United States District Court,
D. Colorado.

LASER TECHNOLOGY, INC., a Delaware corporation,
Plaintiff.
v.
NIKON, INC., a New York corporation, and Asia Optical Co., Inc., a Taiwanese corporation,
Defendants.

No. CIV.A. 00-B-272(PAC)

Aug. 19, 2002.

Owner of patents for laser range finder sued competitor for infringement. On cross-motions for summary judgment, the District Court, Babcock, Chief Judge, held that: (1) three claims were not literally infringed; (2) fact issue existed as to whether remaining claims were literally infringed and whether any claims were equivalently infringed; and (3) patents were valid.

Motions granted in part and denied in part.

5,612,779, 6,057,910, 6,226,077. Construed, Valid, Not Infringed.

Ty Cobb, Andrew R. Shoemaker, Jed W. Caven, Hogan & Hartson, Denver, CO, for plaintiff.

Anthony J. Shaheen, Davis, Graham & Stubbs LLP, Denver, CO, Robert Charles Faber, Ostrolenk, Faber, Gerb & Soffen, New York City, Leonard J. Santisi, Brad Jon Hattenbach, Dorsey & Whitney, LLP, Denver, CO, Neil Peck, Snell & Wilmer, LLP, Denver, CO, for defendants.

MEMORANDUM OPINION AND ORDER

BABCOCK**, Chief Judge.**

This is a patent infringement action by Plaintiff Laser Technology, Inc. against Defendants Nikon, Inc. and Asia Optical Co., Inc. Plaintiff claims Defendants infringed upon twenty-one patent claims in three separate but related U.S. patents, U.S. Patent No. 5,612,779 ('779 patent), U.S. Patent No. 6,057,910 ('910 patent), and U.S. Patent No. 6,226,077 ('077 patent). The patents claim inventions for low-cost, high-quality laser range finders suitable for recreational use. Defendant Asia Optical manufactures such laser range finders in Taiwan and China, and sells them to distributors such as Defendant Nikon, Inc. for sale in the United States. Five of the patent claims are independent: Claim 11 of the '779 patent; Claim 18 of the '779 patent; Claim 25 of the '779 patent; Claim 8 of the '910 patent; Claim I of the '077 patent. The other sixteen claims are dependent on those five independent claims. The parties cross move for claim construction and summary judgment.

Three main features of the accused device, made by Asia Optical, are at issue: 1) whether the laser range finder assigns pulse values to received laser pulses; 2) whether the device includes an automatic noise threshold adjustment circuit; and 3) whether the device includes a precision timer for determining the time-of-flight of received laser pulses. *See* Plaintiff's Memorandum in Support of Its Combined (1) Cross-Motion

for Proposed Claim Construction and Summary Judgment and (2) Response to Defendants' Proposed Claim Construction and Motion for Summary Judgment (*Plaintiff's Memo*), 1-2.

There are two motions pending: 1) Plaintiff's Cross-Motion for Summary Judgment Including Markman Claim Construction; 2) Defendants' Cross-Motion for Summary Judgment Including Markman Claim Construction. Plaintiff contends its patent claims teach a definite structure to one of ordinary skill in the art. Id. at 2. Plaintiff further asserts that Defendants' mean-plus-function arguments fail because none of the claims of the patents-in-suit are means-plus-function claims. Plaintiff argues the patent claims at issue are not drafted in a way that would invoke 35 U.S.C. s. 112 para. 6. Id. Plaintiff contends Defendants' argument that certain claims are means-plus-function claims is an attempt to inappropriately narrow the claims so that they do not apply to the accused laser range finder. Id.

Defendants argue Plaintiff chose unclear language that does not adequately define some claim terms. Defendants' Reply Memorandum in Support of Their Proposed Claim Construction and in Opposition to Plaintiff's Proposed Claim Construction and Cross-Motion for Summary Judgment (*Defendants' Reply Memo*), 7. Therefore, Defendants contend the Court must reference specifications in the patent to understand the claim language, thereby invoking 35 U.S.C. s. 112, para. 6, and narrowing the meaning of some of the patent claims. Id. Defendants further argue that "the patent claims in suit are so limited in scope as to not extend to the accused Nikon/AOI laser range finder." *Defendants' Reply Memo,* 3.

Defendants state that there are three main concepts embodied in various combinations in the claims of the three patents-in-suit. Id. They are: "(a) a precision timing circuit for timing the time of flight of a laser pulse, (b) the assignment of pulse values to be used for enabling discriminating true return pulse from a noise pulse and (c) an automatic noise threshold adjustment to eliminate some noise pulse signals to enable the laser range finder to discriminate the return [pulses] from the noise pulses." Id.

Defendants argue that the accused Nikon/AOI laser range finder does not have any of the features claimed by Plaintiff because the device: "(a) does not have a timing circuit that clocks the flight time of a pulse, (b) ... does not automatically adjust the noise threshold to achieve a constant noise pulse firing rate, and does not adjust the noise threshold, (c) and ... does not assign any values or pulse values to any pulse signals." Defendants' Memorandum in Support of Their Proposed Claim Construction and Motion for Summary Judgment (*Defendants' Memo*), 3. Defendant argues that when the claims are properly construed their laser range finder is a different structure and practices a different method than those claimed in the patents-in-suit. Id.

Disputed Claim Language and Summary of Construed Claims

1) '779 patent, *Claim 11:* "assigning a pulse value for each of said reflected signal pulses with respect to said series of signal pulses transmitted to said target;"
Claim Construction: Pulse value means a value identifying time-of-flight data, including noise and signals reflected from the target, that provides information sufficient to permit correlation of the received signal with other received signals to determine which of the received signals represents the actual return or target-reflected signal, as opposed to random noise signals.

2) '779 patent, *Claim 11:* "comparing each of said assigned pulse values with other ones of said assigned pulse values"; "continuing to perform said comparing step until a predetermined number of said assigned pulse values coincide within a specific precision"; and "determining said actual return signal to be represented by said ... values."

Claim Construction: Comparison of pulse values-both noise and target-continually until a large enough number of pulse values is gathered that falls within a specific, limited degree of variation. The comparison is not necessarily an immediate one. The actual target signal represents the distance from range finder to

target. It corresponds to the pulse values within that specified, limited degree of variation. The target signal is associated with the "matching" pulse values that correspond within the specified limit.

3) '779 patent, *Claim 18:* "a circuit for automatically adjusting a noise threshold of said laser light receiver to a level at which said laser light receiver produces an output from said noise light pulses having a constant pulse firing rate."

Claim Construction: A circuit consisting of a feedback loop composed in part of diode 316 that adjusts a noise threshold of a laser light receiver to a level at which a laser light receiver produces an output from noise light pulses having a constant pulse firing rate.

4) '779 patent, *Claim 25:* "A method for adjusting a noise threshold of said laser light receiver to a level at which said laser light receiver produces a noise light pulse output having a constant pulse firing rate."

Claim Construction: A method including a feedback loop composed in part of diode 316 for adjusting a noise threshold of a laser light receiver to obtain a constant pulse firing rate from the laser light receiver to a level at which said laser light receiver produces a noise light pulse output having a constant pulse firing rate.

5) '910 patent, *Claim 8:* "a precision timing section coupled to said laser transmit section and said laser receive section for determining a flight time of said laser pulses to said target and said reflected laser pulses from said target"; "based upon a flight time of a pulse"

Claim Construction: A precision timer coupled to the transmitter and receiver that determines a flight time of laser pulses reflected from a target. A separate clock or timer is not required.

6) '910 patent, *Claim 8:* "A central processor section ... for determining a range to said target derived from said flight time of said laser pulses to said target and said flight time of said reflected laser pulses from said target."

Claim Construction: A processor compares time-of-flight information stored in memory to locate the times-of-flight that occur with the greatest frequency, and uses the most frequent times-of-flight to determine a range to the target. Neither a specific microcomputer nor anything that puts received laser pulses in a "stack" is required.

7) '077 patent, *Claim 1:* "for input to a comparator circuit for providing an automatic noise threshold adjustment to said laser receiving section to facilitate discrimination between said returned laser pulses and said noise pulses"

Claim Construction: For input to a circuit that consists of a feedback loop composed in part of diode 316 for adjusting the noise threshold based on the noise environment in relation to reflected pulses received by the laser receiving section, before the noise signals are parsed out from the actual target signals. The circuit adjusts the noise threshold by comparing incoming pulse values with previously received pulse values to ascertain the noise environment.

8) '077 patent, *Claim 1:* "a central processing section coupled to said laser transmitting and receiving sections for determining a distance to said target based on a time of flight of said transmitted and returned laser pulses"

Claim Construction: A processor that determines a distance to the target using time-of-flight information from the received laser pulses.

Plaintiff's Assertions of Infringement

1) Defendants' device infringes on Claim 11 of the '779 patent by assigning pulse values to received signals and comparing the pulse values to discriminate between the target signal and random noise;
2) Defendants' device infringes on Claim 18 of the '779 patent because the noise threshold adjustment circuit in Defendants' device generates a constant noise pulse output;

3) Defendants' device infringes on Claim 25 of the '779 patent because the noise threshold adjustment circuit in Defendants' device generates a constant pulse firing rate;

4) Defendants' device infringes on Claim 8 of the '910 patent by using a precision timer for determining the time-of-flight of received laser pulses; and

5) Defendants' device infringes on Claim 1 of the '077 patent by including an automatic noise threshold adjustment circuit and a central processing section that determines distance to a target based on time-of-flight information.

Plaintiff's Memo, 1-2.

I. Summary of the Ruling

1) For '779 patent Claim 11, both cross-motions for summary judgment as to literal infringement and infringement by the doctrine of equivalents are DENIED.
2) For '779 patent Claim 18, DEFENDANT's cross-motion for summary judgment as to literal infringement is GRANTED. Both cross motions for summary judgment as to infringement by the doctrine of equivalents are DENIED.

3) For '779 patent Claim 25, DEFENDANT's cross-motion for summary judgment as to literal infringement is GRANTED. Both cross-motions for summary judgment as to infringement by the doctrine of equivalents are DENIED.

4) For '910 patent Claim 8, both cross-motions for summary judgment as to literal infringement and infringement by the doctrine of equivalents are DENIED.

5) For '077 patent Claim 1, DEFENDANT's cross-motion for summary judgment as to literal infringement of the first disputed claim language is GRANTED. Both cross-motions for summary judgment as to infringement by the doctrine of equivalents of the first disputed claim language are DENIED. Both cross-motions for summary judgment as to literal infringement and infringement by the doctrine of equivalents of the second disputed claim language are DENIED.

6) For all patents-in-suit, PLAINTIFF's cross-motion for summary judgment for patent validity is GRANTED.

II. Law

A. Claim Construction

1. Markman *Analysis: Two-step Determination*

[1] Patent infringement requires a two-step analysis. CCS Fitness, Inc. v. Brunswick Corp., 288 F.3d 1359, 1365 (Fed.Cir.2002). *See also,* Johnson Worldwide Assocs. v. Zebco Corp., 175 F.3d 985, 988 (Fed.Cir.1999). First, I "must determine as a matter of law the correct scope and meaning of a disputed claim term." *CCS Fitness* at 1365; Lizardtech, Inc. v. Earth Resource Mapping, Inc., 35 Fed.Appx. 918, 923

(Fed.Cir.2002) (Claim terms may be "viewed in the context of the invention as a whole and through the lens of one skilled in the relevant art."); Hoganas AB v. Dresser Indus., Inc., 9 F.3d 948, 952 n. 15 (Fed.Cir.1993) (citing SmithKline Diagnostics, Inc. v. Helena Laboratories Corp., 859 F.2d 878, 882 (Fed.Cir.1988) ("[T]he claims should be construed as one skilled in the art would construe them.")). At the first stage, I construe the claims' meaning without reference to what is known as the "accused device." *See* Young Dental Mfg. Co. v. Q3 Special Prods., 112 F.3d 1137, 1141 (Fed.Cir.1997).

[2] The "accused device" is the device, machine, or method that allegedly infringes the patents-in-suit. In interpreting a patent's claims, I first look to the intrinsic evidence of record, including the claims of the patent, the specification, and the prosecution history. *See CCS Fitness* at 1366 ("Claim interpretation begins with an examination of the intrinsic evidence, *i.e.,* the claims, the rest of the specification and, if in evidence, the prosecution history."); Gart v. Logitech, Inc., 254 F.3d 1334, 1339-40 (Fed.Cir.2001). A patent claim is "an assertion of what the invention purports to accomplish [that] define[s] the invention and the extent of the grant." BLACK'S LAW DICTIONARY 169 (6th ed.1991). A patent specification is "a particular or detailed statement, account, description, or listing of the various elements, materials, dimensions, etc. involved" in the patent. *Id.* at 973. The prosecution history is the account of every step in the process to obtain a United States patent. *See id.* at 849.

Intrinsic evidence is "the most significant source of the legally operative meaning of disputed claim language." Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1996). Only if the intrinsic evidence is ambiguous in delineating the scope of the patent should I resort to extrinsic evidence. *See* Phillips Petroleum Co. v. Huntsman Polymers Corp., 157 F.3d 866, 870 (Fed.Cir.1998).

Second, I must compare "the properly construed claims to the accused device, to see whether that device contains all the limitations, either literally or by equivalents, in the claimed invention." CCS Fitness, Inc., 288 F.3d at 1365. *See also,* Johnson Worldwide, 175 F.3d at 988. Although generally a question of fact, "[t]he litigants frequently do not dispute the structure of the accused device, meaning the infringement analysis often turns on the interpretation of the claims alone." *CCS Fitness* at 1365.

[3] [4] [5] [6] In step one, I start with the language of the claims themselves. There is a "heavy presumption that a claim term carries its ordinary and customary meaning." *Id.* at 1366 (internal citations omitted). *See also, Johnson Worldwide* at 989. Also, "[a] word or phrase used consistently throughout the patent claims should be interpreted consistently." Epcon Gas Sys., Inc. v. Bauer Compressors, Inc., 279 F.3d 1022, 1030 (Fed.Cir.2002). If a claim "recites a general structure without limiting that structure to a specific subset of structures, [I] will generally construe the term to cover all known types of that structure that the patent disclosure supports." *CCS Fitness* at 1366 (internal citations omitted) (citing Renishaw PLC v. Marposs Societa' per Azioni, 158 F.3d 1243, 1250 (Fed.Cir.1998)). I may use dictionary definitions to establish a claim term's ordinary meaning. *See CCS Fitness* at 1366. *See also,* Rexnord Corp. v. Laitram Corp., 274 F.3d 1336, 1344 (Fed.Cir.2001).

[7] [8] A patentee need not "describe in the specification every conceivable and possible future embodiment of his invention." *CCS Fitness* at 1366. But a claim "may not be construed [by the patentee] one way in order to obtain [its] allowance [approval from the U.S. Patent and Trademark Office] and in a different way against accused infringers." Spectrum Int'l v. Sterilite Corp., 164 F.3d 1372, 1379 (Fed.Cir.1998) (internal citations omitted).

[9] [10] [11] An accused infringer may overcome the heavy presumption that the claim terms embody their ordinary meaning, and attempt to narrow the meaning of the terms, although he "cannot do so simply by pointing to the preferred embodiment or other structures or steps disclosed in the specification or prosecution history." CCS Fitness, Inc., 288 F.3d at 1366. *See also,* Johnson Worldwide, 175 F.3d at 989-90, 992. Instead, it may attempt to convince the Court that the claims' terms should be narrowed in one or more of four different ways. First, "the claim term will not receive its ordinary meaning if the patentee acted as

his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification or prosecution history." *Id*. Second, "a claim term will not carry its ordinary meaning if the intrinsic evidence shows that the patentee distinguished that term from prior art on the basis of a particular embodiment, expressly disclaimed subject matter, or described a particular embodiment as important to the invention." *CCS Fitness* at 1366-67. Third, "a claim term also will not have its ordinary meaning if the term chosen by the patentee so deprive[s] the claim of clarity as to require resort to the other intrinsic evidence for a definite meaning." *Id*. *See also, Johnson Worldwide* at 990. Other intrinsic evidence includes the specification and prosecution history.

[12] [13] Finally, "as a matter of statutory authority, a claim term will cover nothing more than the corresponding structure or step disclosed in the specification, as well as equivalents thereto, if the patentee phrased the claim in ... means-plus-function format." *CCS Fitness* at 1367 (citing 35 U.S.C. s. 112 para. 6 (2001)). *See also,* Watts v. XL Sys., 232 F.3d 877, 880-81 (Fed.Cir.2000) (construing s. 112 para. 6). A claim written in means-plus-function format describes a function but does not describe the structure or materials for performing that function. Therefore, one must turn to the patent specification for performance instruction. I must read the claims in the context of the specification, which includes a written description of the invention that must be clear and complete enough to allow those of ordinary skill in the art to make and use the patented method or device. *See* Vitronics, 90 F.3d at 1582.

[14] [15] [16] "The specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term." *Id*. *See also,* Multiform Desiccants, Inc. v. Medzam Ltd., 133 F.3d 1473, 1478 (Fed.Cir.1998) ("The best source for understanding a technical term is the specification from which it arose, informed, as needed, by the prosecution history.").

The claims are always construed in light of the specification, of which they are a part. The role of the specification includes presenting a description of the technologic subject matter of the invention, while the role of claims is to point out with particularity the subject matter that is patented. The claims are directed to the invention that is described in the specification; they do not have meaning removed from the context from which they arose. Thus the claims are construed to state the legal scope of each patented invention, on examination of the language of the claims, the descriptionin the specification, and the prosecution history.

Netword, LLC v. Centraal Corp., 242 F.3d 1347, 1352 (Fed.Cir.2001) (internal citations omitted). Two fundamental rules of claim construction assist reading claims in light of the specification:

(a) one may not read a limitation into a claim from the written description, but (b) one may look to the written description to define a term already in a claim limitation, for a claim must be read in view of the specification of which it is a part. These two rules lay out the general relationship between the claims and the written description.

Renishaw, 158 F.3d at 1248. The specification can also define claim terms either expressly or by implication. Vitronics, 90 F.3d at 1582 ("The specification acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication.").

Reference to prosecution history further informs understanding of the meaning of disputed claim language. *See* Biodex Corp. v. Loredan Biomedical, Inc., 946 F.2d 850, 862 (Fed.Cir.1991). For example, a patentee may disclaim certain interpretations of claim language to avoid replicating prior art. *See id*. at 863; Builders Concrete, Inc. v. Bremerton Concrete Products Co., 757 F.2d 255, 260 (Fed.Cir.1985) ("[T]he prosecution history of all claims is not insulated from review in connection with determining the fair scope of [a] claim.... To hold otherwise would be to exalt form over substance and distort the logic of this jurisprudence, which serves as an effective and useful guide to the understanding of patent claims.").

After gleaning as much information as I can from the intrinsic evidence, I may rely on extrinsic evidence to

correctly interpret the true meaning of the patent's language. *See* CCS Fitness, Inc., 288 F.3d at 1366 ("Courts may also use extrinsic evidence (*e.g.,* expert testimony, treatises) to resolve the scope and meaning of a claim term."). I will only consider extrinsic evidence when intrinsic evidence fails to sufficiently describe the claim's scope. Vitronics Corp., 90 F.3d at 1583. The type of extrinsic evidence I may consider and the extent of its use are limited. Extrinsic evidence regarding the proper construction of claim terms is permissible only when "the patent documents, taken as a whole, are insufficient to enable the court to construe disputed claim terms." *Id*. at 1585. I begin with the language of the claims, specification, and prosecution history and will only resort to extrinsic evidence if the disputed claim terms are not clear in that context. *Id*. at 1584. In this case I need not refer to extrinsic evidence to construe the disputed claim language.

2. Means-plus-function Construction

[17] Whether a claim is written in means-plus-function format is a question of law. Personalized Media Communs., LLC v. ITC, 161 F.3d 696, 702 (Fed.Cir.1998). Some claim limitations portray a function to be executed, but provide no instruction as to the structure or materials for executing that function. Such means-plus-function claims are construed pursuant to 35 U.S.C. s. 112 para. 6:

An element in a claim for a combination [where the claim encompasses two or more elements combined to work together] 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. s. 112 para. 6 (2001). So, "s. 112 para. 6 operates to restrict claim limitations drafted in such functional language to those structures, materials or acts disclosed in the specification (and their equivalents) that perform the claimed function." Personalized Media Communs., 161 F.3d at 703. *See also,* CIVIX-DDI, LLC v. Microsoft Corp., 84 F.Supp.2d 1132, 1141 (D.Colo.2000) (quoting Data Line Corp. v. Micro Technologies, Inc., 813 F.2d 1196, 1201 (Fed.Cir.1987) (" '[W]here a claim sets forth a means for performing a specified function, without reciting any specified 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 the equivalents thereof.' ")).

[18] [19] Moreover, "use of the word 'means' [in the claim language] creates a presumption that s. 112 para. 6 applies ... and that the failure to use the word 'means' creates a presumption that s. 112 para. 6 does not apply." *Personalized Media Communs*. at 703-04. A party may rebut these presumptions using intrinsic and extrinsic evidence. "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 s. 112 para. 6." *Id*. at 704. Specifically, a party may rebut the presumption that s. 112 para. 6 does not apply by "demonstrat[ing] that the claim term fails to recite sufficiently definite structure or else recites a function without reciting sufficient structure for performing that function." CCS Fitness, Inc., 288 F.3d at 1369. To assist my analysis, I examine whether the claim term has an understood meaning in the art. *Id*.

[20] If the claim embodies means-plus-function language, I then determine the structure(s) identified in the specification that perform(s) that function. "The applicant must describe in the patent specification some structure which performs the specified function.... [A] court must construe the functional claim language 'to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.' " Valmont Industries, Inc. v. Reinke Mfg. Co., 983 F.2d 1039, 1042 (citing 35 U.S.C. s. 112 para. 6 (2001)). However, a claim term can avoid application of s. 112 para. 6 even if it does not describe a precise physical structure if it describes structural components sufficient for performing the function. *CCS Fitness* at 1370.

The Federal Circuit applied the s. 112 para. 6 standards in *Personalized Media Communs*. It reversed the International Trade Commission's conclusion that the claim phrase "digital detector" was a means-plus-

function limitation subject to s. 112 para. 6:

"[D]etector" had a well-known meaning to those of skill in the electrical art connotative of structure, including a rectifier or demodulator.... Moreover, neither 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 the structure. 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." We therefore conclude that the term "detector" is a sufficiently definite structural term to preclude the application of s. 112 para. 6.

Personalized Media Communs., 161 F.3d at 705-06.

B. Summary Judgment

[21] [22] [23] The very purpose of a summary judgment motion is to assess whether trial is necessary. White v. York Int'l Corp., 45 F.3d 357, 360 (10th Cir.1995). Summary judgment is appropriate in patent cases as it is in any other case. Becton Dickinson & Co. v. C.R. Bard, Inc., 922 F.2d 792, 795-96 (Fed.Cir.1990). Pursuant to Fed.R.Civ.P. 56, I shall grant summary judgment if the pleadings, depositions, answers to interrogatories, admissions, or affidavits show that there is no genuine issue of material fact and the moving party is entitled to judgment as a matter of law. Fed.R.Civ.P. 56(c). The non-moving party has the burden of showing that there are issues of material fact to be determined. Celotex Corp. v. Catrett, 477 U.S. 317, 322, 106 S.Ct. 2548, 91 L.Ed.2d 265 (1986). A party seeking summary judgment bears the initial responsibility of informing the district court of the basis for its motion, and identifying those portions of the pleadings, depositions, interrogatories, and admissions on file together with affidavits, if any, which it believes demonstrate the absence of genuine issues for trial. *See* Celotex at 323, 106 S.Ct. 2548; Mares v. ConAgra Poultry Co., 971 F.2d 492, 494 (10th Cir.1992). Once a properly supported summary judgment motion is made, the opposing party may not rest on the allegations contained in his complaint, but must respond with specific facts showing the existence of a genuine factual issue to be tried. *See* Otteson v. United States, 622 F.2d 516, 519 (10th Cir.1980); Fed.R.Civ.P. 56(e). These specific facts may be shown "by any of the kinds of evidentiary materials listed in Rule 56(c), except the pleadings themselves." Celotex, 477 U.S. at 324, 106 S.Ct. 2548.

If a reasonable juror could not return a verdict for the non-moving party, summary judgment is proper and there is no need for a trial. *Id*. at 323, 106 S.Ct. 2548. The operative inquiry is whether, based on all documents submitted, reasonable jurors could find by a preponderance of the evidence that the plaintiff is entitled to a verdict. Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 250, 106 S.Ct. 2505, 91 L.Ed.2d 202 (1986). However, I should not enter summary judgment if, viewing the evidence in a light most favorable to the nonmoving party and drawing all reasonable inferences in that party's favor, a reasonable jury could return a verdict for that party. Anderson at 252, 106 S.Ct. 2505; Mares, 971 F.2d at 494. Where, as here, the parties file cross-motions for summary judgment, I assume that no evidence need be considered other than that filed by the parties. "When both parties move for summary judgment, each party's motion must be evaluated on its own merits and all reasonable inferences must be resolved against the party whose motion is under consideration." McKay v. United States, 199 F.3d 1376, 1380 (Fed.Cir.1999).

[24] "To support a summary judgment of noninfringement it must be shown that, on the correct claim construction, no reasonable jury could have found infringement on the undisputed facts or when all reasonable factual inferences are drawn in favor of the patentee." Netword, LLC v. Centraal Corp., 242 F.3d 1347, 1353 (Fed.Cir.2001). *See also,* Anderson at 248, 106 S.Ct. 2505 ("[A dispute is genuine] if the evidence is such that a reasonable jury could return a verdict for the nonmoving party.").

C. Summary Judgment Related to Infringement

1. **Markman** *Construction and Infringement Analysis*

As discussed above, I first determine the scope of the claims of the patents-in-suit. Markman v. Westview Instruments, 517 U.S. 370, 384, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996). This is a matter of law. *Id.* Second, I apply the properly construed claims to the accused device. Pitney Bowes, Inc. v. Hewlett-Packard Co., 182 F.3d 1298, 1304 (Fed.Cir.1999). "Thus, summary judgment of non-infringement can only be granted if, after viewing the alleged facts in the light most favorable to the non-movant, there is no genuine issue whether the accused device is encompassed by the claims." *Id.* If the parties do not dispute relevant facts regarding the accused product, summary judgment may be appropriate. Johnson Worldwide, 175 F.3d at 988-89.

If the parties disagree over the possible claim interpretations but not the accused device, the *Markman* analysis resolves the disagreements because at this point there are no genuine issues of material fact left that would preclude summary judgment. *See Johnson Worldwide* at 988-89. Therefore, if the parties do not dispute the relevant aspects of the accused device's structure and function, summary judgment may enter based only on claim construction. Hence, I may decide the infringement question as a matter of law if no genuine issues of material fact exist, expert testimony is not required to explain the patents-in-suit or the accused device, and a claim or claims read(s) on the accused device. Amhil Enters. v. Wawa, Inc., 81 F.3d 1554, 1557-58 (Fed.Cir.1996). As will be discussed, here significant disputes exist concerning relevant aspects of the accused device.

2. Infringement

[25] [26] [27] A patent owner must prove either "literal" infringement or infringement under the "doctrine of equivalents" by a preponderance of the evidence. *See* Under Sea Industries, Inc. v. Dacor Corp., 833 F.2d 1551, 1557 (Fed.Cir.1987). To infringe a claim literally, the accused device must incorporate *every* limitation in a valid claim *exactly*. *See* Zodiac Pool Care, Inc. v. Hoffinger Indus., 206 F.3d 1408, 1415 (Fed.Cir.2000) (emphasis added). To infringe a claim under the doctrine of equivalents, the accused device must incorporate *every* limitation in a valid claim *by a substantial equivalent*. *Id.*

a. Literal Infringement

I begin by comparing each limitation in every disputed claim with the accused device to discover if the limitations are present in the accused device. *See* Pennwalt Corp. v. Durand-Wayland, Inc., 833 F.2d 931, 935 (Fed.Cir.1987) (*en banc*), *cert. denied,* 485 U.S. 961, 108 S.Ct. 1226, 99 L.Ed.2d 426 (1988) (overruled on other grounds). The question whether a properly construed claim corresponds or "reads on" the accused device is generally one of fact. *See* General Mills, Inc. v. Hunt-Wesson, Inc., 103 F.3d 978, 980-981 (Fed.Cir.1997).

b. Infringement by the Doctrine of Equivalents

[28] If every claim limitation is not present in the accused device so that the device literally infringes upon the patent, I turn to the doctrine of equivalents. The doctrine holds that if part of the accused device performs *substantially the same function* in *substantially the same way* to achieve *substantially the same result* as an element or limitation of the claimed device, then that part of the accused device is considered equivalent. *See* Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 39, 117 S.Ct. 1040, 137 L.Ed.2d 146 (1997); Graver Tank & Mfg. Co. v. Linde Air Products Co., 339 U.S. 605, 609, 70 S.Ct. 854, 94 L.Ed. 1097 (1950). This is called the "function-way-result" test. Alpex Computer Corp. v. Nintendo Co., 102 F.3d 1214, 1222 (Fed.Cir.1996), *cert. denied,* 521 U.S. 1104, 117 S.Ct. 2480, 138 L.Ed.2d 989 (1997). Under this doctrine, I analyze each claim limitation literally missing from the accused device to determine whether the accused device contains the equivalent of that claim limitation. *See* Warner-Jenkinson at 21, 117 S.Ct. 1040. Where the differences between the claim limitation and the accused device are *insubstantial,*equivalence exists. *Id.* at 36, 39-40, 117 S.Ct. 1040. Finally, the analysis proceeds on a

limitation-by-limitation (element-by-element) basis, rather than comparing the claim as a whole to the accused device. *Id*. at 40, 117 S.Ct. 1040.

[29] If the challenging party shows that a person skilled in the art knows that a claimed feature and an accused feature are interchangeable, that is strong evidence of insubstantial differences. *Id*. at 37, 117 S.Ct. 1040. The question is not whether the structures serve the same function. Rather, the question is whether it was known that one structure is the equivalent of the other. Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., 145 F.3d 1303, 1310 (Fed.Cir.1998). "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." *Id*. (quoting Graver Tank & Mfg. Co., 339 U.S. at 609, 70 S.Ct. 854). Infringement by the doctrine of equivalents appears to me to be more fact-intensive than literal infringement.

3. Infringement of Claims Construed under s. 112 para. 6 Means-Plus-Function Format

[30] Infringement occurs under the s. 112 para. 6 means-plus-function format if the relevant structure in the accused device performs the *identical* function recited by the claim, and the relevant structure is *identical or equivalent* to the corresponding structure in the specification. Odetics, Inc. v. Storage Tech. Corp., 185 F.3d 1259, 1267 (Fed.Cir.1999). Thus, I look to whether a claim limitation written in s. 112 para. 6 form is met literally or equivalently, like all other claims. For an accused structure to literally infringe a s. 112 para. 6 means-plus-function claim limitation, the accused structure must be either the same as the claimed structure or a s. 112 para. 6 "equivalent." *See id*. at 1267. A s. 112 para. 6 "equivalent" performs the identical function and is insubstantially structurally different than that proffered by the claim limitation. *Id*.

Section 112 para. 6 structural equivalence is "an application of the doctrine of equivalents ... in a restrictive role, narrowing the application of broad literal claim elements." Warner-Jenkinson Co., 520 U.S. at 28, 117 S.Ct. 1040. Thus, the s. 112 para. 6 test and the doctrine-of-equivalents test are similar approaches to the notion of *insubstantial* change. *See* Chiuminatta, 145 F.3d at 1310.

The most important difference between the two tests is that s. 112 para. 6 equivalence requires functional identity. The function of the asserted substitute must be shown before I reach the equivalence analysis. *See* 35 U.S.C. s. 112 para. 6 (2001); Chiuminatta, 145 F.3d at 1308. It follows then that I may apply s. 112 para. 6's identical function requirement to the doctrine of equivalents analysis. Two structures may be equivalent pursuant to s. 112 para. 6 if they perform the *identical* (rather than substantially the same) function in *substantially the same way* to produce *substantially the same result*. *See* Warner-Jenkinson at 39, 117 S.Ct. 1040; Graver Tank at 609, 70 S.Ct. 854. Simply put, I replace " *substantially the same* function" with " *identical* function," then apply the doctrine-of-equivalents analysis in light of this modified rule.

4. Invalidity for Indefiniteness

[31] [32] [33] United States patents are presumed valid. United States v. Telectronics, Inc., 857 F.2d 778, 785 (Fed.Cir.1988). Invalidity is a question of law. Exxon Research & Eng'g Co. v. United States, 265 F.3d 1371, 1376 (Fed.Cir.2001). To rebut the presumption of validity, a defendant must establish by clear and convincingevidence that the patent is invalid. *Telectronics* at 785. The presumption of validity applies to all of the statutory requirements for patent validity, including those of s. 112 para. 6. *Id*. If as a matter of law, the evidence of record is insufficient to show clearly and convincingly patent invalidity, summary judgment may enter on the validity question. Transmatic, Inc. v. Gulton Indus., 53 F.3d 1270, 1274-75 (Fed.Cir.1995).

[34] [35] Two provisions of 35 U.S.C. s. 112 provide standards for patent validity. Pursuant to s. 112 para. 1, patents must meet both a description requirement so that one may identify the invention possessed by the patentee, and an enabling requirement so that one can build the invention. If a patent specification describes the claimed invention with enough detail so that one skilled in the art can reasonably conclude the inventor possessed the claimed invention, that satisfies the "description requirement" of the statute. *See* Vas-Cath,

Inc. v. Mahurkar, 935 F.2d 1555, 1560-63 (Fed.Cir.1991). If a patent specification describes the claimed invention so that one skilled in the art can make and use the device without unduly extensive experimentation, that also satisfies the "enabling requirement" of s. 112 para. 1. *See Telectronics* at 785.

[36] [37] Section 112 para. 2 requires patent claims to particularly define the subject that the applicant regards as his invention. Section 112 para. 2's definiteness requirement is met if those skilled in the art understand the scope of the invention after reading the claim in light of the patent specification. Orthokinetics, Inc. v. Safety Travel Chairs, Inc., 806 F.2d 1565, 1576 (Fed.Cir.1986). "As has been noted in the context of definiteness, the inquiry under section 112, paragraph 2, now focuses on whether the claims, as interpreted in view of the written description, adequately perform their function of notifying the public of the [scope of the] patentee's right to exclude." Solomon v. Kimberly-Clark Corp., 216 F.3d 1372, 1379 (Fed.Cir.2000). But if the claims are so ambiguous that a person of ordinary skill in the art cannot determine their scope, the claims are invalid for indefiniteness. *See* Exxon, 265 F.3d at 1375.

Again, claims construed pursuant to s. 112 para. 6 must comply with the first and second paragraphs of 35 U.S.C. s. 112. *See* In re Donaldson Co., 16 F.3d 1189, 1195 (Fed.Cir.1994). If a claim is in s. 112 para. 6 format, I must interpret it to cover the corresponding structure, acts, or materials and their equivalents in the specification. *See* 35 U.S.C. s. 112 para. 6; B. Braun Medical v. Abbott Lab., 124 F.3d 1419, 1424 (Fed.Cir.1997).

Although [35 U.S.C. s. 112 para. 6] statutorily provides that one may use means-plus-function language in a claim, one is still subject to the requirement that a claim 'particularly point out and distinctly claim' the invention. Therefore, 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 [35 U.S.C. s. 112 para. 2].

In re Donaldson Co., 16 F.3d at 1195.

III. DISCUSSION

A. Five Independent Claims for Construction

'779 Claim 11

Disputed Claim Language

"assigning a pulse value for each of said reflected signal pulses with respect to said series of signal pulses transmitted to said target;"

Analysis

[38] Plaintiff argues that the claim term "pulse value" should be construed according to its plain meaning. *Plaintiff's Memo,* 3. The plain meaning, according to Plaintiff, would require "assigning a pulse value to reflected signal pulses received in the receiving section of the laser range finder." *Id*. "Pulse value" would mean "a value that provides information sufficient to permit correlation of the received signal with other received signals to determine which of the received signals represents the actual return-reflected signals, as opposed to noise signals." *Id*.

This claim language does not define "pulse value." What is clear from the claim language, however, is that each reflected signal pulse is assigned a pulse value, whatever its definition may be. There is one "pulse value" for each of "said reflected signal pulses."

The '779 patent specification sheds light on the term "signal pulses" as related to "pulse value." It reads: "The system includes means responsive to the central processing section for determining a desired signal-to-noise ratio for a series of *possible signal pulses, including both noise and actual signal pulses* received through the signal receiving section. The possible signal pulses each have a representative pulse value with respect to a pulse previously transmitted from the signal transmitting device." '799 Patent, col. 2, lines 22-29 (emphasis added). From this, I conclude that the term "signal pulses" covers both noise and actual pulses, which fall into the category of "possible" signal pulses. Further, I conclude that each signal pulse, including both noise and actual pulses, has an associated pulse value.

Other sections of the '779 specification support my conclusions. The device must arrange all of the "possible signal values" before the "predetermined number of them coincide within a specified precision." Id. at col. 2, 30-32. Then, "the value of one or more of the predetermined number of the possible signal values is ... considered to be representative of the actual return signal." Id. at col. 2, 32-35. The specification then states "a method for discriminating between an actual return signal and associated noise ... [which] comprises the steps of transmitting a series of signal pulses to a target and receiving a number of possible reflected signal pulses therefrom with the possible reflected signal pulses including both noise and actual signal pulses." Id. at col. 2, 55-62.

So, the "possible" signal values consist of both noise and target signals, because the device could not parse out the noise values before receiving all possible values, consisting of both noise and those values "representative of the actual return signal." That the target signal is the "actual" return signal is buttressed by the statement that pulses are transmitted to the target, with possible reflected signals including both noise and actual signal pulses. I conclude that this statement also clarifies that both noise and actual signal pulses are reflected signal pulses.

I agree with Plaintiff that "pulse value should be construed to mean a value that provides information sufficient to permit correlation of the received signal with other received signals to determine which of the received signals represents the actual return-reflected signal, as opposed to random noise signals." *Plaintiff's Reply Memo,* 3.

I reject Defendants' contention that a pulse value should only refer to "reflected" signals but not "noise" signals. *Defendants' Reply Memo,* 12. *See also, Defendants' Memo,* 26 (Defendants argue that "pulse value" is undefined). The '779 patentspecification reads, "the possible reflected signal pulses includ[e] both noise and actual signal pulses." '779 patent, col. 2, lines 61-62. The specification further reads: "The system includes means responsive to the central processing section for determining a desired signal-to-noise ratio for a series of possible signal pulses, including both noise and actual pulses received through the signal receiving section. The possible signal pulses each have a representative pulse value with respect to a pulse previously transmitted from the signal transmitting device." Id. at col. 2, lines 22-29.

The '779 patent specification clearly acknowledges that the possible signal pulses include both noise and actual signals. Indeed, even I, a layperson, understand that in order to determine whether a signal is one reflected from the target-here, the "actual" signals-or reflected from other light-reflecting surfaces-here, "noise" signals, there must be a way to identify them so that they may be separated from one another in the process of target discrimination.

Finally, Defendants argue that "pulse value" itself lacks clear meaning. *Defendants' Memo,* 28-30; *Defendants' Reply Memo,* 12. Although Defendants point to deposition testimony as support for their contention, *see* id., they need not go so far. Neither in the plain language of Claim 11 nor in the patent

specification is there clear indication of what "pulse value" means. But Defendants assume, and virtually conceded at oral argument, that "the pulse value assigned is a time of flight," contending "... this is not done by the Nikon/AOI laser range finder." Id.

In any event, construing "pulse value" to mean "time of flight" makes the most sense. As Plaintiff argues, "[t]he claim term *pulse value* should be construed to mean a value that provides information sufficient to permit correlation of the received signal with other received signals to determine which of the received signals represents the actual return-reflected signal, as opposed to random noise signals.... Indeed, why else would one assign a value to a pulse for the purpose of target discrimination other than to assist in the discrimination process?" *Plaintiff's Memo,* 3 (citing McAlexander Decl. para.para. 18-19). Discounting the parties' "battle of experts" over the meaning of "pulse value," I construe "pulse value" to identify time-of-flight data.

CONSTRUCTION: Pulse value should be construed to mean a value identifying time-of-flight data, including noise and signals reflected from the target, that provides information sufficient to permit correlation of the received signal with other received signals to determine which of the received signals represents the actual return or target-reflected signal, as opposed to random noise signals.

Disputed Claim Language

"comparing each of said assigned pulse values with other ones of said assigned pulse values"; "continuing to perform said comparing step until a predetermined number of said assigned pulse values coincide within a specific precision"; and "determining said actual return signal to be represented by said ... values."

Analysis

[39] Plaintiff argues that the these claim elements should be construed according to their plain meaning "to require comparing pulse values until a predetermined number of the pulse values coincide within a specified precision and determining the target signal to be the signal associated with a desired threshold of matching pulse values (as opposed to the random pulse values associated with noise signals)." *Plaintiff's Reply Memo,* 7. Plaintiff contends that this construction is supportedby the '779 patent specification. I agree. "The specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term." Johnson Worldwide, 175 F.3d at 990.

Given the patent specification language referenced above ('779 patent specification, col. 2, lines 22-29, 30-35, 50-62), I conclude that pulse values are assigned to both noise and actual pulses. Therefore, when each pulse value is compared with every other pulse value, logical relationships result. Noise pulse values are compared with other noise pulse values. Noise pulse values are compared with actual, or target pulse values. Actual, target pulse values are compared with other actual pulse values.

Accordingly, the plain language of the claim elicits the following construction. The device compares pulse values continually until a large enough sample of pulse values is gathered that falls within a specific, limited degree of variation. The actual target signal (representing the distance from range finder to target) corresponds to the pulse values within that specified, limited degree of variation. Therefore, I agree with Plaintiff that the target signal is associated with the "matching" pulse values that correspond within the specified limit.

This claim interpretation is consistent with the '779 patent specification. "A representative pulse value is assigned for each of the possible reflected signal pulses with respect to the series of signal pulses transmitted to the target and each of the representative pulse values is compared with other ones of the representative pulse values. Each of the representative pulse values [is] compared until any predetermined number of the representative pulse values coincide within a specified precision and the actual return signal

is determined to be represented by the predetermined number of the representative pulse values...." '799 patent, col. 2, lines 62-67, col. 3, lines 1-4.

The nature of the claimed invention further supports my reading. Because the range finder emits multiple pulses of laser light, it receives multiple return signals. The device must sort them out and decide which of them are actual target signals. Assigning pulse values to each signal gives the machine "handles" with which to identify each signal for later grouping. When a group of very similar values grows to a large enough number within a user-specified range of pulse values, the device defines this group as representative of the target.

This makes sense. If the target is a certain, specific distance from the range finder, laser pulses emitted from the range finder will travel that same, specific distance to the target, and return that same, specific distance to the range finder. Variations in the topography of the target surface might cause slight variations in the target, or actual, signal travel distance. These subtle variations would seem to be of much smaller magnitude than random variations in signals reflected from noise-creating objects like dust or water droplets in the air that could be any distances from the range finder. Therefore, pulse values indicative of the target should be similar.

Defendants argue that "the element of the claim 'comparing each of said assigned pulse values with other ones of said assigned pulse values' ... should be construed [so] each newly arrived pulse is assigned a pulse value that ... is immediately compared at the time of arrival with previously stored pulses"; and "each newly arrived representative pulse value [is] compared with all previously assigned representative pulse values at the time the newly arrived pulse value [sic] is assigned its pulse value, and not at the end of the pulse transmission, pulse collection and pulse storage process." *Defendants' Reply Memo,* 10. I disagree. I "may not add a narrowing modifier before an otherwise general claim term that stands unmodified in a claim." CCS Fitness, Inc., 288 F.3d at 1365-68. While Claim 11 of the '779 patent recites the term "comparing," it says nothing about *comparing immediately* as Defendants suggest. And, nothing in the '779 patent specification or other intrinsic evidence supports the conclusion that comparisons must happen immediately instead of at the end of the pulse transmission, collection, and storage process.

At first, Defendants argued that Claim 11 does not instruct a person of ordinary skill in the art how to compare pulse values. *Defendants' Memo,* 29-30. Defendants argued that the claim element merely states the function of comparing. Id. Now, Defendants seem to acknowledge that the comparison requires discrimination "between actual returned reflected signals and noise signals." *Defendants' Reply Memo,* 9. Still, Defendants argue that the proper way to construe this claim language is to require "assigning pulse values for the laser pulses transmitted and the actual reflected pulses received (but not for noise pulses), comparing pulse values for a match and then halting the comparing upon finding a match to a selected precision." *Defendants' Memo,* 33. *See also, Defendants' Reply Memo,* 12 (arguing that Claim 11 requires "assigning pulse values to the return pulse (and not the noise pulses) and comparing each incoming pulse with previously recorded pluses").

I agree that actual reflected pulses receive pulse values. I disagree, however, that Claim 11 limits pulse values to actual-or target-reflected pulses. As Defendants acknowledge, without differentiating between noise and actual pulses, it would be impossible for the device to separate the wheat (the actual, target pulses) from the chaff (the noise). *See* id. As I have said, both noise and target pulses receive pulse values under Claim 11.

CONSTRUCTION: Comparison of pulse values-both noise and target-continually until a large enough number of pulse values is gathered that falls within a specific, limited degree of variation. The comparison is not necessarily an immediate one. The actual target signal represents the distance from range finder to target. It corresponds to the pulse values within that specified, limited degree of variation. The target signal is associated with the "matching" pulse values that correspond within the

specified limit.

'779 Claim 18

Disputed Claim Language

"a circuit for automatically adjusting a noise threshold of said laser light receiver to a level at which said laser light receiver produces an output from said noise light pulses having a constant pulse firing rate."

Analysis

[40] Defendants argue I should construe this claim element in means-plus-function format pursuant to s. 112 para. 6. *Defendants' Memo,* 35. I agree. Means-plus-function formatting applies to claim limitations that portray a function to be executed, but provide no instruction as to the structure or materials for executing that function. *See* CCS Fitness, Inc., 288 F.3d at 1369-70. Because I conclude that this claim element is in that format, I go to the specification to understand the "means" for performing the function embodied by the claim.

The second element of Claim 18 is not written in means-plus-function format, typified by the use of the word "means." Personalized Media Communs., 161 F.3d at 703-704 (citations omitted). Therefore, there is a rebuttable presumption that the element should not be construed according to means-plus-function format. *Id*. Defendants may rebut the presumption that s. 112 para. 6 does not apply by "demonstrat[ing] that the claim term fails to recite sufficiently definite structure or else recites a function without reciting sufficient structure for performing that function." CCS Fitness, Inc., 288 F.3d at 1369. Also, "[i]n 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 s. 112 para. 6." Personalized Media Communs., 161 F.3d at 704. To determine whether the claim term recites sufficient structure, I may examine whether the claim term has an understood meaning in the art. *See CCS Fitness* at 1369.

Defendants argue that "circuit" does not have a definite meaning. *Defendants' Reply Memo,* 20. They cite a Southern District of New York case in which "use of the words 'circuit,' 'interface' and 'units' were means-plus-function claims even though the customary terms 'means' or 'means for' were not used." *Id*. (citing Apex, Inc. v. Raritan Computer, Inc., 187 F.Supp.2d 141 (S.D.N.Y.2002)). That court concluded that the term "circuit" is "so generic that by itself it conveys no structure at all." *Id*. at 158 (citations omitted).

In 1998, the Federal Circuit decided that a very similar claim element was not in means-plus-function format. The Court held that "video delay circuit" was not limited to the preferred embodiment in the patent specification. Comark Communs. v. Harris Corp., 156 F.3d 1182 (Fed.Cir.1998). Other district courts are in accord. *See* CellNet Data Sys. v. Itron, Inc., 17 F.Supp.2d 1100 (N.D.Cal.1998) (The Northern District of California held that "circuit means for recording energy use" was not a means-plus-function claim because one of ordinary skill in the art would understand the claim element as a structural limitation.); Intel Corp. v. Broadcom Corp., 172 F.Supp.2d 478, 515 (D.Del.2001) (The District of Delaware ruled that "I/O circuitry ... for providing processed video signal to said I/O port ..." was not in means-plus-function format because it could be reasonably understood by one skilled in the art.).

In all three of those cases, the word "circuit" is modified in a way that sufficiently narrows its meaning so one skilled in the art may understand it. "Video delay circuit," *Comark* at 1182, is a phrase in which "video" and "delay" significantly modify "circuit" so that the term is clearly not just any of millions of circuits in existence. Similarly, "circuit means for recording energy use," *CellNet Data Systems* at 1100, can only be understood when the words "for recording energy use" appear. If they did not, circuit would exist in a vacuum. Moreover, the word "circuitry" in "I/O circuitry ... for providing processed video signal to said I/O port," *Broadcom* at 515, can only be understood in light of "I/O" and "for ... port." Otherwise, "circuitry" lies naked in the claim.

In Claim 18, "circuit" similarly is modified by its companion terms in a way that gives it meaning. Without "for automatically adjusting a noise threshold," circuit cannot be understood by one skilled in the art as anything but a universally abundant electrical component. Without the modifying language, a dictionary definition provides little clarification either. Circuit may be "[t]he complete path of an electric current including any displacement current" (6a); or "[a] specified portion of a circuit" (6b); or "[a]n assemblage of electronic elements" (8a). WEBSTER'S 3RD NEW INTERNATIONAL DICTIONARY 408 (3rd ed.1986). None of these definitions provides more than a murky outline.

If a claim element recites a function without reciting sufficient structure for performing that function, s. 112 para. 6 may apply. CCS Fitness, Inc., 288 F.3d at 1369. But while the functional phrase "for automatically adjusting a noise threshold" gives "circuit" context, without more it does not provide sufficient structural meaning to withstand application of s. 112 para. 6. There is no structural context that teaches one how a circuit, which may be as vague as "an assemblage of electronic elements" automatically adjusts a noise threshold.

Pursuant to s. 112 para. 6, I must go to the patent specification and the prosecution history for clues to the meaning of Claim 18. "One of skill in the art can only reconcile the claim language with the inventor's disclosure by recourse to the specification." Comark, 156 F.3d at 1187.

Defendants state: "[t]his claim element should be construed to require a feedback circuit which adjusts the noise threshold...." *Defendants' Reply Memo,* 18. Defendants also argue that I should read diode 316, found in the preferred embodiment in the '779 patent specification, into Claim 18. Defendants argue that diode 316 is "at the essence of the circuit for automatically adjusting a noise threshold, [so] the essence cannot be ignored when construing the claim or determining infringement." *Defendants' Memo,* 38.

While Defendants may overcome the heavy presumption that the claim terms embody their ordinary meaning and attempt to narrow the meaning of the terms, they "cannot do so simply by pointing to the preferred embodiment or other structures or steps disclosed in the specification or prosecution history." CCS Fitness, Inc., 288 F.3d at 1366. Here, Defendants do more than simply point to the specification or prosecution history. They identify a portion of the prosecution history without which the '779 patent likely would not have been approved by the U.S. Patent and Trademark Office. By doing so, the presumption is rebutted.

During the prosecution of the '779 patent, inventor Jeremy Dunne distinguished his invention from the prior art embodied in Frungel's U.S. Patent no. 4,259,592. In an amendment to his '779 patent application, Dunne summarized Frungel's invention in two-and-a-half pages. Amendment to Application for Automatic Noise Threshold Determining Circuit and Method for a Laser Range Finder, U.S. Patent and Trademark Office, 1995 (*Amendment*). Immediately thereafter, he summarized his invention to distinguish it from patent no. 4,259,592. In his summary relating to Claim 18, Dunne wrote: "The essence of [the] automatic noise threshold section ... is a feedback loop that comprises the detected (see detector 314, 316, 322, 324) average noise firing rate...." Id. at 16. Plaintiff and Defendants agree that the "316" of the "detector" of the feedback loop is diode 316. Motions Hearing, U.S. District Court for the District of Colorado, July 18, 2002 (*Motions Hearing*). *See* Figure 8, '779 patent. Later in the same document, Dunne writes that "no structure within the cited Frungel patent operates to dynamically use a range/noise signal that is reflected from the target in order to change a detection threshold as a function of noise pulses that are received.... Frungel purposely does not generate a noise threshold signal." *Amendment,* 22-23.

The feedback loop that is at the "essence" of Claim 18 of the '779 patent includes diode 316. And without that feedback loop, Plaintiff's laser range finder would not be able to perform the noise thresholding that distinguishes Dunne's invention from the Frungel prior art. Defendants'explanation of the importance of diode 316 in the feedback loop was not overcome by Plaintiff at the motions hearing. Because diode 316 is

integral to the feedback loop that is essential to the noise thresholding circuit of Claim 18, I conclude as a matter of law that the thresholding circuit requires diode 316 and the feedback loop.

CONSTRUCTION: A circuit consisting of a feedback loop composed in part of diode 316 that adjusts a noise threshold of a laser light receiver to a level at which a laser light receiver produces an output from noise light pulses having a constant pulse firing rate.

'779 Claim 25

Disputed Claim Language

"A method for adjusting a noise threshold of said laser light receiver to a level at which said laser light receiver produces a noise light pulse output having a constant pulse firing rate."

Analysis

[41] Defendants argue that I should read the structural limitation of diode 316 into this claim as I did in Claim 18. *Defendants' Reply Memo,* 27. Again, I agree. Defendants argue: "[j]ust as the adjustment circuit in Claim 18 is a means-plus-function element, the adjusting step in Claim 25 is a step-plus-function element, and a reader must turn to the specification to learn how one does [the method]."

Section 112 para. 6 applies when a claim element recites a step plus a function, without reciting actions to enact the function. O.I. Corp. v. Tekmar Co., 115 F.3d 1576, 1582-83 (Fed.Cir.1997). Here, "adjusting a noise threshold of said laser light receiver to a level at which said laser light receiver produces a noise light pulse output having a constant pulse firing rate" is a method, or step, for doing something. This claim language does not recite a "function." The purpose for which the adjusting ultimately is done-the why and what for-is noticeably absent from the disputed language. Therefore, this is a step without a function, and s. 112 para. 6 does not apply.

Nonetheless, there are three other circumstances in which I may refer to intrinsic evidence outside the claim language to construe a claim. First, "the claim term will not receive its ordinary meaning if the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification or prosecution history." CCS Fitness, Inc., 288 F.3d at 1366. Second, "a claim term will not carry its ordinary meaning if the intrinsic evidence shows that the patentee distinguished that term from prior art on the basis of a particular embodiment, expressly disclaimed subject matter, or described a particular embodiment as important to the invention." *Id*. at 1366-67. Third, "a claim term also will not have its ordinary meaning if the term chosen by the patentee so deprive[s] the claim of clarity as to require resort to the other intrinsic evidence for a definite meaning." *Id*. at 1367.

All three apply here. First, Jeremy Dunne, the '779 patent inventor, clearly defined the "method for adjusting a noise threshold of said laser light receiver to a level at which said laser light receiver produces a noise light pulse output having a constant pulse firing rate" in the prosecution history. He described, detail-by-detail, the automatic noise threshold section, which is the embodiment of the method described in Claim 25, for two-and-half pages. *Amendment,* 16-18. He began by stating, "[a]n important feature of the present invention is the detailed construction and arrangement of ... [the] automatic noise threshold section. The essence of [the] automatic noise threshold section ... is a feedback loop that comprisesthe detected (see detector 314, 316, 322, 324) average noise firing rate...." Id. at 16. Second, by describing his automatic noise thresholding mechanism which includes diode 316, Dunne distinguished patent '779 from patent no. 4,259,592 by highlighting the "essence" of a particular embodiment, *i.e.,* the feedback loop including diode 316. Id. Third, the phrase "a method for adjusting the noise threshold" is so deprived of clarity that it is not sufficiently understandable without reference to other intrinsic evidence. Claim 18 gives meaning to the method. Based on my construction of that claim, I look to the feedback loop that includes diode 316.

All three circumstances require me to look to the feedback loop composed in part of diode 316 that is at the "essence" of the automatic noise thresholding mechanism for understanding. Therefore, I construe Claim 25 to incorporate the feedback loop and diode 316.

CONSTRUCTION: A method including a feedback loop composed in part of diode 316 for adjusting a noise threshold of a laser light receiver to obtain a constant pulse firing rate from the laser light receiver to a level at which said laser light receiver produces a noise light pulse output having a constant pulse firing rate.

'910 Claim 8

Disputed Claim Language

"a precision timing section coupled to said laser transmit section and said laser receive section for determining a flight time of said laser pulses to said target and said reflected laser pulses from said target"; "based upon a flight time of a pulse"

Analysis

[42] [43] Plaintiff argues that this claim should be construed in accordance with its plain language and that there is no basis for construing the claim subject to s. 112 para. 6. I agree.

As discussed above, means-plus-function formatting applies to claim limitations that portray a function to be executed, but provide no instruction as to the structure or materials for executing that function. *See* CCS Fitness, Inc., 288 F.3d at 1369, 1370. Claim 8 does not fit this format. First, the Claim 8 language is not written in means-plus-function format, typified by the use of the word "means." *See id*. at 1369. Therefore, the rebuttable presumption applies that the element should not be construed according to means-plus-function format. Personalized Media Communs., 161 F.3d at 702. Second, a claim term can avoid application of 112 para. 6 even if it does not espouse a precise physical structure. *CCS Fitness* at 1370.

Once again, Defendants may rebut the presumption that s. 112 para. 6 does not apply by "demonstrat[ing] that the claim term fails to recite sufficiently definite structure or else recites a function without reciting sufficient structure for performing that function." *Id*. at 1369. "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 s. 112 para. 6." Personalized Media Communs. 161 F.3d at 704. To determine whether the claim term recites such sufficient structure, I may examine whether the claim term has an understood meaning in the art. *See* CCS Fitness, Inc., 288 F.3d at 1370. Defendants fail to rebut the presumption as to this claim language.

The disputed language in Claim 8 describes definite structure. The precision timing section is "coupled" to the laser transmit and laser receive sections. The verb "couple" means "to fasten together" (2), or "to bring (electric circuits) into such close proximity as to permit mutual influence" (2d-2), or "to join (electric circuits or devices) into a single circuit." (2d-3). WEBSTER'S 3RD NEW INTERNATIONAL DICTIONARY 521 (3rd ed.1986). This joining or increase in proximity connotes the relationship of two or more parts. Structure itself is defined as "something made up of more or less interdependent elements or parts" (2b), "the interrelation of parts dominated by the general character of the whole" (5), and "the elements or parts of an entity or the position of such elements or parts in their external relationship to each other" (6). *Id*. at 2267.

While the claim language here might not describe a "known specific structure," it need not do so. *See CCS Fitness* at 1370. I conclude that the claim language recites sufficiently definite structure to resist application of 112 para. 6.

I also conclude that Claim 8 does not require more than one separate precision timing section or clock, and does not require a capacitor. *See Defendants' Memo,* 29-30. Both of these interpretations would have me look beyond the plain claim language. *Markman* construction of a claim requires me to look first to the plain text of the claim language. *See CCS Fitness* at 1366. While Defendants suggest I look beyond the plain language, it is not apparent from the specification that Plaintiff intended the claim language to embody anything but its ordinary meaning. And, "[r]eferences to a preferred embodiment, such as those often present in a specification, are not claim limitations." Laitram Corp. v. Cambridge Wire Cloth Co., 863 F.2d 855, 865 (Fed.Cir.1988), *cert. denied,* 490 U.S. 1068, 109 S.Ct. 2069, 104 L.Ed.2d 634 (1989).

Defendants refer to extrinsic evidence to support their conclusion that Claim 8 requires a separate clock. *See Defendants' Memo,* 29 (citing Creusere Decl. para. 35). They argue that "[since] the precision timing section is not defined by components specified in Claim 8, construing the claim element requires reference to the '910 patent specification." Id. I conclude there is no basis to import the limitation of a separate clock into the claim from the specification sections-parts of the preferred embodiment-that Defendants cite ('910, col. 8, lines 1-25 and 52-55; col. 12, lines 26-31 and 34-38).

As Plaintiff argues, the precision timing section includes a transistor that charges a capacitor, but the capacitor itself is not the precision timing section. *See Plaintiff's Reply Memo,* 28 (citing '910 patent, col. 8, lines 31-35). The capacitor effectively "stretches" the time-of-flight of received laser pulses. That information then goes to a system clock. The preferred embodiment clearly depicts a capacitor that expands the flight time "so that the slower clock in the CPU section can then count it accurately." '910 patent, col. 8, lines 29-34.

While the capacitor is part of the preferred embodiment of Claim 8, there is no reason to construe the claim to require the capacitor. There is no mention of a capacitor in the claim itself, and the capacitor is not the precision timing section. Although the capacitor assists the laser range finder's ability to clock laser-pulse flight times by "stretching" the times-of-flight, it does not determine the times-of-flight. Therefore, I conclude that Claim 18 requires "a precision timer coupled to the transmitter and receiver that determines a flight time of laser pulses reflected from a target." *Plaintiff's Reply Memo,* 26.

CONSTRUCTION: A precision timer coupled to the transmitter and receiver that determines a flight time of laser pulses reflected from a target. A separate clock or timer is not required.

Disputed Claim Language

"A central processor section ... for determining a range to said target derived from said flight time of said laser pulses to said target and said flight time of said reflected laser pulses from said target."

Analysis

[44] Defendants contend the elements of the central processor section are not specified, nor is any microprocessor, algorithm or the like specified in the claim. I agree. Because the term "central processor section" is unclear, I look for meaning in the specification. It describes a microcomputer that places flight times of received laser pulses in a "stack," and compares successively received pulses to those already in the stack. '910 patent, col. 17, lines 3-20. Each place in the "stack" must represent a flight time, so when a relatively large number of pulses occupy one "slot" in the "stack," that "slot" represents the flight time indicative of the distance to the target.

Plaintiff argues that in the preferred embodiment for the central processor section, "the processor compares time-of-flight information stored in memory to locate the time-of-flight information that occurs with the greatest frequency, and uses these signals to determine a range to the target." '910 patent, col. 17, line 3-col. 18, line 30. I also agree with Plaintiff. Plaintiff's description is general while Defendants' description focuses

on the specifics of the "stack" mechanism. In the end, both parties describe the same process.

I construe the disputed claim language in the general sense that Plaintiff uses to describe the preferred embodiment of the disputed claim. As stated above, while Defendants may overcome the heavy presumption that the claim terms embody their ordinary meaning and attempt to narrow the meaning of the terms, they "cannot do so simply by pointing to the preferred embodiment or other structures or steps disclosed in the specification or prosecution history." CCS Fitness, Inc., 288 F.3d at 1366. Here, Defendants point to the preferred embodiment of the '910 patent specification to impermissibly narrow the meaning of the claim to include the stacking mechanism. But "limitations from the specification are not to be read into the claims." Comark, 156 F.3d at 1186. "[W]hile ... claims are to be interpreted in light of the specification and with a view to ascertaining the invention, it does not follow that limitations from the specification may be read into the claims." *Id*. Therefore, I decline to incorporate the specification language that describes the stacking mechanism into the disputed language of Claim 8.

CONSTRUCTION: A processor compares time-of-flight information stored in memory to locate the times-of-flight that occur with the greatest frequency, and uses the most frequent times-of-flight to determine a range to the target. Neither a specific microcomputer nor anything that puts received laser pulses in a "stack" is required.

'077 Claim 1

Disputed Claim Language

"for input to a comparator circuit for providing an automatic noise threshold adjustment to said laser receiving section to facilitate discrimination between said returned laser pulses and said noise pulses"

Analysis

[45] Plaintiff asserts that this disputed claim language should be read in accordance with its plain meaning and argues I should refer to Claim 18 of the '779 Patent for analysis. *Plaintiff's Reply Memo,* 32. But here, Plaintiff argues that this claim does not require obtaining a constant pulse firing rate as does Claim 18. Defendants contend that Claim 1 "includes several of the elements discussed above in connection with claims in the other two patents," specifically, "an automatic noise threshold adjustment" and "a comparator circuit." *Defendants' Memo,* 35. Apparently, Defendants ask me to refer to previousanalysis of those components of this claim. Id.

A comparator "compares something to be measured with a standard measure." WEBSTER'S 3RD NEW INTERNATIONAL DICTIONARY 462 (3rd ed.1986). By the plain language of Claim 1, this comparison provides a foundation for adjusting the noise threshold. Both parties refer me to Claim 18. There, I construed the noise threshold circuit to include a feedback loop composed in part of diode 316. Here, I do the same.

CONSTRUCTION: For input to a circuit that consists of a feedback loop composed in part of diode 316 for adjusting the noise threshold based on the noise environment in relation to reflected pulses received by the laser receiving section, before the noise signals are parsed out from the actual target signals. The circuit adjusts the noise threshold by comparing incoming pulse values with previously received pulse values to ascertain the noise environment.

Disputed Claim Language

"a central processing section coupled to said laser transmitting and receiving sections for determining a distance to said target based on a time of flight of said transmitted and returned laser pulses"

Analysis

[46] For the reasons stated above in my discussion of the central processor section in Claim 8 of the '910 patent, and because Defendants simply point me toward their previous argument there, I accept Plaintiff's suggested construction of the disputed claim language. This language requires "a processor that determines a distance to the target using time-of-flight information from the received laser pulses." *Plaintiff's Reply Memo,* 33.

CONSTRUCTION: A processor that determines a distance to the target using time-of-flight information from the received laser pulses.

B. Infringement Analysis

Infringement generally is a matter of fact to be decided by the fact finder. However, summary judgment may enter if the pleadings, depositions, answers to interrogatories, admissions, or affidavits show there is no genuine issue of material fact and the moving party is entitled to judgment as a matter of law. Fed.R.Civ.P. 56(c).

At this juncture, I must apply the claims as construed to the accused device. Pitney Bowes, Inc. v. Hewlett-Packard Co., 182 F.3d 1298, 1304 (Fed.Cir.1999). "Thus, summary judgment of non-infringement can only be granted if, after viewing the alleged facts in the light most favorable to the non-movant, there is no genuine issue whether the accused device is encompassed by the claims." *Id.*

If the parties disagree over the possible claim interpretations but not the accused device, the Court's *Markman* analysis resolves the disagreements, because at that point there could be no genuine issues of material fact left that would preclude summary judgment. *See* Johnson Worldwide Assocs., 175 F.3d at 988-89. Having construed the disputed claim language, I turn to whether genuine issues of fact remain as to the relevant aspects of Defendants' accused device. In this case, the parties incorporate into their briefs and attach expert declarations and deposition testimony based in part on reverse engineering of the accused device.

'779 Claim 11

[47] Plaintiff argues that the Nikon/Asia Optical laser range finder "assigns to received signals a pulse value that corresponds directly to the time-of-flight of the received signal." *Plaintiff's Reply Memo,* 4. "Each assigned value comprises a '1' stored in a memory location that corresponds directly to the time-of-flight of the received signal." *Id.* Plaintiff argues that this "1" is recorded in a memory element "at a position in an array of memory elements (*i.e.,* the delay line) which uniquely identifies the time-of-flight of the received signal." *Id.* (emphasis provided).

According to Plaintiff, undisputed facts establish that Defendants' range finder assigns pulse values to received signals to uniquely identify time-of-flight information. First, Plaintiff asserts Defendants' device uses "flip-flop" circuits in a "delay line." *Id.* Plaintiff defines flip-flop circuits as digital circuit elements that store either a "0" or a "1" in reaction to a clock signal. *Id.* at n. 2. Second, each received signal that exceeds a "noise threshold" causes a "one-shot circuit" to output a "1." When a signal is not received, the device records a "0." *Id.* at 5. Third, "when a laser pulse is transmitted, the delay line is activated so that the output of the one-shot circuit during each clock cycle is written to a flip-flop in the delay line that corresponds directly to the number of clock cycles that have elapsed since the laser pulse was transmitted." *Id.* Plaintiff argues that the output (1 or 0) of the one-shot circuit during the first "clock cycle" is stored in the first flip-flop, and the output during the second clock cycle is stored in the second flip-flop, and so forth. *Id.* Further, Plaintiff contends (based on Dr. Chien's affidavit) that the Nikon/Asia Optical range finder includes a clock that measures flight times of received optical signals. *Id.* Finally, Plaintiff argues that in Defendants' technical reports by Dr. Creusere, Defendants "implicitly admit that the [Defendants'] laser range finder

assigns pulse values representative of time-of-flight of received signals." *Id*. at 6.

In summary, Plaintiff asserts that each flip-flop in the delay line "represents a specific and different point in time that has elapsed since the transmission of a laser pulse." *Id*. at 7 (citing McAlexander Decl. para. 24). Therefore, in Plaintiff's view, no two pulse values are identical because each individual "1" attached to a specific flip-flop circuit "uniquely identifies the time-of-flight of the received pulse that generated the ... '1'." *Id*. at 7.

According to Defendants, their range finder "does not either assign or rely on pulse values." *Defendants' Memo,* 29. Defendants state:

[W]hen an optical pulse enters a detector of the [Defendants'] laser range finder, the pulse is electrically amplified and ultimately actuates a one-shot circuit. A one-shot circuit is a circuit that for each pulse it receives at its input provides a digital output of fixed duration. The digital output of the one-shot is fed into a delay line composed of flip-flops.... The delay line acts much like a ski lift: it starts operating when a pulse is transmitted toward a target and each received pulse 'boards' the lift at fixed intervals. If no pulse is present at the time when the chair swings by, that chair goes up empty. After running for a period of time, the 'lift' (*i.e.*, the delay line) stops and the contents of each chair [are] placed into a range bin corresponding to the position of each stopped chair. The position of each stopped chair corresponds directly to a possible target range. After the contents of the chairs are placed in the range bins, the 'lift' begin[s] another cycle of operation corresponding to another target pulse. By transmitting multiple laser pulses and adding up the contents of the range bins after the process is complete, the Nikon/AOI rangefinder can determine which range bin corresponds to the actually [sic] target (the chair that always has someone sitting in it).

Id. at 30 (citing Creusere Decl. para. 11). So, Defendants argue that their range finder "does not assign pulse values as called for in the claim, does not have representative pulse values, as called for in the specification, does not recognize any pulse value and the claim element is not infringed." *Id*. at 30.

Plaintiff also contends Defendants' laser range finder "compares pulse values to discriminate the target signal from noise." *Plaintiff's Reply Memo,* 9. Plaintiff asserts that, according to Dr. Chien's deposition, Defendants' device compares pulse values that indicate time-of-flight for received laser pulses to discriminate the target signal from noise signals. *Id*. at 9. Plaintiff asserts that Defendants acknowledge in their Memorandum that "[t]he computer ... looks at the loaded range bins and sees how many pulses are stored in each bin. [And] the range bins are searched to determine in which range bin the maximum number of pulses [has] been recorded." *Plaintiff's Reply Memo* at 9-10 (quoting *Defendants' Memo* at 10 and stating that Defendants "misleadingly" refer to time bins as "range bins" there).

Defendants respond that their range finder does not do any comparing, so does not infringe this element. *Defendants' Memo,* 33. They argue that a "1" in a range bin indicates that the delay line picked up that pulse at the moment it was received. *Id*. While a "0" indicates no pulse was received, a "1" may indicate either a target or a noise signal. *Id*. Defendants state:

Pulse values ... are not assigned. Consequently, pulse values are not compared and are not compared until a predetermined number of assigned pulse values coincide within a specified position. [Defendants'] laser range finder never looks for coincidence of values to a particular precision ... [and] does not compare for either coincidence of pulse values or compare to a level of precision.

Id. Finally, Defendants argue the claim phrase "determining said actual return signal to be represented by said predetermined number of said assigned pulse values" relies upon assigned pulse values. *Id*. at 34. Since their range finder does not rely upon pulse values, Defendants argue there is no infringement. *Id*.

My review of the record leads me to conclude that genuine issues of fact exist as to the relevant aspects of

Defendants' accused device. McAlexander's Third Declaration does not alter my conclusion. Therefore, summary judgment is inappropriate for any party as to literal infringement or infringement under the doctrine of equivalents. The parties' cross-motions for summary judgment will be denied as to Claim 11 of the '779 patent.

'779 Claim 18

Defendants base their non-infringement argument on the "essence" of diode 316 and the fact that Plaintiff's laser range finder has this diode and theirs does not have it. *Defendants' Reply Memo,* 38. Defendants argue, simply, that their laser range finder does not infringe this patent claim because their device does not have a diode for preventing electrical back-flow. Id. at 39.

Defendants argue that expert McAlexander recognized Defendants' laser range finder lacks diode 316, "the essence." But, McAlexander never refers to it as such. Id. at 39-40 (citing McAlexander Depo., 74, lines 13-21). They also state that Plaintiff's expert, Faber, never measured whether Defendants' laser range finder achieves a constant pulse firing rate. Id. at 41. Defendants also argue expert Creusere's tests established that Defendant's laser range finder does not produce a constant noise pulse firing rate. Id.

In sum, Defendants contend: "With part of the essence of the invention missing from the Nikon/AOI laser range finder, nothing apparently taking its place, and no measurement of whether the Nikon/AOI laser range finder operates in the same way as in the LTI patent without the essential diode, there is no basis on which to find infringement of this claim element." Id.

Literal Infringement

[48] To infringe on this claim literally, each limitation in the disputed claim must be present in the accused device. *See* Pennwalt Corp. 833 F.2d at 935. This is a question of fact. *See* General Mills, Inc., 103 F.3d at 980-981. I construed the disputed language of '779 Claim 18 to require "a circuit consisting of a feedback loop composed in part of diode 316 that adjusts a noise threshold of a laser light receiver to a level at which a laser light receiver produces an output from noise light pulses having a constant pulse firing rate." *See* Claim 18 claim construction, above.

Plaintiff and Defendants agree that the accused device does not include diode 316. Since each limitation in the construed claim must be present in the accused device, and diode 316 is missing, Defendants' laser range finder does not literally infringe '779 patent Claim 18. Based on my review of the record, I find that no issues of genuine material fact exist with regard to literal infringement of Claim 18. Summary judgment for Defendants is appropriate to that extent.

Infringement Under the Doctrine of Equivalents

[49] Defendants contend that their device does not infringe '779 Claim 18 under the doctrine of equivalents because "the Nikon/AOI laser range finder does not set or reset a noise threshold automatically, as there is no apparatus therein for doing so." *Defendants' Memo,* 61-62. Plaintiffs argue that with regard to noise thresholding, Defendants' device includes "an integrating RC circuit that provides negative feedback to the MAX 913 comparator to automatically adjust the receiver's noise threshold so that the receiver maintains a constant noise output." *Plaintiff's Memo,* 70 (citing McAlexander Decl. para. 68). I construed this claim as one under s. 112 para. 6. Under the s. 112 para. 6 doctrine of equivalents, if part of the accused device performs *identically the same function* in *substantially the same way* to achieve *substantially the same result* as an element or limitation of the claimed device, then that part of the accused device is considered equivalent. *See* Warner-Jenkinson Co., 520 U.S. at 39, 117 S.Ct. 1040. Plaintiff asserts that Defendants' device performs noise thresholding (identically the same function) using an integrating feedback circuit (in substantially the same way) to a receiver that generates a constant noise output (to achieve substantially the same result). *Plaintiff's Memo,* 70.

However, Plaintiff concedes there may exist a question of material fact whether Defendants' device generates a constant pulse firing rate, which Plaintiff uses interchangeably with the phrase "constant noise output." *Plaintiff's Reply Memo,* 37. Plaintiff asserts that experts Carpenter and McAlexander testified, based on their own tests of Defendants' device, that Defendants' range finder generates a constant pulse firing rate. *Id*. at 18-20 (citing Carpenter Depo., 74; McAlexander Decl. para. 38; Second McAlexander Decl. para.para. 7, 11).

Defendants contend their device does not infringe because it has no feedback circuit, does not automatically adjust the noise threshold, and does not generate a constant frequency of noise pulses. *Id*. Specifically, Defendants assert their device does not provide a feedback signal proportional to the noise pulse firing rate because it lacks diode 316. *Id*. Defendants concludethat "without that diode, automatic noise threshold adjustment cannot occur." *Id*. at 19. Defendants have consistently referred to diode 316 as the "essence" of the comparator circuit at issue here and in other claims. *See e.g., id*. at 38.

Plaintiff argues that Defendants' device uses a MAX 913 component as the comparator circuit. *See e.g., Plaintiff's Reply Memo,* 16. I have construed the word "circuit" in relation to automatic noise thresholding as requiring diode 316 as part of a feedback loop. *See* '779 Claim 18 claim construction, above. Defendants argue that the MAX 913 circuit is not used as a comparator, but rather is used as an amplifier that has nothing to do with automatic noise thresholding. *Motions Hearing,* Defendants' argument re: MAX 913.

Whether the MAX 913 circuit actually provides for the threshold adjustment to sort out noise and target signals is unclear. Defendants argue that their expert, Creusere, "specifically conducted an experiment and found that there is no automatic noise threshold adjustment in the Nikon/AOI laser range finder," so the accused device cannot generate a constant pulse firing rate. *Defendant's Reply Memo,* 24. Plaintiff contends its expert Joe McAlexander analyzed the accused device and found it "automatically adjusted the noise threshold of the MAX 913 comparator to generate a constant pulse firing rate." *Plaintiff's Reply Memo,* 21 (citing McAlexander Decl. para. 38; Second McAlexander Decl. para. 11).

Plaintiff's and Defendants' experts testified that they tested the accused device to find out whether it automatically adjusts the noise threshold to produce a constant pulse firing rate. Plaintiff's experts and Defendants' expert disagree so a genuine issue of material fact exists. Plaintiff concedes that "Claims 18[and] 25 should proceed to trial on the issue of whether the Nikon/Asia Optical laser range finder generates a constant pulse firing rate." *Plaintiff's Reply Memo,* 37. The issue whether the MAX 913 component functions as part of an automatic noise thresholding system similarly prevents me from issuing summary judgment.

My review of the record leads me to conclude that because these genuine issues of fact exist as to the relevant aspects of Defendants' accused device, summary judgment is inappropriate for any party as to infringement under the doctrine of equivalents. So, to this extent, the parties' cross-motions for summary judgment will be denied as to Claim 18 of the '779 patent.

'779 Claim 25

As with Claim 18, Claim 25 must be analyzed under s. 112 para. 6. Plaintiff argues that, "[a]s required by Claim 25, the Nikon/Asia Optical laser range finder adjusts the negative input on the MAX 913 comparator in response to the noise level of the received signal in a way that achieves a constant pulse firing rate." *Plaintiff's Reply Memo,* 24 (citing McAlexander Decl. para. 38; Carpenter Depo., 71-72). Plaintiff asserts that Claim 18 analysis applies with equal force here. In addition, "[n]otwithstanding the test referred to by Dr. Creusere, the majority of the evidence shows that the Nikon/Asia Optical laser range finder obtains a constant pulse firing rate." Id. at 25.

Defendants argue "[t]he reasons for non-infringement of this claim element ... are the same as for the corresponding element in Claim 18.... When this element of Claim 25 is properly construed to require the presence of a diode, [it] does not infringe." *Defendants' Reply Memo,* 46.

Literal Infringement

To infringe on this claim literally, each limitation in the disputed claim must be present in the accused device. *See* Pennwalt Corp. 833 F.2d at 935. I construed the disputed language of '779 Claim 25 to require "a method including a feedback loop composed in part of diode 316 for adjusting a noise threshold of a laser light receiver to obtain a constant pulse firing rate from the laser light receiver to a level at which said laser light receiver produces a noise light pulse output having a constant pulse firing rate." *See* Claim 25 claim construction, above.

Plaintiff and Defendants agree that the accused device does not include diode 316. Since each limitation in the construed claim must be present in the accused device, and diode 316 is missing, Defendants' laser range finder does not literally infringe '779 patent Claim 25. As with Claim 18, no genuine issues of material fact remain that preclude summary judgment as to literal infringement. *See* Johnson Worldwide Assocs., 175 F.3d at 988-89.

Infringement Under the Doctrine of Equivalents

Defendants contend their device does not infringe '779 Claim 25 under the doctrine of equivalents because "the Nikon/AOI laser range finder does not set or reset a noise threshold automatically, as there is no apparatus therein for doing so." *Defendants' Memo,* 61-62. Plaintiffs argue that with regard to noise thresholding, Defendants' device includes "an integrating RC circuit that provides negative feedback to the MAX 913 comparator to automatically adjust the receiver's noise threshold so that the receiver maintains a constant noise output." *Plaintiff's Memo,* 70 (citing McAlexander Decl. para. 68). Under s. 112 para. 6 doctrine of equivalents, if part of the accused device performs *identically the same function* in *substantially the same way* to achieve *substantially the same result* as an element or limitation of the claimed device, then that part of the accused device is considered equivalent. *See* Warner-Jenkinson Co., 520 U.S. at 39, 117 S.Ct. 1040. Plaintiff asserts that Defendants' device performs noise thresholding (identically the same function) using an integrating feedback circuit (in substantially the same way) to a receiver that generates a constant noise output (to achieve substantially the same result). *Plaintiff's Memo,* 70.

My s. 112 para. 6 doctrine of equivalents analysis of Claim 25 is identical to that of Claim 18. As with Claim 18, Plaintiff's and Defendants' experts testified that they tested the accused device to find out whether it automatically adjusts the noise threshold to produce a constant pulse firing rate. Plaintiff's experts and Defendants' expert disagree so a genuine issue of material fact exists. Plaintiff concedes that "Claims 18[and] 25 should proceed to trial on the issue of whether the Nikon/Asia Optical laser range finder generates a constant pulse firing rate." *Plaintiff's Reply Memo,* 37. The issue whether the MAX 913 component functions as part of an automatic noise thresholding system also prevents me from issuing summary judgment.

My review of the record leads me to conclude that because these genuine issues of fact exist as to the relevant aspects of Defendants' accused device, summary judgment is inappropriate for any party as to infringement under the doctrine of equivalents. So, to this extent, the parties' cross-motions for summary judgment will be denied as to Claim 25 of the '779 patent.

'910 Claim 8

[50] Plaintiff argues that "[t]he same undisputed facts, deposition testimony, and admissions that establish infringement of Claim 11 of the '779 patent also establish that [Defendants'] laser range finder includes a precision timer that determines the time-of-flight of received signals." *Plaintiff's Reply Memo* at 29. Plaintiff

argues that, because Defendants' range finder records a flip-flop "1" for each received signal at a position in the delay line that uniquely identifies the flight time of the signal, the delay line implements a precision timer. Id. Plaintiff claims that Defendants' laser range finder "includes a precision timing section driven by the system clock and including the one-shot circuit clement and the data latch section (or delay line) of flip-flops." Id.

Next, Plaintiff argues that, because there is nothing in the claim that requires a clock separate from the internal system clock, Defendants do not escape infringement because their laser range finder does not have an extra clock. Id. Finally, Plaintiff argues that the data latch section of Defendants' laser range finder "implements a clock ... capable of measuring a time duration of 256 clock cycles." Id. at 30 (citing Creusere Rebuttal Report, 3, 9).

Defendants respond that their range finder "does not time the interval between the firing of a laser pulse and the detection of a received pulse. A particular pulse is not clocked so ... the basic clocking function is not performed." *Defendants' Memo,* 53. "Rather, all detected pulses are delivered to registers based on increments of distance and an individual pulse itself is not timed. The distance a pulse traveled has been determined by which register or range bin it ends up in and not by using a counter to precisely time it." Id. at 54 (citing Creusere Decl. para. 37).

Further, Defendants argue that "[t]he Nikon/AOI laser range finder does not determine a range of target from individual flight times or pulses, does not place pulses in a stack and certainly does not compare successive pulses with location in the stack or successive pulses with one another, which is how the central processor circuit section operates by its algorithmas described in the '910 Patent." Id. at 56 (citing Creusere Decl. para. 41). "Since the Nikon/AOI laser range finder uses a different technique to determine range, does not place pulses in any stack and does not compare pulses with locations in the stack or with other pulses in the stack, the Nikon/AOI laser range finder does not infringe this element of Claim 8 of the '910 Patent." Id.

As with Claim 11 of the '779 patent, my review of the record leads me to conclude that genuine issues of material fact exist as to the relevant aspects of Defendants' accused device. Because summary judgment is inappropriate for any party as to literal infringement or infringement under the doctrine of equivalents, the cross motions will be denied.

'077 Claim 1

Plaintiff argues Defendants' range finder falls within the literal scope of the claim language "a comparator circuit for providing an automatic noise threshold adjustment to said laser receiving section." *Plaintiff's Reply Memo,* 32. Plaintiff contends Defendants' range finder receiver includes a MAX 913 component as a comparator that provides automatic noise threshold adjustment, an issue already discussed in the context of Claims 18 and 25 of the '779 patent. The only difference is that Claim 1 does not require a constant pulse firing rate. Id. at 32-33.

Second, Plaintiff contends Defendants' range finder "includes a central processing section that determines the distance to the target based on time-of-flight information." *Plaintiff's Reply Memo,* 34. Plaintiff argues that, as established in its arguments about Claim 11 of the '779 patent and Claim 8 of the '910 patent, Defendants' laser range finder "includes a precision timer that determines the time-of-flight of received signals." Id. According to Plaintiff, Defendants' device records two kinds of information about each received signal. The first is the receipt of the signal, representedby the flip-flop switch "1." Id. at 35. The second is the position in the delay line where the "1" is recorded. Hence, this positioning "uniquely identifies the time-of-flight of the received signal." Id. Further, Plaintiff asserts "the undisputed evidence demonstrates that the Nikon/Asia Optical laser range finder correlates time-of-flight information through a central processor that determines the range to the target." Id. (citing *Defendants' Memo,* 31). To support its argument, Plaintiff contends that Defendants' expert Chien admitted that the Nikon/Asia Optical device

includes "a microprocessor that correlates the time-of-flight of received optical signals to determine the range to the target." Id. (citing Chien Depo., 72-73).

Defendants counter that their discussion of Claims 18 and 25 of the '779 patent applies here to the claim element "for input to a comparator circuit for providing an automatic noise threshold adjustment to said laser receiving section to facilitate discrimination between said returned laser pulses and said noise pulses." *Defendants' Memo,* 57. Further, Defendants' assert, "this claim element has an objective of discriminating between returned laser pulses and noise pulses." Id. As discussed in connection with Claims 18 and 25, Defendants reemphasize that "such discriminating step is not performed by the Nikon/AOI laser range finder, when that clause of the claim is properly construed." Id. (citing Creusere Decl. para. 43). Defendants contend that when this claim is construed with reference to what they deem the "essence" of the comparator circuit, the 316 diode, the Nikon/AOI laser range finder does not infringe because it does not have such a diode.

Finally, Defendants argue that, in connection with Claim 8 of the '910 patent, they discussed the the central processor circuit aspect of Claim 1 of the '077 patent, at issue here. "For the reasons stated there," Defendants contend, "when this claim element is properly construed, it is not present in the Nikon/AOI laser range finder, and this claim element is not infringed." Id. at 59.

Literal Infringement

To infringe on this claim literally, each limitation in the disputed claim must be present in the accused device. *See* Pennwalt Corp., 833 F.2d at 935. This is a question of fact. *See* General Mills, Inc., 103 F.3d at 980-981. I construed the first disputed claim language of '077 Claim 1 as follows: "[f]or input to a circuit that consists of a feedback loop composed in part of diode 316 for adjusting the noise threshold based on the noise environment in relation to reflected pulses received by the laser receiving section, before the noise signals are parsed out from the actual target signals. The circuit adjusts the noise threshold by comparing incoming pulse values with previously received pulse values to ascertain the noise environment." *See* Claim 1 claim construction, above. I construed the second disputed claim language to require "a processor that determines a distance to the target using time-of-flight information from received laser pulses." *Id.*

The first part of my analysis of Claim 1 necessarily parallels my analysis of Claims 18 and 25. Plaintiff argues Defendants' device "includes a MAX 913 comparator that provides automatic noise threshold adjustment." *Plaintiff's Reply Memo,* 32. Plaintiff contends this process is exactly what Claim 1 requires. *Id.* As discussed previously in relation to '779 patent Claims 18 and 25, Plaintiff's and Defendants' experts disagree about whether the accused device adjusts a noise threshold or produces a constant pulse firing rate. However, Plaintiff and Defendants agree that the accused device does not include diode 316. Since each limitation in the construedclaim must be present in the accused device, and diode 316 is missing, Defendants' laser range finder does not literally infringe '779 patent Claim 25. Based on my review of the record, I find that no issues of genuine material fact exist with regard to the first disputed claim language in Claim 1, so I grant summary judgment for Defendants as to literal infringement.

Plaintiff next contends Defendants' device includes a central processing section that determines the distance to the target based on time-of-flight information. *Plaintiff's Reply Memo,* 34. Plaintiff refers to '779 Claim 11 and '910 Claim 8 to establish that Defendants' device includes a precision timer that determines flight times. Id. I determined that summary judgment for infringement of '779 Claim 11 and '910 Claim 8 may not enter for either party. For the same reasons stated above in my infringement analyses of those claims, summary judgment may not enter here for the second disputed claim language of '077 Claim 1.

Infringement Under the Doctrine of Equivalents

Plaintiffs again argue that with regard to noise thresholding, Defendants' device includes "an integrating RC

circuit that provides negative feedback to the MAX 913 comparator to automatically adjust the receiver's noise threshold." *Plaintiff's Memo,* 70 (citing McAlexander Decl. para. 68). As described in my s. 112 para. 6 analyses of '779 Claims 18 and 25, whether Defendants' device performs noise thresholding is a genuine question of material fact because Plaintiff's and Defendants' experts disagree over the function of the accused device. *See* doctrine of equivalents analysis for Claims 18 and 25, above. Therefore, summary judgment under the doctrine of equivalents does not issue for either party for the first disputed claim language of Claim 1.

As for the second disputed claim language, I have construed it to require "a processor that determines a distance to the target using time-of-flight information from received laser pulses." *See* '077 Claim 1 claim construction, above. As I discussed at length in relation to '910 patent Claim 8 and '779 patent Claim 11, *see* Claim 8 and Claim 11 infringement analyses above, Plaintiff and Defendants disagree whether the accused device uses time-of-flight information. As with those claims, my review of the record leads me to conclude that genuine issues of material fact exist as to the relevant aspects of Defendants' accused device. Because summary judgment is inappropriate for any party as to infringement under the doctrine of equivalents, the cross motions will be denied.

C. Invalidity Analysis

[51] Defendants argue that all of the patents-in-suit are invalid because Plaintiff redefines its claims so they differ from the meanings provided in the specification. *Defendants' Reply Memo,* 38. Defendants do not make their arguments in relation to each patent-in-suit. Instead, they profer various examples. Id. For example, Defendants state: "Plaintiff now says that 'automatic noise threshold adjustment' does not include a diode which the prosecution history of the '779 patent says is part of the essence of that element, [and] 'a pulse value' apparently can have any number of meanings, not only the meaning in the specification." Id.

The inquiry under s. 112 para. 2 is whether the claims in light of their written descriptions notify the public of the scope of the patent. *See* Solomon, 216 F.3d at 1379. When the claims are so ambiguous that a person of ordinary skill in the art cannot determine their scope, the claims are invalid for indefiniteness. *See* Exxon, 265 F.3d at 1375. Patents are presumed valid. *Id*. at 1376. To rebut the presumption of validity, a defendant must establish by clear and convincing evidence that the patent is invalid. Telectronics, 857 F.2d at 785. Defendants fail to present any genuine issue of material fact sufficient to overcome the presumption of validity.

A patent specification which describes the claimed invention with sufficient detail so that one skilled in the art can reasonably conclude that the inventor possessed the claimed invention satisfies the "description requirement" of 35 U.S.C. s. 112 para. 1. *See* Vas-Cath, Inc. v. Mahurkar, 935 F.2d 1555, 1560-63 (Fed.Cir.1991). If a patent specification describes the claimed invention so that one skilled in the art can make and use the device without unduly extensive experimentation, that also satisfies the "enabling requirement" of s. 112 para. 1. *See* Telectronics, 857 F.2d at 785.

As discussed above in relation to Claims 18 and 25 of the '779 patent and Claim 1 of the '077 patent, the automatic noise thresholding mechanism claimed in those patents requires diode 316 as part of a feedback loop. *See* Claims 18, 25 and 1 claim constructions, above. In the '779 patent prosecution history, inventor Dunne described the feedback loop and diode 316 as essential to the automatic noise thresholding mechanism. *See Amendment,* 16. In the preferred embodiment of the '779 patent, diode 316 is clearly required. "The automatic noise threshold section 36 of FIG. 8 discloses a circuit that automatically sets a threshold such that a constant noise pulse firing rate is output from the detector comprising resistor 315, *diode 316,* capacitor 324 and resistor 322." '779 patent specification, col. 14, lines 41-45 (emphasis added). Although this language does not refer to a "feedback loop," it describes the feedback loop in sufficient detail, including diode 316, to meet the requirements of s. 112 para. 1. For that reason and based on the reasoning throughout this Order, I conclude that Claims 18 and 25 of the '779 patent and Claim 1 of the '077

are not so ambiguous that a person of skill in the art cannot determine their scope or the public cannot understand their scope.

Defendants assert '910 Claim 8 is invalid in light of prior art apparently pursuant to 35 U.S.C. s.s. 102(a) and 103(a). *Defendants' Reply Memo,* 32. Section 102(a) states: "[a] person shall be entitled to a patent unless the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent." 35 U.S.C. s. 102(a) (2001). Section 103(a) states:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

35 U.S.C. s. 103(a) (2001).

[52] In order to establish such an invalidity claim, a defendant must clearly and convincingly state facts relating to scope and content of the prior art, the level of ordinary skill in the art, the differences between the claimed invention and the prior art, and objective evidence of nonobviousness. C.R. Bard, Inc. v. M3 Sys., Inc., 157 F.3d 1340, 1349 (Fed.Cir.1998). Here, Defendants argue that Plaintiff's patent is invalid because Claim 8 describes a laser transmitter and laser receiver that was already in the prior art. *Defendants' Reply Memo,* 32-33. They also contend Plaintiff's use of a precision timing section, elapsed-time processor, and target-acquisition switch makes Plaintiff's patent invalid in light of prior art. *Id.* at 33-34. Defendants do not address the prior art specifically, nor do they follow the *C.R. Bard* test. Without clear and detailed reference to the scope and content of the prior art, the ordinary skill in the art, and the differences between the prior art and Plaintiff's patent, *see C.R. Bard,* Defendants fail to convince me that any part of Claim 8 is invalid.

Accordingly, I **ORDER** that:

1) For '779 patent *Claim 11,* both cross-motions for summary judgment as to literal infringement and infringement by the doctrine of equivalents are **DENIED**.

2) For '779 patent *Claim 18,* **DEFENDANT**'s cross-motion for summary judgment as to literal infringement is **GRANTED**. Both cross-motions for summary judgment as to infringement by the doctrine of equivalents are **DENIED**.

3) For '779 patent *Claim 25,* **DEFENDANT**'s cross-motion for summary judgment as to literal infringement is **GRANTED**. Both cross-motions for summary judgment as to infringement by the doctrine of equivalents are **DENIED**.

4) For '910 patent *Claim 8,* both cross-motions for summary judgment as to literal infringement and infringement by the doctrine of equivalents are **DENIED**.

5) For '077 patent *Claim 1,* **DEFENDANT**'s cross-motion for summary judgment as to literal infringement of the *first disputed claim language* is **GRANTED**. Both cross-motions for summary judgment as to infringement by the doctrine of equivalents of the *first disputed claim language* are **DENIED**. Both cross-motions for summary judgment as to literal infringement and infringement by the doctrine of equivalents of the *second disputed claim language* are **DENIED**.

6) For *all patents-in-suit,* **PLAINTIFF**'s cross-motion for summary judgment for patent validity is

GRANTED.

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