cir. 1989),* discussed at § 18.06(2)(a)(iii).

See also *Valmont Industries, Inc. v. Reinke Manufacturing Co., Inc., 983 F.2d 1039, 1042, 25 USPQ2d 1451, 1454 (Fed. Cir. 1993),* discussed § 18.03[5][c][iii] ("Indeed the section operates more like the reverse doctrine of equivalents than the doctrine of equivalents because it restricts the coverage of literal claim language.").

Compare *In re Donaldson Company, Inc., 16 F.3d 1189, 1194, n.5, 29 USPQ2d 1845, 1849, n.5 (Fed. Cir. 1994)* (in banc), discussed at *§ 11.03[1]* ("there is no legislative history suggesting that Congress's purpose in enacting paragraph six was to codify the reverse doctrine of equivalents, ... and thus there is no reason to believe that Congress intended to limit the application of paragraph six to post-issuance claim interpretation."; "Of course, this is not to say that this may not have been one of the *results* of enacting this paragraph. In *Johnston v. IVAC Corp.* ... this court noted that paragraph six effectively restricts the scope that one would attribute to means-plus-function language if one were to read it in a vacuum without reference to the specification.").

(n598) Footnote 58. In *Johnston* the patent in suit related to electronic medical thermometers having disposable covers for the thermometer probe. The claim specified in one element that a probe be "deformed to define at least one integral, substantially rigid salient section ... said section terminating in a sharp edge." *885 F.2d at 1578, 12 USPQ2d at 1384.* Another element specified that there be "means for inserting forcing said probe cover to deform over said salient section and causing said sharp edge to inscribe itself fixedly into said probe cover." *885 F.2d at 1578, 12 USPQ2d at 1384.* The Federal Circuit affirmed the district court ruling that the claim, properly interpreted, cannot read literally on a thermometer with a separately formed metal retaining ring affixed to the probe, the ring being machined free of any sharp edge to allow removal of the cover and the cover being designed for a friction fit. It rejected the patentee's argument that the district court should have determined whether the accused devices " 'infringed the ... patent under the means plus function test ... as properly defined and applied.' " *885 F.2d at 1580, 12 USPQ2d at 1386.*

"That part of a claim contains means-plus-function language does not make section *112 P 6* applicable to the entirety of the claim... . [S]ection *112 P 6* is clearly not a separate *test* for infringement inasmuch as an infringement determination necessarily involves all parts of the claim... . Even with respect to the part of the claim to which it pertains, section *112 P 6* does not ... *expand* the scope of the claim. An element of a claim described as a means for performing a function, if read literally, would encompass *any* means for performing the function... . But section *112 P 6* operates to *cut back* on the types of *means* which could literally satisfy the claim language... . [T]he section has no effect on the function specified--it does not extend the element to equivalent functions... . Properly understood section *112 P 6* operates more like the reverse doctrine of equivalents than the doctrine of equivalents because it restricts the scope of the literal claim language."

885 F.2d at 1580, 12 USPQ2d at 1386.

(n599) Footnote 59. *Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co., 520 U.S. 17, 41 USPQ2d 1865 (1997), remanded, 114 F.3d 1161, 43 USPQ2d 1152 (Fed. Cir. 1997),* discussed at *§ 18.02[5].*

(n600) Footnote 60. *520 U.S. at 28, 41 USPQ2d at 1870.*

See also *Sunrise Medical MHHG, Inc. v. AirSep Corp., 95 F. Supp.2d 348, 440 (W.D. Pa. 2000)* ("Not every structure capable of performing the recited function of a means element will be either disclosed in the patent specification or an equivalent of the disclosed, corresponding structure. Accordingly, § *112 P 6* operates as a restriction on claim coverage rather than an expansion of it."); *Lampi, LLC v. American Power Products, Inc., 65 F. Supp.2d 757, 767 (N.D. Ill. 1999), aff'd in part, vacated in part and remanded, 228 F.3d 1365, 56 USPQ2d 1445 (Fed. Cir. 2000)* (" § 112 operates like a reverse doctrine of equivalents because it restricts the coverage of literal claim language."); *Contempo Tobacco Products Inc. v. McKinnie, 45 USPQ2d 1969, 1974 n.4 (C.D. Ill. 1997)* ("the equivalency requirement under section 112, paragraph 6, actually restricts the scope of the claim language. ... This is to be contrasted with the more general 'doctrine of equivalents' which expands claims beyond their literal language.").

(n601) Footnote 61. *National Presto Industries, Inc. v. Black & Decker Inc., 1992 WL 125559* at *2 (N.D. Ill. 1992).

(n602) Footnote 62. *Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc., 145 F.3d 1303, 46 USPQ2d 1752 (Fed. Cir. 1998).*

(n603) Footnote 63. *IMS Technology Inc. v. Haas Automation Inc., 206 F.3d 1422, 54 USPQ2d 1129 (Fed. Cir. 2000), cert. dismissed, 530 U.S. 1299 (2000).*

See also *O.I. Corp. v. Tekmar Co., Inc., 115 F.3d 1576, 1581, 42 USPQ2d 1777, 1780 (Fed. Cir. 1997),* discussed at *§ 18.07[4][a]* (the district court erred in treating the word "passage" in an apparatus patent claim's phrase "means for passing the ... slug through a passage" as part of the means clause because the "passage" was "the place where the function occurs, not the structure that accomplishes it").

(n604) Footnote 64. *206 F.3d at 1432, 54 USPQ2d at 1135.*

(n605) Footnote 65. *206 F.3d at 1427, 54 USPQ2d at 1131.*

(n606) Footnote 66. *206 F.3d at 1432-33, 54 USPQ2d at 1135.*

(n607) Footnote 67. *206 F.3d at 1432, 54 USPQ2d at 1135-36.*

(n608) Footnote 68. *Valmont Industries, Inc. v. Reinke Manufacturing Co., Inc., 983 F.2d 1039, 25 USPQ2d 1451 (Fed. Cir. 1993),* discussed *infra*; *Atari Corp. v. Sega of America Inc., 32 USPQ2d 1237, 1241 (N.D. Calif. 1994)* ("Given that the function is simply to impose a delay positioned between the memory and the display, there is no apparent reason why placement of the delay before rather than after the parallel-to-serial converter is a substantial change or adds anything of significance."; "interchangeability is evidence of equivalency").

See also *Laitram Corp. v. Rexnord, Inc., 939 F.2d 1533, 1538, 19 USPQ2d 1367, 1371 (Fed. Cir. 1991),* discussed at § 18.03[5][d][ii], § 18.03[5][e][i] (the patentee's assertion that the accused and specification structures are "the same because they perform the same function" lacks merit: "Different structures are not *ipso facto* equivalent merely because they perform the same function. To so hold would effectively eliminate the statutory restriction of section 112(6)."; the infringer's expert's testimony that the two structures are "similar" did "not establish [their] structural equivalency."); *Texas Instruments Inc. v. U.S. Int'l Trade Comm'n, 871 F.2d 1054, 1063, 10 USPQ2d 1257, 1261 (Fed. Cir. 1989),* discussed at *§ 18.07[6][b][ii]* (the Commission correctly found that certain accused devices (dynamic random access memory chips-"DRAMS") infringed patent claims that contained a means-plus-function limitation, "means for precharging the column lines prior to said selected time." Many techniques were available to those skilled in the art for achieving the described function. "Since these equivalents were available in the art, [the infringer] had only to select a means after learning the principle from the [patentee's] teachings."); *Rite-Hite Corp. v. Kelley Company, Inc., 819 F.2d 1120, 1124, 2 USPQ2d 1915, 1918 (Fed. Cir. 1987)* (as to the scope of a claim in a means-plus-function form, "[i]nterchangeability is a useful consideration when determining whether two specific structures are equivalents."); *Data Line Corp. v. Micro Technologies, Inc., 813 F.2d 1196, 1201,* 1 USPQ2d 2052, 2055 (Fed. Cir. 1987) ("Congress has provided this statute as a specific instruction on interpretation of this type of claim which otherwise might be held to be indefinite. Thus, the provision excludes some means which perform the specified function from *literally* satisfying the claim limitation. On the other hand, the provision precludes an interpretation that construes the means-plus-function limitation to *cover only* the means disclosed in the specification. ... If all other limitations in such a claim are literally met, and the accused device is shown to contain an equivalent of the structure which was identified in the means-plus-function limitation of the claim and disclosed in the specification, infringement is said to be 'literal' as distinguished from infringement under the doctrine of equivalents. ... Therefore, where a claim sets forth a means for performing a specific function, without reciting any specific structure for performing that function, the structure disclosed in the specification must be considered, and the patent claim construed to cover both the disclosed structure and equivalents thereof.").

Cf. *Kartarik v. Remote Transaction Technologies, 812 F. Supp. 910, 915, 26 USPQ2d 1284, 1288 (D. Minn. 1993)* (access "means" does not include human operation; "A human being is not deemed the equivalent of a machine, particularly in cases such as the present case, where there is no support for the use of a human being in the specification."); *King Instrument Corp. v. Perego, 737 F. Supp. 1227, 1232, 1239, 16 USPQ2d 1994, 1998, 2004 (D. Mass. 1990), aff'd, 65 F.3d 941, 36 USPQ2d 1129 (Fed. Cir. 1995), reh'g denied, suggestion for reh'g in banc declined, 72 F.3d 855 (Fed. Cir. 1995), cert. denied, 517 U.S. 1188 (1996).*

In *De Graffenried v. United States, 16 USPQ2d 1321, 1339-40 (U.S. Cl. Ct. 1990),* Judge Andewelt opined that Section 112 equivalents are not restricted to physical or structural equivalents.

"The concept of equivalence has meaning in patent law outside of Section 112 and the concept has not been limited to equivalent physical structures ... .

"... [A]pplying the doctrine of equivalence is distinct from determining literal infringement of a claim using means plus function language under *35 U.S.C. § 12.* But in using the term 'equivalents' in Section 112, Congress intended to reference the *Graver Tank* concepts of equivalence ... .

"Limiting Section 112 'equivalents' to objects that are structurally equivalent to those objects described in a patent specification would undermine Congress' intent in 1952 in adding the third paragraph of Section 112. By specifically authorizing the use of 'means plus function' terminology, Congress apparently recognized that such terminology can be a highly efficient way to draft a patent claim, *i.e.*, to define the metes and bounds of the patentee's invention. However, limiting literal infringement of 'means plus function' claims to objects that have physical structures equivalent to those objects specifically described in the patent specification could seriously undermine the usefulness of such claims. Under such an interpretation, literal infringement ... may be avoided simply by replacing the structures specifically described in the patent specification with known functional equivalents that operate in substantially the same way but have fundamentally different structures. To avoid such a result, a patent owner would reasonably have to include in the patent specification an exhaustive list of structures that possibly could perform each function described in the claim ... .

"... Equivalence of physical structure may be an appropriate part of the analysis but it is not a *sine qua non* for a finding of section 112 'equivalents.' " *20 Cl. Ct. at 480-81, 16 USPQ2d at 1339-40.*

See also *Davies v. United States, 35 USPQ2d 1027, 1033 (Cl. Ct. 1994)* ("Means-plus-function claims are not construed to cover only physical equivalents of the specified structure", but "the structure described in the specification is the touchstone for construing a means-plus-function claim.").

(n609) Footnote 69. *Valmont Industries, Inc. v. Reinke Manufacturing Co., Inc., 983 F.2d 1039, 25 USPQ2d 1451 (Fed. Cir. 1993).*

See also *Utah Medical Products, Inc. v. Clinic Innovations Associates, Inc., 79 F. Supp.2d 1290, 1299 (D. Utah 1999), aff'd, 251 F.3d 171 (Fed. Cir. 2000)* (unpublished) (quoting *Valmont Indus.*; "The Federal Circuit defines 'equivalent' in the § 112(6) context as 'an insubstantial change which adds nothing of significance to the structure, material, or acts disclosed in the patent specification.' "); *McGinley v. Franklin Sports, Inc., 75 F. Supp.2d 1218, 1222-23 (D. Kan. 1999), rev'd in part, aff'd in part, 262 F.3d 1339, 60 USPQ2d 1001 (Fed. Cir. 2001)* (quoting *Valmont Indus.*).

(n610) Footnote 70. *983 F.2d at 1044, 25 USPQ2d at 1455.*

(n611) Footnote 71. *983 F.2d at 1043, 25 USPQ2d at 1455.*

In *Valmont Industries*, the patent in suit concerned a self-propelled irrigation apparatus that waters the corners of a field that a center pivot irrigator misses. The patent specification disclosed an extension arm assembly with self-propelled support towers, the arm being attached to the irrigator's main arm. To reduce crop damage, the extension arms followed the same path into the corners on each revolution. Encoders measured the angles between (i) the main arm and a predefined axis in the field, and (ii) the extension and main arms. The encoders sent a signal to a comparator circuit, which, in turn, sent a signal to a steering motor on the extension arm. The patent claim required "*control means for operating said moving means to move said extension arm assembly relative to said main arm assembly. ...*" *983 F.2d at 1040, 25 USPQ2d at 1453.*

In the accused apparatus, sensors on the extension arm receive steering signals from cable buried in the field. The district court found that "the means for steering in the two systems are equivalent" because "they are substantially the same function--there's a control means for operating the moving means; they perform the function in substantially the same way--by imparting an electric signal to the steering motors to cause the steering wheels to pivot; and they achieve substantially the same result--the movement of the extension arm in an angle relative to the main arm in order to reach and irrigate the corners of a field." *983 F.2d at 1041, 25 USPQ2d at 1453.*

The appeals court held that this finding was erroneous: "Upon confronting means-plus-function terms in the 'control means' limitation, the trial court should have identified the structure in the specification." *983 F.2d at 1041, 25 USPQ2d at 1455.* The specification refers to control means that entail angle encoders, comparator circuits, and a steering motor that maintain angular relationships between the irrigator arms.

"With this structure setting the limits for the control means, the trial court should have compared this structure to Reinke's device to see if it uses these means or their structural equivalent to perform the claimed control means function. The record shows that [the accused] extension arm support towers [sense and follow a] buried cable. ...

"Comparison of these two control means compels the conclusion that the claimed control means and [the accused structure's] control means are not structurally equivalent under section 112. ... The trial court's determination suggests that it compared the accused system to [the patentee's] irrigation system, rather than to the control means structure in the

specification. Moreover, even though both the control means in the specification and the control means on [the accused] device use electric signals, the structures generating those signals are strikingly different." *983 F.2d at 1044, 25 USPQ2d at 1455-56.*

The patentee's assertion that the accused apparatus' buried cable means is equivalent to the patent's control means was directly contradicted by statements it made during a PTO reissue proceeding involving another patent in which it sought protection for a buried cable system and argued that buried cable systems were "completely different" from its patented angular position measuring control system.

The appeals court held that the district court also erred "[t]o the extent that [it] applied the doctrine of equivalents to the claimed invention as a whole." *983 F.2d at 1044, 25 USPQ2d at 1456.* The accused device "does not meet the 'way' prong of the tri-partite test under the doctrine of equivalents" because the accused apparatus' "buried cable controls the extension arm in a very different way from the angle comparator controls disclosed in the patent." *983 F.2d at 1044, 25 USPQ2d at 1456.*

(n612) Footnote 72. *In re Hayes Microcomputer Products Inc. Patent Litigation 982 F.2d 1527, 25 USPQ2d 1241 (Fed. Cir. 1992).*

For a decision on whether access to computer code used in an accused device is necessary to establish infringement of a patent claim phrased in "means" terms see *Cochran Consulting, Inc. v. Uwatec USA, Inc., 102 F.3d 1224, 1225, 1231, 41 USPQ2d 1161, 1162, 1167 (Fed. Cir. 1996)* (the district court erred by imposing sanctions on a company accused of infringing a patent, which concerned a device for indicating dive parameters to scuba divers, after the company failed to produce computer programming (ROM) code owned by the company's Swiss affiliate because, inter alia, a Swiss court decision barred the disclosure and "the ROM code [was] unnecessary to prove infringement of the patented invention."; the patent's claim required information providing "means", but its specification gave no details as to the coding or contents of a "ROM"; "Infringement resides not in the way the claim limitations and functions are translated into computer language, but whether these limitations and functions are performed by the [accused device]."); "The [patented] invention is not an invention of software programming: it is an invention of a scuba indicator device for divers, having specified mechanical and electronic components and performing specified functions, as set forth in Claim 1 ... ."; "The entire content of the patent concerning the ROM code is the following sentence: 'The memory may comprise a read only memory (ROM) and a random access memory (RAM) to not only enable storage of information relating to dive tables but to also enable ancillary calculations to be carried out or to store information such as surface interval duration between dives, bottom time water temperature and depth attained in a dive for example.' "; "The presence of the claim elements and the performance of the claim functions does not depend on the use of any particular ROM code, and infringement is not proved by reference to the ROM code."; "The accused device is a mechanical and electronic indicator most of which is not computer operated. ... [L]ess than 1% of the demanded ROM code relates to the disputed aspect of infringement, *viz.* the transmission of dive parameters to the diver."; "[T]he schematics of the instrument were provided during discovery and explained during deposition.").

(n613) Footnote 73. *982 F.2d at 1543, 25 USPQ2d at 1253.*

See also *Odetics, Inc. v. Storage Technology Corp., 185 F.3d 1259, 1278, 51 USPQ2d 1225, 1238 (Fed. Cir. 1999)* (an expert's testimony provided evidentiary support for a finding of equivalency of structure, not merely identity of function; an accused structure may be equivalent even though it is not capable of performing additional, unrelated functions performed by the patent specification structure; LOURIE, dissenting: "[R]eliance merely on functional identicality to prove literal infringement erroneously expands § 112, P 6, beyond its intended limits. ... ('section 112, paragraph 6, rules out the possibility that any and every means which performs the function specified in the claim literally satisfies that limitation.') (emphasis deleted). [The patentee's expert's] testimony concerning functional identicality did not serve the dual role of also proving structural equivalency.").

(n614) Footnote 74. *982 F.2d at 1542, 25 USPQ2d at 1253.*

The patent's claims were to an improved two mode operation modem that included "means defining a predetermined sequence of said data signals as an escape character", the improvement comprising two "means" limitations, a timing means and a detecting and switching means. The specification disclosed that the two means are incorporated in a programmed microprocessor. It indicated that the escape sequence that caused the modem to switch from transparent mode to command mode should be one full second of no data, followed by the predetermined escape command, followed by another full second of no data. The "no data" period is known as "guardtime."

The accused infringer designed its product to be compatible with the patentee's Hayes SmartModem, which used a sequence of one second guardtime (_), followed by three pluses (+ + +), followed by another one second guardtime (_).

To establish infringement, the patentee relied on its expert, Dr. Cliett. The accused infringer argued that the expert "never read section 112," "had no knowledge of the internal structure of the accused products", and "never compared the disclosed structure in the specification with the structure of the accused device."

The accused infringer stipulated that the accused modems had a microprocessor. The expert testified that (1) the accused modems had transparent-command mode switching, (2) he tested them to verify that they had the "+ + +" escape sequence, and (3) they were "functionally equivalent" to the claimed invention. The accused infringer's engineer, who designed the accused modems, testified that they had firmware requiring both the leading and trailing guardtimes for the modem to switch modes.

(n615) Footnote 75. *982 F.2d at 1543, 25 USPQ2d at 1253.*

(n616) Footnote 76. See § 18.04(1)(a)(iii)(G).

(n617) Footnote 77. *62 F.3d at 1518, 35 USPQ2d at 1645.*

(n618) Footnote 78. *Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co., 520 U.S. 17, 41 USPQ2d 1865 (1997), remanded, 114 F.3d 1161, 43 USPQ2d 1152 (Fed. Cir. 1997),* discussed at *§ 18.02[5]* and *§ 18.04[1][d].*

(n619) Footnote 79. E.g., *Telemac Cellular Corp. v. Topp Telecom, Inc., 247 F.3d 1316, 58 USPQ2d 1545 (Fed. Cir. 2001); Ishida Co., Ltd. v. Taylor, 221 F.3d 1310, 55 USPQ2d 1449 (Fed. Cir. 2000); Kemco Sales, Inc. v. Control Papers Company, Inc., 208 F.3d 1352, 1364-65, 54 USPQ2d 1308, 1316 (Fed. Cir. 2000)* (a patent concerned a plastic security envelope that is "tamper-evident", that is, it indicates whether someone has opened and resealed the envelope; the envelope used two sealing means, a primary closer and a tamper indicator; the claim required a "plastic envelope closing means"; the corresponding structure in the specification includes a piece of plastic that folds over the envelope's opening and is secured to one or both of the envelope's panels; all of the embodiments in the specification showed a plastic fold-over flap; an accused envelope used two sealing means as with the patented invention but had two flaps ("lips") that sealed together with an internal adhesive rather than a flap that folded over the opening; HELD: "(T)he district court did not err in holding that no reasonable jury could find that the (accused infringer's) dual-lip structure was an equivalent of a fold-over flap, interpreted either under section 112, paragraph 6 or the doctrine of equivalents."; DIFFERENT WAY: "both the accused and disclosed structures perform the identical function, which is to close the envelope. ... However, unlike the disclosed flap, which closes by folding over the envelope, the dual-lip structure closes the accused envelope in a different way by meeting together and binding via the internal adhesive."; DIFFERENT RESULT: "The accused structure's different way of closing also yields a substantially different result. The first and second sealing means in the disclosed structure are ultimately attached to the outside of the envelope. In contrast, the first sealing means in the (accused) envelope is internally attached to the two lips of the dual-lip structure, thereby sealing the envelope."); *Cortland Line Co., Inc. v. Orvis Co., Inc., 203 F.3d 1351, 1358, 53 USPQ2d 1734, 1738 (Fed. Cir. 2000); C.R. Bard, Inc. v. M3 Systems, Inc., 157 F.3d 1340, 48 USPQ2d 1225 (Fed. Cir. 1998), reh'g denied & suggestion for reh'g in banc declined, 161 F.3d 1380, 49 USPQ2d 1219 (Fed. Cir. 1998),* cert. denied, *526 U.S. 1130 (1999); Mas-Hamilton Group v. LaGard, Inc., 156 F.3d 1206, 48 USPQ2d 1010 (Fed. Cir. 1998); Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc., 45 F.3d 1303, 46 USPQ2d 1752 (Fed. Cir. 1998); Kahn v. General Motors Corp., 135 F.3d 1472, 45 USPQ2d 1608 (Fed. Cir. 1998), cert. denied, 525 U.S. 875 (1998); Kegel Company, Inc. v. AMF Bowling, Inc., 127 F.3d 1420, 44 USPQ2d 1123 (Fed. Cir. 1997)* (lack of equivalency to prior art reference prevents anticipation of claim); *Sage Products, Inc. v. Devon Industries, Inc., 126 F.3d 1420, 44 USPQ2d 1103 (Fed. Cir. 1997); Micro Chemical, Inc. v. Great Plains Chemical Co., Inc., 103 F.3d 1538, 1547, 41 USPQ2d 1238, 1246 (Fed. Cir. 1997), cert. denied, 521 U.S. 1122 (1997), further appeal, 194 F.3d 1250, 52 USPQ2d 1258 (Fed. Cir. 1999).*

(n620) Footnote 80. *Vulcan Engineering Co., Inc. v. Fata Aluminium, Inc., 278 F.3d 1366, 1374, 61 USPQ2d 1545 (Fed. Cir. 2002), cert. denied,* _ U.S. _, *123 S. Ct. 81 (2002)* ("Known interchangeability is an important factor in determining equivalence. *See Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 36, 41 USPQ2d 1865, 1874 (1997).*"); *McGinley v. Franklin Sports, Inc., 262 F.3d 1339, 1346,* 60 USPQ2d 1001 (Fed. Cir. 2001) (a patent concerned a baseball with finger placements for teaching a student how to grasp the ball when throwing types of pitches; the patent disclosed the use of "egg-shaped" indicia that were slightly taped to indicate the correct orientation of the baseball in the student's palm. The patent's claims required "means for indicating the orientation of the baseball relative to the palm of the hand."; in granting summary judgment of infringement, a district court correctly determined that the corresponding structures for carrying out the claimed function were indicia with "a slight taper at the portion of

each indicia situated closest to the palm of the hand, and any equivalents of such structure."; an accused infringer's balls had "finger-like outlines that are blunted at the end furthest from the fingertips."; summary judgment was proper because there was no dispute that "the finger-shaped indicia on the accused ... baseball [were] structural equivalents of the tapered egg-shaped indicia."); *Stryker Corp. v. Davol Inc., 234 F.3d 1252, 57 USPQ2d 1133 (Fed. Cir. 2000); Toro Co. v. White Consolidated Industries Inc., 199 F.3d 1295, 1300, 53 USPQ2d 1065, 1068 (Fed. Cir. 1999), further appeal, 266 F.3d 1367, 60 USPQ2d 1437 (Fed. Cir. 2001); Odetics, Inc. v. Storage Technology Corp., 185 F.3d 1259, 51 USPQ2d 1225 (Fed. Cir. 1999); Seal-Flex, Inc. v. Athletic Track & Court Construction, 172 F.3d 836, 50 USPQ2d 1225 (Fed. Cir. 1999); Al-Site Corp. v. VSI International, Inc., 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999);* Endress + *Hauser, Inc. v. Hawk Measurement Systems Pty. Ltd., 122 F.3d 1040, 43 USPQ2d 1849 (Fed. Cir. 1997); Lockwood v. American Airlines, Inc., 107 F.3d 1565, 41 USPQ2d 1961 (Fed. Cir. 1997); Fonar Corp. v. General Electric Co., 107 F.3d 1543, 1552, 41 USPQ2d 1801, 1807 (Fed. Cir. 1997), cert. denied, 522 U.S. 908 (1997).*

(n621) Footnote 81. *Odetics, Inc. v. Storage Technology Corp., 185 F.3d 1259, 1267, 51 USPQ2d 1225, 1229 (Fed. Cir. 1999),* discussed *infra.*

(n622) Footnote 82. **Compare** *Asyst Technologies, Inc. v. Empak, Inc., 268 F.3d 1364, 1373, 60 USPQ2d 1567 (Fed. Cir. 2001)* ("Even if [a feature in an component] is considered merely an additional feature, it would be sufficient to defeat an infringement claim under section 112 paragraph 6 if it significantly changes the way the ... function are performed.") **with** *Vulcan Engineering Co., Inc. v. Fata Aluminium, Inc., 278 F.3d 1366, 61 USPQ2d 1545 (Fed. Cir. 2002), cert. denied,* _ U.S. _, *123 S. Ct. 81 (2002)* ("It is irrelevant whether an element has capabilities in addition to that stated in the claim. When the claimed function is performed in the accused system, by the same or equivalent structure, infringement of that claim element is established."). See § 18,03[4][b][iv].

(n623) Footnote 83. *Kahn v. General Motors Corp., 135 F.3d 1472, 45 USPQ2d 1608 (Fed. Cir. 1998), cert. denied, 525 U.S. 875 (1998),* discussed at *§ 18.07[6][d].*

(n624) Footnote 84. *135 F.3d at 1477, 45 USPQ2d at 1612.*

See also *Overhead Door Corp. v. Chamberlain Group, Inc., 194 F.3d 1261, 1273, 52 USPQ2d 1321, 1329 (Fed. Cir. 1999)* (patent claiming a garage door remote control system required a "switch means"; the corresponding "structure" in the patent included a software implementation; a genuine fact issue arose on whether the accused software was equivalent to the patent's software in view of the accused infringer's argument that "its software uses memory more efficiently and minimizes the chances of overwriting previously-stored codes."; "A structure in an accused device is equivalent to the disclosed structure corresponding to a means-plus-function element if it is insubstantially different from the disclosed structure."); *WMS Gaming Inc. v. International Game Technology, 184 F.3d 1339, 1351, 51 USPQ2d 1385, 1393 (Fed. Cir. 1999)* ("The proper test for determining whether the structure in an accused device is equivalent to the structure recited in a section 112, P 6, claim is whether the differences between the structure in the accused device and any disclosed in the specification are insubstantial."); *Smiths Industries Medical Systems, Inc. v. Vital Signs, Inc., 50 USPQ2d 1641 (Fed. Cir. 1999), superseded on reh'g, 183 F.3d 1347, 51 USPQ2d 1415 (Fed. Cir. 1999),* discussed *infra; Mas-Hamilton Group v. LaGard, Inc., 156 F.3d 1206, 48 USPQ2d 1010 (Fed. Cir. 1998); Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc., 145 F.3d 1303, 46 USPQ2d 1752 (Fed. Cir. 1998); Sage Products, Inc. v. Devon Industries, Inc., 126 F.3d 1420, 44 USPQ2d 1103 (Fed. Cir. 1997),* discussed at *§ 18.07[6][d]* (a patent claim limitation to "closure means ... mov[e]able with respect to [a] slot means for controlling access" to the slot, read in light of the corresponding structure in the specification, which disclosed a rotatable cap and, alternatively, a hinged flap, for performing the closure function, both the cap and flap being openable as well as closable, cannot read literally, or though the doctrine of equivalents, on an accused structure in which a lid is locked when closed); *Micro Chemical, Inc. v. Great Plains Chemical Co., Inc., 103 F.3d 1538, 1547, 41 USPQ2d 1238, 1246 (Fed. Cir. 1997), cert. denied, 521 U.S. 1122 (1997), further appeal, 194 F.3d 1250, 52 USPQ2d 1258 (Fed. Cir. 1999),* discussed § 18.03[5][d][i] (the district court did not err in finding that the structure in the accused device was "significantly different, i.e., structurally nonequivalent" to the corresponding structures in the patent's specification); *Oneac Corp. v. Raychem Corp., 20 F. Supp.2d 1233, 1244 (N.D. Ill. 1998)* ("To interpret structural equivalence, the court looks at the intrinsic evidence used to construe the claims, along with expert testimony. *See Durango Assoc., Inc. v. Reflange, Inc., 843 F.2d 1349, 1356 (Fed. Cir.1988)* (listing the factors to be considered as claim language, other claims, the specification, prosecution history, and expert testimony). First, the court addresses the doctrine of claim differentiation to help define the appropriate scope of structural equivalence. This doctrine states that a claim interpretation resulting in one claim having the same scope as another is presumed to be unreasonable. ... Another consideration helpful in determining whether two structures are equivalents is interchangeability. ... If one skilled in the art would view defendant's filter as

interchangeable with plaintiff's filter, it is more likely an equivalent structure. Plaintiff's expert witness testifies that it is 'a simple matter of engineering design choice as to what type of components will be used to form the low pass filter.' ").

Compare *Toro Co. v. White Consolidated Industries Inc., 199 F.3d 1295, 1300, 53 USPQ2d 1065, 1068 (Fed. Cir. 1999), further appeal, 266 F.3d 1367, 60 USPQ2d 1437 (Fed. Cir. 2001)* (an accused infringer argues that "section *112 P 6* requires that the asserted equivalent is described in the specification," but "that is an incorrect statutory interpretation, for such a requirement would render the statutory provision meaningless."); *General Electric Co. v. Nintendo Co., Ltd., 179 F.3d 1350, 50 USPQ2d 1910 (Fed. Cir. 1999),* discussed at *§ 18.07[6][a]* (specification structure and accused structure were interchangeable); Endress + *Hauser, Inc. v. Hawk Measurement Systems Pty. Ltd., 122 F.3d 1040, 1043, 43 USPQ2d 1849, 1852 (Fed. Cir. 1997),* discussed at *§ 18.07[6][a]* ("The district judge, in an extensive series of carefully organized findings of fact and conclusions of law, analyzed the claims and concluded that the [accused] system on these facts comes within the means-plus-function limitations by containing the equivalent of the structure described in the specification. Appellants have failed to demonstrate error in regard to this aspect of the trial court's analysis."); *Fonar Corp. v. General Electric Co., 107 F.3d 1543, 1552, 41 USPQ2d 1801, 1807 (Fed. Cir. 1997), cert. denied, 522 U.S. 908 (1997),* discussed at *§ 18.07[7]* (substantial evidence supported a jury verdict of infringement of patent claims with means clauses; the patentee's expert "testified that the accused devices infringed claim 12 because they performed the identical functions as specified, contained the same or equivalent structure, and performed the steps defined in the claim using the same or equivalent acts. He stated that in forming his opinion he relied upon the technical literature, specifications, and drawings of the accused ... machines. The jury could have reasonably relied upon his testimony in rendering its verdict that the accused machines met the limitations of the asserted claim, and contained equivalent structure or acts where necessary to meet the limitations subject to section 112, P 6... .").

(n625) Footnote 85. *Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc., 145 F.3d 1303, 46 USPQ2d 1752 (Fed. Cir. 1998).*

See generally Note, "*Chiuminatta Concrete Concepts Inc. v. Cardinal Industries, Inc. & Dawn Equipment Co. v. Kentucky Farms, Inc.,*" *14 Berkeley Tech. L.j. 173 (1999).*

Compare *Odetics, Inc. v. Storage Technology Corp., 185 F.3d 1259, 51 USPQ2d 1225 (Fed. Cir. 1999).*

On whether *Chiuminatta Concrete Concepts* dictated a "significant change" in the law regarding means equivalency, see *Odetics Inc. v. Storage Technology Corp., 14 F. Supp.2d 807, 47 USPQ2d 1923 (E.D. Va. 1998), aff'd in part, rev'd in part, 185 F.3d 1259, 51 USPQ2d 1225 (Fed. Cir. 1999), reh'g denied, suggestion for reh'g in banc declined, 185 F.3d 1259, 51 USPQ2d 1225 (Fed. Cir. 1999),* discussed *infra.*

"When the Federal Circuit decided *Chiuminatta*, it did not state, either explicitly or implicitly, that its decision announced a significant change in the proper mode of infringement analysis under § 112, P 6. Yet the analytical framework established and the conclusion reached in that case certainly suggest that the scope of a means-plus-function claim is such that unless the accused structure reads very closely on the disclosed structure, the two will not be deemed equivalent under § 112, P 6. And when that occurs, of course, there can be no literal infringement under Section 112, P 6. *Chiuminatta* further teaches that in such a case, doctrine of equivalents infringement is also absent, unless the technology used in the accused structure was developed after the patent issued.

. ...

"*Chiuminatta* holds that, in the general case, when there is no equivalence under § 112, P 6, there is also no equivalence under the doctrine of equivalents. ... The only exception to this rule is for an accused device that uses technology that was developed after the patent issued."

14 F. Supp.2d 807, 47 USPQ2d 1923.

On appeal in *Odetics,* a Federal Circuit panel majority disagreed with the proposition that *Chiuminatta* fundamentally changed the standard of equivalence. See *infra.*

(n626) Footnote 86. "The proper test is whether the differences between the structure in the accused device and any disclosed in the specification are insubstantial. *See Valmont Indus., Inc. v. Reinke Mfg. Co.* ... (Fed. Cir. 1993) ('In the context of section 112, however, an equivalent results from an insubstantial change which adds nothing of significance to the structure, material, or acts disclosed in the patent specification.'); *Alpex Computer Corp. v. Nintendo Co.* ... (Fed.

Cir. 1996) (noting that equivalents under § 112, P 6, and under the doctrine of equivalents both relate to insubstantial changes). ..." *145 F.3d at 1309, 46 USPQ2d at 1756.*

See also *Cortland Line Co., Inc. v. Orvis Co., Inc., 203 F.3d 1351, 1358,* 53 USPQ2d 1734, 1738 (Fed. Cir. 2000) (citing *Chiuminatta Concrete Concepts*; "A structure in an accused device is equivalent to the disclosed structure corresponding to a means-plus-function element if it is insubstantially different from the disclosed structure."; a patent claim to a fishing reel with an interchangeable line cartridge required a "first spool means", which included a first end plate, a second end plate, and "means of connecting" the second end plate to a first spool axle; given that the patent's specification discloses only one structure for carrying the connecting function, male and female threaded connectors, the "connecting means" must mean a threaded connector or an equivalent thereof; HELD: summary judgment against a patentee's charges of literal and equivalents infringement by an accused device is proper; the accused device used a grommet that provided an "interference fit" with the tapered end of a spool axle and had two prongs on the axle for fitting into a plastic insert; the accused device lacked, literally or by equivalency, both the second end plate and the connecting means required by the patent's claim, properly interpreted; the grommet, alone, or in combination with the plastic insert, is not a "plate" nor is it equivalent to a plate; the interference fit is not equivalent to threaded connectors; during prosecution, the patentee stated that its claimed device was "completely different" from a device cited in a reference; the accused device was "very similar" to the device in the reference.); *Sunrise Medical MHHG, Inc. v. AirSep Corp., 95 F. Supp.2d 348, 441 (W.D. Pa. 2000)* ("The test for statutory equivalence under § *112 P 6* is whether the accused structure is insubstantially different from the structure disclosed in the specification. *Chiuminatta Concrete*); *Transclean Corp. v. Bridgewood Services, Inc., 77 F. Supp.2d 1045, 1085 (D. Minn. 1999), aff'd in part, vacated in part, 290 F.3d 1364, 62 USPQ2d 1865 (Fed. Cir. 2002)* ("Like the doctrine of equivalents, the statutory test for structural equivalence compares the 'insubstantiality of differences' between structures. ... In content, the equivalence test under Section 112, paragraph 6, reduces the function-way-result test to 'way' and 'result,' ... requiring 'a determination of whether the "way" the assertedly substitute structure performs the claimed function, and the "result" of that performance, is substantially different from the "way" the claimed function is performed by the "corresponding structure, acts, or materials described in the specification," or its "result." ' ... Put more succinctly, statutory equivalence will exist when 'the differences between the structure in the accused device and any disclosed in the specification are insubstantial.' "); *Lampi, LLC v. American Power Products, Inc., 65 F. Supp.2d 757, 770 (N.D. Ill. 1999), aff'd in part, vacated in part and remanded, 228 F.3d 1365, 56 USPQ2d 1445 (Fed. Cir. 2000)* (quoting *Chiuminatta* and *Valmont*: "The test of equivalence under § 112, P 6 is 'whether the differences between the structure in the accused device and any disclosed in the specification are insubstantial.' *Chiuminatta* ... An insubstantial change is something that 'adds nothing of significance to the structure, material, or acts disclosed in the patent specification.' *Valmont* ... ."); *Discovision Associates v. Disc Manufacturing, Inc., 25 F. Supp.2d 301, 339 n.43 (D. Del. 1998)* ("With respect to claim 2, the court notes that the analysis for literal infringement and infringement under the doctrine of equivalents converge, since the claim elements at issue are § 112, P 6 'mean-plus-function' claims. In particular, the analysis for infringement under either doctrine rests on similar equivalence inquiries.").

(n627) Footnote 87. See § 18.03(5)(d)(i).

(n628) Footnote 88. "The assertedly equivalent structures are wheels, and the differences between the wheels and the skid plate are not insubstantial. The former support the surface of the concrete by rolling over the concrete while the latter skids. The former are soft, compressible, and round; the latter is hard and predominantly flat (albeit with rounded edges to prevent gouging of the concrete). Additionally, the wheels rotate as opposed to skid as the saw moves across the concrete and thus have a different impact on the concrete. Since the wheels and the skid plate are substantially different from each other, they cannot be equivalent ... ." *145 F.3d at 1309, 46 USPQ2d at 1757.*

(n629) Footnote 89. The patentee "has not alleged that those of ordinary skill in the art recognized the interchangeability of metal plates with wheels for supporting the surface of concrete." *145 F.3d at 1757, 46 USPQ2d at 1310.*

(n630) Footnote 90. "Significantly, the patent discusses the use of wheels in the context of supporting and stabilizing the saw, but never once suggests that wheels could perform the function of the skid plate. Notwithstanding the discussion in the specification regarding the inherent drawbacks of a skid plate, including potential gouging of the concrete and increased drag against the concrete, there is no hint in the specification that the skid plate could be replaced by small wheels adjacent to the blade for supporting the concrete." *145 F.3d at 1757, 46 USPQ2d at 1310.*

(n631) Footnote 91. The patentee argued that "the wheels are equivalent to the skid plate because they are interchangeable; the alleged infringer's saw may be outfitted with a skid plate and the patentee's saw may be outfitted with the accused wheels." The Federal Circuit found this argument "not persuasive."

"The question of known interchangeability is not whether both structures serve the same function, but whether it was known that one structure was an equivalent of another... . [A] finding of known interchangeability, while an important factor in determining equivalence, is certainly not dispositive. *See, e.g., Graver Tank & Mfg. Co v. Linde Air Prods. Co., 339 U.S. 605, 609, ... 85 USPQ 328, 331 (1950)* (stating in reference to the doctrine of equivalents that consideration 'must be given to the purpose for which an ingredient is used in a patent, the qualities it has when combined with the other ingredients, and the function which it is intended to perform. An important factor is whether persons reasonably skilled in the art would have known of the interchangeability of an ingredient not contained in the patent with one that was.'). Such evidence does not obviate the statutory mandate to compare the accused structure to the corresponding structure."

145 F.3d at 1309-10, 46 USPQ2d at 1757.

See also *Kemco Sales, Inc. v. Control Papers Company, Inc., 208 F.3d 1352, 1363-65, 54 USPQ2d 1308, 1315-16 (Fed. Cir. 2000)* (in challenging a district court finding that accused and disclosed structures were not equivalent, a patent owner argued that (1) "the [district] court erred in holding that no reasonable jury could find that the [accused device] infringes under the doctrine of equivalents, based on an erroneous interpretation of *Chiuminatta*," and (2) "the accused and disclosed structures are equivalents under the doctrine of equivalents based on their known interchangeability."; "Although we acknowledge that the court's analysis under *Chiuminatta* was not as precise as might be desired, we do not believe that the court erred in its conclusion."; "In *Chiuminatta* we held that the accused structure in that case was not an equivalent of the disclosed structure under the doctrine of equivalents, for the same reason that the accused structure here was not an equivalent under section 112, paragraph 6: the 'way' in which the accused structure performed the claimed function was substantially different from the way that the disclosed structure performed that function. ... [T]hat is the same situation in this case, except that here the 'result' is also substantially different."; "In light of the reasoning above, we need not reach [the patent's owner's] arguments regarding interchangeability.").

(n632) Footnote 92. *Mas-Hamilton Group v. LaGard, Inc., 156 F.3d 1206, 48 USPQ2d 1010 (Fed. Cir. 1998).*

See also *Ishida Co., Ltd. v. Taylor, 221 F.3d 1310, 1317,* 55 USPQ2d 1449, 1454 (Fed. Cir. 2000) (ROTATION AROUND FIXED AXIS v. CHANGED AXIS OF ROTATION; a patent's claim required "sealing and stripping" means; the patent specification set forth two alternative embodiments as structures for performing the sealing and stripping function; both embodiments had sealing and stripping components mounted on an arm that rotated around a fixed axis; an accused device also had sealing and stripping components mounted on an arm, but it used computer control to change the axis of rotation and vary the trajectory; HELD: summary judgment of no-infringement proper because "no reasonable jury could 'find that the structure which allows this variability of movement constitutes merely "an insubstantial change which adds nothing of significance" to the structure disclosed in the specification.' ... Because the [accused] machine achieves the stripping and sealing function in a substantially different manner than do the structures in the ... patent, the [accused] machine does not infringe that patent."); *C.R. Bard, Inc. v. M3 Systems, Inc., 157 F.3d 1340, 48 USPQ2d 1225 (Fed. Cir. 1998), reh'g denied & suggestion for reh'g in banc declined, 161 F.3d 1380, 49 USPQ2d 1219 (Fed. Cir. 1998), cert. denied, 526 U.S. 1130 (1999)* (substantial evidence supported a jury verdict that claims with means-plus-function limitations in a patent concerning a biopsy needle gun were not infringed; the claims required "sequential energizing means" to move two needles; the accused gun had structure performing the sequential energizing function, but the accused structure was a "box-type" biopsy gun that had no guide sleeve and used linear tensioning in contrast to the structure in the gun in the patent's specification, which had a guide sleeve and used counter-rotational tensioning.); *Sunrise Medical MHHG, Inc. v. AirSep Corp., 95 F. Supp.2d 348, 445, n.743 (W.D. Pa. 2000)* (FLUIDICS AND ELECTRONICS; "while I agree as a general matter that fluidics and electronics can be equivalent technologies, in the circumstances of this case I conclude that the timing circuit for predetermining the pulse dose interval of a method utilizing [the accused device's protocol] is not structurally equivalent to the claimed timing means of the ... Patent."; "the differences between the structures affect the operation of the claimed method itself, *e.g.*, fixed versus variable capacitance and linearity versus nonlinearity.").

(n633) Footnote 93. "A solenoid is an electrically energized coil of insulated wire which produces a magnetic field within the coil to provide power. *See McGraw-Hill Dictionary of Scientific and Technical Terms* 1863 (Sybil P. Parker ed., 5th ed. 1994)." *156 F.3d at 1212, 48 USPQ2d at 1015.*

The solenoid was the corresponding structure for the lever operating means because it provided the power to operate the lever.

"In operation, the solenoid is actuated to move a plunger ... to its right-most position. As the plunger is moved to the right, it causes [a] spherical detent ... to ride up the head of the plunger. The spherical detent is then exposed above the top of the solenoid housing. ... As the cam wheel continues to rotate, the boss ... pushes the spherical detent and therefore the solenoid housing, including recess ... , against the bias of spring. ... The pin ... located in the recess ... and the cantilever arm ... move so that the lever ... pivots until the nose part ... engages the slot ... on the cam wheel. At that point, continued linear translation of the solenoid housing causes the pin in the cantilever arm to ride up the ramp surface ... and onto the outside of the solenoid housing. In order to relock the lock, the dial can be turned in the opposite direction and the process, in essence, is reversed."

156 F.3d at 1212, 48 USPQ2d at 1015.

(n634) Footnote 94. "A stepper motor is an electric motor that rotates in short and essentially uniform angular movements rather than continuously. *See McGraw-Hill, ante,* at 1918." *156 F.3d at 1212, 48 USPQ2d at 1015.*

(n635) Footnote 95. *156 F.3d at 1213, 48 USPQ2d at 1015.*

For similar reasons, the Federal Circuit held that the district court did not err in holding that the accused device did not infringe under the doctrine of equivalents: "the solenoid and the stepper motor provide power to the lever to operate the lock in substantially different ways." *156 F.3d at 1213, 48 USPQ2d at 1016.*

"Although the solenoid and the stepper motor both function to provide power to other components in the lock and hence the lever, as discussed with respect to literal infringement under section 112, P 6, the solenoid draws continuous power and translates its power into linear motion. The stepper motor, however, draws intermittent power and translates its power into rotational motion. The solenoid inside the solenoid housing automatically returns to its original position whereas the stepper motor of the accused device must be manually returned to its original state."

156 F.3d at 1213, 48 USPQ2d at 1016.

(n636) Footnote 96. *Al-Site Corp. v. VSI International, Inc., 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).*

See also *Toro Co. v. White Consolidated Industries Inc., 199 F.3d 1295, 1300, 53 USPQ2d 1065, 1068 (Fed. Cir. 1999), further appeal, 266 F.3d 1367, 60 USPQ2d 1437 (Fed. Cir. 2001)* (patent concerning a "convertible vacuum/blower"; a claim required "attachment means for removably securing" an air inlet cover to a housing; a district court "did not clearly err in ruling that the hinge and latch of the accused device is equivalent to the tab-and-detent illustrated in the ... patent. The use of a latch with a hinged cover is shown in the prior art, performing the identical function of securing [a] cover to [an] air inlet during use as a blower, using known interchangeable structures. *Cf. Rite-Hite Corp. v. Kelley Co., 819 F.2d 1120, 1124, 2 USPQ2d 1915, 1918 (Fed. Cir. 1987)* (equivalence of rack-and-pinion with ratchet-and-pawl).").

(n637) Footnote 97. The patent concerned racks for displaying eyeglasses. The racks "allow consumers to try on eyeglasses and return them to the rack without removing them from their display hangers." *174 F.3d at 1314, 50 USPQ2d at 1163.*

(n638) Footnote 98. *174 F.3d at 1314, 50 USPQ2d at 1163.*

(n639) Footnote 99. *174 F.3d at 1316, 50 USPQ2d at 1165.*

(n640) Footnote 100. *174 F.3d at 1316, 50 USPQ2d at 1165.*

(n641) Footnote 101. *Seal-Flex, Inc. v. Athletic Track & Court Construction, 172 F.3d 836, 50 USPQ2d 1225 (Fed. Cir. 1999).*

(n642) Footnote 102. *172 F.3d at 839, 50 USPQ2d at 1226.* "The foundation typically consists of asphalt or concrete. The mat consists of layers of particulate rubber bound together with latex. Mats constructed according to the claimed method are often used as running tracks." *172 F.3d at 839, 50 USPQ2d at 1226.*

The claimed method requires first spreading "a suitable tack coating uniformly over the foundation surface." For coatings, the specification specifically mentioned "emulsified asphalt diluted 50% by water, such as SS1H, hot applied asphalt, urethanes, and modified epoxies" and stated that "other materials can serve as the tack coating if they perform

the function of adhering the mat to the foundation." *172 F.3d at 839, 50 USPQ2d at 1226.* It did not "expressly mention latex as a tack coating." *172 F.3d at 839, 50 USPQ2d at 1226.*

"The next step in this method involves spreading a layer of particulate rubber over the tack coat. ... Then the builder may add a second coating of the adhesive tack coat material followed by a second layer of particulate rubber. ... To add other layers, the builder applies a liquid binder, such as latex, air dries the binder, and then applies a layer of rubber particles. ... This process continues until the mat has reached its prescribed thickness. The builder completes the project by applying a final sealing coat of binder material." *172 F.3d at 839, 50 USPQ2d at 1226.*

(n643) Footnote 103. The claim required:

" 'A method for constructing an activity mat over a foundation comprising the steps of:

spreading an adhesive tack coating for adhering the mat to the foundation over the foundation surface...

spreading a first uniform layer of particulate rubber over the tack coating;

then, in sequence, first applying a liquid latex binder to the previously spread rubber layer in sufficient quantity to coat substantially all rubber particles of said layer then air drying said applied mixture until substantially no liquid is visible, then spreading a succeeding uniform layer of particulate rubber over the preceding layers; and

continuing the aforesaid sequential application of latex binder, air drying the binder followed by the spreading of a uniform layer of rubber over the preceding layers until the approximate desired thickness for the mat is achieved.' "

172 F.3d at 839, 50 USPQ2d at 1226.

(n644) Footnote 104. *172 F.3d at 839, 50 USPQ2d at 1226.*

(n645) Footnote 105. *172 F.3d at 839, 50 USPQ2d at 1226.*

(n646) Footnote 106. "The district court appropriately instructed the jury that the test for equivalency under § 112, P 6 is whether the accused material is 'insubstantially different' from the material disclosed in the specification for performing the claimed function. *See Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc.* ... (Fed. Cir. 1998) ('The proper test [for determining equivalence under § 112, P 6] is whether the differences between the structure in the accused device and any disclosed in the specification are insubstantial.'); *Valmont Indus., Inc. v. Reinke Mfg. Co.* ... (Fed. Cir. 1993) ('In the context of section 112 ... an equivalent results from an insubstantial change which adds nothing of significance to the structure, material, or acts disclosed in the patent specification.'); *Alpex Computer Corp. v. Nintendo Co.* ... (Fed. Cir. 1996) (noting that equivalents under § 112, P 6, and under the doctrine of equivalents both relate to insubstantial changes)." *172 F.3d at 643, 50 USPQ2d at 1229.*

(n647) Footnote 107. *172 F.3d at 844, 50 USPQ2d at 1230.*

(n648) Footnote 108. *172 F.3d at 844, 50 USPQ2d at 1230.*

(n649) Footnote 109. *172 F.3d at 844, 50 USPQ2d at 1230.*

"As initially drafted, the claim described the first step of the process as 'spreading a tack coating over the foundation surface.' The examiner objected to the indefiniteness of this language: 'The term[] "tack coating" in claim 1 read[s] on "the liquid latex binder" and various resinous materials outside the scope of applicant's specification.' The examiner did not find any prior art that used latex to adhere the mat to the foundation, but was instead concerned that the claim language was not clear enough.

"In response to the examiner's objection, the applicant added the word 'adhesive' before 'tack coating' and clarified its intention to cover broadly 'any material,' including latex, that could serve as an adhesive tack coating:

'[C]laim 1 has been amended to add the words "adhesive" and "for adhering the mat to the foundation" to define the term "tack coating". ... [A]pplicant is entitled to have the term construed to mean any materials suitable for adhering the remaining materials of the mat to the foundation surface in the manner discussed in the specification, whether or not such materials are among those listed as examples and discussed in the specification.' "

172 F.3d at 844, 50 USPQ2d at 1230.

(n650) Footnote 110. "In this passage, the specification advises a particular installation course 'if a relatively thick tack coating of hot asphalt is used.' ... In that event, the specification counsels that 'it may be desirable to utilize the

larger rubber particles for the first layer of the mat. The asphalt tack coating can effectively adhere such larger particles to the foundation.' " *172 F.3d at 844, 50 USPQ2d at 1230.*

The accused infringer argued that "this passage shows that the adhesive tack coating must be able to function alone to adhere the particles to the foundation surface without the need for a binding agent and that latex therefore cannot serve as the adhesive tack coating." *172 F.3d at 844-45, 50 USPQ2d at 1230.*

The specification's statement "only shows that in some defined situations, the particulate rubber may adhere to the tack coating before application of the latex binder. It simply describes a modification of the claimed process when a 'relatively thick coat' of a specific tack coating material is used. This additional guidance in the specification does not limit the process outside the context of a thick coating of asphalt. *See Loctite Corp. v. Ultraseal Ltd. ...* (Fed. Cir. 1985) (advising against reading limitations from the specification into the claims). The reference identified by [the accused infringer] does not show that latex cannot function as the tack coating."

"The specification also discusses the optional application of a second layer of asphalt to adhere the particulate rubber to the first adhesive tack coat. ... The implication of these passages is that the adhesive tack coating does not necessarily function alone to adhere the particulate rubber to the foundation before application of the latex binder." *172 F.3d at 845, 50 USPQ2d at 1230.*

(n651) Footnote 111. *Odetics, Inc. v. Storage Technology Corp., 185 F.3d 1259, 51 USPQ2d 1225 (Fed. Cir. 1999).*

See also *Caterpillar Inc. v. Deere & Co., 224 F.3d 1374, 1380, 56 USPQ2d 1305, 1310 (Fed. Cir. 2000)* ("the district court conducted an impermissible component-by-component analysis to determine that no reasonable jury could find structural equivalence."); *Zip Dee Inc. v. Dometic Corp., 63 F. Supp.2d 913, 915,* 52 USPQ2d 1693, 1694 (N.D. Ill. 1999) (a patent on a metal cover for a recreational vehicle awning structure; the claims required two "means for connecting" structures that, together with an awning, render the overall structure "water-impervious"; the accused infringer "slavishly copied" the patentee's structure, inserted holes in the awning and then introduced another structure to catch moisture coming through the awning; the accused infringer's effort to avoid the patent was "clever, but it is clever only in the same sense as the sleight-of-hand performed by an illusionist whose stock in trade is deceiving the viewer. For this Court the [the accused infringer's] sleight of hand is rendered ineffective in the equivalence context by the Federal Circuit's clarification in *Odetics, Inc. v. Storage Tech. Corp. ...* of that court's earlier decision in *Chiuminatta Concrete Concepts ... . Odetics* says that 'a component-by-component analysis of structural equivalence' ... is not the order of the day and that 'deconstruction or parsing' ... of the type urged by [the accused infringer] is the wrong path to take in the analysis of equivalence.").

(n652) Footnote 112. *185 F.3d at 1266-68, 51 USPQ2d at 1229-30.*

(n653) Footnote 113. *185 F.3d at 1277, 51 USPQ2d at 1237.*

(n654) Footnote 114. *IMS Technology Inc. v. Haas Automation Inc., 206 F.3d 1422, 54 USPQ2d 1129 (Fed. Cir. 2000), cert. dismissed, 530 U.S. 1299 (2000).*

Accord: *Caterpillar Inc. v. Deere & Co., 224 F.3d 1374, 56 USPQ2d 1305 (Fed. Cir. 2000).*

(n655) Footnote 115. "This court has on several occasions compared statutory equivalence under § 112, P 6 and the judicial doctrine of equivalents. *See, e.g., Odetics, Inc. v. Storage Tech. Corp., 185 F.3d 1259, 1267, 51 USPQ2d 1225, 1229-30 (Fed. Cir. 1999); Al-Site Corp. v. VSI Int'l, Inc., 174 F.3d 1308, 1319-21, 50 USPQ2d 1161, 1167-68 (Fed. Cir. 1999); Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc., 145 F.3d 1303, 1310, 46 USPQ2d 1752, 1757-58 (Fed. Cir. 1998); Cybor Corp. v. FAS Techs., 138 F.3d 1448, 1467, 46 USPQ2d 1169, 1184 (Fed. Cir. 1998)* (en banc) (Mayer, C.J., concurring); *Alpex Computer Corp. v. Nintendo Co., 102 F.3d 1214, 1222, 40 USPQ2d 1667, 1673-74 (Fed. Cir. 1996); Valmont Indus., Inc. v. Reinke Mfg. Co., 983 F.2d 1039, 1042-44, 25 USPQ2d 1451, 1453-55 (Fed. Cir. 1993).* While acknowledging that there are differences between § 112, § 6 and the doctrine of equivalents, this court on several occasions has indicated that the tests for equivalence under § 112, P 6 and the doctrine of equivalents are 'closely related,' involving 'similar analyses of insubstantiality of the differences.' *Chiuminatta, 145 F.3d at 1310, 46 USPQ2d at 1757-58; see also Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 28, 41 USPQ2d 1865, 1870 (1997)* (stating that application of § 112, P 6 'is an application of the doctrine of equivalents in a restrictive role ... .); *Valmont, 983 F.2d at 1043, 25 USPQ2d at 1455* ('The word 'equivalent' in section 112 invokes the familiar concept of an insubstantial change which adds nothing of significance.'). Thus, a reduced version of the well-known tripartite test for the doctrine of equivalents has been applied in the § 112, P 6 context to determine if the

differences are insubstantial, i.e., after determining that the accused device performs the identical function, as required by statute, whether it performs the function in substantially the same way to achieve substantially the same result. *See Odetics, 185 F.3d at 1267, 51 USPQ2d at 1229-30; see also Dawn Equip. Co. v. Kentucky Farms Inc., 140 F.3d 1009, 1019-20, 46 USPQ2d 1109, 1116 (Fed. Cir. 1998)* (Plager, J., additional views) (suggesting use of the tripartite test 'to resolve the question of insubstantial changes' under § 112, P 6). Evidence of known interchangeability between structure in the accused device and the disclosed structure has also been considered an important factor. *See Al-Site, 174 F.3d at 1316, 50 USPQ2d at 1165; Chiuminatta, 145 F.3d at 1309, 46 USPQ2d at 1757* (citing *Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 609, 85 USPQ 328, 331 (1950))." 206 F.3d at 1435-36, 54 USPQ2d at 1138.*

See § 18.03[5][b].

(n656) Footnote 116. *206 F.3d at 1436, 54 USPQ2d at 1138.*

(n657) Footnote 117. *206 F.3d at 1436, 54 USPQ2d at 1138-39.*

(n658) Footnote 118. *206 F.3d at 1437, 54 USPQ2d at 1139.*

Accord: *Caterpillar Inc. v. Deere & Co., 224 F.3d 1374, 1380, 56 USPQ2d 1305, 1311 (Fed. Cir. 2000)* (SUBSTANTIALITY OF PHYSICAL DIFFERENCES. "While there are admittedly physical differences between the accused and claimed structures, there is at least an issue of fact as to whether those differences are substantial ... .").

(n659) Footnote 119. *Caterpillar Inc. v. Deere & Co., 224 F.3d 1374, 56 USPQ2d 1305 (Fed. Cir. 2000).*

(n660) Footnote 120. U.S. Pat. No. 5,279,378.

(n661) Footnote 121. *224 F.3d at 1378, 56 USPQ2d at 1309.*

(n662) Footnote 122. *224 F.3d at 1380, 56 USPQ2d at 1311.*

(n663) Footnote 123. *224 F.3d at 1380, 56 USPQ2d at 1311.*

(n664) Footnote 124. *224 F.3d at 1380, 56 USPQ2d at 1311.*

(n665) Footnote 125. *224 F.3d at 1381, 56 USPQ2d at 1311.*

(n666) Footnote 126. *224 F.3d at 1381, 56 USPQ2d at 1311-12.*

(n667) Footnote 127. E.g., *Lockheed Martin Corp. v. Space Systems/Loral, Inc., 249 F.3d 1314, 1324, 58 USPQ2d 1671 (Fed. Cir. 2001), vacated & remanded for further consideration in light of Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722 (2002), 122 S. Ct. 2349 (2002), on remand, 43 Fed. Appx. 372 (Fed. Cir. 2002)* (nonprecedential) ("Once a court establishes that a means-plus-function limitation is at issue, it must identify and construe that limitation, thereby determining what the claimed function is, and what structures disclosed in the written description correspond to the 'means' for performing that function."; "Having identified the function of [a means-plus-function] limitation ... , we next construe the meaning of the words used to describe the claimed function, using ordinary principles of claim construction."); *Medtronic, Inc. v. Intermedics, Inc., 799 F.2d 734, 742, 230 USPQ 641, 645 (Fed. Cir. 1986), cert. denied, 522 U.S. 908 (1997)* ("In construing a 'means plus function' claim, a number of factors, including the language of the claim, the patent specification, the prosecution history of the patent, other claims in the patent, and expert testimony may be considered.").

Cf. *Datascope Corp. v. SMEC, Inc., 879 F.2d 820, 824, 11 USPQ2d 1321, 1323 (Fed. Cir. 1989), cert. denied, 493 U.S. 1024 (1990)* (a patent claim specifying "support means" should not be limited to "solid objects" merely because the embodiments disclosed in the specification use rods and wires; "The claims ... do not limit 'support means' to solid objects and the specification states in several places that illustrations are provided for purposes of 'example and not limitation.' [There was] no evidence suggesting the propriety of anything other than a plain and ordinary reading of the claims."); *Fortel Corp. v. Phone-Mate Inc., 5 USPQ2d 1081, 1088 (C.D. Calif. 1987), aff'd in part, rev'd in part & remanded, 846 F.2d 78 (Fed. Cir. 1988), cert. denied, 488 U.S. 848 (1988)* (rejecting argument that "words appearing before the 'means' in a means plus function clause are to be ignored").

(n668) Footnote 128. *Palumbo v. Don-Joy Co., 762 F.2d 969, 226 USPQ 5 (Fed. Cir. 1985).*

(n669) Footnote 129. *762 F.2d at 975, 226 USPQ at 8.*

(n670) Footnote 130. E.g., *Epcon Gas Systems, Inc. v. Bauer Compressors, Inc., 279 F.3d 1022, 1032, 61 USPQ2d 1470 (Fed. Cir. 2002)* ("Construction of a means plus function limitation requires identification of the function recited

in the claim and a determination of what structures have been disclosed in the specification that correspond to the means for performing that function."); *Acromed Corp. v. Sofamor Danek Group, Inc., 253 F.3d 1371, 1382, 59 USPQ2d 1130 (Fed. Cir. 2001)* ("In construing a means-plus-function limitation, a court must identify both the claimed function and the corresponding structure in the written description for performing that function."); *Budde v. Harley-Davidson, Inc., 250 F.3d 1369, 1376, 58 USPQ2d 1801 (Fed. Cir. 2001)* ("In construing means-plus-function claim limitations, a court must first define the particular function claimed. Thereafter, the court must identify 'the corresponding structure, material, or acts described in the specification.' It is not until the structure corresponding to the claimed function in a means-plus-function limitation is identified and considered that the scope of coverage of the limitation can be measured."); *Medtronic, Inc. v. Advanced Cardiovascular Systems, Inc., 248 F.3d 1303, 1311, 58 USPQ2d 1607 (Fed. Cir. 2001)* ("The first step in construing such a limitation is a determination of the function of the means-plus-function limitation. ... The next step is to determine the corresponding structure described in the specification and equivalents thereof."); *Telemac Cellular Corp. v. Topp Telecom, Inc., 247 F.3d 1316, 1324, 58 USPQ2d 1545 (Fed. Cir. 2001)* ("The first step of a *35 U.S.C. § 112,* P 6 analysis is to identify the function of the claim limitation. ... The second step requires identification of the structures disclosed in the specification and equivalents thereof that perform the claimed function."); *Globetrotter Software, Inc. v. Elan Computer Group, Inc., 236 F.3d 1363, 1368, 57 USPQ2d 1542 (Fed. Cir. 2001)* ("The first step is a determination of the function of the means-plus-function limitation. ... After identifying the function of the means-plus-function limitation, the next step is to determine the corresponding structure described in the specification and equivalents thereof.").

(n671) Footnote 131. Cf. *Transclean Corp. v. Bridgewood Services, Inc., 290 F.3d 1364, 62 USPQ2d 1865 (Fed. Cir. 2002).* In *Transclean,* the majority held that a phrase a patent's claim further defined the "means" not the function. The patent concerned a transmission fluid changing apparatus. The claim 1 required, inter alia, a fresh fluid source, a used fluid receiver, and "means ... for equalizing the fluid flow" into the receiver and out of the source. Its claim 13 required the flow equalizing means be one "exhibiting resilient characteristics" for exerting force. The patent's specification disclosed, as one embodiment, a single tank. The tank had a flexible diaphragm that divided the tank into receiving and source portions. An accused device had a single reservoir (tank) divided into two chambers by a piston. Upholding a jury verdict of infringement, a district court held that "exhibiting resilient characteristics" included *either* returning to an original shape after being deformed *or* to an original position after being compressed. The majority reversed, holding that the "resilient" phrase "requires initial shape deformation." It disagreed with the dissent's view that the phrase 'exhibiting resilient characteristics' describes a function in a means-plus-function limitation."

"[T]he means-plus-function limitation further defined in claim 13 is the 'means for equalizing the flow' previously set forth in claim 1. According to the claim language, the only function performed by that 'means' is 'equalizing the flow.' The phrase 'exhibiting resilient characteristics' is not a second function performed by that 'means'; rather, the phrase further defines characteristics of that 'means.' It is therefore, appropriate, indeed mandatory under *35 U.S.C. § 112,* P 6, to look to the corresponding structure in the specification to ascertain the meaning of the phrase. ... [T]hat corresponding structure, 'a flexible rubber-like diaphragm,' ... is 'resilient' in the sense that it tends to return to its original shape, not just its original position." *290 F.3d at 1375.*

Judge Clevenger dissented, arguing that "resilient" defined the function and that it was improper to use the specification to define that function.

"[I]t is clear to me that the 'exhibiting resilient characteristics' phrase does define function. If I am correct on this point, then of course it is impermissible to define the function by reference to structure disclosed in the written description. Function must be defined by reference to ordinary principles of claim interpretation, before proceeding to determine corresponding structure. ... The majority does not disagree with me on this point: if the phrase in question defines function, then resort to the specification to find structure to define the function is simply wrong, and ordinary tools of claim interpretation apply. Instead, the majority holds that the phrase in question is actually part of the means for equalizing the flow, and that resort to the specification is required to find the structure corresponding to the means limitation. Thus, from the specification the majority fetches the flexible rubber-like diaphragm, and thereupon concludes that 'exhibiting resilient characteristics' must require initial shape deformation because that is the characteristic of the diaphragm." *290 F.3d at 1382,.*

Judge Clevenger further argued that "[t]he majority's rationale [was] self-destructive."

"If the diaphragm is indeed the structure that corresponds to the 'means for equalizing the flow' limitation-as both parties and all the judges on the case agree-then the majority must come to grips with the stark fact that the jury found that the piston structure in [the accused infringer's] device is structurally equivalent, for § *112 P 6* infringement

purposes, to the diaphragm disclosed in Figure 3. Indeed, the case was submitted to the jury precisely to resolve disputed issues of fact on the structural equivalence of the accused piston and the diaphragm structure. No question has been raised that substantial evidence does not support the jury's verdict. Consequently, if, as the majority holds, 'exhibiting resilient characteristics for exerting a force' must be understood as merely 'further defin[ing] the structure of [the] means,' ... there is no possible basis for disturbing the jury's verdict of infringement.

"In short, the majority is wrong on any interpretation of the disputed phrase. If the phrase describes function, it must be interpreted by ordinary interpretative canons, as did the district court. If the phrase is to be interpreted as part of the means limitation, as the majority holds, then the jury verdict of infringement must stand. Either way, the jury verdict of infringement cannot properly be upset, and I respectfully dissent from the majority on this point." *290 F.3d at 1383.*

(n672) Footnote 132. *Wenger Manufacturing, Inc. v. Coating Machinery Systems, Inc., 239 F.3d 1225, 1233, 57 USPQ2d 1679 (Fed. Cir. 2001).*

See also *Generation II Orthotics Inc. v. Medical Technology Inc., 263 F.3d 1356, 1364-65, 59 USPQ2d 1919 (Fed. Cir. 2001)* ("When construing the functional statement in a means-plus-function limitation, we must take great care not to impermissibly limit the function by adopting a function different from that explicitly recited in the claim."; a patent concerned a orthotic knee brace, which had two rigid arms; its claim 1 required, inter alia, "joint means ... for allowing controlled inclination of each rigid arm relative to [a] pivotable joint."; a district court erred in construing the function recited in the means clause, "controlled ... ," as limited to the dynamic control set forth in examples in the specification, that is, "control" throughout the arms' range of motion; "controlled" retained its ordinary meaning of "restrained in some manner".).

(n673) Footnote 133. *Lockheed Martin Corp. v. Space Systems/Loral, Inc., 249 F.3d 1314, 58 USPQ2d 1671 (Fed. Cir. 2001), vacated & remanded for further consideration in light of Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722 (2002), 122 S. Ct. 2349 (2002), on remand, 43 Fed. Appx. 372 (Fed. Cir. 2002)* (nonprecedential).

(n674) Footnote 134. See *infra.* See also *Acromed Corp. v. Sofamor Danek Group, Inc., 253 F.3d 1371, 1382, 59 USPQ2d 1130 (Fed. Cir. 2001)* ("a court may not import into the claim structural limitations from the written description that are unnecessary to perform the claimed function."); *Budde v. Harley-Davidson, Inc., 250 F.3d 1369, 1379-80, 58 USPQ2d 1801 (Fed. Cir. 2001)* ("In construing terms used in patent claims, it is necessary to consider the specification as a whole, and to read all portions of the written description, if possible, in a manner that renders the patent internally consistent."; "In addition, it is important to construe claim language through the 'viewing glass' of a person skilled in the art.").

(n675) Footnote 135. E.g., *Generation II Orthotics Inc. v. Medical Technology Inc., 263 F.3d 1356, 1363, 59 USPQ2d 1919 (Fed. Cir. 2001)* ("As we stated in *Micro Chem.,* [*Inc. v. Great Plains Chem. Co., Inc., 194 F.3d 1250, 1257, 52 USPQ2d 1258, 1263 (Fed. Cir. 1999).]* '[§ 112, P 6] does not permit limitation of a means-plus-function claim by adopting a function different from that explicitly recited in the claim.' ... Correctly identifying the claimed function is important, because '[a]n error in identification of the function can improperly alter the identification of the structure ... corresponding to that function.' "); *Budde v. Harley-Davidson, Inc., 250 F.3d 1369, 58 USPQ2d 1801 (Fed. Cir. 2001).*

(n676) Footnote 136. See § 18.03(2)(c).

E.g. *Multiform Desiccants, Inc. v. Medzam, Ltd., 133 F.3d 1473, 1479, 45 USPQ2d 1429, 1434 (Fed. Cir. 1998),* discussed at *§ 18.07[3][d]* ("claims written in the means-for form of § *112 P 6* do not, by virtue of this form, acquire a scope as to the function beyond that which is supported in the specification, or as to the structure beyond equivalents of that shown in the specification.");

Cf. *Hale Fire Pump Co. v. Tokai, Ltd., 614 F.2d 1278, 1283 n.5, 205 USPQ 123, 126 n.5 (CCPA 1980)* (" 'means for' claims are not to be read in a vacuum and can only be construed by reference to the specification.").

(n677) Footnote 137. E.g. *Kahn v. General Motors Corp., 135 F.3d 1472, 1476, 45 USPQ2d 1608, 1611 (Fed. Cir. 1998), cert. denied, 525 U.S. 875 (1998),* discussed at *§ 18.07[6][d]* ("Unlike the ordinary situation in which claims may not be limited by functions or elements disclosed in the specification, but not included in the claims themselves, in writing a claim in means-plus-function form, a party is limited to the corresponding structure disclosed in the specification and its equivalents."); *Snellman v. Ricoh Company, Ltd., 862 F.2d 283, 288, 8 USPQ2d 1996, 2000 (Fed. Cir. 1988), cert. denied, 491 U.S. 910 (1989)* (as to a claim element in "means-plus-function form", "the specification must be looked to to determine the means claimed to perform the function.").

Compare *Cortland Line Co., Inc. v. Orvis Co., Inc., 203 F.3d 1351, 1357, 53 USPQ2d 1734, 1737 (Fed. Cir. 2000)* ("the specification describes only one structure corresponding to the ... function").

(n678) Footnote 138. See also § 8.04(1)(d).

See also S3 Inc. v. n*VIDIA Corp., 259 F.3d 1364, 1367-68, 59 USPQ2d 1745 (Fed. Cir. 2001)* ("For claim clauses containing functional limitations in 'means for' terms pursuant to § 112 *P 6*, the claimed function and its supporting structure in the specification must be presented with sufficient particularity to satisfy the requirements of § *112 P 2.*"; "As was explained in *In re Donaldson Co., 16 F.3d 1189, 1195, 29 USPQ2d 1845, 1850 (Fed. Cir. 1994)* (en banc), 'if one employs means-plus-function language in a claim, one must set forth in the specification an adequate disclosure showing what is meant by that language. If an applicant fails to set forth an adequate disclosure, the applicant has in effect failed to particularly point out and distinctly claim the invention as required by the second paragraph of section 112.' *See also Atmel Corp., 198 F.3d at 1382, 53 USPQ2d at 1230 (Fed. Cir. 1999)* ('In order for a claim to meet the particularity requirement of P 2, the corresponding structure(s) of a means-plus-function limitation must be disclosed in the written description in such a manner that one skilled in the art will know and understand what structure corresponds to the means limitation.')."); *Budde v. Harley-Davidson, Inc., 250 F.3d 1369, 1377, 1376, 58 USPQ2d 1801 (Fed. Cir. 2001)* ("As a quid pro quo for the convenience of employing § 112, paragraph 6, [a patent owner] has a duty to clearly link or associate structure to the claimed function."; "failure to disclose adequate structure corresponding to the recited function in accordance with *35 U.S.C. § 112,* paragraph 1, results in the claim being of indefinite scope, and thus invalid, under *35 U.S.C. § 112,* paragraph 2."; "Whether or not the specification adequately sets forth structure corresponding to the claimed function necessitates consideration of that disclosure from the viewpoint of one skilled in the art. *See 35 U.S.C. § 112,* P 1; *N. Am. Vaccine, Inc. v. Am. Cyanamid Co., 7 F.3d 1571, 1579, 28 USPQ2d 1333, 1339 (Fed. Cir. 1993); cf. In re Ghiron, 442 F.2d 985, 991, 169 USPQ 723, 727 (1971)* (stating that 'if such a selection would be "well within the skill of persons skilled in the art", such functional-type block diagrams may be acceptable and, in fact, preferable if they serve in conjunction with the rest of the specification to enable a person skilled in the art to make such a selection and practice the claimed invention with only a reasonable degree of routine experimentation')."; "For a court to hold that a claim containing a means-plus-function limitation lacks a disclosure of structure in the patent specification that performs the claimed function, necessarily means that the court finds the claim in question indefinite, and thus invalid. Because the claims of a patent are afforded a statutory presumption of validity, overcoming the presumption of validity requires that any facts supporting a holding of invalidity must be proved by clear and convincing evidence."); *Kemco Sales, Inc. v. Control Papers Company, Inc., 208 F.3d 1352, 1360-61, 54 USPQ2d 1308, 1313 (Fed. Cir. 2000)* ("we have referred to section 112, paragraph 6 as embodying a statutory quid pro quo. *See, e.g., Atmel, 198 F.3d at 1381, 53 USPQ2d at 1230; see also B. Braun Medical, Inc. v. Abbott Laboratories, 124 F.3d 1419, 1424, 43 USPQ2d 1896, 1900 (Fed. Cir. 1997)* ('Th[e] duty to link or associate structure to function is the quid pro quo for the convenience of employing § 112, P 6.'). If a patentee fails to satisfy the bargain because of a failure to disclose adequate structure, the claim will be rendered invalid as indefinite under section 112, paragraph 2. *See In re Donaldson Co., 16 F.3d 1189, 1195, 29 USPQ2d 1845, 1850 (Fed. Cir. 1994)* (en banc)."); *Atmel Corp. v. Information Storage Devices, Inc., 198 F.3d 1374, 1378, 53 USPQ2d 1225, 1228 (Fed. Cir. 1999),* discussed at *§ 8.04[2][d]* ("For purposes of § *112 P 2,* it is the disclosure in the specification itself, not the technical form of the disclosure that counts."); *In re Dossel, 115 F.3d 942, 42 USPQ2d 1881 (Fed. Cir. 1997)* (if a specification in which a claim setting forth a means-plus-function limitation appears fails to set forth any corresponding structure sufficient to determine equivalency, the claim may be rejected for indefiniteness under Section 112's second paragraph rather than for inadequate description under Second 112's first paragraph); *Lacks Industries, Inc. v. McKechnie Vehicle Components USA, Inc., 55 F. Supp.2d 702, 721 (E.D. Mich. 1999)* ("*35 U.S.C. § 112,* P 6 governs my construction of claim 40's securing means because it is in means-plus-function form and it does not recite sufficient structural limitations. ... This presents a dilemma, however, because there is no corresponding structure in the specification as required by section 112, paragraph 6. Nowhere does the specification discuss a cladded wheel built with a permanent securing means and a permanent adhesive. All structures described in the specification use a temporary securing means in combination with a permanent adhesive."; "The apparent lack of a corresponding structure to the permanent securing means implicates validity issues and bars me from arriving at a *Markman* construction for this claim.").

Cf. *Asyst Technologies, Inc. v. Empak, Inc., 268 F.3d 1364, 1374, 60 USPQ2d 1567 (Fed. Cir. 2001)* (a means clause called for a device that sensed the presence of an item, but the patent's "written description does not contain any obvious reference to such a device." The failure to refer to item sensing was "peculiar" and created a "close question," but, properly interpreting the patent, the sensing function is carried out by a "communication means" set forth in the specification.).

(n679) Footnote 139. See, e.g., *Clearstream Wastewater Systems Inc. v. Hydro-Action Inc., 206 F.3d 1440, 1446, 54 USPQ2d 1185, 1190 (Fed. Cir. 2000),* discussed at § 18.03(5)(d)(i) ("it was error for the district court to conclude that the means limitations ... could ouly cover new elements of the preferred embodiment."); *Kemco Sales, Inc. v. Control Papers Company, Inc., 208 F.3d 1352, 54 USPQ2d 1308 (Fed. Cir. 2000); IMS Technology Inc. v. Haas Automation Inc., 206 F.3d 1422, 54 USPQ2d 1129 (Fed. Cir. 2000), cert. dismissed, 530 U.S. 1299 (2000),* discussed at § 18.03[5][d][ii]; *Overhead Door Corp. v. Chamberlain Group, Inc., 194 F.3d 1261, 1272, 52 USPQ2d 1321, 1328 (Fed. Cir. 1999)* ("Determining whether Figure 3 is a 'corresponding structure' for the 'switch means' of claim 5 requires the court to consult again the language of the claim and the other factors that inform claim meaning. Of course, the central focus remains on the claim language. The written description, the prosecution history, and admissible extrinsic evidence may supply context to understand the claim language."); *Micro Chemical, Inc. v. Great Plains Chemical Co., 194 F.3d 1250, 1258, 52 USPQ2d 1258, 1264 (Fed. Cir. 1999)* ("When multiple embodiments in the specification correspond to the claimed function, proper application of § 112, P 6 generally reads the claim element to embrace each of those embodiments."; "the statute [does not] permit incorporation of structure from the written description beyond that necessary to perform the claimed function."); *Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc., 145 F.3d 1303, 46 USPQ2d 1752 (Fed. Cir. 1998),* discussed *infra* (corresponding structure includes the embodiment of the described function but not details of the embodiment that unrelated to the function); *B. Braun Medical, Inc. v. Abbott Laboratories, 124 F.3d 1419, 43 USPQ2d 1896 (Fed. Cir. 1997),* discussed at *§ 18.07[7]* (when a patent's specification discloses a primary structure for performing a function recited in a claim's means clause, discloses an alternate structure, but does not describe the alternate structure as one that performs the function, the means refers only to the primary structure (and to equivalents thereof), not to the alternate structure); *Serrano v. Telular Corp., 111 F.3d 1578, 42 USPQ2d 1538 (Fed. Cir. 1997),* discussed at *§ 18.07[6][d]* (corresponding structure included both the preferred embodiment and an explicitly disclosed alternative); *Fonar Corp. v. General Electric Co., 107 F.3d 1543, 41 USPQ2d 1801 (Fed. Cir. 1997), cert. denied, 522 U.S. 908 (1997),* discussed at *§ 18.07[7]* (when a patent's specification discloses a specific structure corresponding to the "means" in a means-plus-function limitation subject to section 112, P 6, and also indicates generally that other structures may be used, the claim is limited to the specific structure and its equivalents); *Micro Chemical, Inc. v. Great Plains Chemical Co., Inc., 103 F.3d 1538, 41 USPQ2d 1238 (Fed. Cir. 1997), cert. denied, 521 U.S. 1122 (1997), further appeal, 194 F.3d 1250, 52 USPQ2d 1258 (Fed. Cir. 1999),* discussed *infra.*

For district court decisions, see *Rackman v. Microsoft Corp., 102 F. Supp.2d 113 (E.D. N.Y. 2000); Transclean Corp. v. Bridgewood Services, Inc., 77 F. Supp.2d 1045 (D. Minn. 1999), aff'd in part, vacated in part, 290 F.3d 1364, 62 USPQ2d 1865 (Fed. Cir. 2002); Faroudja Laboratories, Inc. v. Dwin Electronics, 76 F. Supp.2d 999, 1012 (N.D. Calif. 1999)* ("Consistent with *35 U.S.C. § 112,* P 6's claim limitation purpose, the Court agrees with [the accused infringer] that the structure described in the specification is not just any 'field comparator' but rather the specific field comparator disclosed in Figure 3. The field comparator in Figure 2 that [the patentee] would have this Court identify as the proper structure is depicted by a box labeled as 'Field comparator 23'. Figure 3, however, provides more meaningful information about the field comparator's particular structure ... ."); *Baxa v. McGaw Inc., 981 F. Supp. 1348, 1358, 44 USPQ2d 1801, 1809 (D. Colo. 1997), aff'd, 185 F.3d 883 (Fed. Cir. 1999)* (unpublished) ("The parties ... disagree whether claim 19 includes a limitation only to a hardware embodiment of plaintiff's invention. To that end, the specification includes the following statement: 'While the foregoing system and method has been illustrated and described generally in hardware form and terms, it will be appreciated that such may be, and in a given instance may preferably be, effected in large measure by suitable corresponding software and/or firmware programming and operation of a computer or computers by such programming in conjunction with such hardware of the system as may be deemed desirable.' I agree that the use of software or programmable firmware is both disclosed in the specification and 'equivalent' ... to the hardware set forth in Figure 1 and the rest of the specification. Therefore, I will interpret the means described in claim 19 to include software and programmable firmware."); *R2 Medical Systems, Inc. v. Katecho, Inc., 931 F. Supp. 1397 (N.D. Ill. 1996),* discussed *infra.*

(n680) Footnote 140. See *Medtronic, Inc. v. Advanced Cardiovascular Systems, Inc., 248 F.3d 1303, 1313, 58 USPQ2d 1607 (Fed. Cir. 2001),* discussed *infra* (ONE STRUCTURE PERFORMING TWO FUNCTIONS; ONE FUNCTION PERFORMED BY TWO STRUCTURES: "The lack of a clear link or association between [certain] structures ... the [claimed] function ... nullifies the significance of [the patent owner's] arguments that a structure may perform two functions and that a function may be performed by two structures. These truisms are irrelevant in the context of a § 112, paragraph 6 analysis without a clear link or association between the function or functions recited in the means-plus-function limitation and the structure or structures disclosed in the specification for carrying out those functions."); *Unidynamics Corp. v. Automatic Products International, Ltd., 157 F.3d 1311, 1319, 48 USPQ2d 1099*

(Fed. Cir. 1998) ("Structure disclosed in the specification ... is only 'corresponding' structure to the claimed means under § 112, P 6 if the structure is clearly linked by the specification or the prosecution history to the function recited in the claim."); *Kahn v. General Motors Corp., 135 F.3d 1472, 1476, 45 USPQ2d 1608, 1611 (Fed. Cir. 1998), cert. denied, 525 U.S. 875 (1998),* discussed at *§ 18.07[6][d]* ("A structure disclosed in the specification is only deemed to be 'corresponding structure' if the specification clearly links or associates that structure to the function recited in the claim. *See B. Braun Med., Inc. v. Abbott Lab.* ... (Fed. Cir. 1997). The duty to link or associate structure in the specification with the function is the quid pro quo for the convenience of employing § 112, P 6. *See O.I. Corp. v. Tekmar Co.* ... (Fed. Cir. 1997)."); *B. Braun Medical, Inc. v. Abbott Laboratories, 124 F.3d 1419, 1424, 43 USPQ2d 1896, 1900 (Fed. Cir. 1997),* discussed at *§ 18.07[7]* ("structure disclosed in the specification is 'corresponding' structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim. This duty to link or associate structure to function is the *quid pro quo* for the convenience of employing § 112, P 6."); *Fonar Corp. v. General Electric Co., 107 F.3d 1543, 1551, 41 USPQ2d 1801, 1807 (Fed. Cir. 1997), cert. denied, 522 U.S. 908 (1997),* discussed § 18.07[7] ("An apparatus claim requires definite structure in the specification to support the function in a means clause.").

For district court decisions, see *Data General Corp. v. International Business Machines Corp., 93 F. Supp.2d 89, 94 (D. Mass. 2000)* ("where the specification elaborates on the details of the preferred embodiment, 'more particularly defining the structure in ways unrelated to the recited function, ... [those] additional structural aspects are not what the statute contemplates as structure corresponding to the recited function.' "); *Transclean Corp. v. Bridgewood Services, Inc., 77 F. Supp.2d 1045, 1069 (D. Minn. 1999), aff'd in part, vacated in part, 290 F.3d 1364, 62 USPQ2d 1865 (Fed. Cir. 2002)* ("the embodiments described in Figs. 4 and 6, which do not carry out this function, are not 'corresponding structures' under Section 112, paragraph 6, in relation to Claim 13. This is so because the structure disclosed in the specification is not a 'corresponding' structure unless it is clearly linked, or associated, to the function recited in the claim, and the additional functional limitations, which are set forth in Claim 13, disassociate the embodiments of Figs. 4 and 6 from Claim 13."); *Charles E. Hill & Associates, Inc. v. Compuserve, Inc., 65 F. Supp.2d 924, 930 (S.D. Ind. 1999), aff'd in part, rev'd in part, vacated in part and remanded, 33 Fed. Appx. 527* (Fed. Cir.), *reh'g denied, 34 Fed. Appx. 740 (Fed. Cir. 2002)* (nonprecedential) ("specific alternative structures mentioned in the specifications, and equivalents thereto, delineate the scope of the patent. ... The alternative structures must be specifically identified, not just mentioned as possibilities, in order to be included in the scope of the patent."); *Atmel Corp. v. Information Storage Devices, Inc., 997 F. Supp. 1210, 1228-29 (N.D. Calif. 1998); Howes v. Zircon Corp., 992 F. Supp. 957, 47 USPQ2d 1617 (N.D. Ill. 1998); Storer v. Hayes Microcomputer Products Inc., 995 F. Supp. 185, 188-89, 46 USPQ2d 1083, 1086-87 (D. Mass. 1998)* (rejecting an accused infringer's arguments that "there is no linkage or association because the structure in question appears only in a discussion of prior art and not in the detailed description of the invention itself" and that "if the specification discloses a structure and points out advantages of that structure over the prior art, then the prior art cannot correspond to a means-plus-function claim element."; the "arguments misapprehend both the linkage requirement and the gravamen of [the patent's Claim 18]. Not only is it possible for a prior art reference in the specification to supply the missing structure in a means-plus-function claim, but [the claim] recites an update means that is entirely distinct from the AP heuristic that the specification distinguishes from prior art."; "As a preliminary matter, it is well established that prior art references can serve as elements in a patent claim."; *Sofamor Danek Group* (Fed. Cir. 1996) "supplies no reason to suppose that the rule should be any different when construing means-plus-function claim elements. In that case, the means-plus-function element being construed was the novel element in a combination claim. The patent specification described the corresponding structure as an improvement over disclosed prior art. The court held that the disclosed prior art could not correspond to the means-plus-function element, not because the prior art structure was inadequately associated or linked to the claim element, but because the applicant had expressly disclaimed its novelty."; "In contrast, the present dispute involves a non-novel claim element. ... It is the combination that the patent claims and protects from infringement, not the individual elements."; "a comparison of the update means elements in Claim 18 and the other independent Claims reveals completely different language. Different usages in different claims are presumed to have different meanings. ... The most natural interpretation of Claim 18's update means element is that it corresponds to a structure other than the AP heuristic. A person having ordinary skill in the art would have no trouble recognizing the [prior art] technique as one such corresponding structure."; "The conclusion ... is fully consistent with the teaching of *B. Braun.* The court in that case concluded that a valve seat structure in a medical device was not linked clearly to the claim element in question because, in contrast to the explicit association between a traverse cross bar structure and the recited function, the valve seat was disclosed only in a diagram, which gave no definite indication that the valve seat was capable of performing the recited function. ... The court properly rejected an attempt to assign the recited function to two different parts of the apparatus when the specification disclosed only one as performing the function.").

(n681) Footnote 141. *Medtronic, Inc. v. Advanced Cardiovascular Systems, Inc., 248 F.3d 1303, 58 USPQ2d 1607 (Fed. Cir. 2001).* Compare *Budde v. Harley-Davidson, Inc., 250 F.3d 1369, 1379, 58 USPQ2d 1801 (Fed. Cir. 2001)* "The specification must be read as a whole to determine the structure capable of performing the claimed function.").

In *Medtronic*, the patent at issue concerned a stent. Its claims required "means for connecting adjacent elements together." The specification disclosed a stent with helical windings. It also disclosed straight wires and hooks for preventing overstretching of the stent. The court held that, properly interpreted, the helical windings were the structures corresponding to the defined function (connecting adjacent elements). The straight wires and hooks were *not* corresponding structure even though they were capable of performing the defined function. Neither the specification nor the prosecution history clearly linked or associated the wire and hook structures with the element connecting function. In the specification, the elements were connected independently of the overstretch prevention structures.

Our inquiry is controlled by this court's decision in [*B. Braun Med., Inc. v. Abbott Labs., 124 F.3d 1419, 43 USPQ2d 1896 (Fed. Cir. 1997)]*. In *Braun*, the question was what structure corresponded to the function of 'holding said disc firmly against said first means in such a manner that said disc is restrained from sideways movement.' The specification, according to *Braun*, was very clear in linking a cross bar with this function. The patentee in *Braun* argued that another structure, a valve seat, also performed the function of restraining sideways movement. The court stated that neither the specification nor the prosecution history contained any indication that the valve seat held the disc against the triangular structure (the first means) so as to restrain sideways movement. Although it is not clear to us that the valve seat could never perform the recited function of restraining sideways movement, the specification apparently made no connection between the valve seat and this function. The present case diverges from the facts of *Braun* only in that the alleged corresponding structure, that is, the straight wire, hooks, and sutures, are definitely capable of performing the function recited in the means-plus-function limitation, that is, connecting adjacent elements together. We find, however, that this is insufficient under the *Braun* test because ... there is no clear link or association between the disclosed structures and the function recited in the means-plus-function claim limitation. ... [T]he specification characterizes and describes the straight wire, wire hooks, and suture ties of the overstretch prevention structures as being applied to the formed and already interconnected 'coils of the helix' or 'helical wire formed coil.' While it is unquestionably true that the structures are connected to the coils of the helically wound stent, their function, as made clear in the specification, is not to connect adjacent elements of the helix together, but to prevent overstretch of the formed coil. Indeed, there is no disclosed embodiment or described application of the overstretch prevention structures to a helix in which adjacent coils or elements are not already connected independently of the overstretch prevention structures. Thus, one skilled in the art would not perceive any clear link or association between these structures and the function of connecting adjacent elements together."

248 F.3d at 1311-13.

(n682) Footnote 142. *Asyst Technologies, Inc. v. Empak, Inc., 268 F.3d 1364, 1370, 1371, 60 USPQ2d 1567 (Fed. Cir. 2001).*

In *Asyst Technologies*, the two patents at issue concerned semiconductor wafer production and, in particular, the verification of information about a wafer, which entails communication of information between microcomputers located on a tool and on a wafer container (pod). Three claims contained "means" clauses. In an infringement suit, a district court and the parties treated the clauses as identical, "but they are not." One means clause did include a communication line connecting two structures mounted on a tool, a controller and a "two-way communication means." It did so because it recited two functions, one performed by the controller and one by the two-way communications means, and, therefore, necessarily included the communication line between the controller and the two-way communication means. On the other hand, the other two means clauses did *not* include the line as corresponding structure The line enabled but did not perform the functions recited for the means (receiving and transmitting information).

The court rejected the patent owner's argument that the line "must be regarded as part of the structure corresponding to the second microcomputer means because the second microcomputer means cannot perform its intended function without a means of conveying data hetween the second microcomputer means and the second two-way communication means." It distinguished *IMS Technology, Inc. v. Haas Automation, Inc., 206 F.3d 1422, 54 USPQ2d 1129 (Fed. Cir. 2000),* discussed *supra* and *infra. IMS Technology* "involved control systems for machine tools." The "claim term in dispute was 'interface means for transporting a control program and control parameters from an external medium into ... alterable memory and for recording the control parameter contents of said memory onto an external medium.' " The patent owner "argued that the district court was wrong to identify the tape cassette transport referred to in the specification as the relevant corresponding structure."

"This court rejected the ... argument and held that the tape cassette transport was the relevant corresponding structure to the functions set forth in the claims because the specification identified it as one of the devices directly involved in performing the functions of transferring data from the tape cassette to the RAM and recording data from the RAM onto the tape cassette. The present case differs from *IMS* because although line 51 enables the second microcomputer means to perform its recited functions, it does not actually perform any of those functions."

268 F.3d at 1371.

(n683) Footnote 143. *R2 Medical Systems, Inc. v. Katecho, Inc., 931 F. Supp. 1397 (N.D. Ill. 1996),* discussed at § 18.05(2)(e).

See also *Stryker Corp. v. Davol Inc., 10 F. Supp.2d 841, 843, 47 USPQ2d 1740 (W.D. Mich. 1998), aff'd, 234 F.3d 1252, 57 USPQ2d 1133 (Fed. Cir. 2000)* (claim to hand-held surgical device, including "means for attaching ... a probe permitting ... simultaneous suction and irrigation"; the claim is not limited to the "hourglass" shape as shown in the specification; "The specification language relied on by [the plaintiff], describes an 'alternative embodiment' of the invention including the hourglass shape conduit. This description cites advantages of the hourglass shape for purposes of concurrent suction and irrigation, but does not suggest explicitly or by implication, that the straight tube design, the 'preferred embodiment,' is incapable of this concurrent functioning. Nor can claim 1, generic in its language, reasonably be construed as excluding the preferred embodiment absent highly persuasive evidence.").

(n684) Footnote 144. *931 F. Supp. at 1435.*

The patent at issue in *R2 Medical Systems* disclosed a cable system with an interface for connecting a pair of multifunctional electrodes to any of three cardiac care devices (a monitoring device, therapeutic device or stimulating device). The accused devices were not capable of simultaneously connecting all three devices. The accused infringer moved for summary judgment of noninfringement of the patent's claim 34, which referred to "cable means electrically joined to said connector means for selectively connecting the monitoring device, the therapeutic device or the stimulating device to said electrode elements by engagement of said connector means and said connecting plug means." *931 F. Supp. at 1432.*

The accused infringer argued that the "cable means" was limited to a structure with simultaneous connection capacity because such capacity was shown in the specification's preferred embodiment. The court disagreed, noting that another claim in the patent expressly referred to simultaneous connection. The claim indicated that the " 'cable means' is [not] for the function of simultaneous connection of the devices, but rather ... for the function of 'selectively connecting the monitoring device, the therapeutic device or the stimulating device' to the connector means and electrode sets." *931 F. Supp. at 1435.*

"In the preferred embodiment, the specification details the structure of a cable for each device, and the necessary connector means so that the cable may attach to a standardized connector plug. Although the specification further describes connectors and protective circuitry to connect the devices together and the disposable electrode set, these additional structures are only required for the preferred embodiment.

"Accordingly, the preferred embodiment presents an 'interrelating arrangement' depicted in figures 1 and 28 that includes the attachment of the protective circuitry and connectormeans for the simultaneous connection of all of three cables and devices.

"But the specification never limits the 'cables means' to either figure 1 or 28. *Cf. Hormone Research Foundation, 904 F.2d at 1563* (specification and prosecution history explicitly limited claimed invention to single accompanying figure). Instead, the specification provides that in addition to the preferred embodiment the invention includes sub-systems using many of the same elements:

'Each of these instruments be connected to the patient's body through the electrode elements by itself or in combination with one or more of the other instruments by means of an appropriate interrelating arrangement.'

"After presenting the preferred embodiment, the specification explains that the invention includes the separate connection of each of the devices to the electrode elements:

'In addition to the provision of a multiplicity of functions through a single pair of electrode elements, this invention also provides for the separate connection of each of the instruments to that pair of electrode elements ... Therefore this invention not only relates to the unique system, but it also relates to a number of novel and unobvious sub-systems and components of that physiological electrode system.'

"The specification details the structures of all the elements necessary for a system capable of only selective connection to the cardiac care devices. Therefore, the specification presents an embodiment of the 'cable means' where only one device is connected at a time as well as one in which a number of devices are connected." *931 F. Supp. at 1435-36.*

(n685) Footnote 145. *Sofamor Danek Group, Inc. v. DePuy-Motech, Inc., 74 F.3d 1216, 37 USPQ2d 1529 (Fed. Cir. 1996),* discussed at § 18.07(7).

(n686) Footnote 146. *74 F.3d at 1219, 37 USPQ2d at 1530.*

(n687) Footnote 147. *74 F.3d at 1220, 37 USPQ2d at 1531.*

Compare *Clearstream Wastewater Systems Inc. v. Hydro-Action Inc., 206 F.3d 1440, 54 USPQ2d 1185 (Fed. Cir. 2000),* discussed at § 18.03[5][d][iv] (distinguishing *Sofamor Danek*: corresponding structure can include a prior art structure adequately disclosed in the specification; unlike the claim in *Sofamor*, the corresponding structure was not the "point of novelty" in the claim, which was to a combination that included another novel element).

(n688) Footnote 148. *Micro Chemical, Inc. v. Great Plains Chemical Co., Inc., 103 F.3d 1538, 41 USPQ2d 1238 (Fed. Cir. 1997), cert. denied, 521 U.S. 1122 (1997), further appeal, 194 F.3d 1250, 52 USPQ2d 1258 (Fed. Cir. 1999).*

See also *Micro Chemical, Inc. v. Great Plains Chemical Co., 194 F.3d 1250, 52 USPQ2d 1258 (Fed. Cir. 1999).*

(n689) Footnote 149. *103 F.3d at 1542, 41 USPQ2d at 1241.*

(n690) Footnote 150. *103 F.3d at 1547, 41 USPQ2d at 1246.*

(n691) Footnote 151. *103 F.3d at 1547, 41 USPQ2d at 1546.*

(n692) Footnote 152. *103 F.3d at 1548, 41 USPQ2d at 1246.*

(n693) Footnote 153. *103 F.3d at 1548, 41 USPQ2d at 1246.*

Compare *Micro Chemical, Inc. v. Great Plains Chemical Co., 194 F.3d 1250, 1259, 52 USPQ2d 1258, 1264 (Fed. Cir. 1999)* (involving alleged infringement of other claims in the patent at issue in *Micro Chemical* (1997); the claims did not require "isolation" but did require "weighing means"; HELD: the district court erred in interpreting the claims' "weighing means" as limited to the specific function of "sequential and cumulative weighing," rather than as extending to "weighing" generally; as a result, the district court erroneously limited the corresponding structure to the patent's preferred embodiment; "The ... patent specification discloses in detail several alternative embodiments of the invention, each having a different type of weighing means. ... Because alternative structures corresponding to the claimed function were described, the district court incorrectly limited 'weighing means' to the specific structures of the preferred embodiment.").

(n694) Footnote 154. *Fonar Corp. v. General Electric Co., 107 F.3d 1543, 41 USPQ2d 1801 (Fed. Cir. 1997), cert. denied, 522 U.S. 908 (1997),* discussed at *§ 18.07[7].*

See also *B. Braun Medical, Inc. v. Abbott Laboratories, 124 F.3d 1419, 1425, 43 USPQ2d 1896 (Fed. Cir. 1997),* discussed at *§ 18.07[7]* ("Because [the] specification does not adequately disclose the [alternate] structure that [performs the function], [the patentee] has failed to particularly point out and distinctly claim that particular means. *Cf. Athletic Alternatives, Inc. v. Prince Mfg., Inc.* ... (Fed. Cir. 1996) (rejecting the patentee's broad interpretation of the claim because the patentee particularly pointed out and distinctly claimed only the narrower interpretation); *Fonar Corp. v. General Elec. Co.* ... (Fed. Cir. 1997) (explaining that although the specification states that other wave forms may be used, it fails to specifically identify those wave forms and thus the § 112, P 6 claim is limited to the generic gradient wave form actually disclosed)."); *Atmel Corp. v. Information Storage Devices, Inc., 997 F. Supp. 1210, 1228-29 (N.D. Calif. 1998)* (structure was a corresponding one even though the specification described it is "optional"; "a general mention of a possible alternative structure cannot expand the scope of the claim. ... The parties have not cited, and the Court has not found, any case discussing how this principle should apply to structural elements described in the specification as 'optional.' ... Given the claim language, some structure must exist that is part of the transfer means but not part of the switching means. Only device 50 fits that bill. If it were absent, some other, undescribed structure would have to take its place, a result that would be inappropriate under the claim limitation rationale of section 112, P 6, and that would not provide claim readers with adequate notice about the patent's scope. The Court therefore holds that despite the language of the specification, device 50 is not optional.").

Compare *Transclean Corp. v. Bridgewood Services, Inc., 77 F. Supp.2d 1045, 1068-69 (D. Minn. 1999), aff'd in part, vacated in part, 290 F.3d 1364, 62 USPQ2d 1865 (Fed. Cir. 2002)* (distinguishing *Fonar*; "Under a 'means plus function' analysis, if the specification mentions specific alternative structures, a claim is not limited to the equivalents of a single preferred structure but, rather, each alternative structure is included in the scope of the patent. ... It is, in fact, only when the specification merely mentions the possibility of alternative structures, without specifically identifying them, that the Court must refrain from expanding the scope of the claim beyond a single embodiment."); *Faroudja Laboratories, Inc. v. Dwin Electronics, 76 F. Supp.2d 999, 1003 (N.D. Calif. 1999)* ("Under a means-plus-function analysis, if the specification mentions specific alternative structures, those structures are included in the scope of the patent. ... A specification that merely mentions the possibility of alternative structures without specifically identifying them is not sufficient to expand the scope of the claim beyond the example used.").

(n695) Footnote 155. *107 F.3d at 1551, 41 USPQ2d at 1806.*

See also *CellNet Data Systems, Inc. v. Itron, Inc., 17 F. Supp.2d 1100, 1104 (N.D. Calif. 1998)* ("A specification that merely mentions the possibility of alternative structures without specifically identifying them is not sufficient to expand the scope of the claim beyond the example used.").

(n696) Footnote 156. *107 F.3d at 1551, 41 USPQ2d at 1807.*

(n697) Footnote 157. *Ishida Co., Ltd. v. Taylor, 221 F.3d 1310, 55 USPQ2d 1449 (Fed. Cir. 2000).*

(n698) Footnote 158. *221 F.3d at 1316, 55 USPQ2d at 1452-53.*

(n699) Footnote 159. *Ethicon, Inc. v. United States Surgical Corp., 135 F.3d 1456, 45 USPQ2d 1545 (Fed. Cir. 1998), cert. denied, 525 U.S. 923 (1998).*

(n700) Footnote 160. *135 F.3d at 1463-1464, 45 USPQ2d at 1550.*

(n701) Footnote 161. *Dawn Equipment Co. v. Kentucky Farms, Inc., 140 F.3d 1009, 46 USPQ2d 1109 (Fed. Cir. 1998),* discussed at § 18.03(5)(b).

(n702) Footnote 162. The patent concerned a device for adjusting the height of a farm implement, such as a row cleaning device that has two wheels with sharp teeth. The patent specification described prior art "multi-hole pinned height adjustment" devices, which a farmer could raise or lower only manually and by inserting pins. The pins were easily lost, and the need to reach beneath the implement increased the risk of injury. The patent illustrated a device with a "control/locking means" that can be operated "safely and quickly from above the farm implement." The patent's figures illustrated the device.

"The device includes a control/locking means ... for alternating the implement between the raised and lowered positions. The control/locking means includes a handle ... , cylindrical rods ... and ... , a cylindrical shaft ... , and a transverse pin ... carried on the cylindrical shaft ... . A spring ... biases the mechanism in the raised position ... . In the lowered position, the pin ... is engaged in the slot ... , against the bias of the spring ... . To move the implement from the lowered position to the raised position, the operator presses down on and turns the handle ... to rotate the pin ... out of the slot ... . The spring ... then overcomes the weight of the farm implement and pushes the implement into the raised position." *140 F.3d at 1011, 140 USPQ2d at 1110.*

Claim 9 was to:

" 'A mechanism for adjusting the height of a farm implement/tool of the type to be carried by a drawing vehicle, said adjusting mechanism comprising:

a connecting means for supporting a farm implement/tool in an operative position;

means for guiding sliding movement of the connecting means selectively between first and second positions corresponding to raised and lowered positions for a farm implement/tool carried by the connecting means;

means for mounting the guiding means to one of a drawing vehicle and a support to be carried by a drawing vehicle;

means for locking the connecting means in one of the first and second positions and for selectively releasing the connecting means to allow the connecting means to be slid into the other of the first and second positions therefor;

means for limiting sliding movement of the connecting means with the connecting means released; and

means for normally spring biasing the connecting means to one of the first and second positions therefor.' " *140 F.3d at 1011-1012, 46 USPQ2d at 1110-1111* (emphasis added).

The accused device included "a connecting bar ... , which telescopes within a rectangular sleeve ... ."

"A row cleaning device, or other farm implement, is attached to the connecting bar ... at a pair of axes ... . The sleeve ... is bolted onto a mounting bracket ... , which is attached to a planter. The connecting bar ... is inserted in sleeve ... , and a bolt ... is inserted in the uppermost opening in the connecting bar ... , to prevent the connecting bar from slipping down through the sleeve ... . A spring ... , attached at its upper end to the sleeve ... , and at its lower end to the connecting bar ... , supports a portion of the weight of the connecting bar and attached row cleaning device."

"The [accused device] has a multiple-hole, pinned height adjustment mechanism. In that mechanism, a removable angled pin ... is used to secure the connecting bar ... within the sleeve ... at a desired height, thereby setting the height of the attached row cleaning device. In particular, the connecting bar ... is adjusted to the desired height, and then the pin ... is inserted through one set of holes ... in the sleeve and one set of holes ... in the connecting bar. A retaining clip ... is then placed through a hole in the straight end of the pin ... , to prevent the pin ... from sliding out. The retaining clip must first be removed before the height can be readjusted." *140 F.3d at 1012-1014, 46 USPQ2d at 1111.*

The patentee sued for infringement.

"Shortly before holding a jury trial, the trial judge held a *Markman* hearing to construe the only asserted patent claim. The trial judge instructed the jury on his claim construction and thereafter submitted the issues of literal infringement and infringement under the doctrine of equivalents to the jury. The issues were submitted by way of two special interrogatories that asked the jury to answer with a simple yes or no whether there was literal infringement and whether there was infringement under the doctrine of equivalents. The jury returned its verdict, answering 'no' to literal infringement and 'yes' to infringement under the doctrine of equivalents. [The accused infringer] filed a motion for JMOL on the doctrine of equivalents infringement verdict. The trial judge denied the motion, and this appeal followed." *140 F.3d at 1010, 46 USPQ2d at 1110.*

On appeal, the Federal Circuit affirmed the trial court's finding of no equivalency infringement despite the contrary jury verdict. It began with the issue of claim construction.

"The pertinent claim limitation here is the means for locking and releasing ... As the parties agree, this limitation is a so-called means-plus-function claim limitation drafted pursuant to *35 U.S.C. § 112,* P 6 (1994). Here, the most closely corresponding structure described in the specification (that is, in the written description) is the control/locking means ... . The patent goes on to explain that '[t]he handle 48 of the locking means 46 is used to selectively rotate the ... pin 54 into and out of [the] slot 72.' ... The patent illustrates this structure in Figures 1 and 2 ... ."

"As a matter of claim construction, the trial judge identified the rotatable shaft 52, the pin 54, and the slot 72 as the structure corresponding to the means for locking and releasing, and accordingly instructed the jury:

'The second [claim clause at issue] is [the] means for locking the connecting [means] in one of the first and second positions and for selectively releasing the connecting means to allow the connecting means to be slid into the other of the first and second positions therefor. The court has determined that the structure described in the patent for performing this function is the rotatable shaft 52, the pin 54, and the slot 72 with which the pin is moved in and out of engagement, the slot being in the bracket 24 to lock the movable connecting stem assembly 30 to the fixed guide bracket 24 in the raised or lowered position. This structure is shown in Figures 1, 2, and 3 of the '282 patent.' " *140 F.3d at 1014, 46 USPQ2d at 1112.*

The accused infringer argued that "the trial judge was correct in identifying the rotatable shaft 52, the pin 54, and the slot 72 as part of the described structure corresponding to the locking and releasing means, but erred by not also including the handle 48." The patentee "asserts that the trial judge got the claim construction right. Thus, the only claim construction issue raised by the parties is whether the corresponding structure includes the handle 48."

Even though resolution of an issue of claim construction is usually the first step of an infringement analysis, the Federal Circuit opted not to "resolve this issue of claim construction because viewing the corresponding structure as including the rotatable shaft 52, pin 54, and slot 72--to which neither party objects and with which we detect no error--is sufficient to resolve the ultimate infringement issue.": "[E]ven construing the corresponding structure as including only the rotatable shaft, pin and slot, [the accused] device does not infringe because, under this claim construction, [the accused] device, though it performs the specified locking and releasing function, does not include equivalent structure.

Further including the handle 48 as part of the corresponding structure, which appears reasonable, would only provide another reason for noninfringement." *140 F.3d at 1014-1015,* USPQ2d at 1112-1113.

The jury was instructed on both the substantial difference and function-way-result tests. Because the invention is a mechanical one, the function-way-result test is "somewhat helpful." The court reached the "obvious conclusion that, applying [the function-way-result] test, no reasonable jury could have found infringement under the doctrine of equivalents."

"[D]oes [the accused] device include an equivalent to the claimed locking and releasing means, such that [the device] satisfies the means-plus-function limitation under the doctrine of equivalents? [The patentee] in essence asserts that the multiple-hole, pinned height-adjustment mechanism in [the accused] device is equivalent to the structure set forth in the patent. As already described, the multiple-hole, pinned height-adjustment mechanism in [the accused] device includes a loose angled pin 30 and two sets of holes 26 and 28. Thus, based on the above claim construction, the issue of infringement under the doctrine of equivalents is, in the vernacular of the function-way-result test, whether the loose pin and holes combination in [the accused] device performs substantially the same function, in substantially the same way, to achieve substantially the same result as the rotatable shaft, pin and slot mechanism shown in Figures 1 and 2 of the ... patent."

"While the functions of the two mechanisms are the same (i.e., locking and releasing a connecting member), the way and result are not substantially the same. The mechanisms are structurally quite different, and operate quite differently. In the patented device, the pin 54 is permanently fixed to the rotatable shaft 52 and is locked into and released from engagement with the slot 72 by rotating the shaft 52. In sharp contrast, in [the accused] device, the pin 30 is not attached to anything and is inserted in and removed from the holes 26 and 28 by hand. ...

"There is damning evidence within the text of the ... patent itself that the two mechanisms do not operate in substantially the same way. Specifically, the patent strongly suggests, if not teaches, that they are not equivalent. The ... patent, in its Background of the Invention section, describes the problems with prior art 'multi-hole pinned height adjustment' mechanisms. The patent teaches that such mechanisms are time-consuming to adjust and are prone to misadjustment by inserting the pin in the wrong holes, and furthermore the loose pins in such mechanisms are easily lost. ... [The accused device's] multiple-hole, pinned height-adjustment mechanism is such a mechanism and shares these same problems. In contrast, the ... patent teaches that the mechanism provided by the patented invention is directed at solving these problems. ... These statements in the patent alone strongly suggest, if not mandate, judgment in [the accused infringer's] favor. *See Sofamor,* ... (resorting to the description in the patent specification of disadvantages of the prior art in evaluating equivalence)."

"... [C]onsistent with these statements in the patent, [the patentee] as unable to provide sufficient evidence that the [accused infringer's] loose pin and holes mechanism operates in substantially the same way as the rotatable shaft, pin and slot mechanism disclosed in the patent. [The patentee] presented substantial expert testimony on infringement, [but] the experts, in testifying with regard to these two mechanisms, merely compared the pins in the two mechanisms. The experts testified that the mechanisms were similar because they both had pins, and opined that the sliding versus rotating motions of the pins in the two mechanisms were simply common alternatives. Most notably, the experts made no reference to the rotatable shaft 52 in the mechanism disclosed in the ... patent. In essence, the experts opined that the two mechanisms were equivalent because they both used pins and because sliding versus rotating the respective pins was, in their opinions, a common alternative. Mere comparison of the pins is insufficient to establish that the devices operate in substantially the same way. As the jury was instructed, the relevant structure disclosed in the ... patent included at least the rotatable shaft, pin and slot--not merely a pin. The testimony by [the patentee's] experts fails to establish that [the accused device's] loose pin and holes combination is equivalent to the rotatable shaft, pin and slot mechanism, particularly in view of the contrary statements in the ... patent. *See Texas Instruments* ... (holding that conclusory expert testimony as to the overall similarity of a claim limitation and the alleged corresponding element in the accused product was insufficient to establish equivalence under the doctrine of equivalents).

"With regard to the result, [the accused device's] loose pin and holes combination does not accomplish substantially the same results provided by the rotatable shaft, pin and slot mechanism disclosed in the ... patent. In particular, the patent touts that the invention reduces adjustment time, prevents misadjustment and eliminates the problem of easily lost pins. The disclosed shaft, pin and slot mechanism plays a major role in achieving these results. Because the mechanism is easy and quick to operate, adjustment time is reduced, and because the mechanism ouly allows for two positions (lowered and raised), misadjustment is prevented. Furthermore, because the pin is fixed to the rotatable shaft, the pin cannot be lost. In sharp contrast, [the accused device's] loose pin and holes combination accomplishes none of

these touted results. As the patent describes, a loose pin and holes mechanism is time consuming to adjust, is prone to misadjustment because of the multiple holes, and the loose pin is easily lost." *140 F.3d at 1016, 46 USPQ2d at 1114.*

(n703) Footnote 163. *Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc., 145 F.3d 1303, 46 USPQ2d 1752 (Fed. Cir. 1998).*

Compare *Mas-Hamilton Group v. LaGard, Inc., 156 F.3d 1206, 1212, 48 USPQ2d 1010, 1015 (Fed. Cir. 1998)* (solenoid motor is part of " 'lever operating means' because it provides the power that operates the lever").

(n704) Footnote 164. *145 F.3d at 1308, 46 USPQ2d at 1756.* See also *Trinity Industries, Inc. v. Road Systems, Inc., 121 F. Supp.2d 1028, 1036 (E.D. Tex. 2000)* ("In construing means plus function claims, a court should not read into the claims the functions of a particular embodiment or example appearing in the specification unless such functions are part of the function recited in the means clause. ... If a structure in the embodiment is defined or elaborated in ways unrelated to the recited function, those additional details should not be read as limiting the scope of the means clause. ... Such additional structural aspects are not what the statute contemplates as structure corresponding to the recited function and should not be construed as corresponding structure."); *Katz v. AT&T Corp., 63 F. Supp.2d 583, 593 (E.D. Pa. 2000)* (NO IMPORTING OF EXCESS LIMITATIONS: "In determining the structure disclosed in the specification that corresponds to the means, the court should be wary of importing excess limitations from the specification. For example, if a structure is defined in the specification in a way unrelated to the recited function in the means-plus-function clause, those additional aspects of the structure should not be read as limiting the scope of the means clause. ... In addition, in construing means plus function claims, generally a court should not import a function of a working device or a preferred embodiment into the claims as part of the 'means' if such a function is not part of the function recited in the claims."); *Pirelli Cable Corp. v. Ciena Corp., 988 F. Supp. 424, 444 (D. Del. 1997)* ("Although the Court can look to the specification to identify the specific means under the means-plus-function analysis, it is improper to willy-nilly import specification language into the claim.").

In *Chiuminatta Concrete Concepts*, the patents concerned an apparatus and a method for "cutting concrete before it has completely cured to a hardened condition." The apparatus patent claims were to a rotary saw with "two significant features." The first feature was a leading edge that "rotates in an upward direction so as to prevent the accumulation of displaced wet concrete in the groove created behind the saw." The second feature is "a support surface [that] applies downward pressure at the point where the saw blade emerges from the concrete in order to prevent the upwardly rotating blade from damaging the concrete (commonly referred to as raveling, chipping, spalling, or cracking)." The claim was for:

" 'A saw for cutting concrete even before the concrete has hardened to its typical, rock-like hardness, comprising:

'a circular concrete cutting blade having sides and a leading cutting edge;

'a motor connected to rotate the concrete cutting blade in an up-cut rotation;

'*means* connected to the saw *for supporting the surface of the concrete* adjacent the leading edge of the cutting blade to inhibit chipping, spalling, or cracking of the concrete surface during cutting;

'wheel means for movably supporting the saw on the surface of the concrete during cutting."

145 F.3d at 1305-06, 46 USPQ2d at 1754 (Emphasis added.)

The Federal Circuit noted that "t]he only structure disclosed for supporting the surface of the concrete is a skid plate."

"The written description summarizes the invention, stating:

'An apparatus is provided for cutting a groove in soft concrete. The apparatus can cut the concrete anytime after the concrete is finished and before the concrete attains its rock like hardness. ...

'The soft concrete saw has a base plate [12] on which are mounted two wheels and a skid plate [24], each of which contacts the concrete to provide three point support on the concrete. ... The saw blade [34] extends through a ... slot in the skid plate, in order to project into and cut the concrete below the skid plate.

'The dimensions of the slot in the skid plate are selected to support the concrete immediately adjacent the saw blade so as to prevent cracking of the concrete as it is cut.' "

145 F.3d at 1306, 46 USPQ2d at 1754.

The accused device "use[d] a rotary blade that rotates upward at its leading edge" and "has two small wheels ... mounted adjacent to the leading edge of the saw blade ... . [The accused infringer] concede[d] that these wheels support the surface of the concrete in order to prevent chipping, spalling, or cracking." *145 F.3d at 1306, 46 USPQ2d at 1754.*

The district court identified the specification phrase--"a 'support surface or plate ... in movable contact with the surface of the concrete,'--as the corresponding structure." This was error: "The corresponding disclosed physical structure is the skid plate, a generally flat hard plate that straddles the leading edge of the cutting blade. The district court's conclusion that the term 'support surface' sufficiently identifies the structure is therefore erroneous." *145 F.3d at 1308-09, 46 USPQ2d at 1756.*

"The function recited in the means clause of claim 11 is 'supporting the surface of the concrete adjacent to the leading edge of the cutting blade to inhibit chipping, spalling, or cracking of the concrete surface during cutting.' The specification clearly identifies the structure performing that function as the skid plate, which is the only embodiment of the 'support surface' disclosed in the specification:

'A *support surface or plate* is in movable contact with the surface of the concrete 13 in order to support the surface of the concrete immediately adjacent the groove being cut in the concrete 13. *In the illustrated embodiment, this surface takes the form of a skid plate* 24 which depends from the base plate 12 in the direction of the concrete 13.'

"The structure of the skid plate is broadly described in the specification of the '499 patent as follows:

'a generally rectangular strip of metal having rounded ends 26 and 28 between which is a flat piece 30. The flat piece 30 is generally parallel to the base plate 12. ...'

"The text continues,

'the saw blade 34 extends ... through an aperture such as slot 38 (FIG.3) in the skid plate 24. ... The slot 38 is also generally rectangular in shape, and is placed on the flat piece 30 of skid plate 24.' "

"The specification of the ... patent elaborates on the details of the preferred skid plate, more particularly defining the structure in ways unrelated to the recited function. These additional structural aspects are not what the statute contemplates as structure corresponding to the recited function. For example, in the preferred embodiment, the skid plate runs beyond the leading edge and continues down the entire length of the saw blade in order to reduce wobbling of the cutting blade. Additionally, the skid plate of the preferred embodiment is sized such that it helps support the weight of the saw. These structural aspects are thus not the means by which the saw 'supports the surface of the concrete' and accordingly are not to be read as limiting the scope of the means clause."

145 F.3d at 1308, 46 USPQ2d at 1756. (Emphasis added.)

(n705) Footnote 165. *Signtech USA, Ltd. v. Vutek, Inc., 174 F.3d 1352, 50 USPQ2d 1372 (Fed. Cir. 1999).*

Compare *Clearstream Wastewater Systems Inc. v. Hydro-Action Inc., 206 F.3d 1440, 1446, 54 USPQ2d 1185, 1189 (Fed. Cir. 2000),* discussed at § 18.03[5][d][iv] (distinguishing *Signtech*: corresponding structure can include a prior art structure adequately disclosed in the specification; "In *Signtech*, a specific prior art structure was described in the written description as 'incapable' of performing the function of the means-plus- function element. Thus, the claim was construed so that it did not cover that specific prior art structure. However, the *Signtech* court noted that the claim could indeed cover alternative embodiments described in the written description, just not the particular prior art structure that was 'incapable' of performing the appropriate function.").

(n706) Footnote 166. Compare *Rodime PLC v. Seagate Technology, Inc., 174 F.3d 1294, 1303, 50 USPQ2d 1429, 1435 (Fed. Cir. 1999), cert. denied, 528 U.S. 1115 (2000),* discussed at § 18.03[5][e][ii] ("A claim need not claim every function of a working device. Rather, a claim may specify improvements in one function without claiming the entire machine with its many functions.").

(n707) Footnote 167. The first novel feature was "mirror printing." The sprayhead "prints an image and its mirror image on opposite sides of a substrate."

"This dual-sided mirror image technique facilitates the printing of backlit signs and billboards. With ink applied to both sides of a substrate, backlit signs do not appear washed out when illuminated. The claimed ink sprayhead design features one pressurized air source to control ink delivery onto the substrate and a second low-volume, high pressure air source to continuously clean the ink nozzle during printing."

The second novel feature was dual air sources for nozzle cleaning.

"The prior art ink sprayheads, including those of the [prior art] '522 patent, contain only a single, pulse-width modulated air source for delivery of the ink to the substrate and lack a second, high pressure air source for cleaning the nozzles."

174 F.3d at 1354, 50 USPQ2d at 1373. The patent stated that (1) "the second air source facilitates continuous printing of large signs without color variations or clogging of the nozzles," and (2) "the prior art (specifically the '522 patent) 'is incapable of producing an enlarged image having the desired color scheme' because it lacks this second, high pressure air source." *174 F.3d at 1354, 50 USPQ2d at 1373.*

(n708) Footnote 168. The claim required:

" '1. An apparatus for reproducing an image on a first side of a substrate and a mirror image on a second side of said substrate, comprising:

a frame;

means for generating control signals representative of said image;

ink delivery means positioned on opposite sides of said substrate, said ink delivery means fluidly communicating with an ink source;

means mounted on said frame for supporting said ink delivery means;

means mounted on said frame for driving said ink delivery means relative to said substrate; and

means responsive to said control signals, *for controlling said ink delivery means to produce said image on said first side of said substrate and said mirror image on said second side of said substrate.' "*

174 F.3d at 1354-55, 50 USPQ2d at 1373. (Emphasis added.)

(n709) Footnote 169. After trial, "the magistrate limited 'ink delivery means' to an ink sprayhead containing a 'second, high pressure air source.' "

"The magistrate primarily based this limitation on the background and summary of the invention sections of the '957 patent which distinguished the invention from the prior art, including the '522 patent. The '957 patent describes its improvement over the prior art by emphasizing its use of two air sources--one for applying the ink and one for removing excess ink from the nozzles. In particular, the '957 patent states explicitly that the ink delivery system of the '522 patent is 'incapable of producing an enlarged image having the desired color scheme' because of its lack of a second air source for cleaning the nozzles. The magistrate therefore concluded:

'By consistently describing its invention--in the Abstract, Background of Invention, Summary of Invention, and Detailed Description sections of the specifications--as one that solves the ink accumulation problem inherent in the prior art, the ink delivery means cannot be interpreted apart from the essential, cleaning, high-pressure air source.' "

... .

"Because § 112, P 6 requires a court to interpret a means-plus-function claim according to the structure disclosed in the specification and its equivalents, the magistrate's limitations on claim scope, with reference to the preferred embodiment and the explicit disavowal of prior art structure, correctly construed the invention."

"The 'ink delivery means' of the preferred embodiment described in the specification expressly includes a second, high pressure air source. Although patentees are not necessarily limited to their preferred embodiment, *see Serrano v. Telular Corp.* ... (Fed. Cir. 1997), interpretation of a means-plus-function element requires this court to consult the structure disclosed in the specification, which often, as in this case, describes little more than the preferred embodiment.

"... [A]lthough the magistrate looked to the structure of the preferred embodiment to help determine the scope of the 'ink delivery means' element, the magistrate's interpretation did not rely solely on that part of the specification. ... [T]he magistrate also looked to the background and summary of the invention sections of the specification which describe the improvements of the ink delivery means of this invention over the prior art (including the accused ink delivery structure of [the accused infringer's] '522 patent). These sections of the specification, in addition to the disclosure of the preferred embodiment, led the magistrate to conclude that the 'ink delivery means' of claim 1 was limited to an ink sprayhead having a second, high pressure air source.

"Specifically, the summary of the invention section of the '957 patent states that the invention 'is capable of producing a sectioned image on the substrate in one continuous print because its sprayhead design prevents ink jet clogging.' ... The specification attributes this unique capability to the invention's use of two separate air sources--one pulse width modulated air source for controlling delivery of the ink to the substrate and a second low-volume, high pressure air source for continuous cleaning of the ink jets.

"Additionally, in the background section, the specification of the '957 patent explains that 'the design of the '522 patent is such that the ink accumulation is not prevented. The '522 patent does not solve the ink accumulation problem because it uses a single constant air pressure source.' ... The '957 patent specification goes on to declare that 'the system disclosed in the '522 patent is incapable of producing an enlarged image having the desired color scheme.' ... The accused ink delivery structure ... is identical to the structure described in the '522 patent--a structure explicitly distinguished by the '957 patent.

"By choosing means-plus-function language to recite the 'ink delivery means' claim element, the patentee necessarily restricted the scope of this element to the structure disclosed in the specification and its equivalents... . [B]y stating that the accused structure was 'incapable' of achieving the desired results of the invention, the patentee expressly excluded it as an equivalent of the disclosed structure. Because § 112, P 6 requires a court to interpret a means-plus-function claim according to the structure disclosed in the specification and its equivalents, the magistrate's limitations on claim scope, with reference to the preferred embodiment and the explicit disavowal of prior art structure, correctly construed the invention."

174 F.3d at 1355-57, 50 USPQ2d at 1373-75.

(n710) Footnote 170. The patentee "points to a portion of the '957 patent specification describing an alternative 'ink delivery means' (shown in Fig. 8) which does not include the second, high pressure air source. ... This alternative embodiment is significantly different than (the) accused device, however. Specifically, the ink sprayhead embodiment of Fig. 8 uses a single constant air flow and a pulse-width modulated ink flow to control delivery of the ink to the substrate. (The) accused device, on the other hand, uses pulse-width modulated constant pressure air flow to control ink delivery. (The patentee's) alternative structure is therefore so different from (the) accused device that no reasonable jury could find it an equivalent structure. Thus, even if this court interpreted the 'ink delivery means' element of claim 1 to include this alternative embodiment, it would not cover the accused structure." *174 F.3d at 1357, 50 USPQ2d at 1375.*

(n711) Footnote 171. The patentee "identifie(d) a species restriction requirement in the parent application of the '957 patent."

"During the prosecution of the application which became U.S. Patent No. 5,294,946 (the '946 patent) (parent application to the '957 patent), the patent examiner directed [the patentee] to select one set of claims from the following three possible inventions described in the application:

A. A single side ink jet printer with two pressure flows to propel the ink and maintain cleanliness of the nozzles, claims 1-6, 27-32.

B. A two side ink jet printer, claims 18-20.

C. A two side ink jet printer with two pressure flows to propel the ink and maintain cleanliness of the nozzles, claims 7-17, 21-26."

174 F.3d at 1357-58, 50 USPQ2d at 1375-76. The patentee argued (1) "the '946 patent embodied the election of species C, while the '957 patent was the result of a continuation application directed toward species B," (2) "it expressly included claim elements for the dual air sources in the '946 patent application but intentionally removed them from the claims of the '957 patent application," and (3) "it is unfair to limit the claims of the '957 patent to an invention elected for prosecution in an earlier application when the examiner explicitly required separation into separate applications." *174 F.3d at 1358, 50 USPQ2d at 1376.*

"Although the prosecution history serves as a tool for claim interpretation, *see In re Hayes Microcomputer Products, Inc. Patent Litigation* ... (Fed. Cir. 1992), the statutory requirements of *35 U.S.C. § 112,* P 6 nonetheless apply to means-plus-function claims. The specification limits the meaning of means-plus-function claim elements; and in this case, the specification expressly limits the invention in the manner described previously."

174 F.3d at 1358, 50 USPQ2d at 1376.

(n712) Footnote 172. *174 F.3d at 1358, 50 USPQ2d at 1376.*

(n713) Footnote 173. *Smiths Industries Medical Systems, Inc. v. Vital Signs, Inc., 50 USPQ2d 1641 (Fed. Cir. 1999), superseded on reh'g, 183 F.3d 1347, 51 USPQ2d 1415 (Fed. Cir. 1999).*

(n714) Footnote 174. *183 F.3d at 1351, 51 USPQ2d 1417.*

(n715) Footnote 175. *183 F.3d at 1358, 51 USPQ2d at 1422.*

(n716) Footnote 176. *183 F.3d at 1359, 51 USPQ2d at 1423.*

(n717) Footnote 177. *183 F.3d at 1361, 51 USPQ2d at 1424.*

(n718) Footnote 178. *Odetics, Inc. v. Storage Technology Corp., 185 F.3d 1259, 51 USPQ2d 1225 (Fed. Cir. 1999),* discussed at § 18.03(5)(c)(iii).

See also *Trinity Industries, Inc. v. Road Systems, Inc., 121 F. Supp.2d 1028, 1047-48 (E.D. Tex. 2000)* ("Defendants assert that there are three separate structures that correspond to bending means: 1) a forward curved wall; 2) a rearward similar curved wall; and 3) a support member connected to the rearward wall. This construction is improper to the extent it implies that the court should construe these three components to require three separate equivalents in any infringing device. The claim limitation in a means plus function claim is the overall structure that performs the claimed function, not the individual components of that structure. ... Furthermore, it is improper to analyze a means plus function claim on a component by component basis. ... Therefore, a proper claim construction cannot rule out equivalents of the overall structure merely because the components of potentially equivalent structures are combined or arranged in a different way or replaced with substitute components. When a fact finder undertakes the task of determining equivalents in the present case, the walls and the support member are to be considered merely as the necessary components of the overall structure, which consists of a rigid curvilinear bending chute or member and a support."; "The claim limitation is the overall structure that performs the claimed function, not the individual components of that structure. ... While consideration of the components of the claim limitations is necessary to understand whether an accused device possesses equivalent 'ways' and 'results,' it is not necessary that an equivalent of every component of the patented device be present.").

(n719) Footnote 179. *185 F.3d at 1268, 51 USPQ2d at 1230.*

(n720) Footnote 180. *WMS Gaming Inc. v. International Game Technology, 184 F.3d 1339, 51 USPQ2d 1385 (Fed. Cir. 1999).*

Compare *Faroudja Laboratories, Inc. v. Dwin Electronics, 76 F. Supp.2d 999, 1010 (N.D. Calif. 1999)* (distinguishing *WMS Gaming*; an accused infringer "relies primarily on *WMS Gaming* for the proposition that functional limitations from the specification may be imported to limit the structural claim elements. ... The Court finds *WMS* inapplicable as it addresses the special situation in which a structure corresponding to the means element is an algorithm executed by a computer. ... The Federal Circuit stated that where a patent discloses a general purpose computer or microprocessor as the structure, '[t]he instructions of the software program that carry out the algorithm electrically change the general purpose computer by creating electrical paths within the device [that] create a special purpose machine for carrying out the particular algorithm.' ... Therefore, computers which can be programmed to carry out a myriad of functions, whereby the program itself changes the structure of the computer by affecting its electrical paths, create a special problem in means-plus-function claim construction. Since the disclosed structure cannot in these circumstances be identified as the general purpose computer, whose structure changes according to its programmed function, a court must identify the special purpose computer programmed to perform the disclosed algorithm. ... In this special case where the structure is altered by virtue of its programmable nature, a court must construe the structural element to include only the structure programmed to perform the particular disclosed function. The Federal Circuit's decision does not lead to the conclusion that a court must, as a routine matter, limit the structural element to its functional purpose by importing functional language into the structure specification."; "Under [the accused infringer's] rationale, *35 U.S.C. § 112,* P 6 would remove the identification of structure completely from this mode of claiming, and functional language would thus both define the function and structure of a claim. Such interpretation was not what the Federal Circuit, nor statute, intended."); *Katz v. AT&T Corp., 63 F. Supp.2d 583, 603 n.15 (E.D. Pa. 2000)* (*WMS Gaming* "does not require that the software corresponding to the means in these limitations be specifically programmed to perform one of the seven formats disclosed in the specifications ... ").

(n721) Footnote 181. *184 F.3d at 1349, 51 USPQ2d at 1391.*

See also *CIVIX-DDI, LLC v. Microsoft Corp., 84 F. Supp.2d 1132, 1160 (D. Colo. 2000), aff'd, 18 Fed. Appx. 892 (Fed. Cir. 2001)* (nonprecedential) (citing *WMS Gaming*; "To the extent [the patentee] contends that the corresponding structure to the recited functional clauses includes a logic processor and software, [the accused infringer] argue that the clause is invalid as no specific algorithm for performing the recited function has been disclosed. I disagree that the patentee must disclose such an algorithm. Instead, I conclude that the disclosure of software, different types of computers and databases, and related communications means is sufficient."); *Nilssen v. Motorola, Inc., 80 F. Supp.2d 921, 928 (N.D. Ill. 2000), modified, 130 F.Supp.2d 976 (N.D.Ill. 2000)* (STRUCTURE--ELECTRONICS; "From its very nature the term 'structure' ordinarily refers to something physical. In the realm of electronics, of course, what is being transported in the figurative sense--electrical current--is without tangible dimension. It is consequently necessary to be wary when citing cases that deal with tangible structures (*Personalized Media*, *Greenberg*, *Cole* and the like) as authorities whose formulations of the operative rules should apply here.").

(n722) Footnote 182. *184 F.3d at 1348, 51 USPQ2d at 1391.*

(n723) Footnote 183. *Kemco Sales, Inc. v. Control Papers Company, Inc., 208 F.3d 1352, 54 USPQ2d 1308 (Fed. Cir. 2000).*

See also *Rackman v. Microsoft Corp., 102 F. Supp.2d 113, 127, 116, 129 (E.D. N.Y. 2000)* (POSSIBILITY OF EMBODYING INVENTION IN ENTIRELY DIFFERENT TECHNOLOGY: VIDEOGAME CARTRIDGE v. FLOPPY DISK OR HARDDISK DRIVE; on "[t]he issue ... whether a specific alternative structure for the particular means-plus-function claim element at issue must be explicitly disclosed, or whether it is enough to disclose the possibility of embodying the invention in an entirely different technology, with the implication that this would necessitate the use of obvious associated structures to perform the functions"; patent on a system for limiting use of "cartridge-controlled" system to authorized cartridges; the patent's specification described "microprocessor-controlled systems, including video game units, which operate according to a series of instructions stored in devices, such as cartridges, containing interchangeable read-only memories (ROM)," but it also stated that "such a cartridge-controlled system is not the only context in which the invention may be used. 'Although the illustrative embodiment of the invention is disclosed in the context of a cartridge-controlled machine, it is to be understood that the principles of the invention apply to systems which are controlled by other types of insertable storage media. For example, the principles of the invention may be applied to programs furnished on discs designed for use with a microcomputer.' "; "The question ... is whether the disclosure in the instant case is more like that in *Atmel* and *Dossel* or that in *Fonar*. The [patent's] specification includes a reference to the possibility of a microcomputer embodiment utilizing programs furnished on disks. It therefore appears to avoid the problem in *Fonar*, where the specification merely mentioned the possibility of an alternative structure without specifically identifying one. The reader of *Rackman* patent is asked to infer the need for a floppy disk drive from the reference to an embodiment in a different technology, a microcomputer utilizing disks. As *Dossel* teaches, the specific word need not be used; the only requirement is adequate disclosure of structure. According to *Atmel*, the dispositive question is whether one skilled in the art would make the inferential leap that plaintiff advocates: from reference to a microcomputer utilizing disks to envisioning the floppy disk drive needed to interface the disks with the computer. Even [the accused infringer's] expert witness answers this question in the affirmative. After quoting the portion of the specification that describes the alternate embodiment of a 'microcomputer' using 'programs furnished on discs,' Dr. Berson states: 'To one of skill in the art of computers, this paragraph indicates that the phrase 'insertable storage medium,' as used in claim 5 of the Rackman patent, means storage devices (like cartridges and floppy disks) which are used by inserting them into a machine such as a game console *or a floppy disk drive*.' ... A floppy disk drive is therefore adequately disclosed as a corresponding structure to the 'means for interfacing.' The claim element 'means for interfacing' therefore includes the floppy disk drive and its equivalents. As discussed above, the reference to 'discs' refers to a floppy diskette, and therefore calls to mind a floppy disk drive. A hard disk drive is not disclosed by the patent.").

(n724) Footnote 184. *208 F.3d at 1359, 54 USPQ2d at 1311.*

(n725) Footnote 185. *208 F.3d at 1359, 54 USPQ2d at 1311.*

(n726) Footnote 186. *208 F.3d at 1360, 54 USPQ2d at 1312.*

(n727) Footnote 187. **Compare** *Laitram Corp. v. Rexnord, Inc., 939 F.2d 1533, 19 USPQ2d 1367 (Fed. Cir. 1991),* discussed at § 18.03[5][e][i] **with** *Wenger Manufacturing, Inc. v. Coating Machinery Systems, Inc., 239 F.3d 1225, 57 USPQ2d 1679 (Fed. Cir. 2001),* discussed *infra.*

See also *Medtronic, Inc. v. Advanced Cardiovascular Systems, Inc., 248 F.3d 1303, 1313, 58 USPQ2d 1607 (Fed. Cir. 2001)* (quoting *Laitram*; "It is settled law ... that independent claims containing means-plus-function limitations do not have the same literal scope as dependent claims reciting specifically the structure that performs the stated function."); *Globetrotter Software, Inc. v. Elan Computer Group, Inc., 236 F.3d 1363, 1369, 57 USPQ2d 1542 (Fed. Cir. 2001)* (a patent concerned a system for limiting the number of computer programs that can be run simultaneously on a network; the claim at issue required "license file means ... for storing ... a selectable authorized number of ... licenses"; the specification disclosed a unique identification ("UID"). Contrary to the patent owner's arguments, and unlike *Micro Chemical* (1999), the UID structure was necessary to carry out the "storing" function; the UID was utilized in both embodiments disclosed in the patent's specification (license transfer and licensee pool); requiring the UID for the claim at issue did not violate the claim differentiation doctrine even though a dependent claim expressly required a "means for assigning a unique identification."); *Clearstream Wastewater Systems Inc. v. Hydro-Action Inc., 206 F.3d 1440, 54 USPQ2d 1185 (Fed. Cir. 2000),* discussed at § 18.03[5][d][v] (claim differentiation supported a conclusion that the corresponding structure included a novel structure (flexible hoses) and a prior art structure (rigid-conduct), both of which were adequately disclosed in specification for carrying out a function in a means clause in one claim (claim 4); a claim dependent on claim 4 specified that the flexible hose structure be used); *IMS Technology Inc. v. Haas Automation Inc., 206 F.3d 1422, 54 USPQ2d 1129 (Fed. Cir. 2000), cert. dismissed, 530 U.S. 1299 (2000),* discussed *infra*; *C.R. Bard, Inc. v. M3 Systems, Inc., 157 F.3d 1340, 1364, 48 USPQ2d 1225, 1242 (Fed. Cir. 1998), reh'g denied & suggestion for reh'g in banc declined, 161 F.3d 1380, 49 USPQ2d 1219 (Fed. Cir. 1998), cert. denied, 526 U.S. 1130 (1999)* ("claims that are written in the form authorized by section 112 paragraph 6 are by statute limited to the structure described in the specification and equivalents of that structure. As discussed in *Laitram Corp. v. Rexnord, Inc...* . (Fed. Cir. 1991) a 'means-plus-function limitation is not made open-ended by the presence of another claim specifically claiming the disclosed structure which underlies the means clause or an equivalent of that structure.' ").

For district court decisions, see *Trinity Industries, Inc. v. Road Systems, Inc., 121 F. Supp.2d 1028, 1048 (E.D. Tex. 2000)* ("the doctrine of claim differentiation, ... presumes different scope for different claims. That doctrine cannot be applied to broaden the scope of a means plus function claim beyond the structure disclosed in the specification and equivalents thereof."); *Johnson Electric North America Inc. v. Mabuchi Motor America Corp., 77 F. Supp.2d 446, 454 (S.D. N.Y. 1999)* ("the Federal Circuit has specifically held that the means-plus-function rule codified by *35 U.S.C. § 112* P 6 trumps the doctrine of claim differentiation where the two doctrines conflict."); *Relume Corp. v. Dialight Corp., 63 F. Supp.2d 788 (E.D. Mich. 1999), aff'd, 4 Fed. Appx. 893 (Fed. Cir. 2001)* (nonprecedential); *Altech Controls Corp. v. E.I.L. Instruments Inc., 44 USPQ2d 1890, 1896 (S.D. Tex. 1997)* ("The recitation of specific structure, material, or act in a dependent claim achieving the function of a Section 112 par. 6 means or step in an independent claim does not invoke the equitable doctrine of claim differentiation because clever drafting cannot override the statutorily required interpretation to be given to a claim pursuant to Section 112 par. 6."); *Signtech USA Ltd. v. Vutek Inc., 44 USPQ2d 1741, 1745 (W.D. Tex. 1997).*

Compare *Katz v. AT&T Corp., 63 F. Supp.2d 583 (E.D. Pa. 2000)* (claim differentiation applies to interpretation of functional language in means clause); *Oneac Corp. v. Raychem Corp., 20 F. Supp.2d 1233, 1244 (N.D. Ill. 1998)* ("the court addresses the doctrine of claim differentiation to help define the appropriate scope of structural equivalence. ... Plaintiff offers that claim 10 of the ... patent specifically defines the 'filter means' as a resistor and capacitor. If claim 1 was read solely to include low pass filters consisting only of a resistor and a capacitor, claim 10, a dependant claim, would in no way refine the scope of claim 1, the independent claim. Thus, the filter means in claim 1 should include equivalents broader than the combination of a resistor and capacitor.").

(n728) Footnote 188. *Laitram Corp. v. Rexnord, Inc., 939 F.2d 1533, 19 USPQ2d 1367 (Fed. Cir. 1991),* discussed at § 18.03(5)(e)(i).

(n729) Footnote 189. *939 F.2d at 1534-1535, 19 USPQ2d at 1368-1369.*

(n730) Footnote 190. *939 F.2d at 1535 n.3, 19 USPQ2d at 1369 n.3.* (Emphasis added.)

(n731) Footnote 191. *939 F.2d at 1536, 19 USPQ2d at 1370.* (Emphasis added.)

(n732) Footnote 192. For a discussion of claim differentiation, see § 18.03(6).

(n733) Footnote 193. *939 F.2d at 1538, 19 USPQ2d at 1371.*

Compare *Alpex Computer Corp. v. Nintendo Co., 34 USPQ2d 1167, 1175, 1194 (S.D. N.Y. 1994), aff'd in part & rev'd in part, 102 F.3d 1214, 40 USPQ2d 1667 (Fed. Cir. 1996), cert. denied, 521 U.S. 1104 (1997),* discussed at § 18.03[5][d][iii] ("The *Laitram* court did not rule out claim differentiation with respect to means-plus-function claims.

Rather, the court held that claim differentiation is a guide, which should be used, as long as it does not run afoul of section 112(6). ... Significantly, the *Laitram* court recognized that notwithstanding disclosure of only one structure in the patent specification, claim differentiation can nonetheless be helpful for identification of equivalents of that structure.").

(n734) Footnote 194. *939 F.2d at 1538, 19 USPQ2d at 1371.*

(n735) Footnote 195. *IMS Technology Inc. v. Haas Automation Inc., 206 F.3d 1422, 54 USPQ2d 1129 (Fed. Cir. 2000), cert. dismissed, 530 U.S. 1299 (2000).*

(n736) Footnote 196. *206 F.3d at 1431, 54 USPQ2d at 1135.*

(n737) Footnote 197. *206 F.3d at 1431, 54 USPQ2d at 1135.*

(n738) Footnote 198. *206 F.3d at 1431, 54 USPQ2d at 1135.*

(n739) Footnote 199. *206 F.3d at 1431, 54 USPQ2d at 1135.*

(n740) Footnote 200. *Wenger Manufacturing, Inc. v. Coating Machinery Systems, Inc., 239 F.3d 1225, 57 USPQ2d 1679 (Fed. Cir. 2001).*

(n741) Footnote 201. *239 F.3d at 1234.*

(n742) Footnote 202. *239 F.3d at 1234.*

(n743) Footnote 203. U.S. Pat. No. 5,100,683.

(n744) Footnote 204. *239 F.3d at 1234.*

(n745) Footnote 205. *Cybor Corp. v. FAS Technologies, Inc., 138 F.3d 1448, 1457, 46 USPQ2d 1169, 1175 (Fed. Cir. 1998)* (in banc), discussed at § 18.06(2)(a)(vi)(B), § 18.07(4)(c).

See also *Wenger Manufacturing, Inc. v. Coating Machinery Systems, Inc., 239 F.3d 1225, 57 USPQ2d 1679 (Fed. Cir. 2001); Desper Products, Inc. v. QSound Labs, Inc., 157 F.3d 1325, 1336-37, 48 USPQ2d 1088, 1096 (Fed. Cir. 1998)* ("Prosecution history is an important source of intrinsic evidence in interpreting claims because it is a contemporaneous exchange between the applicant and the examiner. This is true whether the claim element in question is written pursuant to § 112, *P 6* or not."); *Alpex Computer Corp. v. Nintendo Co. Ltd., 102 F.3d 1214, 40 USPQ2d 1667 (Fed. Cir. 1996), cert. denied, 521 U.S. 1104 (1997),* discussed *infra.*

Compare *Signtech USA, Ltd. v. Vutek, Inc., 174 F.3d 1352, 1358, 50 USPQ2d 1372, 1375 (Fed. Cir. 1999)* ("Although the prosecution history serves as a tool for claim interpretation, ... the statutory requirements of *35 U.S.C. § 112,* P 6 nonetheless apply to means-plus-function claims. The specification limits the meaning of means-plus-function claim elements; and in this case, the specification expressly limits the invention in the manner described previously.").

For district court decisions, see *Schawbel Corp. v. Conair Corp., 122 F. Supp.2d 71, 79 (D. Mass. 2000), aff'd, 15 Fed. Appx. 800 (Fed. Cir. 2001)* (nonprecedential) ("Prosecution history is relevant to claim construction under § 112."); *Altech Controls Corp. v. E.I.L. Instruments Inc., 44 USPQ2d 1890, 1897 (S.D. Tex. 1997)* ("Statements made during the prosecution history are relevant to construing the scope of claims, including claims drafted in accordance with Section 112 par. 6."); *Raleigh v. Tandy Corp., 45 USPQ2d 1715, 1719 (N.D. Calif. 1997); Baxa v. McGaw Inc., 981 F. Supp. 1348, 1358, 44 USPQ2d 1801, 1809 (D. Colo. 1997), aff'd, 185 F.3d 883 (Fed. Cir. 1999)* (unpublished) ("The prosecution history must be considered in determining the literal scope of means-plus-function claims, including equivalents under Section 112, P 6.").

(n746) Footnote 206. *Biodex Corp. v. Loredan Biomedical, Inc., 946 F.2d 850, 20 USPQ2d 1252 (Fed. Cir. 1991), cert. denied, 504 U.S. 980 (1992).*

(n747) Footnote 207. *946 F.2d at 853, 20 USPQ2d at 1254.*

(n748) Footnote 208. *946 F.2d at 862-63, 20 USPQ2d at 1262.*

(n749) Footnote 209. *Alpex Computer Corp. v. Nintendo Co. Ltd., 102 F.3d 1214, 40 USPQ2d 1667 (Fed. Cir. 1996), cert. denied, 521 U.S. 1104 (1997).*

(n750) Footnote 210. *102 F.3d at 1221, 40 USPQ2d at 1673.*

See also *J & M Corp. v. Harley-Davidson, Inc., 269 F.3d 1360, 60 USPQ2d 1746 (Fed. Cir. 2001)* ("[T]he extent of equivalents must be interpreted in light of the disclosure of the invention in the specification, as a whole, as well as the prosecution history."); *Ballard Medical Products v. Allegiance Healthcare Corp., 268 F.3d 1352, 1359, 60 USPQ2d 1493 (Fed. Cir. 2001)* ("When a patentee advises the examiner (and the public after patent issuance) that a particular structure is not within his invention, the patentee is not permitted to assert in a subsequent infringement action that the same structure is equivalent to the structure described in the patentee's specification for purposes of section 112 paragraph 6."; "Statements detailing the shortcomings of the relevant prior art have often proved useful in construing means-plus-function claims."); *Polaroid Corp. v. Eastman Kodak Co., 789 F.2d 1556, 1570, 229 USPQ 561, 572 (Fed. Cir. 1986), cert. denied, 479 U.S. 850 (1986)* (scope of "equivalence" under Section 112 is limited by statements made during the prosecution history).

(n751) Footnote 211. See also *Cybor Corp. v. FAS Technologies, Inc., 138 F.3d 1448, 1457, 46 USPQ2d 1169, 1175 (Fed. Cir. 1998)* (in banc), discussed at § 18.06(2)(a)(vi)(B), § 18.07(4)(c) ("Clear assertions made in support of patentability thus may affect the range of equivalents under § 112, P 6. *Cf. American Permahedge, Inc. v. Barcana, Inc.* ... (Fed. Cir. 1997); *Athletic Alternatives, Inc. v. Prince Mfg., Inc.* ... (Fed. Cir. 1996). The relevant inquiry is whether a competitor would reasonably believe that the applicant had surrendered the relevant subject matter. *See Insituform Techs., Inc., v. CAT Contracting, Inc.* ... (Fed. Cir. 1996).").

At issue in *Alpex Computer* was a patent, applied for in 1974 and issued in 1977, that concerned a microprocessor-based home video game system, which, unlike prior art "dedicated" machines, used modular plug-in units (read-only memory ("ROM") cartridges) to permit playing multiple games, and which allowed games with rotating images. The patent disclosed an apparatus "for producing video signals by means of random access memory (RAM) with storage positions corresponding to each discrete position of the raster for a standard television receiver." *102 F.3d at 1216, 40 USPQ2d at 1669.*

During prosecution, to overcome rejection of some claims, the patentee distinguished its RAM-based, "bit-map" video display system from the prior art Okuda system, which showed a shift register-based video display system in which a full horizontal line of raster points is stored in a shift register, emphasizing that Okuda " 'is unable to selectively modify a single bit in the memory ... but, instead, must operate on a line at a time to modify the stored display data.' " *102 F.3d at 1219, 40 USPQ2d at 1671.*

The claims in suit (12 and 13) required a "means for generating a video signal."

The accused infringer Nintendo's "NES" game system did not "include RAM with storage positions corresponding to *each* discrete position of the raster." *102 F.3d at 1218, 40 USPQ2d at 1669.*

"Instead, the NES utilizes a patented picture processing unit, or PPU, to perform the generation of images on the screen. The PPU receives pre-formed, horizontal slices of data and places each slice in one of eight shift registers, each of which can store a maximum of 8 pixels. These slices of data are then processed directly to the screen. The PPU repeats this process to assemble the initial image on the screen. Thereafter it repeats the process as necessary to form changes in images throughout the progression of the game. Nintendo refers to the PPU as an 'on-the-fly' system. ... [T]he NES video display system, using shift registers to process slices of images (as opposed to entire screens), is a faster means of displaying movement of images on the video screen than the bit-mapping of the RAM-based system of the ... patent." *102 F.3d at 1218, 40 USPQ2d at 1669-70.*

After receiving a special master's report and holding a trial in which the jury rendered a verdict of infringement, the district court denied Nintendo's motion for judgment as a matter of law, adopting the special master's claim construction. The special master refused to consider the prosecution history statements distinguishing the patentee's RAM system from the prior art shift register system because they were directed to claims not asserted by the patentee.

Reversing the infringement judgment, the Federal Circuit held that the district court erred in disregarding the patentee's prosecution statements distinguishing Okuda merely because the statements concerned other claims.

"[T]he examiner rejected claim 1 of the application as being anticipated by Okuda. Claim 1 specified a series of limitations in means-plus-function format to a display control apparatus utilizing a RAM-based, bit-map system. [The patentee] distinguished Okuda before the PTO based on the structural difference of a RAM-based versus a shift register-based video display system: 'Claim 1, as amended, now clearly distinguishes over Okuda. The claim requires a random access memory which, as indicated previously, is not disclosed in Okuda.' ... [W]e discern no reason why prosecution history relating to the structure of the video display in the means-plus-function limitations of claim 1 is not pertinent to

the same structure of the same display system in the means-plus-function limitations of claims 12 and 13." *102 F.3d at 1220, 40 USPQ2d at 1671-72.*

The accused structure "paralleled the structure and operation of ... Okuda. ..." *102 F.3d at 1218, 40 USPQ2d at 1572.* The patentee attempted to "distinguish Okuda from the [accused] NES [system] because Okuda only allows the modification of horizontal lines on the raster, whereas the NES allows the modification of any 8-bit slice on the raster," but "[t]his distinction ... affects neither the structural similarities (both Okuda and the NES use shift registers) nor the pertinent functional similarities (both Okuda and the NES cannot modify a single pixel)." *102 F.3d at 1221, 40 USPQ2d at 1672.*

The Federal Circuit also reversed the finding of infringement under the doctrine of equivalents, again relying on the prosecution history. The patentee "described its claims during the prosecution of the ... patent as covering random access systems capable of changing a single bit. It did not and could not claim image generation by shift registers. ... In this case, using shift registers, instead of RAM, to process data for video display, is not merely an unimportant and insubstantial change." *102 F.3d at 1223, 40 USPQ2d at 1674.* The patentee's expert's testimony concerned only the "equivalence of the functional result."

"[The expert] described the shift registers of the NES as storing 'just one little slice of an object' to be imaged; whereas he said the bit-map system 'stores the whole screen.' ... [He] testified that 'the reason they are equivalent is by storing one line at a time and using it over and over and over again very quickly you can do the same thing.' Thus, [he] concluded that by repeating the NES process the entire screen will eventually be imaged as is done with the bit map system." *102 F.3d at 1221, 40 USPQ2d at 1673.*

(n752) Footnote 212. See § 18.03(2)(e)(vi).

But cf. *Schering Corp. v. Amgen Inc., 18 F. Supp.2d 372, 380 n.14 (D. Del. 1998), reargument denied, 25 F. Supp.2d 293, 50 USPQ2d 1125 (D. Del. 1998), aff'd, 222 F.3d 1347, 55 USPQ2d 1650 (Fed. Cir. 2000)* ("Whether a means-plus-function clause under a § 112, P 6 equivalency determination may be affected by the pioneer status of an invention is a question of some disagreement in the Federal Circuit Court of Appeals and need not be decided by the Court at this time. Compare *Intel Corp. v. U.S. Int'l Trade Comm., 946 F.2d 821, 842 (Fed. Cir.1991)* (pioneer status not important in structural equivalency determination under *35 U.S.C. § 112,* P 6) with *Texas Instruments v. U.S. Int'l Trade Comm., 805 F.2d 1558, 1569-71 (Fed. Cir. 1986)* (pioneer status relevant to means-plus-function equivalency determination).").

(n753) Footnote 213. *Intel Corp. v. U.S. Int'l Trade Comm'n, 946 F.2d 821, 20 USPQ2d 1161 (Fed. Cir. 1991),* discussed at § 18.07(6)(b)(ii).

See also *Micro Chemical, Inc. v. Great Plains Chemical Co., 194 F.3d 1250, 1259, 52 USPQ2d 1258, 1264 (Fed. Cir. 1999),* discussed at § 18.03[5][e][iii]; *Interspiro USA Inc. v. Figgie International Inc., 815 F. Supp. 1488, 1505, 27 USPQ2d 1321, 1330 (D. Del. 1993), aff'd, 18 F.3d 927, 30 USPQ2d 1070 (Fed. Cir. 1994).*

(n754) Footnote 214. See § 18.04(2)(d).

(n755) Footnote 215. *946 F.2d at 842, 20 USPQ2d at 1179.*

See also *Applied Medical Resources Corp. v. United States Surgical Corp., 147 F.3d 1374, 1381, 47 USPQ2d 1289, 1294 (Fed. Cir. 1998), cert. denied, 525 U.S. 1104 (1999)* (the infringer argued that "the district court erred in excluding certain testimony from [its technical expert] Luther about the scope of means-plus-function equivalents that the jury could consider in a direct infringement analysis. For example, in response to the question 'And why did you find [the Green, Yoon, and Honkanen patents] helpful to your analysis on the question of equivalents?,' Luther testified, 'Well, if it's in the prior art, anything in the prior art, it's not available as an equivalent for purposes of considering infringement.' This evidentiary ruling was not an abuse of the trial court's discretion, not only because Luther was being asked to testify beyond the scope of his expertise as a technical witness, but also because Luther's response to Surgical's questions can be relevant only under an erroneous construction of the law. *See, e.g., Intel Corp. v. United States Int'l Trade Comm.* ... (Fed. Cir. 1991) ('It is not necessary to consider the prior art in applying section 112, paragraph 6. Even if the prior art discloses the same or an equivalent structure, the claim will not be limited in scope thereby. It is only necessary to determine what is an equivalent to the structure disclosed in the specification which is performing the function at issue.')."); *Kearns v. Chrysler Corp., 32 F.3d 1541, 1547 n.7, 31 USPQ2d 1746, 1750 n.7 (Fed. Cir. 1994), cert. denied, 514 U.S. 1032 (1995)* ("The trial court's ruling [barring a infringer, who had stipulated to the patents' validity, from introducing prior art to show that the patentee's interpretations of the claims would cause them to read on

the prior art] is consistent with the rule that '[i]t is not necessary to consider the prior art in applying section 112, paragraph 6. Even if the prior art discloses the same or an equivalent structure, the claim will not be limited in scope thereby.' ").

Compare *Mitek Surgical Products, Inc. v. Arthrex, Inc., 21 F. Supp.2d 1309, 1313-14 (D. Utah 1998), aff'd, 230 F.3d 1383 (Fed. Cir. 2000)* (unpublished) (a patentee "argues that the court may not use the prior art to limit the range of structures that may be equivalent to the structure disclosed in a specification for performing an identified function. ... [T]his court disagrees. It is well established that the prior art as cited by the applicant is part of the intrinsic evidence upon which the court must rely to construe the claims. ... The prior art relied upon by the applicant 'gives clues as to what the claims do not cover.' ").

(n756) Footnote 216. *946 F.2d at 842-43, 20 USPQ2d at 1179-80.*

See also *Alpex Computer Corp. v. Nintendo Co. Ltd., 102 F.3d 1214, 1220, 40 USPQ2d 1667, 1672 (Fed. Cir. 1996), cert. denied, 521 U.S. 1104 (1997),* discussed at § 18.03[5][d][iii] ("Statements made during the prosecution relating to structures disclosed in the specification are certainly relevant to determining the meaning of the means-plus-function limitations of the claims at issue."); Vulcan International Inc. v. Jerr-Dan Corp., 31 USPQ2d 1911, 1920 n.23 (N.D. Miss. 1994) (testimony of engineer on literal infringement of a claim with means-plus-function limitations is of limited value when considered with contrary testimony of patent attorney; "While the court agrees with the basic proposition that 'patent specifications are written for those skilled in the art,' ... proper interpretation of a claim is a question of law and the usefulness of an inquiry solely informed by those of technical expertise in the art is limited. When a patentee chooses to employ means plus function language to define his invention, the specification must of necessity be consulted when the patentee later cries infringement. One reading the elements of the claim in light of the structures disclosed in the specification in the context of an action for infringement is not seeking to build the device. Rather, construction of the claims is necessary to determine if the patentee may rightfully exclude others from the subject matter that the patentee regards as his invention. Certainly ordinary skill in the art is necessary to know how a particular structure works, a process is applied or a method employed. When one designs around the prior art ... patent attorneys are consulted as a matter of course by the actual designers to determine if the device sought runs the risk of infringing another's claims and, to that degree, claims must be read from that perspective. But one of ordinary or, for that matter, extraordinary skill in the ... art is not typically going to know nor should she, how to define the scope of a claim under the means plus function analysis. Because patent attorneys typically write patent claims, testimony by those with skill in the art of patent construction, while also of limited usefulness, has as much probative force as that rendered by engineers who could no doubt understand and thereby build the device from the specifications listed but lack any background in defining the scope of anther's invention."); *DF & R Corp. v. American International Pacific Industries Corp., 830 F. Supp. 500, 505, 29 USPQ2d 1135, 1138-39 (D. Minn. 1993)* ("In general, interpretation of a means element involves consideration of the same factors used to construe elements and limitations using non-means language."); *B.F. Goodrich FlightSystems Inc. v. Insight Instruments Corp., 22 USPQ2d 1832, 1835-36 (S.D. Ohio 1992), aff'd, 991 F.2d 810 (Fed. Cir. 1993)* (unpublished) ("Neither the Federal Circuit nor its predecessor courts have established a definitive test to determine the scope of equivalent elements to prove literal infringement.").

(n757) Footnote 217. *Clearstream Wastewater Systems Inc. v. Hydro-Action Inc., 206 F.3d 1440, 54 USPQ2d 1185 (Fed. Cir. 2000).*

(n758) Footnote 218. "In the written description, there are two structures described that correspond to the functions of 'injecting air into the waste water' and 'aerating the liquid.' One is the prior art, rigid-conduit, aeration system detailed at column 1, lines 54-62:

'In waste water treatment plants of this type, air is pumped into the aeration chamber through conduits that extend downwardly to a point adjacent the bottom of the chamber so that the air, as it rises, will pass through most of the liquid in the chamber. Air is usually supplied through plastic pipe, such as PVC pipe, having fine bubble diffusers attached at the lower end. The upper end of each pipe is connected to a source of air under pressure.'

The other corresponding structure to the functions of 'injecting air into the waste water' and 'aerating the liquid' is the new, flexible-hose system described in detail at column 2, line 60-62.

'Positioned in [the rigid] conduits 32 are flexible-hoses 38 through which air is supplied to diffusers 40 connected to the end of the flexible-hoses.' "

206 F.3d at 1445, 54 USPQ2d at 1188-89.

(n759) Footnote 219. *206 F.3d at 1444, 54 USPQ2d at 1188.*

(n760) Footnote 220. *206 F.3d at 1444, 54 USPQ2d at 1188.*

(n761) Footnote 221. *206 F.3d at 1445, 54 USPQ2d at 1189.*

(n762) Footnote 222. *206 F.3d at 1445, 54 USPQ2d at 1189.*

(n763) Footnote 223. *Signtech v. Vutek, 174 F.3d 1352, 50 USPQ2d 1372 (Fed. Cir. 1999),* discussed at § 18.03(5)(d)(i).

(n764) Footnote 224. *Sofamor Danek v. DePuy-Motech, 74 F.3d 1216, 37 USPQ2d 1529 (Fed. Cir. 1996),* discussed at § 18.03(5)(d)(i).

(n765) Footnote 225. *206 F.3d at 1445-46, 54 USPQ2d at 1189-90.*

(n766) Footnote 226. *206 F.3d at 1446-47, 54 USPQ2d at 1190.*

(n767) Footnote 227. *206 F.3d at 1447, 54 USPQ2d at 1190.*

(n768) Footnote 228. *CCS Fitness, Inc. v. Brunswick Corp., 288 F.3d 1359, 62 USPQ2d 1658 (Fed. Cir. 2002); Epcon Gas Systems, Inc. v. Bauer Compressors, Inc., 279 F.3d 1022, 61 USPQ2d 1470 (Fed. Cir. 2002); J & M Corp. v. Harley-Davidson, Inc., 269 F.3d 1360, 60 USPQ2d 1746 (Fed. Cir. 2001); Asyst Technologies, Inc. v. Empak, Inc., 268 F.3d 1364, 60 USPQ2d 1567 (Fed. Cir. 2001); TurboCare Division of Demag Delaval Turbomachinery Corp. v. General Electric Co., 264 F.3d 1111, 60 USPQ2d 1017 (Fed. Cir. 2001), on remand, 214 F.Supp.2d 170 (D. Mass. 2002); Generation II Orthotics Inc. v. Medical Technology Inc., 263 F.3d 1356, 59 USPQ2d 1919 (Fed. Cir. 2001); Lockheed Martin Corp. v. Space Systems/Loral, Inc., 249 F.3d 1314, 58 USPQ2d 1671 (Fed. Cir. 2001), vacated & remanded for further consideration in light of Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722 (2002), 122 S. Ct. 2349 (2002), on remand, 43 Fed. Appx. 372 (Fed. Cir. 2002)* (nonprecedential); *Medtronic, Inc. v. Advanced Cardiovascular Systems, Inc., 248 F.3d 1303, 58 USPQ2d 1607 (Fed. Cir. 2001); Wenger Manufacturing, Inc. v. Coating Machinery Systems, Inc., 239 F.3d 1225, 57 USPQ2d 1679 (Fed. Cir. 2001); Kemco Sales, Inc. v. Control Papers Company, Inc., 208 F.3d 1352, 1361, 54 USPQ2d 1308, 1313 (Fed. Cir. 2000)* ("Before a court attempts to analyze what appears to be a means-plus-function claim limitation, it must first assure itself that such a claim limitation is at issue."); *Rodime PLC v. Seagate Technology, Inc., 174 F.3d 1294, 50 USPQ2d 1429 (Fed. Cir. 1999), cert. denied, 528 U.S. 1115 (2000); Signtech USA, Ltd. v. Vutek, Inc., 174 F.3d 1352, 50 USPQ2d 1372 (Fed. Cir. 1999); Al-Site Corp. v. VSI International, Inc., 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999); Personalized Media Communications, LLC v. U.S. Int'l Trade Comm'n, 161 F.3d 696, 48 USPQ2d 1880 (Fed. Cir. 1998); Unidynamics Corp. v. Automatic Products International, Ltd., 157 F.3d 1311, 48 USPQ2d 1099 (Fed. Cir. 1998); Mas-Hamilton Group v. LaGard, Inc., 156 F.3d 1206, 48 USPQ2d 1010 (Fed. Cir. 1998); Hester Industries, Inc. v. Stein, Inc, 142 F.3d 1472, 46 USPQ2d 1641 (Fed. Cir. 1998), cert. denied, 525 U.S. 947 (1998); Ethicon, Inc. v. United States Surgical Corp., 135 F.3d 1456, 45 USPQ2d 1545 (Fed. Cir. 1998), cert. denied, 525 U.S. 923 (1998); Sage Products, Inc. v. Devon Industries, Inc., 126 F.3d 1420, 44 USPQ2d 1103 (Fed. Cir. 1997),* discussed at *§ 18.07[7]*; *O.I. Corp. v. Tekmar Co., Inc., 115 F.3d 1576, 42 USPQ2d 1777 (Fed. Cir. 1997),* discussed at *§ 18.07[4][a]* (the district court erred (1) in treating the word "passage" in an apparatus patent claim's phrase "means for passing the ... slug through a passage" as part of the means clause because the "passage" was "the place where the function occurs, not the structure that accomplishes it" and (2) erred in construing a method patent claim's phrase "the steps of ... passing the ... slug through a passage" as a step-plus-function clause subject to Section 112, paragraph 6"); *Cole v. Kimberly-Clark Corp., 102 F.3d 524, 531, 41 USPQ2d 1001, 1006 (Fed. Cir. 1996), cert. denied, 522 U.S. 812 (1997),* discussed at § 18.03[5][e][ii], *§ 18.05[2][d][ii]*; *York Products, Inc. v. Central Tractor Farm & Family Center, 99 F.3d 1568, 40 USPQ2d 1619 (Fed. Cir. 1996),* discussed at § 18.03[5][e][ii]; *Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 39 USPQ2d 1783 (Fed. Cir. 1996),* discussed at § 18.03[5][e][ii]; *Laitram Corp. v. Rexnord, Inc., 939 F.2d 1533, 19 USPQ2d 1367 (Fed. Cir. 1991),* discussed at § 18.03[5][d][ii], § 18.03[5][e][i].

For district court decisions, *Relume Corp. v. Dialight Corp., 63 F. Supp.2d 788 (E.D. Mich. 1999), aff'd, 4 Fed. Appx. 893 (Fed. Cir. 2001)* (nonprecedential); *Database Excelleration Systems Inc. v. Imperial Technology Inc., 48 USPQ2d 1533 (N.D. Calif. 1998); CellNet Data Systems, Inc. v. Itron, Inc., 17 F. Supp.2d 1100 (N.D. Calif. 1998); Pirelli Cable Corp. v. Ciena Corp., 988 F. Supp. 424, 433-34 (D. Del. 1997)* ("optical coupling means having an input, an input/output and an output" is *not* a means clause; "Although it is evident from other parts of the patent that the function of the optical coupling means is to separate different wavelengths, nowhere does the claim language state that function. ... Moreover, the Court is counseled by the fact the 'optical coupling means' recites a definite structure, i.e., the

optical coupler. ... Finally, the Court need look no further than the nearly identical language of Claim 7 which refers to the same optical coupling device as a "first optical coupler", with the conspicuous absence of the word "means". See Col. 9, line 14. Therefore, it is apparent that 'optical coupling means' and 'first optical coupler' are synonymous."); *Hay & Forage Industries v. New Holland North America, Inc., 25 F. Supp.2d 1170 (D. Kan. 1998)* ("steering structure" is *not* a means clause); *ADC Telecommunications, Inc. v. Alcoa Fujikura Ltd., 13 F. Supp.2d 951, 957-58, 49 USPQ2d 1988, 1993-94 (D. Minn. 1998); Atmel Corp. v. Information Storage Devices, Inc., 997 F. Supp. 1210, 1227 (N.D. Calif. 1998)* ("the phrase 'high voltage generating means' [is subject to Section 112, paragraph 6 because it] simply describes what the means does, and does not describe any definite structure."); *Louis Berkman Co. v. Davit Master Corp., 46 USPQ2d 1380, 1382 (M.D. Fla. 1998)* ("§ 112, P 6 is invoked" because the claims recite a function and "do not explicitly recite the structure, material or acts needed to perform these functions."); *Contempo Tobacco Products Inc. v. McKinnie, 45 USPQ2d 1969, 1974 (C.D. Ill. 1997); Altech Controls Corp. v. E.I.L. Instruments Inc., 44 USPQ2d 1890, 1896 (S.D. Tex. 1997)* ("means" clauses in patents concerning temperature control of refrigeration systems, properly interpreted, are limited to a "first-on/first-off or 'FIFO' control sequence" and do not encompass a "binary" control sequence; "There are three requirements for a claim element to be subject to Section 112 par. 6: (1) the element must be expressed by the word 'means' or 'step,' either of which raises a presumption that the inventor intended to invoke the claim format of Section 112 par. 6 ... ; (2) a specified function must follow the means or step and be linked to the means or step ... ; and (3) there must be an absence of definite structure, material, or acts for achieving the specified function."; "Because the three requirements ... are satisfied ... the Court concludes that the 'selections means' limitations ... should be interpreted ... as limited to the FIFO strategy that is disclosed in the specification or its equivalent. The specification and the prosecution history of the ... patent contain numerous statements that the 'selectively energizing' of the compressor controllers of the asserted claims employs FIFO logic."; "First, each of the four independent claims ... expressly employs the phrase 'a selection means for.' Second, they also all include the recited function of 'provid[ing] a combination of energized unequal capacity compressors that exceed in number the preselected number of compressors in the system ...' Third, there is an absence of definite structure, material, or acts for achieving the specified function because the word 'selection' does not have a definitive structural definition and because there is no other definitive description of that selection means in structural terms within the claim."); *Caterpillar Inc. v. Detroit Diesel Corp., 961 F. Supp. 1249, 41 USPQ2d 1876 (N.D. Ind. 1996), aff'd, 194 F.3d 1336 (Fed. Cir. 1999)* (unpublished); AMP Inc. v. Fujitsu Microelec- tronics *Inc., 853 F. Supp. 808, 820-21, 31 USPQ2d 1705, 1712-13 (M.D. Pa. 1994)* (" 'means plus function' language may be present despite the appearance of structural language so long as the structural language merely defines the function" but "despite the use of the term 'means' and the subsequent description of function, neither [patent claim] contains 'means plus function' language as contemplated by *35 U.S.C. § 112*(6)"; because the claims in question do not contain means-plus-function limitations, person B is not a co-inventor with person A of the subject matter of the claims even though person B contributed to the structure disclosed in the specification; "In the ... patent, the language refers to very specific structures ('bus solder tail means,' 'the electronically conductive element,' and 'solder tails') and then describes their functions. ... [T]o prevent the overbreadth and ambiguity about which the Supreme Court admonished [in *Halliburton Oil Well Cementing Co. v. Walker*], Congress added the limitation of the ... new paragraph ... . In the instant case, the language ... is not indefinite because [, inter alia,] it requires 'bus solder tail means' rather than just any means to accomplish the function of 'mounting the bus to the printed circuit board' and 'securing the housing to the printed circuit board.' "); *Fairchild Semiconductor Corp. v. Nintendo Co. Ltd., 30 USPQ2d 1657, 1660 (W.D. Wash. 1994), aff'd, 39 F.3d 1197 (Fed. Cir. 1994)* (unpublished) (a claim phrase requiring "locking means having a detent for engaging said locking recess of said cartridge means to hold said cartridge means in a received position" is a means-plus function limitation: the patentee correctly argues that "not all limitations that contain the word 'means' necessarily refer to function, citing "*Quantum Corp. v. Mountain Computer,* 5 USP2d 1103 (N.D. Cal. 1987) ('correction signal generator means' not a means element because corrector signal generator is a structure). ... 'Locking means' is unintelligible without referring to a function because the term 'locking' is too broad a referent. In *Quantum Corp.,* in contrast, a 'correction signal generator' refers to a structure that does not require a functional description. While the words of the claims embody some structural description (*e.g.* 'a detent'), a person of ordinary skill in the art would read the language as a means element."; "The inclusion of some descriptive structural terms does not remove the claim from the ambit of § 112(6)."); *Atari Games Corp. v. Nintendo of America Inc., 30 USPQ2d 1401, 1411-12 (N.D. Calif. 1993)* ("Examining the specification, the Court finds that the 'control means' consists of two main elements: (1) Physical components ... [and] (2) A software program 'for controlling reset ... based on the results of the comparison and determination program routines' ... . [T]he 'control means' operates after the authenticating programs, (i.e. the comparison and determination program routines) have *completed* their analysis ... . Only once that decision is reached ... is the control means invoked ... . [W]hile § *112 P 6* may govern issues relating specifically to how the 'control means' operates, it has no bearing on disputes involving the operation of the authenticating programs themselves. The Court

must therefore use traditional claim construction tools ... ."); *Haney v. Timesavers Inc., 29 USPQ2d 1605, 1608 (D. Ore. 1993), further opinions, 29 USPQ2d 1933 (D. Ore. 1993), 31 USPQ2d 1949 (D. Ore. 1994)* (claim phrase "double-derive mechanism" "is primarily a functional claim limitation. It defines the claim in terms of its function--i.e., what it does--not its structure. If interpreted literally, such a functional element would cover every structure capable of performing the claimed function. Because this claim would be overbroad if interpreted in this manner, this means-plus-function element ... is subject to the limitation in *35 U.S.C. § 112,* para. 6."); *Surgical Laser Technologies Inc. v. Laser Industries Ltd., 29 USPQ2d 1533, 1535 n.5, 1535-36 (E.D. Pa. 1993)* (infringement shown whether or not the phrase "probe tip means" is construed as a "means plus function" clause; "The use of the word 'means' does not, by itself, create a means plus function clause."; "The term 'tip means' is followed by a phrase which describes its composition; whereas the term 'securing means' is followed by the phrase that describes its function. Later in the claim the language 'said tip means to be positioned to perform a surgical procedure on or within a patient' appears. Defendants argued that this was the function linked to the term 'tip means'. However, ... the jury could have concluded that this phrase was meant to describe the positioning of the tip rather than its function."); *Waterloo Furniture Components Ltd. v. Haworth Inc., 798 F. Supp. 489, 493, 494, 25 USPQ2d 1138, 1141, 1142 (N.D. Ill. 1992)* (a patent claim required, inter alia, (1) "first means positioned under said primary support and mounted on said carriage means;" and (2) "second means mounted on said auxiliary support and positioned below the underside thereof"; HELD: interpreted in light of the patent's specification, these claim limitations could refer to "bracket-like structures." It rejected the argument that "the word 'means' can never have any interpretation other than calling for a means-plus-function element."; "the use of the word 'means' in a claim does not as a matter of law refer to an element expressed in means-plus-function form."); *Quantum Corp. v. Mountain Computer Inc., 5 USPQ2d 1103, 1108 (N.D. Calif. 1987), aff'd, 818 F.2d 877 (Fed. Cir. 1987)* (unpublished) (phrase "correction signal generator means" in patent claim "is not a 'means plus function element' as considered in *35 U.S.C. § 112*").

Cf. *Nilssen v. Motorola, Inc., 80 F. Supp.2d 921, 931 (N.D. Ill. 2000), modified, 130 F.Supp.2d 976 (N.D.Ill. 2000)* (patent owner "is bound by his assertion before the Patent and Trademark Office ... that [a clause] is a means-plus-function limitation.").

(n769) Footnote 229. See, e.g., *CCS Fitness, Inc. v. Brunswick Corp., 288 F.3d 1359, 1369, 62 USPQ2d 1658 (Fed. Cir. 2002)* ("A claim limitation that actually uses the word 'means' will invoke a rebuttable presumption that § *112 P 6* applies. ... By contrast, a claim term that does not use 'means' will trigger the rebuttable presumption that § *112 P 6* does not apply."); *Watts v. XL Systems, Inc., 232 F.3d 877, 56 USPQ2d 1836 (Fed. Cir. 2000),* discussed *infra*; *Kemco Sales, Inc. v. Control Papers Company, Inc., 208 F.3d 1352, 1361, 54 USPQ2d 1308, 1313 (Fed. Cir. 2000)* ("Use of the term 'means' in a claim limitation creates a presumption that section 112, paragraph 6 has been invoked, but that presumption may be rebutted if the properly construed claim limitation itself recites sufficiently definite structure to perform the claimed function."; "Conversely, absence of the word 'means' creates a presumption that section 112, paragraph 6 has not been invoked, and that presumption may likewise be rebutted if the claim limitation is determined not to recite sufficiently definite structure to perform the claimed function."); *Micro Chemical, Inc. v. Great Plains Chemical Co., 194 F.3d 1250, 1257, 52 USPQ2d 1258, 1263 (Fed. Cir. 1999)* ("This court has established a framework for determining whether the elements of a claim invoke means-plus-function treatment. ... If the word 'means' appears in a claim element in association with a function, this court presumes that § 112, P 6 applies. ... This presumption collapses, however, if the claim itself recites sufficient structure, material, or acts to perform the claimed function. ... Without the term 'means,' a claim element is presumed to fall outside means-plus-function strictures. ... Once again, however, that presumption can collapse when an element lacking the term 'means' nonetheless relies on functional terms rather than structure or material to describe performance of the claimed function."); *Personalized Media Communications, LLC v. Int'l Trade Comm'n, 161 F.3d 696, 48 USPQ2d 1880 (Fed. Cir. 1998),* discussed *infra*.

See also *Trinity Industries, Inc. v. Road Systems, Inc., 121 F. Supp.2d 1028, 1036 (E.D. Tex. 2000)* ("A court must initially determine whether a particular limitation is stated in means plus function form. If a patentee uses the word 'means' in a claim, a presumption arises that he or she used the word to invoke § 112, P 6. ... There are two ways this presumption may be rebutted: 1) if a claim term uses the word 'means' but recites no corresponding function; or 2) if the claim recites a function but also recites sufficient structure or material for performing the claimed function. ... It is also possible that a claim limitation that does not recite the word 'means' may be construed under § 112, P 6, despite a presumption to the contrary."); *Kudlacek v. DBC, Inc., 115 F. Supp.2d 996, 1024 (N.D. Iowa 2000), aff'd, 25 Fed. Appx. 837 (Fed. Cir. 2001)* (nonprecedential) ("The use of certain language gives rise to a presumption that § 112, P 6 is applicable--that is, that a claim element is a means-plus-function element--but that presumption can be rebutted ... ."); *Sunrise Medical MHHG, Inc. v. AirSep Corp., 95 F. Supp.2d 348, 439 n.739 (W.D. Pa. 2000)* ("if the word 'means' is in the claim limitation, there is a presumption that it is a means-plus-function element to which § *112 P 6* applies. ... In

fact, § *112 P 6* can be invoked even without the use of express 'means' language, when the claim element invokes purely functional terms, without the additional recital of specific structure or material for performing that function. ... Although § *112 P 6* is classically invoked when the patent claim recites 'means for,' use of the language 'means to' has also invoked a § *112 P 6* analysis."); *Maytag Corp. v. Whirlpool Corp., 88 F. Supp.2d 894, 897 (N.D. Ill. 2000).*

(n770) Footnote 230. **Compare** *Kemco Sales, Inc. v. Control Papers Company, Inc., 208 F.3d 1352, 54 USPQ2d 1308 (Fed. Cir. 2000)* (phrase, "plastic envelope closing means" uses "means"; the presumption that it is a Section 112/6 element is not rebutted because the claim "fails to recite sufficient structure for closing the envelope") **with** *York Products, Inc. v. Central Tractor Farm & Family Center, 99 F.3d 1568, 40 USPQ2d 1619 (Fed. Cir. 1996)* ("means formed ... ," the presumption that it is a Section 112/6 element is rebutted because phrase recites structure and does not link the structure to a function); *Rodime PLC v. Seagate Tech., Inc., 174 F.3d 1294, 1302, 50 USPQ2d 1429, 1434 (Fed. Cir. 1999), cert. denied, 528 U.S. 1115 (2000)* ("positioning means for moving"; the presumption that it is a Section 112/6 element is rebutted because, although the claim links the means with a function, it recites "sufficient structure to perform the entire claimed function," that is, the moving function).

Cf. *Cole v. Kimberly-Clark Corp., 102 F.3d 524, 41 USPQ2d 1001 (Fed. Cir. 1997), cert. denied, 522 U.S. 812 (1997)* (suggesting that there is no presumption arising from the use of "means" but holding that the claim phrase "perforation means" is not a Section 112/6 element because the claim recites structure for performing the function).

See also *Asyst Technologies, Inc. v. Empak, Inc., 268 F.3d 1364, 1369, 60 USPQ2d 1567 (Fed. Cir. 2001)* ("limitations contain[ed] some reference to structure," but "the parties have not suggested that the structure recited in the limitations is sufficient to remove those limitations from the reach of section 112 paragraph 6"); *Envirco Corp. v. Clestra Cleanroom, Inc., 209 F.3d 1360, 1365, 54 USPQ2d 1449, 1452 (Fed. Cir. 2000)* ("If a claim element contains the word 'means' and recites a function, this court presumes that element is a means-plus-function element under § 112, P 6. *See Al-Site Corp. v. VSI Int'l, Inc., 174 F.3d 1308, 1318, 50 USPQ2d 1161, 1166 (Fed. Cir. 1999).* That presumption falls, however, if the claim itself recites sufficient structure to perform the claimed function."); *Cortland Line Co., Inc. v. Orvis Co., Inc., 203 F.3d 1351, 1357, 53 USPQ2d 1734, 1737 (Fed. Cir. 2000)* ("Because the claim uses the word 'means' without specifying any structure or material for performing the recited connecting function, this element calls for interpretation under *35 U.S.C. § 112,* P 6 (1994).").

For district court decisions, see *Rackman v. Microsoft Corp., 102 F. Supp.2d 113, 119 (E.D. N.Y. 2000)* ("This presumption is especially strong if the phrase 'means for' is used. *See Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 1584 (Fed. Cir. 1996).* This presumption can be rebutted in two ways. '[A]ccording to its express terms, § 112, P 6 governs only claim elements that do not recite sufficient structural limitations. Therefore, the presumption that § 112, P 6 applies is overcome if the claim itself recites sufficient structure or material for performing the claimed function.' *Al-Site, 174 F.3d at 1318* (internal citations omitted). The second way the presumption is rebutted is if the claim uses the word 'means' but does not recite any corresponding function. *See Rodime, 174 F.3d at 1302.*"); *Boler Corp. v. Neway Anchorlok, International, Inc., 92 F. Supp.2d 671, 675 (N.D. Ohio 2000), 92 F. Supp.2d 680 (N.D. Ohio 2000)* ("The use of the word 'means' creates a presumption that *35 U.S.C. § 112,* P 6 applies."); *Nilssen v. Motorola, Inc., 80 F. Supp.2d 921, 930 (N.D. Ill. 2000), modified, 130 F.Supp.2d 976 (N.D.Ill. 2000)* ("OUTPUT MEANS" NOT A "MEANS" CLAUSE; claim required "output means connected with the AC output terminals; the output means having lamp output terminals adapted to connect with a gas discharge lamp."; "because it states no function, [the] claim ... is not in means-plus-function form. Instead the claim language is construed to mean exactly what it says: an output means connected with the AC output terminals and having lamp output terminals adapted to connect with a gas discharge lamp."); *Katz v. AT&T Corp., 63 F. Supp.2d 583, 592 (E.D. Pa. 2000)* ("If a patentee uses the word 'means' in a claim, a presumption arises that he or she used the word to invoke § 112, P 6. ... There are two ways this presumption may be rebutted: (1) if a claim term uses the word 'means' but recites no function which corresponds, or (2) if the claim recites a function but also recites sufficient structure or material for performing the claimed function.").

(n771) Footnote 231. E.g., *Wenger Manufacturing, Inc. v. Coating Machinery Systems, Inc., 239 F.3d 1225, 1322, 57 USPQ2d 1679 (Fed. Cir. 2001)* ("a limitation that uses the word 'means' but does not recite a function that corresponds to the means does not invoke § 112, P 6.").

(n772) Footnote 232. **Compare** *Mas-Hamilton Group v. LaGard, Inc., 156 F.3d 1206, 48 USPQ2d 1010 (Fed. Cir. 1998)* (phrase, "lever moving elements" does not "use" means but is a Section 112/6 element because the claim did not recite any structure for performing the recited lever moving function) **with** *Watts v. XL Systems, Inc., 232 F.3d 877, 881, 56 USPQ2d 1836 (Fed. Cir. 2000)* (phrase, "sealingly connected" does not use "means"; the presumption that it is

not a Section 112/6 element is not rebutted because the claim "recites or refers to terms that are reasonably well understood in the art as names for structure and which perform the recited function of sealing.").

See also *Generation II Orthotics Inc. v. Medical Technology Inc., 263 F.3d 1356, 1368, 59 USPQ2d 1919 (Fed. Cir. 2001)* ("Because [a patent's claims] do not use the words 'means for' with regard to the structural 'joint' limitation, and do not use the words 'step for' with regard to the 'locating' and 'adjusting' steps, there is a presumption that these limitations are not subject to section 112, paragraph 6."); *CCS Fitness, Inc. v. Brunswick Corp., 288 F.3d 1359, 1369, 62 USPQ2d 1658 (Fed. Cir. 2002)* (an accused infringer "can rebut this presumption if it demonstrates that the claim term fails to 'recite sufficiently definite structure' or else recites a 'function without reciting sufficient structure for performing that function.' ";"To help determine whether a claim term recites sufficient structure, we examine whether it has an understood meaning in the art."; "a term need not connote a precise physical structure in order to avoid the ambit of" section 112, paragraph 6.").

For district court decisions, see *C.R. Bard, Inc. v. United States Surgical Corp., 102 F. Supp.2d 199, 212 (D. Del. 2000)* ("If the drafter does not use the word 'means' or 'means for,' there is a presumption that § *112 P 6* does not apply."; "A claim may invoke § *112 P 6* even though it does not recite the words 'means' or 'means for.' Section 112 paragraph 6 governs only claim elements that do not recite sufficient structural limitations. ... When it is apparent that the element invokes purely functional terms, without the additional recital of a specific structure or material for performing that function, the claim element may be a means-plus-function element despite the lack of express means-plus-function language."); *Katz v. AT&T Corp., 63 F. Supp.2d 583, 599 (E.D. Pa. 2000)* ("It is ... possible that a claim limitation that does not recite the word 'means' may be construed under § 112, P 6, despite a presumption to the contrary."; "The critical factor in determining whether a term in a limitation which does not invoke 'means for' language is subject to means-plus-function analysis despite the presumption to the contrary is whether the term brings to mind a set of structures to those of ordinary skill in the art, and not whether the term is written in functional language.").

(n773) Footnote 233. *Laitram Corp. v. Rexnord, Inc., 939 F.2d 1533, 19 USPQ2d 1367 (Fed. Cir. 1991),* discussed at § 18.03(5)(d)(ii).

(n774) Footnote 234. *939 F.2d at 1534-1535, 19 USPQ2d at 1368.*

(n775) Footnote 235. *939 F.2d at 1535 n.3, 19 USPQ2d at 1369 n.3.* (Emphasis added.)

(n776) Footnote 236. *939 F.2d at 1536, 19 USPQ2d at 1370.* (Emphasis added.)

(n777) Footnote 237. *939 F.2d at 1536, 19 USPQ2d at 1370.*

(n778) Footnote 238. *939 F.2d at 1535, 19 USPQ2d at 1369.*

See also *Unidynamics Corp. v. Automatic Products International, Ltd., 157 F.3d 1311, 1319, 48 USPQ2d 1099, 1104-05 (Fed. Cir. 1998)* (in a patent claiming a vending machine with a door, the claim phrase "spring means tending to keep the door closed" is subject to Section 112, paragraph 6; "the recitation of 'spring,' which is structural language, [does not take] the limitation out of the ambit of the construction dictate of § 112, P 6."; "The recitation of the word 'spring' does not vitiate the patentee's choice. *See Laitram Corp. v. Rexnord, Inc.* ... (Fed. Cir. 1991) ('The recitation of some structure in a means-plus-function element does not preclude the applicability of section 112, P 6 [when it] merely serves to further specify the function of the means.'). *But see Data Line Corp. v. Micro Techs., Inc.* ... (Fed. Cir. 1987) (proper means-plus-function format sets forth a means for performing a specific function without reciting any specific structure for performing that function)."); *Maytag Corp. v. Whirlpool Corp., 95 F. Supp.2d 888, 897 (N.D. Ill. 2000)* ("CONTAINER" NOT SUFFICIENT STRUCTURE; a claim element required "means defining a soil container for collecting non-floating particles from the wash liquid to provide a cleansed liquid"; a party argued that a presumption that the element is a means-plus-function element because it uses "means" was rebutted because it recites a "container" and "there is no aspect of the claimed function which is not accomplished by [that structure]."; HELD: "while it is surely true that something like a 'container' must collect those soil particles, that extraordinarily amorphous generic term scarcely defines a structure in the sense required to avoid the application of [Section 112/6]. There is an almost infinite variety of types of containers, some obviously better than others at performing the claimed function."); *Data General Corp. v. International Business Machines Corp., 93 F. Supp.2d 89, 95 (D. Mass. 2000)* ("memory means for storing and providing data items in response to memory commands, each said memory command including an address specifying a location in said memory means" in a claim in a patent concerning a "method performed by a computer to resolve unresolved pointers"; "The Court must determine whether the claim elaborates sufficient structure to perform the recited function, not simply whether the claim contains a term that has a commonly accepted meaning to those of ordinary skill in the art. ... Although the memory of a general purpose computer system is a sufficiently described structure to perform

the function of 'storing and providing data, ' the ... Patent language is not sufficiently descriptive where the data includes logical addresses. It becomes necessary to examine whether physical or logical memory is used when discussing the use of logical addresses. A physical memory system, in the absence of a mechanism to convert logical addresses into physical addresses, could not perform the function stated in [the claim]. Thus, § 112(6) applies ... ."); *Nilssen v. Motorola, Inc., 80 F. Supp.2d 921, 928-29 (N.D. Ill. 2000), modified, 130 F.Supp.2d 976 (N.D.Ill. 2000)* ("SOURCE MEANS" NOT ADEQUATE STRUCTURE; a claim required a " 'source means having AC terminals and being operative to provide an AC voltage thereat' "; the patent owner argues that " 'source' is a structural term denoting a device that is a source of power. Even so, 'source of power' alone is hardly a sufficient structural recitation to remove the claim from the presumed ambit of Paragraph 6."; "*Cole, 102 F.3d at 531* is not to the contrary, because the presumption in that case was overcome by the claim element's 'precise structural character.' There is no way that ... the word 'source' amounts to a detailed recitation of structure that overcomes the claim element's functional language. Indeed, the definition offered by [the patent owner-'[a]ny device that produces electrical energy'-is purely functional and denotes no structure whatever. ... Nor does the claim's added description of the 'source means' as 'having AC terminals' serve to convert the imprecision of the term 'source means' into a term of 'precise structural character.'; CIRCUIT MEANS: a claim required a "circuit means connected between the inverter output terminals and the lamp terminals, thereby to provide lamp operating voltage to the lamp terminals; the circuit means having a pair of auxiliary output terminals at which is provided a cathode heating voltage."; "the issue is whether enough structure is cited to perform that function to overcome the presumption of Paragraph 6 applicability."; "To negate that presumption [the patent owner] points to *CellNet Data Sys., Inc. v. Itron, Inc., 17 F.Supp.2d 1100, 1107 (N.D. Cal. 1998)* and its finding 'that those skilled in the art would understand the term 'circuit means' as a structural rather than a means-plus-function element.' That conclusion rests on the dictionary definition of 'circuit' as connoting the generic structure of 'the combination of a number of electrical devices and conductors that, when connected together to form a conducting path, fulfill a desired function such as amplification, filtering, or oscillation' (*id. at 1111,* quoting *Penguin Dictionary of Electronics* (hereafter '*Penguin*') (2d ed. 1988)). In addition, the court noted that the location of the 'circuit means' was specified in the claim ... . Claim 17 also specifies the location of the circuit means: 'connected between the inverter output terminals and the lamp terminals.'; the accused infringer "seeks to counter with *Relume Corp. v. Dialight Corp., 63 F.Supp.2d 788, 802 (E.D. Mich. 1999),* which decided that the claim language 'adaptive clamp circuit means' was in means-plus-function form. But because the *Relume* plaintiff did not dispute that construction, the court was deprived of an opposing viewpoint that might perhaps have highlighted terms of art in the claim that could communicate sufficient structure to overcome the presumption."; "Nonetheless this Court would be wholly unpersuaded by *CellNet* (and hence by [the patent owner]) if 'circuit means' were the only relevant language in the claim element. Although its own days as a highly trained technician (and in one instance as the author of a modest invention) during the formative--nay, primitive--days of airborne radar have so faded into the dim past as to render any possible claim by this Court to being even moderately 'skilled in the art' a serious Rule 10b-5 violation, it takes no electronic sophistication at all to understand that electrical circuits are virtually infinite in number. It is not that 'circuit' is nongeneric--it is rather that it is so generic that by itself it conveys no sense of structure at all. To say simply that an electrical circuit will be inserted into another circuit to accomplish a stated function is to afford the skilled reader no sense whatever of the structure of that insertion.").

Compare *Rodime PLC v. Seagate Technology, Inc., 174 F.3d 1294, 1304, 50 USPQ2d 1429, 1436 (Fed. Cir. 1999), cert. denied, 528 U.S. 1115 (2000)* ("[T]his case is different from *Laitram*-relied on by the district court-where the claim element merely recited 'some' structure that only 'serve[d] to further specify the function of [the] means.' ... Rather, in the words of *Laitram*, the structure specified in claims 3, 5, and 8 tells what the means 'is structurally.' *Id.*"); *Al-Site Corp. v. VSI International, Inc., 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).*

(n779) Footnote 239. *Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 39 USPQ2d 1783 (Fed. Cir. 1996).* Accord: *CCS Fitness, Inc. v. Brunswick Corp., 288 F.3d 1359, 62 USPQ2d 1658 (Fed. Cir. 2002)* (citing *Greenberg*: "reciprocating members"; "the dictionary definitions of 'member' show that an artisan of ordinary skill would understand this term to have an ordinary meaning and to connote beam-like structures.").

See also *SDS USA, Inc. v. Ken Specialties, Inc., 107 F. Supp.2d 574, 591, 594 (D. N.J. 2000)* ("AT LEAST ONE RETRACTABLE ELONGATE MEMBER" is *not* a Section 112/6 "means" clause; "the elongate member phrase nowhere includes the operative 'means for' language ... . Therefore, the court presumes that Paragraph 6 does not apply. And dictionary definitions, not to mention common sense, point to the word 'member' (descriptive modifier notwithstanding) as a structural term. *See Webster's New International Dictionary* (2d ed. 1956) defining 'member' as, *inter alia*, '... 5. A part of a whole; an independent constituent of a body, structure, or any organized thing, or a unit in a series ... 12. *Engin.* Any essential part of a framed structure.' "; CUTTER: "a cutter for cutting said ribbon stock at a predetermined location" is not a Section 112/6 "means" clause; "The court first notes the Federal Circuit's comment that

the mere coincidence that a device takes its name from its function should not convert a claim into the means-plus-function format. *Greenberg, 91 F.3d at 1583* (listing 'filter,' 'screwdriver,' 'suture applicators' *and 'cutters'*) (emphasis added). The court next turns to the dictionary relied upon by defendant, the International Association of Diecutting and Diemaking 'Glossary of Terms,' which stipulates: 'CUTTER--A term used to describe a bench tool used to cut steel rule stock in the manufacture of steel rule dies.' ... This definition, evidently familiar to those skilled in the diemaking and diecutting art, supports the legal presumption that the cutter, with no reference to 'means,' should not be analyzed under Paragraph 6. Like the elongate member, it is structure."); *Magnivision, Inc. v. Bonneau Co., 33 F. Supp.2d 1218, 1237 (C.D. Calif. 1998), aff'd in part, rev'd in part, 250 F.3d 758 (Fed. Cir. 2000)* (unpublished) ("rod receiving area" is *not* a means clause because it recited a definite structure; "cantilever support engaging said eyeglass contacting member in a manner ... so that" *is* a means clause; "Courts have construed functional language introduced by 'so that' to implicate *35 U.S.C. § 112,* P 6."); *Hay & Forage Industries v. New Holland North America, Inc., 25 F. Supp.2d 1170, 1175-76 (D. Kan. 1998)* (" 'steering structure' is not a means clause"; "The clause 'steering structure connected between the junction box and the tongue for causing the junction box to swing responsively when the latter is pivoted about said first axis ...' clearly has some structural language and some functional language."; "The steering structure clause at issue here discloses structure sufficient to avoid the means-plus-function limitation. 'Steering structure,' as used in claim 1, is used in the same manner as the other structural components of claim 1. Thus, the claim would give one skilled in the art no reason to believe that a 'steering structure' is any less a 'definite structure,' ... than a 'mobile frame,' 'pull tongue,' 'harvesting header,' 'mechanical drive line,' 'junction box,' 'input shaft,' or 'output shaft.' Moreover, the language following 'steering structure,' when read in conjunction with the rest of the claim 1 language, provides further detail sufficient to enable one skilled in the art to understand the meaning of the term. The steering structure disclosed in claim 1 is not just an abstract means for performing a specified function, it is a specific device 'connected between the junction box and the tongue.' ... The plaintiffs have provided the court with an extensive list of patents using the term 'steering structure' as a noun (not a means for accomplishing a function) in the mechanical arts. ... This list further convinces the court that an artisan of ordinary skill would understand the disputed term to have structure sufficient to avoid application of section 112(6).").

(n780) Footnote 240. Dr. Greenberg's patent involved surgical instruments used in procedures in which the surgeon makes a small incision in a patient's body, inserts an instrument into the body, and manipulates handles at the instrument's proximal end to cause a tool at the instrument's distal end to perform surgical functions. A problem with prior art instruments was that the surgeon was required to rotate the entire instrument to rotate the tool. To solve this problem, one prior art instrument used a wheel to rotate the instrument's shaft. A disadvantage of this instrument was that the wheel could rotate freely and required the surgeon to hold the wheel in a desired position. Greenberg's patent disclosed a "detent mechanism" for inhibiting the wheel's free rotation and "holding it in one of a number of predetermined positions until some force is applied to turn the wheel." The specification described a detent mechanism that consisted of "a spring-loaded ball built into one of the handles of the instrument." As the wheel rotates, the ball seats sequentially in recesses in the wheel's face.

The patent's claim required:

" 'A surgical instrument comprising a pair of axially matable and relatively slidable shafts each having at their distal ends cooperating working tools, a sleeve mounted adjacent the proximal end of said shafts, one of said shafts being fixedly attached to said sleeve for conjoint movement therewith, the other of said sbafts extending freely through said sleeve and being exposed at its proximal end, a pair of handle members pivotally attached to each other and arranged scissor-like for manipulation by one hand, one of said handles being attached to said sleeve for conjoint axial movement and relative free rotary movement therewith, said sleeve and said one handle being arranged so that said sleeve is manipulatable by a finger of the same hand simultaneous with the manipulation of said handle, a radially enlarged wheel on said sleeve and *said wheel and said one handle having a cooperating detent mechanism defining the conjoint rotation of said shafts in predetermined intervals*, said other handle being universally attached to the exposed proximal end of said freely extending shaft, said shafts being caused to reciprocate relative to each other on manipulation of said handle members and to rotate about their common axis by manipulation of said sleeve, *whereby said tools may be operated and moved into selected rotary positions relative to the axis of said shafts.*' " *91 F.3d at 1581-82, 39 USPQ2d at 1784* (emphasis added).

The patentee Greenberg sued Ethicon, alleging infringement. The district court granted Ethicon's motion for summary judgment of noninfringement. It reasoned that the claim element in which "detent mechanism" appeared "set forth a means for performing a specified function and thus was subject to the provisions of *35 U.S.C. § 112,* paragraph six (hereafter, section 112(6))." The district court determined that each accused device performed the specified function-

-"defining the conjoint rotation of [the] shafts in predetermined intervals." The accused devices fell into three categories. The first used a spring-loaded ball that set into grooves, the second had cooperating teeth, and the third had a plastic tab. The district court held that the patentee's evidence did not adequately show that the accused devices were structurally equivalent to the detent mechanism disclosed in the specification. The only evidence submitted, an expert affidavit, was "extremely conclusory."

The district court gave two principal reasons why the claim language is "equivalent to the more conventional 'means plus function' formulation and should be accorded the same legal effect." "First, the court concluded that 'detent mechanism' in itself invoked section 112(6), because the term did not describe a particular structure but described any structure that performed a detent function."

"The court noted that both the dictionary definition of the word 'detent' (*i.e.*, 'a device for positioning and holding one mechanical part in relation to another') and the definition of 'detent mechanism' provided by [the patentee's] expert (*i.e.*, '[a]ny device for positioning and holding one mechanical part in relation to another so that the device can be released by force applied to one of the parts') were expressed in functional terms." *91 F.3d at 1583, 39 USPQ2d at 1785.*

Second, it "reasoned that although [the] patent claim employed the term 'detent mechanism,' the summary of the invention twice used 'detent means' when referring to the detent that defined the rotation of the shafts at predetermined intervals, and that the two terms should therefore be viewed as synonymous, at least as used in the ... patent."

(n781) Footnote 241. *91 F.3d at 1583, 39 USPQ2d at 1784.*

"Many devices take their names from the functions they perform. The examples are innumerable, such as 'filter,' 'brake,' 'clamp,' 'screwdriver,' or 'lock.' Indeed, several of the devices at issue in this case have names that describe their functions, such as 'graspers,' 'cutters,' and 'suture applicators.'

" 'Detent' (or its equivalent, 'detent mechanism') is just such a term. Dictionary definitions make clear that the noun 'detent' denotes a type of device with a generally understood meaning in the mechanical arts, even though the definitions are expressed in functional terms. *See Random House Unabridged Dictionary* 541 (2d ed. 1993) ('a mechanism that temporarily keeps one part in a certain position relative to that of another, and can be released by applying force to one of the parts'); *Webster's Third New International Dictionary* 616 (1968) ('a part of a mechanism (as a catch, pawl, dog, or click) that locks or unlocks a movement'); G.H.F. Nayler, *Dictionary of Mechanical Engineering* (4th ed. 1996) ('A catch or checking device, the removal of which allows machinery to work such as the detent which regulates the striking of a clock.'). It is true that the term 'detent' does not call to mind a single well-defined structure, but the same could be said of other commonplace structural terms such as 'clamp' or 'container.' What is important is not simply that a 'detent' or 'detent mechanism' is defined in terms of what it does, but that the term, as the name for structure, has a reasonably well understood meaning in the art." *91 F.3d at 1583, 39 USPQ2d at 1786.*

Second, "the term 'detent mechanism' in the ... patent should [not] be treated as synonymous with the term 'detent means' simply because the patent uses the term 'detent means' in place of 'detent mechanism' on two occasions in the 'summary of the invention' portion of the specification."

"The drafter of the application that matured into the ... patent appears to have been enamored of the word 'means,' as the word is used repeatedly in the summary of the invention. A close reading of the specification reveals, however, that the term is used in that portion of the patent simply as a shorthand way of referring to each of the key structural elements of the invention. Each of those elements is subsequently described in detail, without the use of the term 'means,' in the 'description of the invention' portion of the specification, and each is subsequently claimed, again without the use of the term 'means,' in [the patent's] claim. ..." *91 F.3d 1583-94, 39 USPQ2d 1786.*

(n782) Footnote 242. *91 F.3d at 1583-84, 39 USPQ2d at 1786.*

See also *Katz v. AT&T Corp., 63 F. Supp.2d 583, 592 (E.D. Pa. 2000)* ("Even if a mechanism is defined in functional terms, such as a 'filter,' 'brake', 'clamp,' or 'detent mechanism,' or if it does not call to mind a single well-defined structure, it may not be subject to means-plus- function analysis. ... In addition, a structural term need not connote a precise physical structure to those of ordinary skill in the art to avoid a means-plus-function analysis, as long as it conveys a variety of structures that are referred to by that term.").

(n783) Footnote 243. *Cole v. Kimberly-Clark Corp., 102 F.3d 524, 531, 41 USPQ2d 1001, 1006 (Fed. Cir. 1996), cert. denied, 522 U.S. 812 (1997),* discussed *infra*, § 18.05[2][d][ii]; *York Products, Inc. v. Central Tractor Farm & Family Center, 99 F.3d 1568, 40 USPQ2d 1619 (Fed. Cir. 1996),* discussed *infra.*

See also *Hester Industries, Inc. v. Stein, Inc, 142 F.3d 1472, 46 USPQ2d 1641 (Fed. Cir. 1998), cert. denied, 525 U.S. 947 (1998)* ("Use of the word 'means' in a claim clause triggers a presumption that § *112 P 6* applies. *See York Prods., Inc. v. Central Tractor Farm & Family Ctr...* . (Fed. Cir. 1996). The presumption can be overcome if the clause recites sufficient structure... . The clause at issue here recites no structure for performing the function of passing the conveyor belt through the housing. Accordingly, § *112 P 6* unquestionably applies."); *Contempo Tobacco Products Inc. v. McKinnie, 45 USPQ2d 1969, 1974 (C.D. Ill. 1997)* ("Simply because a named element of a patent claim is followed by the word 'means' does not automatically make that element a means-plus-function element under *35 U.S.C. Section 112,* P 6. ... While the use of the word 'means' triggers a presumption that the patentee intended to invoke the statutory mandates for means-plus-function clauses, the existence of express structural (as opposed to functional) limits on such a means will rebut this presumption. ... The Court must decide on an element-by-element basis, based upon the patent and its prosecution history, whether section 112, paragraph 6 applies.").

(n784) Footnote 244. *York Products, Inc. v. Central Tractor Farm & Family Center, 99 F.3d 1568, 40 USPQ2d 1619 (Fed. Cir. 1996).*

See also *IMS Technology Inc. v. Haas Automation Inc., 206 F.3d 1422, 1430, 54 USPQ2d 1129, 1134 (Fed. Cir. 2000), cert. dismissed, 530 U.S. 1299 (2000)* (citing *York Prods.*; "That the term 'means' is used in a limitation does not necessarily mean that the limitation is properly a § 112, P 6 limitation."); *Ethicon, Inc. v. United States Surgical Corp., 135 F.3d 1456, 1463, 45 USPQ2d 1545, 1550 (Fed. Cir. 1998), cert. denied, 525 U.S. 923 (1998)* ("The use of the word 'means' gives rise to 'a presumption that the inventor used the term advisedly to invoke the statutory mandates for means-plus-function clauses.' *York Prods., Inc. v. Central Tractor Farm & Family Ctr.* ... (Fed. Cir. 1996). Although the presumption is not conclusive, *see, e.g., id.* (construing 'means' in claim without reference to section 112, paragraph 6), the means language here invokes the interpretation regimens of section 112, paragraph 6."); *Fonar Corp. v. General Electric Co., 107 F.3d 1543, 41 USPQ2d 1801 (Fed. Cir. 1997), cert. denied, 522 U.S. 908 (1997),* discussed at *§ 18.07[7]* ("An apparatus claim requires definite structure in the specification to support the function in a means clause. Because claim 12 does not recite such structure in support of the defined function, it is therefore subject to section 112, P 6. *See Cole v. Kimberly-Clark Corp.* ... (Fed. Cir. 1996); *see also Greenberg v. Ethicon Endo-Surgery, Inc.* ... (Fed. Cir. 1996) (stating that 'the use of the term "means" has come to be so closely associated with "means-plus-function" claiming that it is fair to say that the use of the term "means" (particularly as used in the phrase "means for") generally invokes section 112(6) and that the use of a different formulation generally does not.').").

(n785) Footnote 245. *99 F.3d at 1574, 40 USPQ2d at 1623.*

In *York Products*, the patent concerned protective liners for truck cargo bodies. Its claim 32 recited:

"A protective liner for a cargo bed of a vehicle, said protective liner allowing a structure positioned in the trunk cargo bed to be supported and affixed in position in the vehicle cargo bed, including: a liner floor portion having elevated portions formed thereupon to conform to wheel wells protruding from the cargo bed floor; upwardly extending liner sidewall portions extending upwardly from opposite sides of the liner floor portion an upwardly extending liner frontwall portion extending upwardly from a front end of the liner floor portion; and *means formed on the upwardly extending liner sidewall portions including a plurality of spaced apart, vertically extending ridge members protruding from the liner sidewall portions and forming load locks in gaps separating adjacent ones of the ridge members, said load locks having a depth sufficient to anchor a structure positioned and supported in the cargo bed.*" (Emphasis added).

The illustrative embodiments in the patent's specification showed protective ridges in the sidewalls, which extended the entire height of the liner's side walls, and which served to lock a load in the truck in place. In at least some of the accused devices, the protective ridges did not extend up the entire height of the sidewalls.

The court construed the claim "without reference to section 112, P 6."

"While the last paragraph of claim 32 begins with the word 'means,' what follows is a detailed recitation of structure. The clause begins with a description of 'means formed on the ... sidewall portions including ... ridge members.' This language describes generally, indeed expressly includes, ridge members that serve as anchors for load locks. The clause then refers to 'forming load locks,' followed by still more structural language about gaps between

ridge members and the depth of the load locks ('load locks having a depth sufficient to anchor a structure positioned and supported in the cargo bed').

"The claim language, however, does not link the term 'means' to a function. In language again suggestive of structure, the claim notes that the 'means' 'protrud[e] from the liner sidewall portions and form[] load locks.' This language vaguely hints at the function of anchoring a load in the cargo bed. Nowhere does the claim language following 'means' state that function. Instead, the claim recites structure. Without an identified function, the term 'means' in this claim cannot invoke *35 U.S.C. § 112,* P 6. Without a 'means' sufficiently connected to a recited function, the presumption in use of the word 'means' does not operate. In any case, the express structural limits of the claim language limit its scope." *99 F.3d at 1573-74, 40 USPQ2d at 1623-24.*

(n786) Footnote 246. *Cole v. Kimberly-Clark Corp., 102 F.3d 524, 531, 41 USPQ2d 1001, 1006 (Fed. Cir. 1996), cert. denied, 522 U.S. 812 (1997),* discussed at *§ 18.05[2][d][ii].*

Accord: *Envirco Corp. v. Clestra Cleanroom, Inc., 209 F.3d 1360, 1365, 54 USPQ2d 1449, 1452-53 (Fed. Cir. 2000)* ("second baffle means" is *not* a Section 112/6 means; "The recital of structure in this claim for the second baffle is similar to the claim element in *Cole* ... In that case, this court held that the term 'perforation means ... for tearing' was not a means-plus-function clause, because the claim sufficiently described a structure (i.e., the perforation itself) to perform the function of tearing. Relying on the dictionary definition for the word 'perforation,' the court construed the term, 'perforation means ... for tearing' to mean 'perforations.' ... Likewise, in this case the claims recite sufficient structure (i.e. a baffle disposed radially outward from the centrifugal fan, with inner surfaces for directing airflow). Therefore the second baffle limitation is not a means-plus-function claim element. Because the claims recite sufficient structure, including details about the location and formational details about the second baffle, this court holds that the district court erred in construing the 'second baffle means' as a means-plus-function claim element under § 112, P 6.").

See also *Rodime PLC v. Seagate Technology, Inc., 174 F.3d 1294, 50 USPQ2d 1429 (Fed. Cir. 1999), cert. denied, 528 U.S. 1115 (2000); Pannu v. Iolab Corp., 155 F.3d 1344, 47 USPQ2d 1657 (Fed. Cir. 1998)* (district court found that "snag-resistant means" recited sufficient structure so as to make the phrase not subject to Section 112, paragraph 6); *Relume Corp. v. Dialight Corp., 63 F. Supp.2d 788, 799 (E.D. Mich. 1999), aff'd, 4 Fed. Appx. 893 (Fed. Cir. 2001)* (nonprecedential) (in claims in patents concerning light emitting diode ("LED") traffic signals, U.S. Pat. No. 5,661,645; U.S. Pat. No. 5,783,909, the claim phrase "power factor correction converter means," which generates regulated voltage, is *not* a Section 112/6 means clause because "a person of ordinary skill in the art of LED array power supplies would understand claim 1's 'power factor correction converter means' to require the structure of a switching power supply."; "Close scrutiny of the term 'power factor correction converter means' reveals that it implicitly elaborates sufficient structure to a person of ordinary skill in the art of power supplies. The structural device claimed is a 'converter means,' and its functions are 'power factor correction' and 'being responsive to said rectified d.c. power ... for generating regulated voltage d.c. power.' "; "Identification of the 'power factor correction' function is less obvious than the voltage regulation function because the qualifier 'power factor correction' is not phrased in the 'means ... for' format that usually specifies a function in claim language. The 'means ... for' formality, however, need not be present ... to interpret 'power factor correction' as an additional functional constraint on the 'converter means.' "; "Although perhaps unremarkable to the layperson, the word 'converter' is a structurally meaningful term-of-art to those of ordinary skill in the art of power supply electronics. According to Marty Brown's Power Supply Cookbook (1994), it connotes the generic structure of a switching power supply: that is, a switch and its controller circuit."; "The Power Supply Cookbook is an authoritative instructional design text for engineers in the field of power supply electronics. The background section of [one of the patents in suit] patent cites it as relevant prior art. Thus I consider it to be evidence intrinsic to the ... patent and properly considered in my *Markman* construction of the claim term 'converter.' "; "The Power Supply Cookbook also makes it clear that power factor correction and voltage regulation are typical functions for a switching power supply to perform. ... Thus claim 1's association of 'converter means' with its specified functions of power factor correction and voltage regulation would reinforce the structural connotations of 'converter' to one of ordinary skill in this art."); CellNet Data Systems, Inc. v. Itron, Inc., 17 F. Supp.2d 1100, 1107-08 (N.D. Calif. 1998) ("circuit means for recording energy use" in a patent claim to a device for use with utility meters is *not* a means clause; "the Court finds that those skilled in the art would understand the term 'circuit means' as a structural rather than a means-plus- function element. ... [T]he absence of a corresponding disclosure of the necessary circuitry in the ... patent specification indicates that 'circuit means' is not a means-plus-function element. [The accused infringer] contends that the structural details of [the patentee's] 'circuit means' can be imported from [a copending] patent. ... However, [the accused infringer] has not cited any authority, and the Court has not found any, for the proposition that the structural limitations for a means-plus-function claim element can be imported from a pending patent application. Indeed, the relevant case law disapproves of the importation of

substantive claim limitations by reference to other documents."; "Finally, the prosecution history can be helpful in the determination of whether the patentees intended to assert a means-plus-function claim. ... The prosecution history of the ... patent does not contain any evidence that suggests the patentees intended to assert a means-plus-function limitation in claim 1."); *MediaCom Corp. v. Rates Technology, Inc., 4 F. Supp.2d 17, 26-27 (D. Mass. 1998)* ("The Federal Circuit has made it clear that the use of the words 'means for _ing' in a claim element does not blindly trigger application of *35 U.S.C. § 112,* P 6. ... The means-plus-function analysis applies only where the claim merely recites a function without a definite structure, material, or act. If a claim uses the word 'means for _ing', but also recites a structure, material, or act, with sufficient clarity that it satisfies the particularity and distinctness requirements of *35 U.S.C. § 112,* P 2 ... the means-plus- function analysis is unnecessary."; claim phrase "switch means operatively connected to said first jack means for disconnecting said first telephone from said network" is *not* a Section 112, paragraph 6, means clause; "Not only is the structure named, but it is described as connected to an adjacent structure ... ."); *Louis Berkman Co. v. Davit Master Corp., 46 USPQ2d 1380, 1381 (M.D. Fla. 1998)* ("If an element recites a definite structure (as opposed to function) it does not come under the means-plus-function statute.").

Compare *Unidynamics Corp. v. Automatic Products International, Ltd., 157 F.3d 1311, 1319, 48 USPQ2d 1099, 1104 (Fed. Cir. 1998)* (in a patent claiming a vending machine with a door, the claim phrase "spring means tending to keep the door closed" is subject to Section 112, paragraph 6; the claim is, therefore, limited to the specification-disclosed structure, a spring, and does not cover the accused machines, which use a padded bracket or a magnet; "the recitation of 'spring,' which is structural language, [does not take] the limitation out of the ambit of the construction dictate of § 112, P 6."; "The use of the term 'means' generally (but not always) shows that the patent applicant has chosen the option of means-plus-function format invoking § 112, P 6 construction. *See Greenberg v. Ethicon Endo-Surgery, Inc.* ... (Fed. Cir. 1996)."; "The written description also supports this choice by stating that '[t]he spring 46 is an example of spring means tending to keep the door closed.' ").

In *Unidynamics Corp.,* the Federal Circuit distinguished *Cole.*

"In *Cole,* we interpreted the following claim phrase involving easily removable training pants for toilet training of toddlers: 'perforation means extending from the leg band means to the waist band means through the outer impermeable layer means for tearing the outer impermeable layer means for removing the training brief in case of an accident by the user.' We held that the perforation means did not meet the requirement of § 112, P 6 because it not only described definite structure, perforations, that supported the described function, tearing, but also described the location and extent of the structure. *Cole.* ...

"Here, spring is the only recitation of structure with the remainder pertaining solely to the function of the means limitation."

157 F.3d at 1319, 48 USPQ2d at 1105.

Later, the Federal Circuit distinguished *Unidynamics* , holding that the phrase "compressed spring means" in a patent claiming a shaft in a steam turbine shaft seal was *not* a means-plus-function element.

"In *Unidynamics,* we concluded that the claim language 'spring means tending to keep the door closed' was in means-plus-function form and therefore governed by section 112, paragraph 6. The specification in *Unidynamics* stated that a 'spring' was only one example of a 'spring means,' which indicated that the claim term 'spring means' was broader than the meaning of the term 'spring' generally recognized in the mechanical arts. Thus, we concluded that the patentee in *Unidynamics* defined spring means functionally as anything that performs a springing or biasing function. In this case, by contrast, the claim recites a particular kind of spring--a 'compressed spring'--and the specification makes clear that the claim term 'compressed spring means' was used to denote structure, not function. The preferred embodiment uses S-shaped compressed springs. The specification adds that other types of springs can be employed, but there is no suggestion that the claim was meant to include biasing mechanisms other than springs. Accordingly, we conclude that the patentee in this case has defined 'compressed spring' to refer to a particular type of device."

TurboCare Division of Demag Delaval Turbomachinery Corp. v. General Electric Co., 264 F.3d 1111, 1121, 60 USPQ2d 1017 (Fed. Cir. 2001), on remand, 214 F.Supp.2d 170 (D. Mass. 2002).

(n787) Footnote 247. *102 F.3d at 531, 41 USPQ2d at 1006.*

In *Cole,* the patent concerned disposable, close-fitting, legless underpants used for toilet training. The claimed brief combined (1) "three separate absorbent layers of varying thickness" and (2) "sides that can be easily torn open so that a soiled brief can be removed without pulling it over the legs." *102 F.3d at 526, 41 USPQ2d at 1002.* Claim 1 required

leg band means, waist band means, several layer means, side means, and "*perforation means* extending from the leg band means to the waist band means through the outer impermeable layer means for tearing the outer impermeable layer means for removing the training brief in case of an accident by the user." *102 F.3d at 530, 41 USPQ2d at 1002* (emphasis added.)

The district court construed "perforation means ... for tearing" to mean "a perforation" and granted summary judgment against infringement because the accused products used bonded seams capable of tearing rather than perforations.

Affirming, the Federal Circuit noted that the claim drafter "was clearly enamored of the word 'means': six of seven elements in that claim include the word 'means,' which occurs in the claim fourteen times," but it found "no reason to construe any of the claim language in claim 1 as reciting means-plus-function elements within the meaning of § 112, P 6." *102 F.3d at 531, 41 USPQ2d at 1006.*

"[T]he 'perforation means ... for tearing' element of [the patentee's] claim fails to satisfy the statute because it describes the structure supporting the tearing function (i.e., perforations). The claim describes not only the structure that supports the tearing function, but also its location (extending from the leg band to the waist band) and extent (extending through the outer impermeable layer). An element with such a detailed recitation of its structure, as opposed to its function, cannot meet the requirements of the statute. Here, the claim drafter's perfunctory addition of the word 'means' did nothing to diminish the precise structural character of this element. It definitely did not somehow magically transform this element into a § 112, P 6, 'means-plus-function' element." *102 F.3d at 531, 41 USPQ2d at 1006.*

(n788) Footnote 248. Judge Rader noted:

"Under the statutory regime of *35 U.S.C. § 112,* P 6, a means-plus-function format has significant implications. Because the 'perforation means ... for tearing' claim also recites some structure, this court avoided addressing those implications. The recitation of some structure, however, does not remove a claim from the scope of section 112, P 6. *Laitram Corp. v. Rexnord, Inc.* ... (Fed. Cir. 1991). Mere invocation of the word 'means' also does not magically conjure all the implications of means-plus-function claiming, but *Laitram* suggests that the use of 'means' creates at least a presumption in favor of section 112, P 6. *See id.*; *see also York Prods. Inc. v. Central Tractor Farm & Family Ctr.* ... (Fed. Cir. 1996) ('[T]he use of the word "means" triggers a presumption that the inventor used the term advisedly to invoke the statutory mandates for means-plus-function clauses.') (*citing Greenberg v. Ethicon Endo-Surgery, Inc.* ... (Fed. Cir. 1996)). Some claim language describing the location of the structure should not be sufficient to over-come this presumption. Nor does the word 'perforation' provide enough structure to negate the import of the very next word--'means.' I would honor the presumption and construe this claim under the statutory guidance of section 112."

102 F.3d at 533, 41 USPQ2d at 1008.

(n789) Footnote 249. See, e.g., *Watts v. XL Systems, Inc., 232 F.3d 877, 56 USPQ2d 1836 (Fed. Cir. 2000),* discussed *infra*; *Envirco Corp. v. Clestra Cleanroom, Inc., 209 F.3d 1360, 54 USPQ2d 1449 (Fed. Cir. 2000); Kemco Sales, Inc. v. Control Papers Company, Inc., 208 F.3d 1352, 54 USPQ2d 1308 (Fed. Cir. 2000); Personalized Media Communications, LLC v. Int'l Trade Comm'n, 161 F.3d 696, 48 USPQ2d 1880 (Fed. Cir. 1998),* discussed *infra.*

In *Watts*, the court reiterated a discussion in *Personalized Media Communications*, which, in turn, built on a "line of cases," including *Laitram Corp. v. Rexnord, Inc., 939 F.2d 1533, 19 USPQ2d 1367 (Fed. Cir. 1991); Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 39 USPQ2d 1783 (Fed. Cir. 1996); Cole v. Kimberly-Clark Corp., 102 F.3d 524, 41 USPQ2d 1001 (Fed. Cir. 1997), cert. denied, 522 U.S. 812 (1997); Mas-Hamilton Group v. LaGard, Inc., 156 F.3d 1206, 48 USPQ2d 1010 (Fed. Cir. 1998);* and *Unidynamics Corp. v. Automatic Prods. Int'l, Ltd., 157 F.3d 1311, 48 USPQ2d 1099 (Fed. Cir. 1998).*

"In *Personalized Media Communications, LLC v. Int'l Trade Comm'n, 161 F.3d 696, 48 USPQ2d 1880 (Fed. Cir. 1998),* building upon a line of cases interpreting *35 U.S.C. § 112,* paragraph 6, ... we stated that the failure to use the word 'means' in a claim element created a rebuttable presumption that *35 U.S.C. § 112,* paragraph 6 did not apply. ... We also reiterated that in determining whether a presumption is rebutted, 'the focus remains on whether the claim ... recites sufficiently definite structure.' ... We noted, however, that the claim limitation need not 'connote a precise physical structure.' ... The following year, we further clarified that the presumption that § 112, paragraph 6 did not apply could be rebutted by showing that the claim element recited a function without reciting sufficient structure for performing that function. *See Rodime PLC v. Seagate Tech., Inc., 174 F.3d 1294, 1302, 50 USPQ2d 1429, 1434 (Fed. Cir. 1999), cert. denied, 528 U.S. 1115 (2000)* (explaining the converse rules for rebutting a presumption that § 112, paragraph 6 does apply). ... As an aid in determining whether sufficient structure is in fact recited by a term used in a

claim limitation, this court has inquired into whether the 'term, as the name for structure, has a reasonably well understood meaning in the art.' *Greenberg, 91 F.3d at 1583, 39 USPQ2d at 1786* (applying this test to the term 'detent mechanism')."

232 F.3d at 880, 56 USPQ2d at 1838.

(n790) Footnote 250. *Sage Products, Inc. v. Devon Industries, Inc., 126 F.3d 1420, 44 USPQ2d 1103 (Fed. Cir. 1997),* discussed at § 18.07(7).

(n791) Footnote 251. *126 F.3d at 1427-1428, 44 USPQ2d at 1109-1110.*

See also *Maytag Corp. v. Whirlpool Corp., 88 F. Supp.2d 894, 898 n.8 (N.D. Ill. 2000)* ("Although *Sage Products* addressed a claim element that included the word 'means,' the opinion's reference to what structure is needed to perform the recited function 'entirely' is equally applicable to a claim element that does not employ the word 'means' but is potentially in means-plus-function format despite the word's omission. Suppose for example that a claim element specifies three functions, while the only structure referred to there provides support for just two of the three functions. In that situation *Section 112 P 6* governs the claim element, irrespective of whether the word 'means' does or does not appear in that element.").

(n792) Footnote 252. *Mas-Hamilton Group v. LaGard, Inc., 156 F.3d 1206, 48 USPQ2d 1010 (Fed. Cir. 1998).*

See also *Signtech USA, Ltd. v. Vutek, Inc., 174 F.3d 1352, 50 USPQ2d 1372 (Fed. Cir. 1999); Nilssen v. Motorola, Inc., 80 F. Supp.2d 921, 933-34 (N.D. Ill. 2000), modified, 130 F.Supp.2d 976 (N.D.Ill. 2000)* (ADJUSTMENT INPUT IS A "MEANS" CLAUSE; inverter circuit has "an adjustment input operable, in response to receiving an adjustment action, to adjust the magnitude of the lamp current by way of adjusting the frequency of the alternating lamp voltage"; "the only possible candidate for a 'structure' referred to in the claim element is 'input.' And although [the patent owner] is correct in stating that 'input' is a common term--'widely known in the art of electronics' ...--that does not at all suffice. *Greenberg, 91 F.3d at 1583,* reconfirmed by *Mas-Hamilton, 156 F.3d at 1213-14,* requires that the term under scrutiny must be widely known 'as the name for a structure.' It can scarcely be gainsaid that 'input' is essentially as broadly generic in those terms as the term 'circuit'--neither of those terms qualifies as a 'definite structure' that satisfies the standard prescribed by the caselaw."; POWER CONDITIONING CIRCUIT IS A "MEANS" CLAUSE: a claim required " 'a power conditioning circuit having (i) power input terminals connected with the AC terminals, and (ii) power output terminals connectable with the lamp terminals; the power conditioning being functional, as long as the lamp terminals are indeed connected with the power output terminals, to properly power the gas discharge lamp; the power conditioning circuit being further characterized by: (a) including a transistor having a pair of transistor output terminals across which exists a transistor output voltage whose magnitude varies in accordance with a periodic waveform ... (b) having a pair of DC terminals between which exists a DC voltage whose absolute magnitude is substantially constant and distinctly higher than the peak absolute magnitude of the AC power line voltage.' "; "the claim element's subparagraph (a) describes the inverter and its subparagraph (b) describes the rectifier, both of which are included in the circuit," but "those elements (well known as they are to persons skilled in the art) do not form the totality of the power conditioning circuit--as the claim element itself states, that circuit includes those elements but is not said to comprise only those elements. ... That being the case, it appears that the disclosed structural elements--the inverter and rectifier alone--do not suffice 'to perform entirely the recited function' (*Sage Prods., 126 F.3d at 1428).* And to repeat, as counseled in such cases as *Cole, 102 F.3d at 531,* 'merely because an element does not include the word "means" does not automatically prevent that element from being construed as a means-plus-function element.')"); Katz v. AT&T Corp., 63 F. Supp.2d 583, 608 (E.D. Pa. 2000) ("RECORDING TESTING STRUCTURE" AND "ANALYSIS STRUCTURE FOR PROCESSING" ARE MEANS CLAUSES; "The Court concludes that 'record testing structure' implicates § 112, P 6 because 'record testing' is clearly a functional term and it does not connote any structure for performing the function of receiving and testing said caller data signals including said calling number identification data and said caller personal identification data against previously stored calling number identification and caller personal identification data."; "The term analysis structure is written in functional language and does not connote sufficient structure to avoid the application of § 112, P 6, despite the presumption to the contrary."; "The term 'processing,' even as part of the phrase 'means for processing,' is not subject to means-plus-function analysis, so an immediate resort to the specification for meaning is not appropriate unless there is some 'hook' in the claim language on which limitations from the specification may be hung."); *ADC Telecommunications, Inc. v. Alcoa Fujikura Ltd., 13 F. Supp.2d 951, 958, 49 USPQ2d 1988, 1994 (D. Minn. 1998)* ("HOLDING STRUCTURE FOR HOLDING" is a means clause; "the use of the word 'means' is not required in order to invoke section 112(6)."; "the clause does not recite an identified structure.

Rather, the clause states a function; holding. Thus, the court must look to the specification to find the corresponding structure that performs the holding function. The court determines that the claim language invokes section 112(6).").

Compare *Personalized Media Communications, LLC v. U.S. Int'l Trade Comm'n, 161 F.3d 696, 48 USPQ2d 1880 (Fed. Cir. 1998); TM Patents L.P. v. International Business Machines Corp., 72 F. Supp.2d 370, 391, 392, 395, 53 USPQ2d 1093, 1109, 1110, 1111-12, supplemental opinion 77 F. Supp.2d 480 (S.D. N.Y. 1999)* (ADAPTER; MESSAGE TRANSFER CIRCUIT; SWITCH; one claim phrase recited: "an adapter connected to [A, B, and C] for, in response to [D], (i) generating [x] ... (ii) dividing [y] ... , and (iii) transmitting [z]"; HELD: the phrase is *not* a Section 112/6 "means" clause; an accused infringer "argues that limitation qualifies as a means-plus-function claim because it discloses nothing more than the function performed (an adapter that does x, y and z) rather than disclosing any structure. [The patent owner] supported by a greater number of cases, urges me to find that this limitation discloses enough structure, in addition to the functions performed, to keep the claim within the presumption."; "A claim qualifies for Section 112, para. 6 treatment when it covers any and all means for achieving a desired result. ... Thus, the 'lever moving element for moving a lever' in *Mas-Hamilton* encompasses anything that can be used to make a lever move. It is a tautological claim. The instant claim is not. It does not cover any conceivable means for dividing the data words, generating error codes and sending the data and associated error codes on their respective ways. It covers one means: an adaptor that is simultaneously connected to both types of storage units (data and error correction bit) and to the parallel bus. If this could be converted into a means-plus-function claim, then so could any claim in which the disclosed structure takes its name from the function it performs, e.g., 'brake', 'clamp', or 'filter,' to name a few."; a patent phrase recited a MESSAGE TRANSFER CIRCUIT: "the phrase 'message transfer circuit' refers to a structure within the computer system. That this structure has a particular function to perform, and must therefore be capable of performing that function, does not transmute a structural component of a computer system into a means-plus-function claim to which Section 112, para. 6 applies."; the patentee "has not here attempted to patent an unspecified 'means for routing messages through a computer system without forcing the head of the message to wait for the tail.' It cannot be expected to recite an invention without identifying its component parts. ... Yes, it is a circuit that transfers messages--that is its function in the invention--but the fact that a disclosed structural element has a function should surprise no one. Under [the accused infringer's] reasoning, nearly every patent limitation would qualify for Section 112 para. 6 treatment."; SWITCH: the accused infringer argues that the patentee's "use of the word 'switch,' which it believes to be amorphous as to structure, converts this part of the claim into a means-plus-function claim that is subject to the strictures of Section 112, para. 6. ... I disagree ... . A switch is commonly understood to be a structure. It is a device for making, breaking, or changing connections in an electrical circuit. Like the word 'brake,' 'clamp,' or 'screw,' the name of the device connotes what it does. The commonly understood meaning of the word is cast in terms of its function. It is well settled that naming a function-specifying device in a patent claim is not sufficient to bring that claim within the ambit of Section 112, para. 6."; the patent owner "did not patent a better means for making, breaking, or changing connections in an electrical circuit. It patented a computer system that is configured so as to route messages more efficiently. One of that system's component parts is a switch--a switch that must be able to decode, establish, and maintain a path through the system. The switch is the structure that is used to accomplish a certain result. It is incorporated into the system in a particular way--by connecting it to the input circuits, which are in turn connected to the communications links."; "I also reject [the accused infringer's] argument that I should construe 'switch' in means-plus-function terms because the specifications do not use the word 'switch.' [The accused infringer] cites no authority for that proposition, and as a matter of logic it makes no sense.").

(n793) Footnote 253. *156 F.3d at 1213, 48 USPQ2d at 1016.*

(n794) Footnote 254. *156 F.3d at 1213, 48 USPQ2d at 1016.*

(n795) Footnote 255. *156 F.3d at 1213, 48 USPQ2d at 1016.*

(n796) Footnote 256. *156 F.3d at 1213, 48 USPQ2d at 1016.*

(n797) Footnote 257. *156 F.3d at 1214, 48 USPQ2d at 1017.*

(n798) Footnote 258. *156 F.3d at 1213, 48 USPQ2d at 1016.*

(n799) Footnote 259. *156 F.3d at 1213, 48 USPQ2d at 1016.*

(n800) Footnote 260. *156 F.3d at 1215, 48 USPQ2d at 1017.* The limitation required: "*a movable link member for holding* the lever out of engagement with the cam surface before entry of a combination *and for releasing* the lever after entry of the combination. ..."

(n801) Footnote 261. *Personalized Media Communications, LLC v. U.S. Int'l Trade Comm'n, 161 F.3d 696, 48 USPQ2d 1880 (Fed. Cir. 1998).*

See also *Harmonic Design, Inc. v. Hunter Douglas, Inc., 88 F. Supp.2d 1102, 54 USPQ2d 1273 (C.D. Calif. 2000)* ("ELECTRONIC CIRCUIT", "CONTROL SIGNAL GENERATOR," AND "COMMUNICATIONS LINK" ARE NOT SECTION 112/6 CLAUSES; "Failure to use the phrase 'means for' creates a presumption that § 112, P6 does not apply. ... This presumption can be rebutted if evidence intrinsic to the patent and any relevant extrinsic evidence so warrant. ... In deciding whether the presumption has been rebutted, the focus remains on whether the claim as properly construed connotes 'sufficiently definite structure' in the minds of those skilled in the art. ... If the claim does connote sufficiently definite structure, § 112, § 6 does not apply."; patents required "an electronic circuit electrically connected to the control signal generator and the battery for processing the control signal to cause the battery to energize the motor to move the rod"; "the ordinary meaning of the word 'circuit' connotes sufficiently definite structure to avoid application of § 112, P 6. The term 'circuit' is defined as 'an arrangement of interconnected electronic components that can perform specific functions upon application of proper voltages and signals.' IEEE Standard Dictionary of Electrical and Electronic Terms (Institute of Electrical and Electronics Engineers, 6th ed.1997) (hereinafter 'IEEE Standard Dictionary'), p. 156. Several courts have agreed that the word 'circuit' connotes sufficiently definite structure to those skilled in the art. *See Nilssen v. Magnetek, Inc., 1999 WL 982966,* * 9 (N.D.Ill. Oct. 26, 1999) (considering term 'circuit means'); *CellNet Data Sys., Inc. v. Itron, Inc., 17 F.Supp.2d 1100, 1109 (N.D.Cal.1998)* (same); *Database Excelleration Sys. Inc. v. Imperial Technology Inc., 1998 WL 785302, 48 U.S.P.Q.2d 1533, 1537 (N.D. Cal. 1998)* (considering term 'control circuit')."; PHYSICAL LOCATION: the claims "identify the physical location of the electronic circuit as 'electrically connected to the control signal generator and the battery.' ... Language identifying physical location suggests that a patentee intended to recite a structural element."; the accused infringer "argues that the term 'electronic circuit' does not connote sufficiently definite structure because it is a generic term that refers to a multitude of structures. The test, however, is not whether a claim term connotes a precise physical structure. On the contrary, *35 U.S.C. § 112,* P 6 is inapplicable even where the claim term denotes a variety of structures to one knowledgeable in the art."; CONTROL SIGNAL GENERATOR: "The relevant claim language references 'a control signal generator for generating a control signal.' "; the patent owner "has not pointed to a dictionary definition of 'control signal generator.' It does appear, however, that the term refers to a component of an electronic circuit that produces a control signal, which is defined as 'any signal that purposely affects the recording, processing, transmission or interpretation of data by a system element.' IEEE Standard Dictionary, p. 218."; "A review of both intrinsic and extrinsic evidence supports this conclusion. First, the language of the disputed claims specifies that the control signal generator is electrically connected to the electronic circuit, which is in turn electrically connected to the battery. See, e.g., 855 Patent, claim 1. Such language suggests that the patentee intended to recite a structural element as opposed to functional language that would invoke *35 U.S.C. § 112,* P 6. *See Cole, 102 F.3d at 531.* Second, Figure 7 of the '480 patent identifies a control signal generator as a component of the electronic circuitry. And third, extrinsic evidence indicates that the term 'control signal generator' connotes sufficiently definite structure to one of ordinary skill in the art. See Kamm Decl., P 9 (noting that those skilled in the art would recognize that a control signal generator may refer to an electronic circuit or component, a photodiode, a photoransistor, or other devices)."; COMMUNICATIONS; claims required a 'communications link for communicating between a user of the system and the database'; "Although not dispositive, the phrase at issue here does not use the word 'means.' ... the specification supports the patentee's contention that " 'communications link' is a connection allowing for the transmission of information between one or more databases and one or more ports. ... The patent is careful not to limit itself to the recited forms that this structure might take."); *SDS USA, Inc. v. Ken Specialties, Inc., 107 F. Supp.2d 574, 595-96 (D. N.J. 2000)* (TRANSFERRING UNIT: " 'transferring unit' is *not* a Section 112/6 means clause; the Federal Circuit "has made clear that a patentee may disclose structure, and thus avoid means-plus-function treatment, by including in the patent claims language describing structural limitations. ... ; Alternatively, even where structure is not explicitly described in the claims, the Federal Circuit has approved the use of terms with 'a well-known meaning to those of skill in the [relevant art] connotative of structure.' *Personalized Media Communications LLC v. Int'l Trade Comm'n, 161 F.3d at 704-705.* ... This court follows *Personalized Media* and *Greenberg* to conclude that, though no structure is explicitly recited for the 'transferring unit' in the claims themselves, that phrase is mere 'shorthand' for referring to the 'transfer roller 10' described in the specification. Though 'transferring unit' may well be a 'generic structural term,' *see Personalized Media* at 704, a 'transfer roller' is a definite structure--and ... the terms are interchangeable. ... Further, the claims themselves state the location, as well as purpose, of the claimed roller, referring to, for example, 'a transferring unit for transfer of ribbon stock through a passage formed by a guide, said passage defining a longitudinal axis (claim 1)'. ... As in *Greenberg*, the 'transfer roller' is described in detail in the specification, and the 'transferring unit' is specified in the claims. Each phrase conveys, permissibly, 'a variety of structures.' *Personalized Media, 161 F.3d at 705.*"; "The court finds that the transferring unit connotes structure, not function, to

one skilled in the art. Accordingly, means-plus-function treatment is denied. Instead, the transferring unit is interpreted as a mechanism that moves ribbon stock, from a roll at the beginning of the assembly line, through the claimed machine."); *Harmonic Design, Inc. v. Hunter Douglas, Inc., 88 F. Supp.2d 1102, 1104-07, n.2, 54 USPQ2d 1273, 1275-77, n.2 (C.D. Calif. 2000)* ("ELECTRONIC CIRCUIT" AND "CONTROL SIGNAL GENERATOR" ARE NOT SECTION 112/6 CLAUSES; "Failure to use the phrase 'means for' creates a presumption that § 112, P 6 does not apply. ... This presumption can be rebutted if evidence intrinsic to the patent and any relevant extrinsic evidence so warrant. ... In deciding whether the presumption has been rebutted, the focus remains on whether the claim as properly construed connotes 'sufficiently definite structure' in the minds of those skilled in the art. ... If the claim does connote sufficiently definite structure, § 112, § 6 does not apply."; patents required "an electronic circuit electrically connected to the control signal generator and the battery for processing the control signal to cause the battery to energize the motor to move the rod"; "the ordinary meaning of the word 'circuit' connotes sufficiently definite structure to avoid application of § 112, P 6. The term 'circuit' is defined as 'an arrangement of interconnected electronic components that can perform specific functions upon application of proper voltages and signals.' IEEE Standard Dictionary of Electrical and Electronic Terms (Institute of Electrical and Electronics Engineers, 6th ed. 1997) (hereinafter 'IEEE Standard Dictionary'), p. 156. Several courts have agreed that the word 'circuit' connotes sufficiently definite structure to those skilled in the art. *See Nilssen v. Magnetek, Inc., 1999 WL 982966,* * 9 (N.D. Ill. Oct. 26, 1999) (considering term 'circuit means'); *CellNet Data Sys., Inc. v. Itron, Inc., 17 F.Supp.2d 1100, 1109 (N.D. Cal. 1998)* (same); *Database Excelleration Sys. Inc. v. Imperial Technology Inc., 1998 WL 785302, 48 U.S.P.Q.2d 1533, 1537 (N.D. Cal.1998)* (considering term 'control circuit')."; PHYSICAL LOCATION: the claims "identify the physical location of the electronic circuit as 'electrically connected to the control signal generator and the battery.' ... Language identifying physical location suggests that a patentee intended to recite a structural element."; the accused infringer "argues that the term 'electronic circuit' does not connote sufficiently definite structure because it is a generic term that refers to a multitude of structures. The test, however, is not whether a claim term connotes a precise physical structure. On the contrary, *35 U.S.C. § 112,* P 6 is inapplicable even where the claim term denotes a variety of structures to one knowledgeable in the art."; CONTROL SIGNAL GENERATOR: "The relevant claim language references 'a control signal generator for generating a control signal.' "; the patent owner "has not pointed to a dictionary definition of 'control signal generator.' It does appear, however, that the term refers to a component of an electronic circuit that produces a control signal, which is defined as 'any signal that purposely affects the recording, processing, transmission or interpretation of data by a system element.' IEEE Standard Dictionary, p. 218."; "A review of both intrinsic and extrinsic evidence supports this conclusion. First, the language of the disputed claims specifies that the control signal generator is electrically connected to the electronic circuit, which is in turn electrically connected to the battery. See, e.g., 855 Patent, claim 1. Such language suggests that the patentee intended to recite a structural element as opposed to functional language that would invoke *35 U.S.C. § 112,* P 6. *See Cole, 102 F.3d at 531.* Second, Figure 7 of the '480 patent identifies a control signal generator as a component of the electronic circuitry. And third, extrinsic evidence indicates that the term 'control signal generator' connotes sufficiently definite structure to one of ordinary skill in the art. See Kamm Decl., P 9 (noting that those skilled in the art would recognize that a control signal generator may refer to an electronic circuit or component, a photodiode, a photoransistor, or other devices)."); *CIVIX-DDI, LLC v. Microsoft Corp., 84 F. Supp.2d 1132, 1141-42 (D. Colo. 2000), aff'd, 18 Fed. Appx. 892 (Fed. Cir. 2001)* (nonprecedential) (USER STATION; "a user station within said predetermined region for interrogating said apparatus."; accused infringers argue that "this phrase denotes only a place for interrogating the apparatus, recites no structure and, accordingly, must be construed as limited to the corresponding structure disclosed in the patent specification."; "Although the latter part of the quoted phrase describes a function, the claim includes a specific recitation of the structure to support that function--a 'user station.' In addition, ... this phrase includes a limitation on the user station--it must be 'within said predetermined region.' Furthermore, the phrase 'user station' is expressed throughout Claims 1 & 5 as a specific structural element, such as a kiosk. Accordingly, the phrase at issue does not meet the requirements of *35 U.S.C. § 112* P 6, and I will not analyze it as a means-plus-function element."); *Nilssen v. Motorola, Inc., 80 F. Supp.2d 921, 932, 935 (N.D. Ill. 2000), modified, 130 F.Supp.2d 976 (N.D.Ill. 2000)* (INVERTER NOT A "MEANS" CLAUSE: "an inverter-type power supply that is connected with the DC output terminals and operative to provide a high-frequency AC voltage between a first inverter output terminal and an inverter reference terminal"; "Though functionally derived, 'inverter' has a well-understood meaning in the art (expressed, e.g., in *Standard Handbook for Electrical Engineers* (hereafter '*Handbook*') 22-105 (Donald G. Fink & H. Wayne Beaty eds., 13th ed. 1993)[)] as 'a power converter in which the normal direction of power flow is from a dc source to an ac load'). In short, 'inverter' is an industry term of art that describes a structure (even though, to be sure, 'inverter' is a generic term--...the term describes a particular kind of circuit and is plainly not as devoid of substantive content (that is, structure) as the term 'circuit' alone)."; "Indeed, though it is entirely true that 'inverter' alone does not necessarily 'call to mind a *single* well-defined

structure' (*Greenberg, 91 F.3d at 1583* (emphasis added)), the very fact that the claim uses the term 'inverter-type' strongly suggests that inventor Nilssen did not intend to limit himself to a single species of inverter. Instead the claim's 'inverter-type' locution would normally appear to incorporate, quite deliberately, more than one kind of inverter, rather than being limited by a single example in the specification."; "RECTIFYING AND FILTERING CIRCUITRY" NOT A "MEANS" CLAUSE; " 'rectifying and filtering circuitry connected with the AC terminals and operative to provide a substantially constant DC supply voltage across a pair of DC terminals' "; " 'rectifying and filtering circuitry' will be construed consistently with the commonly understood meaning of those terms. Once again Paragraph 6 does not come into play.); *Katz v. AT&T Corp., 63 F. Supp.2d 583, 600 (E.D. Pa. 2000)* ("INTERFACE STRUCTURE" AND "SWITCHING STRUCTURE" *NOT* MEANS CLAUSES; "although the term 'interface structure' is written in functional language, the limitation sufficiently connotes structure such that § 112, P 6 does not apply. That is, I conclude that, based on the cited prior art, references, and testimony of the experts at the *Markman* hearing, the term 'interface structure' would have called to mind a specific set of structures to a person of ordinary skill in the art such that such a person would be able to build the [patented] inventions."; "switching structure" "would have connoted a specific set of structures to those of ordinary skill in the art."); *Database Excelleration Systems Inc. v. Imperial Technology Inc., 48 USPQ2d 1533, 1536-37 (N.D. Calif. 1998)* ("CONTROL CIRCUIT" is *not* a Section 112/6 means clause; "The application of section 112, paragraph 6 appears to require a determination of whether the applicant intended to invoke it."; the claims "specifies that the 'control circuit' comprises a first port, second port, a first control line, and a second control line and defines their structural relationship. ... The term 'circuit' alone indicates sufficient structure to avoid application of section 112, paragraph 6."); *Isogon Corp. v. Amdahl Corp., 47 F. Supp.2d 436, 449-50 (S.D. N.Y. 1998)* "event detector for detecting," "collector for obtaining," "recorder for recording," and "correlator for correlating" are means clauses; an examiner's determination that phrases were not means clause is not binding on court; "The presence of a definite structure will remove a claim from the limitation imposed by § 112, P 6 despite the use of the classic 'means' formulation, but only if it contains such a 'detailed recitation' of structure that it is no longer seen as largely a function claim."; "unlike the claim construed in Cole, these claims contain no recitation of structure, and certainly no details such as location or extent. The structures are simply not defined in these claims. ... These claims are dominated by functional description.").

Compare *Signtech USA, Ltd. v. Vutek, Inc., 174 F.3d 1352, 50 USPQ2d 1372 (Fed. Cir. 1999).*

(n802) Footnote 262. See § 18.07(7).

(n803) Footnote 263. For a discussion of the requirement that a specification recited sufficient corresponding structure to support a "means" clause, see § 8.04(2)(d).

(n804) Footnote 264. The court reviewed its recent case law on "whether certain claim language has invoked § 112, P 6."

"In *Greenberg v. Ethicon Endo-Surgery, Inc.* ... (Fed. Cir. 1996), we were presented with the claim language 'detent mechanism defining conjoint rotation of said shafts.' In deciding that § 112, P 6 was not invoked, we stated

'[T]he fact that a particular mechanism-here "detent mechanism"-is defined in functional terms is not sufficient to convert a claim element containing that term into a "means for performing a specified function" within the meaning of [§ 112, P 6]. Many devices take their names from the functions they perform. The examples are innumerable, such as "filter," "brake," "clamp," "screwdriver," or "lock.". ...

' "Detent" (or its equivalent "detent mechanism") is just such a term. Dictionary definitions make clear that the noun "detent" denotes a type of device with a generally understood meaning in the mechanical arts, even though the definitions are expressed in functional terms. It is true that "detent" does not call to mind a single well-defined structure, but the same could be said of other commonplace structural terms such as "clamp" or "container." What is important is not simply that a "detent" or "detent mechanism" is defined in terms of what it does, but that the term, as the name for structure, has a reasonably well understood meaning in the art.'

"... We also made clear that use of the term 'means' is central to the analysis: 'the use of the term "means" has come to be so closely associated with "means-plus- function" claiming that it is fair to say that the use of the term "means" (particularly as used in the phrase "means for") generally invokes [§ 112, P 6] and that the use of a different formulation generally does not.'

"Subsequent cases have clarified that use of the word 'means' creates a presumption that § 112, P 6 applies, *see York Prods., Inc. v. Central Tractor* ... (Fed. Cir. 1996) ('In determining whether to apply the statutory procedures of [§ 112, P 6], the use of the word "means" triggers a presumption that the inventor used this term advisedly to invoke the

statutory mandates for means-plus-function clauses.'). ... [n.9 *See also Unidynamics Corp. v. Automatic Prods. Int'l, Ltd.* ... (Fed. Cir. 1998) (holding that the claim language 'spring means tending to keep the door closed' invokes § 112, P 6: 'the recitation of "spring," which is structural language, [does not take] the limitation out of the ambit of the construction dictate of § 112, P 6."); *Serrano v. Telular Corp.* ... (Fed. Cir. 1997) (holding that the claim language 'determination means ... for determining' invokes § 112, P 6); *Laitram Corp. v. Rexnord, Inc.* ... (Fed. Cir. 1991) (holding that the claim language 'means for joining said pluralities [of link ends] to one another so that the axes of [certain holes are arranged in certain configurations]' invokes § 112, P 6: 'The recitation of some structure in a means-plus-function element does not preclude the applicability of [§ 112, P 6 when it] merely serves to further specify the function of the means. The recited structure tells only what the means-for-joining *does*, not what it *is* structurally.') (emphasis in original).]"

161 F.3d at 703-04, n.9, 48 USPQ2d at 1886-87, n.9.

The cases also clarify that "the failure to use the word 'means' creates a presumption that § 112, P 6 does not apply, *see Mas-Hamilton, 156 F.3d at 1213, 48 USPQ2d at 1016.*" *161 F.3d at 703-04, 48 USPQ2d at 1887.*

" ... These presumptions can be rebutted if the evidence intrinsic to the patent and any relevant extrinsic evidence so warrant. ... *See, e.g., Cole v. Kimberly-Clark Corp.*, ... (Fed. Cir. 1996) (noting that whether § 112, P 6 is invoked involves an analysis of the 'patent and the prosecution history,' and consulting a dictionary definition of 'perforation' to understand if one of skill in the art would understand this term to connote structure)[; n.10 *Mas-Hamilton* ... (holding that the claim language 'lever moving element for moving the lever' invokes § 112, P 6: 'even though the catch phrase ["means for"] is not used, the limitation's language does not provide any structure. The limitation is drafted as a function to be performed rather than definite structure or materials.'); *id.* ... (holding that the claim language 'a movable link member for ...' invokes § 112, P 6); *York* ... (holding that the claim language 'means formed on the ... sidewall portions including a plurality of spaced apart ... members protruding from the ... sidewall portions and forming load lock ...' did not invoke § 112, P 6: 'The claim language does not link the term means to a function ... Instead, the claim recites structure. ... Without a "means" sufficiently connected to a recited function, the presumption in use of the word "means" does not operate.'); *Cole v. Kimberly-Clark Corp.* ... (Fed. Cir. 1996) (holding that the claim language 'perforation means extending from the leg band means to the waist band means through the outer impermeable layer means' did not invoke § 112, P 6: this language 'describes the structure supporting the tearing function (i.e., perforations). The claim describes not only the structure that supports the tearing function, but also its location (extending from the leg band to the waist band). An element with such a detailed recitation of structure, as opposed to its function, cannot meet the requirements of [§ 112, P 6].'); *see also Unidynamics* ... (distinguishing *Cole*: '[We held that the claim limitation in *Cole*] did not meet the requirement of § 112, P 6 because it not only described definite structure, perforations, that supported the described function, tearing, but also described the location and extent of the structure. Here, spring is the only recitation of structure. ...') (citation omitted)].

..."In deciding whether either presumption has been rebutted, the focus remains on whether the claim as properly construed recites sufficiently definite structure to avoid the ambit of § 112, P 6. *See Sage Prods. v. Devon Indus., Inc.* ... (Fed. Cir. 1997) ('[W]here a claim recites a function, but then goes on to elaborate sufficient structure, material, or acts within the claim itself to perform entirely the recited function, the claim is not in means-plus-function format' even if the claim uses the term 'means')."

161 F.3d at 704, n.10, 48 USPQ2d at 1887, n.10.

(n805) Footnote 265. " 'Detector' is not a generic structural term such as 'means,' 'element,' or 'device'; nor is it a coined term lacking a clear meaning, such as 'widget' or 'ram-a-fram.' " *161 F.3d at 704, 48 USPQ2d at 1887.*

(n806) Footnote 266. "(A)s noted by the (trier of fact) by reference to dictionary definitions, 'detector' had a well-known meaning to those of skill in the electrical arts connotative of structure, including a rectifier or demodulator." "For example, the (trier of fact) quoted the following dictionary definition of 'detector': ' "(1): a device for determining the presence of a signal (2): a rectifier of high-frequency current (as a cat whisker and crystal or a vacuum tube) (3): a device for extracting the intelligence from a signal (4) DEMODULATOR 1." ' ... (citation to Webster's omitted)." *161 F.3d at 704-05, n.12, 48 USPQ2d at 1887-88,* n,12.

(n807) Footnote 267. "(N)either the fact that a 'detector' is defined in terms of its function, nor the fact that the term 'detector' does not connote a precise physical structure in the minds of those of skill in the art detracts from the definiteness of structure. *See Greenberg.* ... Even though the term 'detector' does not specifically evoke a particular

structure, it does convey to one knowledgeable in the art a variety of structures known as 'detectors.' " *161 F.3d at 705, 48 USPQ2d at 1888.*

See also *Rackman v. Microsoft Corp., 102 F. Supp.2d 113, 124 (E.D. N.Y. 2000)* ("even if a claim element does not, on its face, recite definite structure, it may still call to mind definite structure to one skilled in the art and therefore avoid falling under § 112, P 6."; "the phrase 'means for interfacing' would not have called to mind a definite structure to one skilled in the art. Therefore, the presumption that this is a means-plus-function claim element has not been rebutted, and 'means for interfacing' will be construed according to the dictates of § 112, P 6.").

(n808) Footnote 268. *161 F.3d at 705, 48 USPQ2d at 1888.* "(A)n adjectival qualification ('digital') placed upon otherwise sufficiently definite structure ('detector') does not make the sufficiency of that structure any less sufficient for purposes of § 112, P 6. Instead, it further narrows the scope of those structures covered by the claim and makes the term more definite. The use of the word 'digital' in conjunction with the word 'detector' merely places an additional functional constraint (extraction of digital information) on a structure (detector) otherwise adequately defined. *See, e.g.*, '277 patent, col. 21, ll. 46-47 (defining 'digital detector' as a device that 'acts to detect the digital signal information' in other information)." *161 F.3d at 705, 48 USPQ2d at 1888.*

(n809) Footnote 269. *Al-Site Corp. v. VSI International, Inc., 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).*

(n810) Footnote 270. "This court has delineated several rules for claim drafters to invoke the strictures of *35 U.S.C. § 112,* P 6. Specifically, if the word 'means' appears in a claim element in combination with a function, it is presumed to be a means-plus-function element to which § 112, P 6 applies. *See Sage Prods., Inc. v. Devon Indus., Inc.* ... (Fed. Cir. 1997); *Greenberg v. Ethicon Endo-Surgery, Inc.* ... (Fed. Cir. 1996). Nevertheless, according to its express terms, § 112, P 6 governs only claim elements that do not recite sufficient structural limitations. ... Therefore, the presumption that § 112, P 6 applies is overcome if the claim itself recites sufficient structure or material for performing the claimed function. *See Sage* ... ('[W]here a claim recites a function, but then goes on to elaborate sufficient structure, material, or acts within the claim itself to perform entirely the recited function, the claim is not in means-plus-function format.'); *York Prods., Inc. v. Central Tractor Farm & Family Ctr.* ... (Fed. Cir. 1996); *Cole v. Kimberly-Clark Corp.* ... (Fed. Cir. 1996).

"Although use of the phrase 'means for' (or 'step for') is not the only way to invoke § 112, P 6, that terminology typically invokes § 112, P 6 while other formulations generally do not. *See Greenberg.* ... Therefore, when an element of a claim does not use the term 'means,' treatment as a means-plus-function claim element is generally not appropriate. *See Mas-Hamilton Group v. LaGard, Inc.* ... (Fed. Cir. 1998). However, when it is apparent that the element invokes purely functional terms, without the additional recital of specific structure or material for performing that function, the claim element may be a means- plus-function element despite the lack of express means-plus-function language. *See, e.g., Cole* ... ('[M]erely because an element does not include the word 'means' does not automatically prevent that element from being construed as a means-plus-function element.'); *Mas-Hamilton* ... (interpreting 'lever moving element' and 'movable link member' under § 112, P 6)." *174 F.3d at 1318, 50 USPQ2d at 1166.*

(n811) Footnote 271. The '345 and '726 patents' claims required " '(t)he combination of an eyeglass display member and an eyeglass hanger member.'," the combination including "a 'display member' with 'cantilever support means' and 'an eyeglass hanger member for mounting a pair of eyeglasses.' " *174 F.3d at 1317, 50 USPQ2d at 1165.*

The claims "further define the structure of the eyeglass hanger member." *174 F.3d at 1317, 50 USPQ2d at 1165.* The '345 patent's claim "describes the eyeglass hanger member as 'made from flat sheet material,' and having an 'opening means formed ... below [its] upper edge.' " *174 F.3d at 1317, 50 USPQ2d at 1165.*

The district court held that the "eyeglass hanger member" elements were subject to Section 112, paragraph 6. The Federal Circuit reversed. The "elements are not in traditional means-plus-function format. The word 'means' does not appear within these elements." *174 F.3d at 1318, 50 USPQ2d at 1166-67.* They "include a function, namely, 'mounting a pair of eyeglasses,' " but "the claims themselves contain sufficient structural limitations for performing those functions." *174 F.3d at 1318, 50 USPQ2d at 1167.*

"[C]laim 1 of the '345 patent describes the eyeglass hanger member as 'made from flat sheet material' with an 'opening means formed ... below [its] upper edge.' This structure removes this claim from the purview of § 112, P 6. Similarly, according to claim 1 of the '726 patent, the eyeglass hanger member has 'an attaching portion attachable to a portion of said frame of said pair of eyeglasses to enable the temples of the frame [to be opened and closed].' This structure also precludes treatment as a means-plus-function claim element. The district court therefore improperly

restricted the 'eyeglass hanger member' in these claims to the structural embodiments in the specification and their equivalents." *174 F.3d at 1318-19, 50 USPQ2d at 1167.*

The Federal Circuit held that the district court similarly erred in interpreting as a means-plus-function elements (1) "the 'attaching portion attachable to a portion of said frame of said pair of eyeglasses' element of claim 1 of the '726 patent," and (2) the 'combination of an eyeglass display member and an eyeglass contacting member' " of Claims 1, 2, and 3 of the '911 patent. The former is "not in traditional means-plus-function form and supplies structural, not functional, terms." *174 F.3d at 1319, 50 USPQ2d at 1167.* The latter "is also not a means-plus-function element."

"Again, this claim element is not in traditional means-plus-function form. Furthermore, the claim itself recites sufficient structure for performing the recited function. Specifically, claim 1 of the '911 patent describes the 'eyeglass contacting member' as 'having an encircling portion adapted to encircle a part of said frame of said pair of eyeglasses to enable the temples of the frame to be selectively [opened and closed].' Similarly, claim 3 of the '911 patent describes the 'eyeglass contacting member' as 'having an attaching portion attachable to a portion of said frame of said eyeglasses.' "

174 F.3d at 1319, 50 USPQ2d at 1167.

(n812) Footnote 272. *174 F.3d at 1323, 50 USPQ2d at 1170.*

(n813) Footnote 273. *Seal-Flex, Inc. v. Athletic Track & Court Construction, 172 F.3d 836, 50 USPQ2d 1225 (Fed. Cir. 1999).*

(n814) Footnote 274. *172 F.3d at 849 n.4, 50 USPQ2d at 1234 n.4.*

(n815) Footnote 275. *172 F.3d at 849, 50 USPQ2d at 1234.*

(n816) Footnote 276. *172 F.3d at 850, 50 USPQ2d at 1235.*

(n817) Footnote 277. *Signtech USA, Ltd. v. Vutek, Inc., 174 F.3d 1352, 50 USPQ2d 1372 (Fed. Cir. 1999).*

(n818) Footnote 278. The claim provided:

" '1. An apparatus for reproducing an image on a first side of a substrate and a mirror image on a second side of said substrate, comprising:

a frame;

means for generating control signals representative of said image;

ink delivery means positioned on opposite sides of said substrate, said ink delivery means fluidly communicating with an ink source;

means mounted on said frame for supporting said ink delivery means;

means mounted on said frame for driving said ink delivery means relative to said substrate; and

means, responsive to said control signals, *for controlling said ink delivery means* to produce said image on said first side of said substrate and said mirror image on said second side of said substrate.'

(emphasis added)." *174 F.3d at 1354-55, 50 USPQ2d at 1373.*

(n819) Footnote 279. "Typically, if the word 'means' appears in a claim element in combination with a function, it is presumed to be a means-plus-function element to which § 112, P 6 applies... . (A)ccording to the language of the statute, § 112, P 6 governs only claim elements that do not recite sufficient 'structure, material, or acts in support (of the means or step-plus-function element).' *35 U.S.C. § 112,* P 6. *See Sage.* ... [T]he claim element 'ink delivery means' uses the term 'means' in association with a function, namely 'ink delivery.' Although the phrase 'means for' is not used, the phrase 'ink delivery means' is equivalent to the phrase 'means for ink delivery,' because 'ink delivery' is purely functional language. Furthermore, the claim does not recite disqualifying structure which would prevent application of § 112, P 6." *174 F.3d at 1356, 50 USPQ2d at 1374.*

See also *Micro Chemical, Inc. v. Great Plains Chemical Co., 194 F.3d 1250, 52 USPQ2d 1258 (Fed. Cir. 1999),* discussed *infra* ("weighing means" is, but "hopper means" is not, within Section 112/6's ambit).

(n820) Footnote 280. *Rodime PLC v. Seagate Technology, Inc., 174 F.3d 1294, 50 USPQ2d 1429 (Fed. Cir. 1999), cert. denied, 528 U.S. 1115 (2000).*

See also *Relume Corp. v. Dialight Corp., 63 F. Supp.2d 788, 799 (E.D. Mich. 1999), aff'd, 4 Fed. Appx. 893 (Fed. Cir. 2001)* (nonprecedential) ("A claim recites sufficient structure when it elaborates the structure, material, or acts necessary to perform entirely the recited function."; patent on light emitting diode (LED) arrays for use in traffic signals: "the implicitly sufficient level of structural elaboration in the term 'converter' removes the 'power factor correction converter means' from its presumed statutory category as a means-plus-function element governed by section 112, paragraph 6. ... Accordingly, I hold that a person of ordinary skill in the art of LED array power supplies would understand claim 1's 'power factor correction converter means' to require the structure of a switching power supply."); *Katz v. AT&T Corp., 63 F. Supp.2d 583, 637, 640 (E.D. Pa. 2000)* ("FIRST RESPONSE MEANS" AND "MEMORY MEANS" NOT "MEANS" CLAUSES; a prior art article "demonstrates that the term 'audio response unit' ... was used by people in the art of computer telephony and would have connoted sufficient structure to those of ordinary skill in the art at the time."; " 'memory means' would have connoted sufficient structure to one of ordinary skill in the art at the time of the Katz patents such that it is not subject to analysis under § 112, P 6.").

(n821) Footnote 281. The patent, U.S. Pat. No. 4,638,383, concerned "the miniaturization of hard drive technology from 5 1/4 inches to 3 1/2 inches, a size particularly suited for use in portable computers, and problems incident thereto."

"Disk drives store electromagnetic data on the concentric tracks of disks. While the disks spin at high speed, small electromagnets called 'transducers' or 'read/write heads' move near the disk surface retrieving and recording electromagnetic information on the concentric tracks. A positioning mechanism supports the heads and moves them to the correct location for data storage or retrieval. To ensure accurate recording and retrieval, the positioning mechanism must place the head precisely and consistently at the correct storage position on a disk track."

174 F.3d at 1297-98, 50 USPQ2d at 1431.

(n822) Footnote 282. "(T)he patent addresses power consumption, vibration mounting, heat dissipation, storage capacity, and compatibility of the electrical interface with existing technology." *174 F.3d at 1297, 50 USPQ2d at 1431.*

(n823) Footnote 283. "Typically, disk drives incorporate stainless steel components where strength is critical and aluminum components elsewhere to minimize overall weight. Temperature variations cause these components, constructed of different materials, to expand or contract at different rates as the disk drive heats or cools. The different expansion rates change the locations of these parts relative to one another. For example, when the temperature of a disk drive rises during warm-up, the disk itself will expand radially outward from the hub, which causes the tracks on the disk to move in a radially outward direction. The other components of the disk drive also expand, resulting in a cumulative offset of the head from the track. Thus, this temperature-induced offset prevents the read/write head from reaching the correct position on the disk track. Without some compensation for temperature variations, the head will not find the correct track position to retrieve information." *174 F.3d at 1298, 50 USPQ2d at 1431.*

To solve the temperature expansion problem, the patent "teaches a thermal compensation scheme. Thermal compensation accounts for different expansion and contraction rates of a disk drive's components. In the embodiment disclosed in the patent, the thermal compensation system is built into the 'positioning mechanism'--the mechanism responsible for moving the heads between tracks. Specifically, the patent prescribes constructing the positioning mechanism from appropriate materials 'to automatically compensate for any mispositioning between the transducer and a track caused by thermal effects.' In addition to using stainless steel and aluminum, some of the components of the positioning mechanism use a third class of materials, such as an aluminum/bronze alloy, for its thermal expansion characteristics. The components of the positioning mechanism expand by controlled amounts, causing a corrective movement of the transducer to position it at the right location within a track." *174 F.3d at 1298, 50 USPQ2d at 1431.*

(n824) Footnote 284. "Each of the asserted independent claims (3, 5, and 8) recites a 'positioning means,' the interpretation of which is central to this case. In claim 3, this element reads:

'positioning means for moving said transducer means between the concentrically adjacent tracks on said micro hard-disk, said positioning means including:

two support arms each supporting one of said read/write heads with each read/write head being mounted at one end of its respective support arm;

a pivot shaft having an axis located on one side of said support arms and spaced away from said support arms;

a positioning arm to which the other ends of said support arms are attached, said positioning arm having one end thereof coupled to said pivot shaft;

a bearing assembly supporting said pivot shaft for rotational movement thereby enabling said positioning arm to be pivoted about the axis of said pivot shaft;

a stepper motor having an output drive shaft;

means for operating said stepper motor in step increments; and

a tensioned steel band coupling said drive shaft of said stepper motor to the other end of said positioning arm, said band being arranged in a pulley arrangement whereby rotational movement of said stepper motor causes pivoting of said positioning arm about said pivot shaft for moving said support arms and the read/write heads in incremental steps with each increment causing said read/write heads to move from one track to the next adjacent track on said micro hard-disk.' "

"Claims 5 and 8 recite an almost identical 'positioning means' to each other, but somewhat different from that of claim 3:

'positioning means for moving said first and second transducer means between the concentrically adjacent tracks on said micro hard-disks, said positioning means including a positioning arm disposed within the sealed housing, a pivot shaft coupled to one end of said positioning arm and supporting said positioning arm for rotational movement relative to said micro hard-disks, four support arms, each supporting one of said heads at one end and each connected to said positioning arm at its other end, a stepper motor having a shaft extending into said sealed housing and means for operating said stepper motor in step increments, each increment causing said read/write heads to move from one track to the next adjacent track on said micro hard-disks. ...' "

174 F.3d at 1298-99, 50 USPQ2d at 1431-32.

(n825) Footnote 285. "This pin within (the accused infringer's) positioning mechanism has a precise amount of stiffness. When temperature rises and the disk components begin to expand, this expansion stresses the thermal pin causing it to bend. The bending of the pin causes a corrective movement of the head to maintain it at the proper position in the track." *174 F.3d at 1299, 50 USPQ2d at 1432.*

(n826) Footnote 286. *174 F.3d at 1301, 50 USPQ2d at 1433.*

(n827) Footnote 287. *174 F.3d at 1301, 50 USPQ2d at 1433.*

(n828) Footnote 288. *174 F.3d at 1303, 50 USPQ2d at 1435.*

See also *Smiths Industries Medical Systems, Inc. v. Vital Signs, Inc., 50 USPQ2d 1641 (Fed. Cir. 1999)* (district court by reading limitation into recited function), *on reh'g 183 F.3d 1347, 51 USPQ2d 1415 (Fed. Cir. 1999).*

(n829) Footnote 289. *174 F.3d at 1303, 50 USPQ2d at 1435.*

"The word 'means' is 'part of the classic template for functional claim elements.' *Sage Prods. Inc. v. Devon Indus., Inc.* ... (Fed. Cir. 1997). Accordingly, in determining whether a claim element falls within § 112, P 6, this court has presumed an applicant advisedly used the word 'means' to invoke the statutory mandates for means- plus-function clauses. ... Two specific rules, however, overcome this presumption. First, a claim element that uses the word 'means' but recites no function corresponding to the means does not invoke § 112, P 6. ... Second, even if the claim element specifies a function, if it also recites sufficient structure or material for performing that function, § 112, P 6 does not apply. *See id.* ... ('[W]here a claim recites a function, but then goes on to elaborate sufficient structure, material, or acts within the claim itself to perform entirely the recited function, the claim is not in means-plus-function format.'); *Personalized Media* ... ('In deciding whether [the] presumption has been rebutted, the focus remains on whether the claim as properly construed recites sufficiently definite structure to avoid the ambit of § 112, P 6.'); *Cole v. Kimberly-Clark Corp.* ... (Fed. Cir. 1996) ('An element with such a detailed recitation of structure ... cannot meet the requirements of [§ 112, P 6].')."

174 F.3d at 1302, 50 USPQ2d at 1434.

(n830) Footnote 290. *174 F.3d at 1303, 50 USPQ2d at 1435.* After holding that Section 112, paragraph 6, presumptively applies because of the use of "means," the court "next look(ed) to whether the element specifies a function for performing the claimed means."

"In making that determination, this court relies primarily on the claim language itself. The claim element clearly associates the function of 'moving said transducer means between the concentrically adjacent tracks' with the 'positioning means.' The district court ... interpreted the element to require more than movement between tracks: 'In the disputed claims, the positioning means must not only function to move the head from track to track, it must be able to record data onto a disk and retrieve that data at a later time. Accordingly, the positioning means ... must be able to *accurately* locate a track upon which information was recorded at an earlier time.' (emphasis added). The district court reasoned that the positioning means could only achieve such 'accuracy' with thermal compensation. Thus, according to the district court, thermal compensation must be a function of the claimed means.

"In so construing the claims, the district court erred by importing the functions of a working device into these specific claims, rather than reading the claims for their meaning independent of any working embodiment. ..." [T]he district court's strained interpretation of the claimed function cannot stand.

"The claim language itself clearly states the function of the positioning means: to move the transducer between tracks on the hard-disk. The prepositional link 'for' ties the 'means' to its function. Later in the same element, the claim reiterates: 'causing said read/write heads to move from one track to the next adjacent track on said micro hard disk.' The claim says nothing about accurate placement of a head within a track. Nor does it mention thermal compensation in any respect."

174 F.3d at 1302-03, 50 USPQ2d at 1435.

The accused infringer argued that the "positioning" modifier " 'denotes placement beyond mere moving.' " but "the language of claims 3, 5, and 8 do[es] not recite a thermal compensation function at all." *174 F.3d at 1304, 50 USPQ2d at 1436.*

The claims' "context ... within the patent underscore[d] that they do not include a thermal compensation function."

"For example, the language of claim 11, not asserted in this litigation, supports the reading of claims 3, 5, and 8 to require only a moving function. Claim 11 recites: 'positioning means for moving said transducer means between the tracks on said hard-disk, *said positioning means being formed of selected materials for compensating for any mispositioning arising from thermal effects.* ...' (emphasis added)... . [T]he narrower claim 11 adds a thermal compensation function expressly not included in the broader claims 3, 5, and 8. Had [the patentee] intended or desired to claim thermal compensation as a function of the positioning means in the asserted claims, it could have done it explicitly, as in claim 11. The absence of any such explicit language, however, shows that claims 3, 5, and 8 do not include the function of thermal compensation."

Similarly, the specification "underscore[d] the function of movement amongst tracks."

"It explains that the 'positioning mechanism *moves* the transducer between the tracks.' ... (emphasis added)... . [T]he specification states that the 'positioning means *moves* the transducer along an arcuate path that extends in the radial direction with respect to the disk' so that 'the transducer can *move* between the innermost and outermost tracks on the disk.' ... (emphasis added). These passages emphasize that the function expressly recited in claims 3, 5, and 8 is the claimed function."

174 F.3d at 1304-05, 50 USPQ2d at 1435-36.

The preferred embodiment in the specification did have a thermal compensation function, but this did not justify reading that function into the claim.

"Any difficulty in identifying the function performed by the claimed means apparently stems from the description of the preferred embodiment of the positioning mechanism, which has thermal compensation built into it. As the specification explains: 'By appropriately selecting materials of different coefficients of thermal expansion for the various components of the positioning mechanism, it is possible to provide thermal compensation so as to ensure that the read/write heads remain on track irrespective of thermal effects.' This passage ... merely highlights the unremarkable fact that a particular means may perform more than one function. It does not follow, however, that the positioning means in claims 3, 5, and 8 necessarily performs both these functions. *See Velo-Bind, Inc. v. Minnesota Mining & Mfg. Co., 647 F.2d 965, 968-69, 211 USPQ 926, 929 (9th Cir.1981)* (declining to interpret 'cutting means' to include a binding function merely because the specification disclosed a hot knife that performed both cutting and binding)."

"Indeed, the two functions are not inextricably intertwined. Rather, the specification associates separate structure with each separate function. The specification teaches one of ordinary skill in this art to construct and use a positioning

mechanism to move the transducer heads from track to track without 'appropriately selecting materials of different coefficients of thermal expansion.' While such a construction would not compensate for thermal effects, it would nevertheless operate to move the read/write heads from track to track. In other words, thermal compensation is an additional function, with separate, additional structure, included within this patent as a separate claimed feature within the broader parameters of the entire claimed invention. Each claim, however, need not carry the limitations of narrower, specific claimed features. The specification makes this distinction and supports the interpretation of this language of claims 3, 5, and 8 which recite only the function of movement between tracks."

174 F.3d at 1305, 50 USPQ2d at 1436-37.

Finally, the patent's prosecution history supported "the express claim language."

"During reexamination, the examiner rejected claim 11--which specifically recites thermal compensation as a function of the positioning means ... based on European Patent Application No. 0,055,568. That reference describes a thermal compensation system in a prior Rodime hard-disk. Responding to that rejection, [the patentee] distinguished its claimed thermal compensation structure from the prior art. The examiner, recognizing the additional function in narrower claim 11, cited no thermal compensation art against claims 3, 5, and 8, nor did [the patentee] raise thermal compensation at all in relation to those claims. This prosecution history accords with this interpretation of the language of the claims. The claim language does not recite any thermal compensation function in claims 3, 5, and 8 and the examiner understood that interpretation. In addition to the claim language, this prosecution history also served to notify the public of differences between the narrower functions of claim 11 and the broader functions of claims 3, 5, and 8."

174 F.3d at 1305, 50 USPQ2d at 1437.

(n831) Footnote 291. Claim 3's "detailed recitation of structure for performing the moving function takes this claim element out of the scope of § 112, P 6."

"Following the portion of the claim element quoted above ('positioning means for moving said transducer means between the concentrically adjacent tracks on said micro hard-disk'), claim 3 further provides a list of the structure underlying the means: 'said positioning means including: two support arms ... a pivot shaft ... a positioning arm ... a bearing assembly ... a stepper motor ... means for operating said stepper motor ... and a tensioned steel band. ...' The claim also recites the specific location and interconnection of each of these structural sub-elements. The pivot shaft, for example, has 'an axis located on one side of said support arms and spaced away from said support arms.' The positioning arm has attached to it 'ends of said support arms' and is also 'coupled to said pivot shaft.' The tensioned steel band couples 'said drive shaft of said stepper motor to the other end of said positioning arm.' "

174 F.3d at 1303-04, 50 USPQ2d at 1435.

A similar analysis applied to claims 5 and 8.

"Those claims recite: 'positioning means for moving said first and second transducer means between the concentrically adjacent tracks on said micro hard-disks, said positioning means including a positioning arm ... a pivot shaft ... four support arms ... a stepper motor ... and means for operating said stepper motor.' In addition to the recited structure, these claims also recite the interconnection of the structural components and their location with respect to other elements of the claimed combination. For example, the positioning arm is 'disposed within the sealed housing.' The pivot shaft is 'coupled to one end of said positioning arm' and supports 'said positioning arm for rotational movement relative to said micro hard-disks.' As with claim 3, this detailed recitation of structure for performing the moving function removes this element from the purview of § 112, P 6."

174 F.3d at 1304, 50 USPQ2d at 1435-36.

(n832) Footnote 292. *174 F.3d at 1304, 50 USPQ2d at 1436.* "(T)he claim need only recite 'sufficient' structure to perform entirely the claimed function. *See Sage* ... ; *Personalized Media.* ... Based on the structure disclosed in the specification for performing the moving function, these claims recite nearly all (if not all) of the structural components of the positioning mechanism. In any case, they clearly recite more than sufficient structure for moving the transducer from track to track... . [T]his case is different from *Laitram*--relied on by the district court--where the claim element merely recited 'some' structure that only 'serve[d] to further specify the function of [the] means.' ... Rather, in the words of *Laitram*, the structure specified in claims 3, 5, and 8 tells what the means 'is structurally.' *Id.*" *174 F.3d at 1304, 50 USPQ2d at 1304.*

(n833) Footnote 293. *174 F.3d at 1304, 50 USPQ2d at 1436.*

(n834) Footnote 294. *Kemco Sales, Inc. v. Control Papers Company, Inc., 208 F.3d 1352, 54 USPQ2d 1308 (Fed. Cir. 2000).*

(n835) Footnote 295. *208 F.3d at 1359, 54 USPQ2d at 1311.*

(n836) Footnote 296. *208 F.3d at 1355, 54 USPQ2d at 1309-10.*

(n837) Footnote 297. *Watts v. XL Systems, Inc., 232 F.3d 877, 56 USPQ2d 186 (Fed. Cir. 2000).*

(n838) Footnote 298. *232 F.3d at 879, 56 USPQ2d at 1837.*

(n839) Footnote 299. *232 F.3d at 881, 56 USPQ2d at 1839.*

(n840) Footnote 300. *232 F.3d at 881, 56 USPQ2d at 1839.*

(n841) Footnote 301. *35 U.S.C. § 112.*

See *§ 8.04[2][e].*

(n842) Footnote 302. *Seal-Flex, Inc. v. Athletic Track & Court Construction, 172 F.3d 836, 850 n.5, 50 USPQ2d 1225, 1234 n.5 (Fed. Cir. 1999)* (RADER, concurring: "Only a few cases have found the existence of a step-plus-function claim element. *See, e.g., In re Roberts, 470 F.2d 1399, 176 USPQ 313 (CCPA 1973)* (finding § 112, P 6 (then P 3) applicable to claim element which recited 'reducing the coefficient of friction to below about 0.40.'); *Ex Parte Zimmerly, 153 USPQ 367 (BPA 1966)* (finding § 112, P 6 (then P 3) applicable to claim element which recited 'raising the pH.')."); *Serrano v. Telular Corp., 111 F.3d 1578, 42 USPQ2d 1538 (Fed. Cir. 1997),* discussed at *§ 18.07[6][d]*; *Fonar Corp. v. General Electric Co., 107 F.3d 1543, 41 USPQ2d 1801 (Fed. Cir. 1997), cert. denied, 522 U.S. 908 (1997),* discussed at *§ 18.07[7].*; *SDS USA, Inc. v. Ken Specialties, Inc., 107 F. Supp.2d 574 (D. N.J. 2000)* (claim phrase, "transferring ribbon stock through a passage formed by a guide", is *not* a Section 112/6 step-plus-function clause); *CIVIX-DDI, LLC v. Microsoft Corp., 84 F. Supp.2d 1132 (D. Colo. 2000), aff'd, 18 Fed. Appx. 892 (Fed. Cir. 2001)* (nonprecedential); *Thomson Consumer Electronics, Inc. v. Innovatron, S.A., 43 F. Supp.2d 26, 31 (D. D.C. 1999)* (patent claim to electronically connecting a portable card required "bringing, respectively, said corresponding contact surfaces of said electrically conductive terminals into contacting relationship with said corresponding contact surfaces of said conductor elements."; "bringing" is not a Section 112, paragraph 6, step clause); *Level One Communications, Inc. v. Seeq Technology, Inc., 987 F. Supp. 1191 (N.D. Calif. 1997); Caterpillar Inc. v. Detroit Diesel Corp., 961 F. Supp. 1249, 41 USPQ2d 1876 (N.D. Ind. 1996), aff'd, 194 F.3d 1336 (Fed. Cir. 1999)* (unpublished), discussed *infra.*

Cf. *Sandisk Corp. v. Lexar Media, Inc., 91 F. Supp.2d 1327, 1333-34 (N.D. Calif. 2000)* ("Method claims, unlike means-plus-function claims, are not limited to the structures disclosed in a specification for the performance of the method.").

(n843) Footnote 303. *Caterpillar Inc. v. Detroit Diesel Corp., 961 F. Supp. 1249, 41 USPQ2d 1876 (N.D. Ind. 1996), aff'd, 194 F.3d 1336 (Fed. Cir. 1999)* (unpublished).

See also *Level One Communications, Inc. v. Seeq Technology, Inc., 987 F. Supp. 1191, 1206 (N.D. Calif. 1997)* (patent's claim 8 to "[a] method for transmit equalization comprising the steps of: a) receiving input data in a non-return to zero format and providing mnltiplexer control signals in response thereto; b) storing output data representing a plurality of predetermined waveforms; c) multiplexing the output data representing one of the predetermined waveforms into a bus; d) de-skewing the output data on the bus; e) converting the output data on the bus into a differential analog signal; and f) impressing the analog signal onto a transmission line"; "Claim 8 is not written as a means-plus-function claim, nor does the word 'steps' in the preamble make it so; such a reading would make every process claim into a means-plus-function claim by definition. Rather, it is written as a standard process or method claim. ... Whether it should also be read as a means-plus-function claim depends on whether it adequately recites the structures for the functions it describes. ... [W]hether the patent examiner analyzed the claim under section 112(6) is not determinative, particularly since the ... patent issued before the Federal Circuit conclusively held that application of section 112(6) was part of the patent determination made by the PTO. *In re Donaldson ...* ."; "Reviewing Claim 8 on an element-by-element basis, the court concludes that Claim 8 is not a means-plus-function claim. Each of the functions recited as part of the claimed method have a corresponding structure that is evident from the language of Claim 8 itself or from Claim 1.").

(n844) Footnote 304. *961 F. Supp. at 1255, 41 USPQ2d at 1882.*

The district court rejected the patentee's argument that "no authority exists for the application of paragraph 6 to method claims." *961 F. Supp. at 1252, 41 USPQ2d at 1879.*

"[T]he court concludes that, contrary to [the patentee's] assertion, paragraph six of § 112 applies to method claims, and not only to apparatus claims. The court's conclusion is based on the statute's plain language, commentary of one of its drafters, case law at the time of enactment of paragraph six and since then, and on Patent and Trademark Office guidelines.

"[P]aragraph six of § 112 does not define a new and distinct variety of patent claim. Rather, the plain language of paragraph six makes clear that the method it prescribes applies on an element-by-element basis and that it applies to both apparatus and methods claims ... From the statute courts derive the terms 'means-plus-function' and 'step-plus-function' for functional language contained in apparatus and methods claims respectively.

"Commentary by one of paragraph six's drafters supports its application to method/process claims. The Reviser's Notes regarding paragraph six included the following comment by P.J. Federico, then Examiner-in-Chief of the Patent Office:

'The last paragraph of section 112 relating to so-called functional claims is new. It provides that an element of a claim for a combination (and a combination may be not only a combination of mechanical elements, but also a combination of substances in a composition claim, or steps in a process claim) may be expressed as a means or step for performing a specified function, without the recital of structure, material or acts in support thereof.'

2 Chisum, Patents, § 8.04[2][a] at 8-64 (citing Federico, Commentary on the New Patent Act, *35 U.S.C.A. 1,* 25-26 (1954)). ... That paragraph six applies to method/process claims also finds support in PTO guidelines published in the wake of the Federal Circuit's decision in *In re Donaldson Inc., 16 F.3d 1189, 1193-1194 (Fed. Cir. 1994).* Charles E. Van Horn (PTO Patent Policy and Projects Administrator), PTO Notice on Means or Step Plus Function Limitation Under *35 U.S.C. Section 112,* 6th Paragraph, 47 Pat. Trademark & Copyright J. (BNA) 571, 571 (1994) ... . The guidelines (which were 'distributed to patent examiners for guidance on examining practice and procedure' and 'incorporated into the Manual of Patent Examining Procedure') begin by setting forth six examples of elements of claims that are written in functional language that invokes paragraph six of § 112. ... The guidelines' last two examples are elements of process claims from *In re Roberts, 470 F.2d 1399 (C.C.P.A. 1973),* and *Ex parte Zimmerley, 153 U.S.P.Q. 367 (Bd. App. 1966),* respectively:

"(5) reducing the coefficient of friction of the resulting film [step plus function; 'step' unnecessary], and

"(6) raising the Ph [sic] of the resultant pulp to about 5.0 to precipitate ...'

The guidelines also provide that 'step' and 'act' are related in the same way as 'means' and 'structure.'

"In *Roberts*, the Court of Customs and Patent Appeals reversed the examiner's rejection of four method claims. ... The examiner's rejection was based on the claims' functional language; the examiner thought the step of ' "reducing the coefficient of fiction--to below about 0.40" define[d] a result but fail[ed] to identify the specific act or acts required to produce the result claimed.' ... The court disagreed with the examiner's conclusion because '[t]he [sixth] paragraph of [section 112] specifically allows the use of functional language to define claim limitations.' ... '[T]he absence in the claim of specific steps which would bring about the desired friction property is no defect. The claims define the limits of the claimed invention, and it is the function of the specification to detail how this invention is to be practiced.' ... In *Zimmerley*, the Patent Office Board of Appeals reversed a rejection of a method claim for failing to particularly point out and distinctly claim the invention; specifically, the examiner thought that the claim element of 'raising the ph level of the resultant pulp to about 5.0 to precipitate dissolved molybdenum as molybdenum trihydroxide' should have recited a specific way of raising the pH level. ... The court found the examiner's rejection improper because paragraph six of § 112 'sanctions functionally defined steps in claims drawn to a combination of steps.'

"In *In re Cohn, 58 C.C.P.A. 996, 438 F.2d 989 (1971),* the court noted that paragraph six of § 112 applies to allow functional language in a method claim, though it went on to find inexplicable inconsistencies within the claims at issue and affirmed the examiner's rejection of the patent as indefinite under the second paragraph of § 112. *438 F.2d at 999* ('It is true that claim language which expresses performing particular steps until a given result or state is reached, or a given condition obtained, may be proper under § 112, [sixth] paragraph.')."

961 F. Supp. at 1253-55, 41 USPQ2d at 1880-82.

(n845) Footnote 305. In *Caterpillar*, the patent concerned "a system providing variable engine power while using vehicle cruise control." Claim 1 was to:

1. A method of operating a vehicle engine (12) equipped with a cruise control (44) which is engageable to control the speed of the vehicle (38) in response to a set speed wherein the engine includes a fuel delivery system (14) which is responsive to a command signal to in turn control the rate of fuel delivery to the engine, comprising the steps of:

providing a memory (86) having stored therein two sets of data representing two different fuel delivery limit curves wherein each fuel delivery limit curve defines predetermined fuel delivery limits as a function of engine speed;

determining when the cruise control (44) is engaged;

retrieving one of the sets data from the memory (86) representing one of the fuel deliver limit curves when the cruise control (44) is engaged;

retrieving the other set of data from the memory (86) representing the other fuel delivery limit curve when the cruise control (44) is not engaged; and

using the retrieved data to develop the command signal."

961 F. Supp. at 1250, 41 USPQ2d at 1878. The court noted that the claim's elements "are written as steps-plus-functions" but that this "factor ... is not determinative." The Federal Circuit's *Greenberg* decision "teaches that an element's language is not dispositive of whether § 112(6) applies ... and that the court should consider whether the functional term has a 'reasonably well understood meaning in the art,' and the drafter's intent, as may be evidenced by the language, reference to other elements or claims, and the prosecution history." *961 F. Supp. at 1256, 41 USPQ2d at 1882.*

(n846) Footnote 306. *Fonar Corp. v. General Electric Co., 107 F.3d 1543, 41 USPQ2d 1801 (Fed. Cir. 1997), cert. denied, 522 U.S. 908 (1997),* discussed at *§ 18.07[7].*

(n847) Footnote 307. *107 F.3d at 1550, 41 USPQ2d at 1806.*

(n848) Footnote 308. *107 F.3d at 1550, 41 USPQ2d at 1806.*

(n849) Footnote 309. *Serrano v. Telular Corp., 111 F.3d 1578, 42 USPQ2d 1538 (Fed. Cir. 1997),* discussed at § 18.07(6)(d).

(n850) Footnote 310. *111 F.3d at 1583, 42 USPQ2d at 1542.*

(n851) Footnote 311. *111 F.3d at 1583, 42 USPQ2d at 1542.*

(n852) Footnote 312. *O.I. Corp. v. Tekmar Co., Inc., 115 F.3d 1576, 42 USPQ2d 1777 (Fed. Cir. 1997),* discussed at § 18.07(4)(a).

See also *CIVIX-DDI, LLC v. Microsoft Corp., 84 F. Supp.2d 1132, 1148-49 (D. Colo. 2000), aff'd, 18 Fed. Appx. 892 (Fed. Cir. 2001)* (nonprecedential) ("merely claiming a step or even a series of steps without recital of a function does not implicate *35 U.S.C. § 112* P 6."; a patent's claim read, pertinent part: " 'A method for identifying the location within a predetermined region of a selected group of a set of a plurality of subscribers relative to the location of a user station comprising, providing to said user station map electronic information representing a map of said predetermined region around said user station, providing to said user station subscriber electronic information representing the location and at least one characteristic for each subscriber of said set of subscribers, said at least one characteristic being common to the members of a group, selecting at said user station at least one of said characteristics as a group characterization identifying a group of said subscribers, searching said subscriber electronic information with respect to said group characterization, and providing said map at said user location displaying the locations of members of said selected group identified by said group characterization relative to the location of said user station."; accused infringers argued that "the emphasized elements of this claim, beginning with the terms providing, providing, selecting, searching, providing, constitute steps-plus-function limitations. *35 U.S.C. § 115* P 6. I disagree. Although not determinative, the term 'step for' does not appear in this method claim. *See Seal-Flex, Inc. v. Athletic Track and Court Construction, 172 F.3d 836, 849 (Fed. Cir. 1999)* (Rader, J., concurring) (holding that only the words 'step for' raise the presumption that *35 U.S.C. § 112* P 6 applies). Further, this method claim is not composed of steps aimed at performing a specified function.").

(n853) Footnote 313. *115 F.3d at 1582, 42 USPQ2d at 1781.*

(n854) Footnote 314. *115 F.3d at 1582-1583, 42 USPQ2d at 1781-1782.*

(n855) Footnote 315. *115 F.3d at 1583, 42 USPQ2d at 1782.*

(n856) Footnote 316. *115 F.3d at 1583, 42 USPQ2d at 1782.*

See also *Charles E. Hill & Associates, Inc. v. Compuserve, Inc., 65 F. Supp.2d 924, 929 (S.D. Ind. 1999), aff'd in part, rev'd in part, vacated in part and remanded, 33 Fed. Appx. 527* (Fed. Cir.), *reh'g denied, 34 Fed. Appx. 740 (Fed. Cir. 2002)* (nonprecedential) ("This paragraph of § 112 'is implicated only when steps plus *function* without acts are present' in the claim. *O.I. Corp., 115 F.3d at 1583* (emphasis in original).' Merely stating in the preamble of a patent claim the overall purpose of the process or method, and describing a series of steps to be performed to reach that result, does not convert each step into a step-plus-function element. *Id.* Unless the step is 'individually associated' with a function to be performed by that step, it does not implicate § 112, P 6. *Id.*").

(n857) Footnote 317. Accord: *Epcon Gas Systems, Inc. v. Bauer Compressors, Inc., 279 F.3d 1022, 1028, 61 USPQ2d 1470 (Fed. Cir. 2002)* (a district court "erred in analyzing" a method claim "according to § 112, paragraph 6" merely because it was similar to an apparatus claim that the patent owner conceded was subject to § 112, paragraph 6."; the method claim was "a garden variety process claim."; "For a method claim, § 112, paragraph 6 is implicated only when steps plus function without acts are present. *O.I. Corp. v. Tekmar Co. Inc., 115 F.3d 1576, 1583, 42 USPQ2d 1777, 1782 (Fed. Cir. 1997).*"; "Merely claiming a step by itself, or a series of steps, without recital of a function does not trigger the application of § 112, paragraph 6. Furthermore, method claims that 'parallel,' or have limitations similar to, apparatus claims admittedly subject to § 112, paragraph 6 are not necessarily subject to the requirements of § 112, paragraph 6."); *Generation II Orthotics Inc. v. Medical Technology Inc., 263 F.3d 1356, 1368, 59 USPQ2d 1919 (Fed. Cir. 2001)* (applying *O.I. Corp.* : "The mere fact that a method claim is drafted with language parallel to an apparatus claim with means-plus-function language does not mean that the method claim should be subject to an analysis under § 112, paragraph 6. Rather, each limitation of each claim must be independently reviewed to determine if it is subject to the requirements of § 112, paragraph 6.").

(n858) Footnote 318. *115 F.3d at 1583-1584, 42 USPQ2d at 1782.*

(n859) Footnote 319. *115 F.3d at 1578, 42 USPQ2d at 1778.*

(n860) Footnote 320. " 'An apparatus for removing water vapor from an analyte slug passing between a sparge vessel, trap and analytical instrument, comprising:

(a) first *means for passing the analyte slug through a passage* heated to a first temperature higher than ambient, as the analyte slug passes from the sparge vessel to the trap; and

(b) second means for passing the analyte slug through the passage that is air cooled to a second temperature below said first temperature but not below ambient, as the analyte slug passes from the trap to the analytical instrument.' " *115 F.3d at 1579, 42 USPQ2d at 1779* (Emphasis added.)

(n861) Footnote 321. " 'A method for removing water vapor from an analyte slug passing between a sparge vessel, trap and gas chromatograph, comprising *the steps of*:

(a) *passing the analyte slug through a passage* heated to a first temperature higher than ambient, as the analyte slug passes from the sparge vessel to the trap; and

(b) *passing the analyte slug through the passage* that is air cooled to a second temperature below said first temperature but not below ambient, as the analyte slug passes from the trap to the gas chromatograph.' " *115 F.3d at 1579, 42 USPQ2d at 1779* (Emphasis added.).

(n862) Footnote 322. *115 F.3d at 1581, 42 USPQ2d at 1780.* The court noted:

"The recited function ... consists of passing the analyte slug through a passage, the analyte slug comprising a gas stream with contaminant and water vapor. Structure supporting the means for passing the analyte slug through the water management device containing the passage is not recited in the claim. Although the passage may act upon the slug by channeling it while it is being passed, it is not the means that causes the passing. Rather, it is the place where the function occurs, not the structure that accomplishes it. Thus, although [the] claim ... is a means-plus-function claim subject to section 112, P 6, it is not so in respect of the word 'passage.' " *115 F.3d at 1581, 42 USPQ2d at 1780.*

The court also noted that "[t]he specification ... fails to indicate structure for accomplishing the passing which would support the means. It does, however, explain that the water management device is located between the sparge vessel and the trap for use in a backflush or, alternatively, a foreflush system, and the passing therefore apparently

occurs by means known to those skilled in the art. Since we are not presented with the question whether the missing structure for carrying out the recited means limits the meaning of the claim, we will not dwell further on that question." *115 F.3d at 1581, 42 USPQ2d at 1780.*

(n863) Footnote 323. *115 F.3d at 1583, 42 USPQ2d at 1782.*

(n864) Footnote 324. *115 F.3d at 1582, 42 USPQ2d at 1781.*

(n865) Footnote 325. *115 F.3d at 1583, 42 USPQ2d at 1782.*

(n866) Footnote 326. *115 F.3d at 1583, 42 USPQ2d at 1782.*

(n867) Footnote 327. See § 18.07(4)(a).

(n868) Footnote 328. *Seal-Flex, Inc. v. Athletic Track & Court Construction, 172 F.3d 836, 50 USPQ2d 1225 (Fed. Cir. 1999).*

(n869) Footnote 329. The patent concerned a "method for constructing an all-weather activity mat on a foundation." See § 18.03(5)(c)(iii). The patent's claim 1 provided:

" 'A method for constructing an activity mat over a foundation comprising the steps of:

spreading an adhesive tack coating for adhering the mat to the foundation over the foundation surface;

spreading a first uniform layer of particulate rubber over the tack coating;

then, in sequence, first applying a liquid latex binder to the previously spread rubber layer in sufficient quantity to coat substantially all rubber particles of said layer then air drying said applied mixture until substantially no liquid is visible, then spreading a succeeding uniform layer of particulate rubber over the preceding layers; and

continuing the aforesaid sequential application of latex binder, air drying the binder followed by the spreading of a uniform layer of rubber over the preceding layers until the approximate desired thickness for the mat is achieved.'

(emphasis added)." *172 F.3d at 839, 50 USPQ2d at 1226.*

The patent owner sued the accused infringer alleging infringement. The district court grant summary judgment that the patent was invalid because of a Section 102(b) bar. The Federal Circuit reversed. *Seal-Flex, Inc. v. Athletic Track & Court Constr., 98 F.3d 1318, 40 USPQ2d 1450 (Fed. Cir. 1996).*

At a trial on infringement, the patent owner introduced evidence showing that the accused infringer, inter alia, "began construction by spraying the foundation with a coat of latex." The accused infringer "contended that the claims do not encompass the use of latex as the 'adhesive tack coating.' " Both the accused infringer and the patentee "agreed that the first element of claim 1 ... invoked the application of *35 U.S.C. § 112,* P 6 (1994)." *172 F.3d at 840-41, 50 USPQ2d at 1227.*

The trial court instructed the jury that "to find literal infringement of claim 1 ... , it must find that [the accused infringer] uses a material to perform the identical function and that the material used for performing that function was the same as or equivalent to the corresponding materials disclosed in the specification." *172 F.3d at 841, 50 USPQ2d at 1227.* "[T]he jury returned a verdict finding that [the accused infringer] had literally infringed the ... patent." *172 F.3d at 841, 50 USPQ2d at 1227.*

(n870) Footnote 330. "This court reviews the first step, claim construction, without deference to the trial court. *See Cybor Corp. v. FAS Techs., Inc.* ... (Fed. Cir. 1998) (en banc); *Markman v. Westview Instruments, Inc.* ... (Fed. Cir. 1995) (en banc), *aff'd* ... (1996). However, where, as here, the parties agree to a particular construction of the claims which is adopted by the district court, and neither party disputes that construction on appeal, this court declines to raise an issue *sua sponte* which the parties have not presented on appeal." *172 F.3d at 842, 50 USPQ2d at 1228.*

(n871) Footnote 331. *172 F.3d at 843, 50 USPQ2d at 1229.* "According to (the accused infringer), the parties agreed 'that the first step ... involves a ... "means-plus-function" element.' (The patentee's) trial arguments, however, make it clear that (the patentee) interpreted this as a step-plus-function element. In its appeal brief, (the patentee) states only that the parties agreed 'that the language ... brought § 112 equivalents into play' without further identifying whether means or step- plus-function treatment is appropriate.

"Although this court has previously held that, in § 112, P 6, 'structure' and 'material' are associated with means-plus-function claim elements while 'acts' is associated with step-plus-function claim elements, *see O.I. Corp. v. Tekmar Co. Inc.* ... (Fed. Cir. 1997) ('In this paragraph, structure and material go with means, acts go with steps.'), the district court's jury instructions apparently combined mean-plus-function and step-plus-function analyses. Specifically, the district court instructed the jury that

'Claim 1 ... includes the step of spreading an adhesive tack coating for adhering the mat to [the] foundation over the foundation surface, which is written in the form of a step for performing a function. An element in a claim for a combination may be expressed as a step for performing a specified function without the recital of material, or acts in support thereof, and such claim shall be construed to cover the corresponding material or acts described in the specification and equivalents thereof.'

"After thus instructing the jury that this claim element was in step-plus-function form, the district court instructed the jury to decide 'whether ... [the accused infringer] used a material which performed the function of adhering the mat to the foundation over the foundation surface.' The district court next instructed the jury that if it found that [the accused infringer] used a material to perform this function, it must then 'determine whether the material ... [the accused infringer] is the same as those disclosed by that function in the patent specification or an equivalent.' " *172 F.3d at 842-43, n.3, 50 USPQ2d at 1229, n.3.*

"Therefore, the district court instructed the jury to determine whether the material used by [the accused infringer] for performing the claimed function was equivalent to those disclosed in the ... patent specification." *172 F.3d at 843, 50 USPQ2d at 1229.*

(n872) Footnote 332. See § 18.03(5)(c)(iii).

(n873) Footnote 333. "(T)he parties' agreement on claim interpretation invokes special treatment under title 35. ... (T)his court has an obligation to independently determine whether § 112, P 6 applies to the claim element at issue in this case. Particularly, ... identifying whether this element is a means-plus-function element, a step-plus-function element, or neither, is crucial to a proper determination of this case. The facts show that the parties themselves were uncertain about applying § 112, P 6. The district court's jury instructions further reflect this confusion." *172 F.3d at 847, 50 USPQ2d at 1232.*

Compare *Infigen, Inc. v. Advanced Cell Technology, Inc., 65 F. Supp.2d 967, 976 (W.D. Wis. 1999)* (an accused infringer's argument that a claim to a method for cloning cattle "must be read as covering the corresponding acts described in the specification because the claim is written to cover functions without specifying how the functions are to be achieved" "may be correct," but the argument was not timely, having been raised only in a reply belief and not sufficiently developed).

(n874) Footnote 334. "Although similar, means and step-plus-function claim elements are not identical and require distinct analyses. This court has rarely examined step-plus-function claim elements; however, the language of § 112, P 6 and this court's means-plus-function case law give guidance for determining whether a claim element is in step-plus-function form so as to invoke the statute's claim interpretation requirements.

"The statute explicitly authorizes expressing claim elements in both means-plus-function and step-plus-function form. ... The statute's format and language suggest a strong correlation between means and step-plus-function claim elements in both their identification and interpretation. Based on the arrangement of § 112, P 6, it is apparent that 'structure' and 'material' are associated with 'means,' while 'acts' is associated with 'step.' *See O.I. Corp. v. Tekmar Co. Inc.* ... (Fed. Cir. 1997) ('In this paragraph, structure and material go with means, acts go with steps.'). Therefore, a claim element deserves means-plus-function treatment when 'expressed as a means ... for performing a specified function without the recital of *structure* [or] *material* ... in support thereof.' *Id.* (emphasis added). Similarly, a claim element deserves step-plus-function treatment when 'expressed as a ... step for performing a specified function without the recital of ... *acts* in support thereof.' *Id.* (emphasis added).

"The correlation between means-plus-function and step-plus-function claim elements assists the difficult process of identifying step-plus-function claim elements." *172 F.3d at 848, 50 USPQ2d at 1232-33.*

(n875) Footnote 335. "This court has set forth a structured analysis for determining whether the elements of a claim are in means-plus-function form. Specifically, if the word 'means' appears in the claim element, there is a presumption that it is a means-plus-function element to which § 112, P 6 applies. ... This presumption is overcome if the claim itself

recites sufficient structure or material for performing the claimed function or when it fails to recite a function associated with the means.

"When an element of a claim does not use the term 'means,' treatment as a means-plus-function claim element is generally not appropriate. ... However, when it is apparent that the element invokes purely functional terms, without the additional recital of specific structure or material for performing that function, the claim element may be a means-plus-function element, despite the lack of express 'means' language.

"Given the parallel format of the statute, a similar analysis applies to step-plus-function claim elements. Certain phrases trigger a presumption that § 112, P 6 applies, but other aspects of the element, such as the recitation of a specific act, may overcome that presumption."

172 F.3d at 848, 50 USPQ2d at 1233.

(n876) Footnote 336. "The difficulty of distinguishing acts from functions in step-plus-function claim elements, however, makes identifying step-plus-function claims inherently more problematic. This difficulty places a significant burden on the claim drafter to choose language with a definite and clear meaning. To invoke a presumption of § 112, P 6 application, a claim drafter must use language that expressly signals the recitation of a function as distinguished from an act." *172 F.3d at 848-49, 50 USPQ2d at 1233.*

(n877) Footnote 337. "As used in § 112, *P 6*, 'step' is the generic term for 'acts' in the same sense that 'means' is the generic term for 'structure' and 'material.' ... The word 'step,' however, may introduce either an act or a function depending on context within the claim. Therefore, use of the word 'step,' by itself, does not invoke a presumption that § 112, P 6 applies. For example, method claim elements may begin with the phrase 'steps of' without invoking application of § 112, P 6. ... The phrase 'steps of' colloquially signals the introduction of specific acts, rather than functions, and should therefore not presumptively invoke application of § 112, P 6. Similarly, using 'of' in an apparatus claim would probably be understood to introduce structure or materials rather than a function (i.e., 'by means *of* a stick').

"Unlike 'of,' the preposition 'for' colloquially signals the recitation of a function. Accordingly, the phrase 'step for' generally introduces functional claim language falling under § 112, P 6. ... Thus, the phrase 'step for' in a method claim raises a presumption that § 112, P 6 applies.

"This presumption gives legal effect to the commonly understood meanings of 'of'--introducing specific materials, structure or acts--and 'for'--introducing a function." *172 F.3d at 849, 50 USPQ2d at 1233-34.*

(n878) Footnote 338. "Even when a claim element uses language that generally falls under the step-plus-function format, however, § 112, P 6 still does not apply when the claim limitation itself recites sufficient acts for performing the specified function... . Therefore, when the claim language includes sufficient acts for performing the recited function, § 112, P 6 does not apply." *172 F.3d at 849, 50 USPQ2d at 1234.*

(n879) Footnote 339. "Again similar to a means-plus-function analysis, the absence of the phrase 'step for' from the language of a claim tends to show that the claim element is not in step-plus-function form. However, claim elements without express step-plus-function language may nevertheless fall within § 112, P 6 if they merely claim the underlying function without recitation of acts for performing that function." *172 F.3d at 849, 50 USPQ2d at 1234.*

(n880) Footnote 340. *172 F.3d at 849, 50 USPQ2d at 1234.*

(n881) Footnote 341. *172 F.3d at 849-50, 50 USPQ2d at 1234.*

(n882) Footnote 342. "(C)laim 1 ... uses the phrase 'steps of' in the preamble to introduce several 'steps.' The specific element at issue recites the step of 'spreading an adhesive tack coating for adhering the mat to the foundation over the foundation surface.' Because the phrase 'step for' is lacking in both the preamble and the disputed claim element, this language tends to show that the verb 'spreading' recites an act rather than a function. However, if an examination of the claim element reveals that it recites only the underlying function, § 112, P 6 nonetheless applies. Therefore, this court next looks to whether the claim element recites only the underlying function of the element itself as opposed to an act for performing it.

"Although claim 1 recites several 'steps' 'for constructing an activity mat over a foundation,' the recitation of the overall function of the claim in the preamble does not suffice to convert each element into an act for performing that function so as to preclude application of § 112, P 6. Rather, according to the statute, each element must be examined individually to determine whether it merely recites that element's function or a specific act for performing it.

"If the language of the claim element does not expressly state its function, the function of that element may nonetheless be discernible from the context of the overall claim and the disclosure in the specification. In *O.I. Corp.*, for example, the functions of the elements at issue were not explicitly recited. Both of the elements in the *O.I. Corp.* claim recited 'passing the analyte slug through [a temperature controlled] passage.' This court's review disclosed that each of these elements recited an act. ... Therefore, this court appropriately declined to apply § 112, P 6.

"The contested element in this case is therefore not in classical step-plus-function form. Moreover, this element recites more than a function, namely the claimed act of 'spreading.' Unlike the claim elements in *O.I. Corp.*, the function of the element at issue in this case, namely, 'adhering the mat to the foundation,' appears explicitly in the claim language. The preposition 'for' introduces this underlying function and links the 'adhering' function to the act of 'spreading.' In other words, the function of 'adhering' is the result achieved by performing the claimed act of 'spreading.' The claim discloses 'spreading' as an act by using the introductory terms 'steps of.' If, instead of this language, this limitation had claimed 'a step for adhering the mat to the foundation,' without the additional recitation of an act or acts for 'adhering,' then § 112, P 6 would have governed its interpretation. Likewise, if this claim limitation had specified only the underlying function, namely, 'adhering the mat to the foundation,' without recital of specific acts for 'adhering,' § 112, P 6 would have governed, despite the lack of 'step for' language."

"Here, however, because the claim drafter did not use the phrase 'step for' and claimed acts for performing the underlying function, I perceive that the district court erred by construing this limitation as a step-plus-function element."

"For reasons similar to why this disputed claim element does not register as a step-plus-function element, it also does not register as a means-plus-function element. In the first place, the claim language does not use the traditional term 'means.' ... Furthermore, the term 'adhesive tack coating' in the disputed element of claim 1 is a sufficient disclosure of material for performing the claimed function to preclude application of § 112, P 6. For these reasons, § 112, P 6 does not govern interpretation of this claim element." *172 F.3d at 850-51, 50 USPQ2d at 1235.*

(n883) Footnote 343. *172 F.3d at 851, 50 USPQ2d at 1235.*

(n884) Footnote 344. *172 F.3d at 852, 50 USPQ2d at 1236.*

(n885) Footnote 345. *Micro Chemical, Inc. v. Great Plains Chemical Co., 194 F.3d 1250, 52 USPQ2d 1258 (Fed. Cir. 1999).*

(n886) Footnote 346. *194 F.3d at 1253, 52 USPQ2d at 1259;* U.S. Pat. No. 4,733,971.

(n887) Footnote 347. In the "loss of weight" alternative, "a load cell supporting each storage bin measures the bin weight. By measuring the decreasing bin weight, the CPU again ensures that a proper amount of each ingredient enters the slurry. ... A variation of this embodiment measures the amount of microingredient dispensed from the storage bin using a weight per unit time formula, or volumetric metering mode, rather than a load cell. ... Yet another embodiment uses volumetric measurement of liquid microingredients in combination with weight measurement of solid microingredients." *194 F.3d at 1254, 52 USPQ2d at 1262.*

(n888) Footnote 348. *194 F.3d at 1254, 52 USPQ2d at 1262.*

(n889) Footnote 349. *194 F.3d at 1259, 52 USPQ2d at 1264.*

(n890) Footnote 350. The "corresponding acts include all acts described in the specification for dispensing microingredient quantities measured by weight. These acts include the cumulative weigh method of the preferred embodiment and the loss of weight method of the alternative embodiment, as well as the weigh dump method of the prior art. *See Intel Corp. v. United States Int'l Trade Comm'n* ... (Fed. Cir. 1991) ('It is not necessary to consider the prior art in applying section 112, paragraph 6. Even if the prior art discloses the same or an equivalent structure, the claim will not be limited in scope thereby . ... Claim limitations may, and often do, read on the prior art, particularly in combination [claims].'). In sum, the patent specification describes each of these methods as a way to accomplish the desired function of dispensing predetermined weights of microingredients without substantial intermixing prior to entry into the liquid.

"Although the applicant noted in the patent's background section that a particular piece of prior art which practiced the weigh dump method was less effective than the preferred embodiment in accomplishing the claimed function, the weigh dump method itself was nowhere disavowed as being incapable of performing that function. To the contrary, the specification specifically included this prior art as a component of the combination claim." *194 F.3d at 1259-60, 52 USPQ2d at 1264.*

(n891) Footnote 351. *194 F.3d at 1260, 52 USPQ2d at 1265.*

(n892) Footnote 352. "The disputed limitations are 'dispensing predetermined weights of selected said additive concentrates into a liquid carrier with no substantial intermixing of the additive concentrates before they enter the liquid carrier' and 'weighing predetermined amounts of selected said additives, with no substantial intermixing of the selected additives during the weighing process.' The weigh dump method satisfies the ordinarily understood meanings of these claim limitations. The weigh dump method weighs predetermined amounts of the microingredients and dispenses them into the liquid carrier with no substantial intermixing of microingredients during the weighing process. (The accused infringer) odes not dispute this. Rather, (its) efforts to avoid infringement rested primarily on incorporation of a cumulative weighing requirement into the method claims. The claim language, however, does not require such an incorporation. The district court erred by limiting the disputed method claims to the cumulative weigh method of the preferred embodiment. The dispensing and weighing elements of the method claims encompass the accused method." *194 F.3d at 1260, 52 USPQ2d at 1265.*

(n893) Footnote 353. *Texas Instruments, Inc. v. U.S. Int'l Trade Comm'n, 805 F.2d 1558, 231 USPQ 833 (Fed. Cir. 1986), opinion on denial of reh'g, 846 F.2d 1369, 6 USPQ2d 1886* (Fed. Cir.), *reh'g in banc denied, 7 USPQ2d 1414 (Fed. Cir. 1988),* discussed at *§ 18.04[4][f].*

(n894) Footnote 354. *805 F.2d at 1570, 231 USPQ at 840.*

See also *Deuterium Corp. v. United States, 16 Cl. Ct. 361, 11 USPQ2d 1481, 1486 n.6 (Cl. Ct. 1989), further opinion, 19 Cl. Ct. 624, 14 USPQ2d 1636 (Cl. Ct. 1990)* ("Where the rapidity of technological advances within a field result[s] in multiple minor departures from a literal reading of the claim, the totality of change in the invention as a whole may override a holding of infringement.").

Compare *B.F. Goodrich FlightSystems Inc. v. Insight Instruments Corp., 22 USPQ2d 1832, 1836 n.3 (S.D. Ohio 1992), aff'd, 991 F.2d 810 (Fed. Cir. 1993)* (unpublished) ("The descriptions advanced in *Texas Instruments* were described in *Intel Corp. v. International Trade Comm'n, 946 F.2d 821, 20 USPQ2d 1161 (Fed. Cir. 1991)* as dicta, and are apparently useful as analogous interpretive guides only. Thus, to the extent the *Texas Instruments* language may help to animate the otherwise undefined and esoteric concept of structural equivalents in a means plus function limitation, the Court presumes the Federal Circuit would not disapprove reliance upon those concepts in this case.").

(n895) Footnote 355. The court noted that the inventors' prototype calculator "was accepted for the permanent collection of the *Smithsonian's Museum of History and Technology." 805 F.2d at 1561, 231 USPQ at 834.*

(n896) Footnote 356. Claim 1 of the patent (U.S. Pat. No. 3,819,921) provides:

"1. A miniature, portable, battery operated electronic calculator comprising:

a. input means including a keyboard for entering digits of numbers and arithmetic commands into said calculator and generating signals corresponding to said digits and said commands, the keyboard including only one set of decimal number keys for entering plural digits of decimal numbers in sequence and including a plurality of command keys;

b. electronic means responsive to said signals for performing arithmetic calculations on the numbers entered into the calculator and for generating control signals, said electronic means comprising an integrated semi-conductor circuit array located in substantially one plane, the area occupied by the integrated semiconductor array being no greater than that of the keyboard, said integrated semiconductor circuit array comprising:

i. memory means for storing digits of the numbers entered into the calculator,

ii. arithmetic means coupled to said memory means for adding, subtracting, multiplying and dividing said numbers and storing the resulting answers in the memory means, and

iii. means for selectively transferring numbers from the memory means through the arithmetic means and back to the memory means in a manner dependent upon the commands to effect the desired arithmetic operation;

c. means for providing a visual display coupled to said integrated semiconductor circuit array and responsive to said control signals for indicating said answer; and

d. the entire calculator including keyboard, electronic means, means for providing a visual display, and battery being contained within a 'pocket sized' housing."

805 F.2d at 1561, 231 USPQ at 834.

(n897) Footnote 357. See § 16.05(3).

(n898) Footnote 358. *805 F.2d at 1569, 231 USPQ at 839.*

The court stressed that *35 U.S.C. § 112,* paragraph 6 "provides, and extensive judicial analysis has reinforced, that when the claimed invention is a novel combination of steps, all possible methods of carrying out each step of the combination are not required to be described in the specification":

"The purpose is to grant the inventor of a combination invention a fair scope that is not dependent on a catalogue of alternative embodiments in the specification. This court has cautioned against limiting the claimed invention to preferred embodiments or specific examples in the specification. ... The details of performing each step need not be included in the claims unless required to distinguish the claimed invention from the prior art, or otherwise to specifically point out and distinctly claim the invention."

805 F.2d at 1562-63, 231 USPQ at 835.

(n899) Footnote 359. *805 F.2d at 1569, 231 USPQ at 840.*

(n900) Footnote 360. *805 F.2d at 1570, 231 USPQ at 840.*

Compare *American Standard Inc. v. Pfizer Inc., 722 F. Supp. 86, 106, 14 USPQ2d 1673, 1688-89 (D. Del. 1989)* ("Since the equivalence of the subsequently developed devices is established by showing only accomplishment of the same result, the sum total of the technological changes effecting the characteristics of the [accused structure] does not alter the primary function ... beyond what the inventor disclosed and, therefore, does not place the accused products beyond the scope of the claims ... .").

(n901) Footnote 361. *805 F.2d at 1569, 231 USPQ at 839-40.*

(n902) Footnote 362. *805 F.2d at 1570, 231 USPQ at 841.*

The court denied a petition for rehearing of its holding of no literal infringement. *846 F.2d 1369, 6 USPQ2d 1886 (Fed. Cir. 1988).* Because the functions recited in the three means-plus-function elements of the claim to the pocket calculator "viewed solely as functions, were in the calculator prior art," and because "the patentability of the combination depended on the totality of changes in the structures by which the functions were performed," "the equivalency of each changed means is evaluated in the context of the accused device as a whole."

"It is a distortion of the accused devices to evaluate the equivalency of each changed means as if *all* the other functions are performed by the original means described in the ... specification. To do so is to evaluate some theoretical device made up of all but one of the patentee's disclosed structures plus one new structure: a device that does not exist ...

"Each function in a claim is part of a combination, not a separate invention. In cases ... in which all functions are performed but multiple means are changed, the equivalency of each changed means is appropriately determined in light of the other structural changes in the combination. As in all cases involving assertions of equivalency, wherein the patentee seeks to apply its claims to structures not disclosed by the patentee, the court is required to exercise judgment. In cases of complex inventions, the judgment must take account of situations where the components of the claimed combination are of varying importance or are changed to varying degrees. This is done by viewing the components in combination."

846 F.2d at 1372, 6 USPQ2d at 1988-89.

(n903) Footnote 363. *805 F.2d at 1571, 231 USPQ at 841.*

(n904) Footnote 364. *805 F.2d at 1571-72, 231 USPQ at 841.*