United States District Court,
N.D. Illinois.

IMPLANT INNOVATIONS, INC., a Florida corporation,
Plaintiff.
v.
NOBELPHARMA AB, a Swedish corporation,
Defendant.

Oct. 1, 1998.

MEMORANDUM OPINION AND ORDER

NORDBERG**, Senior District J.**

In this action, Plaintiff Implant Innovations, Inc. ("3I") 3I contends that Defendant Nobelpharma AB ("NAB") infringes one of its patents: U.S. Patent No. 4,850,870 to Lazzara et al, entitled "Prosthodontic Restoration Components." In turn, NAB contends that 3I infringes three of its patents: U.S. Patent No. 5,000,685 to Brajnovic et al, entitled "Spacer for Dental Implants;" U.S. Patent No. 5,087,200 to Brajnovic et al, entitled "Spacer for Dental Implants;" and U.S. Patent No. 5,069,622 to Rangert et al, entitled "Spacer." The Court held a *Markman* hearing to determine the claim construction of the claims at issue. The Court permitted the parties to present expert testimony relating to the disputed claim interpretations. The parties first submitted direct written testimony for each expert witness. Then, after a brief introductory direct examination, the parties conducted extensive cross-examinations and redirect-examinations of each expert witness.

After the *Markman* hearing, counsel for 3I and NAB submitted proposed findings of fact and conclusions of law. The Court has given full consideration to the parties' submissions and to its own notes. The following are the Court's Findings of Fact ("Findings") and Conclusions of Law ("Conclusions"). To the extent (if any) that the Findings as stated may be deemed conclusions of law, they shall also be considered Conclusions. In the same way, to the extent (if any) that matters later expressed as Conclusions may be deemed findings of fact, they shall also be considered Findings. *See* Miller v. Fenton, 474 U.S. 104, 113-14, 106 S.Ct. 445, 88 L.Ed.2d 405 (1985).

FINDINGS OF FACT AND CONCLUSIONS OF LAW

I. INTRODUCTION

1. Plaintiff Implant Innovations, Inc. ("3I") is a Florida corporation that designs, manufactures and sells "dental implants" and associated products.

2. Defendant Nobel Biocare AB ("NAB") is a Swedish corporation that designs, manufactures and sells "dental implants" and associated products. Defendant Nobel Biocare was previously known as Nobelpharma

AB. It changed its name since this lawsuit was filed.

3. In this action, NAB contends that 3I infringes three of its patents: U.S. Patent No. 5,000,685 to Brajnovic et al, entitled "Spacer for Dental Implants;" U.S. Patent No. 5,087,200 to Brajnovic et al, entitled "Spacer for Dental Implants;" and U.S. Patent No. 5,069,622 to Rangert et al, entitled "Spacer."

4. In this action, 3I contends that NAB infringes one of its patents: U.S. Patent No. 4,850,870 to Lazzara et al, entitled "Prosthodontic Restoration Components."

5. The parties have submitted briefs on the interpretation of the claims of the patents-in-suit. The Court also held a hearing in which it received the written direct testimony and heard live direct testimony and cross examination of the following witnesses: (1) On behalf of 3I: Keith Beaty, President of 3I and one of the inventors of the '870 patent; Dr. Daniel Sullivan, a prosthodontist; and, Dr. Steven Detsch, a periodontist; and (2) On behalf of NAB: Dr. Brien Lang, professor of the University of Michigan Dental School and a practicing prosthodontist; and, Lars Jorneus, an employee of NAB and one of the inventors of each of NAB's patents

6. In addition, 3I submitted the written testimony of Donald Banner a patent attorney. This Court granted NAB's motion to strike Mr. Banner's testimony, considered the testimony as a legal argument, and granted NAB leave to file a brief in response to Mr. Banner's arguments. NAB advised the Court that it would respond to Mr. Banner's legal argument in its proposed findings of fact and conclusions of law.

7. Further, although Dr. Detsch submitted written testimony and Dr. Detsch further testified in court on direct and cross-examination, 3I has now decided not to rely on his testimony for the purposes of claim interpretation. *See Letter of January 20, 1998 from Peter McCabe to Eric C. Cohen, Appendix, Tab 1.*

8. This court has jurisdiction over the parties pursuant to 28 U.S .C. s. 1331.

9. This court has jurisdiction over the cause of action pursuant to 28 U.S.C. s. 1338.

10. Venue is proper in this judicial district pursuant to 28 U.S.C. s. 1391 and 28 U.S.C. s. 1400.

II. CLAIM CONSTRUCTION

11. A literal patent infringement analysis involves two steps: the proper construction of the asserted claim and a determination as to whether the accused method or product infringes the properly construed asserted claim. *See* Vitronics Corp. v. Conceptronic, Inc. ., 90 F.3d 1576, 1581-82 (Fed.Cir.1996). Claim construction is a matter of law for the court. *See* Markman v. Westview Instruments, Inc., 52 F.3d 967, 979 (Fed.Cir.1995) (en banc), *aff'd,* 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996). In interpreting the asserted claim, the Court should first refer to the following intrinsic evidence: the patent itself, including the claims, the specification, and the prosecution history. *See* Vitronics, 90 F.3d at 1582. "Such intrinsic evidence is the most significant sources of the legally operative meaning of disputed claim language." *Id.* Moreover, "[i]n most situations, an analysis of the intrinsic evidence alone will resolve any ambiguity in a disputed claim term. In such circumstances, it is improper to rely on extrinsic evidence." *Id* at 1583.

12. In determining the proper construction of a claim, the Court should look first to the words of the claims themselves, both asserted and non asserted. *See id.* at 1582. Words are generally given their ordinary and

customary meaning, unless the patentee has chosen to be his own lexicographer and use terms in a manner other than their ordinary meaning. *See id*. The special definition, however, must be clearly stated in the patent specification or file history. *See* Hoechst Celanes Corp. v. BP Chems. Ltd, 78 F.3d 1575, 1578 (Fed.Cir.1996). "In other words, where the inventor does not clearly explain the adoption of an uncommon or new definition for a claim term, the common meaning of that term to one of ordinary skill in the art controls." Loral Fairchild Corp. v. Victory Co., 906 F.Supp. 798, 803 (E.D.N.Y.1995). As the Federal Circuit has recently stated:

[T]he focus in construing disputed terms in claim language is not the subjective intent of the parties to the patent contract when they used a particular term. Rather the focus is on the objective test of what one of ordinary skill in the art at the time of the invention would have understood the term to mean.

Markman, 52 F.3d at 986.

13. Thus, the Court must always review the specification to determine whether the inventor has used any terms in a manner inconsistent with their ordinary meaning. *See* 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 used by implication." *Id*. It is always relevant to claim construction and usually is dispositive. *See id*. "[I]t is the single best guide to the meaning of a disputed term." *Id*.

14. If in evidence, the Court may also consider the prosecution history of the patent, which is a complete record of all the proceedings before the Patent and Trademark Office, including express representations made by the applicant regarding the scope of the patent claims. *See id*. This is often significant because the prosecution history limits the interpretation of the claims so as to exclude any interpretation that was disclaimed during prosecution of the patent. *See* Southwall Tech., Inc. v. Cardinal IG Co., 54 F.3d 1570, 1576 (Fed.Cir.1995). "Included within an analysis of the [prosecution] history may be an examination of the prior art cited therein." Vitronics, 90 F.3d at 1583.

15. If the intrinsic evidence is insufficient to determine the meaning of the asserted claims, the Court may also rely on extrinsic evidence to understand the technology and to construe the claims. *See id*. at 1584.

Extrinsic evidence is that evidence which is external to the patent and file history, such as expert testimony, inventor testimony, dictionaries, and technical treatises and articles. However, ... extrinsic evidence in general, and expert testimony in particular, may be used only to help the court come to the proper understanding of the claims; it may not be used to vary or contradict the claim language. Nor may it contradict the import of other parts of the specification. Indeed, where the patent documents are unambiguous, expert testimony regarding the meaning of a claim is entitled no weight.... Nor may the inventor's subjective intent as to claim scope, when unexpressed in the patent documents have any effect. Such testimony cannot guide the court to a proper interpretation when the patent documents themselves do so clearly.

Id.

1. The '685 patent**-the preamble**

16. The analysis in this section is based entirely on intrinsic evidence consisting of the patent, the prosecution history and the reexamination history.

17. The first claim element at issue is the meaning of the "adapted ...for" and "adapted ... to" clauses of the preamble.

18. "[A] claim preamble has the import that the claim as a whole suggests for it." Bell Communications Research, Inc. v. Vitalink Communications Corp., 55 F.3d 615, 620 (Fed.Cir.1995). Where a patentee uses the claim preamble to recite structural limitations of his claimed invention, the PTO and courts give effect to that usage. *See id.;* Corning Glass Works v. Sumitomo Elec. U.S.A., Inc., 868 F.2d 1251, 1257 (Fed.Cir.1989).

19. In the reexamination of the '685 patent, NAB relied on the preamble of claim 1 to demonstrate that the Scharbach patent was not relevant to the art of dental prostheses. The examiner agreed, stating that it was not relevant "to the art of dental prosthetics in that it does not address any of the problems encountered in this area." As in *Corning Glass Works,* the specification makes it clear that the inventors were working on solving a problem with the art of dental prosthetics, not with hip replacements. Thus, the preamble of Claim 1 limits claim 1 to the art of dental prosthetics. 20.

The preamble recites that one end of the angled spacer element is "adapted ... for attachment to a fixture [1] defining therein a threaded aperture [7], said fixture [1] being intended for implantation in the maxillary." Thus, the preamble describes the fixture as a dental fixture having a threaded aperture. The preamble further recites that the other end of the spacer element is "adapted at its other end to support a dental prosthesis."

21. 3I has argued that these two "adapted" clauses are "means-plus-function" elements under 35 U.S.C. s. 112, para. 6. 3I argues that the phrase in the preamble, "adapted at its other end to support a dental prosthesis," is functional language which limits the upper end of the angled abutment to the exact configuration shown in Fig. 2 of the patent.

22. 3I has cited no case, and the Court has been unable to find a case, holding that an "adapted ... for" or "adapted ... to" clause in a preamble is a means-plus-function element. 3I's argument is without merit, in view of several recent Federal Circuit authority on means-plus-function clauses.

23. Section 112 para. 6 of the patent statute provides that

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

35 U.S.C. s. 112, para. 6 (1994).

24. "To invoke this statute, the alleged means-plus-function claim element must not recite a definite structure which performs the described function." Cole v. Kimberly-Clark Corp., 102 F.3d 524, 531 (Fed.Cir.1996). In *Cole,* the Federal Circuit held that the phrase "perforation means ... for tearing" fails to satisfy the statute "because it describes the structure supporting the tearing functions (i.e., perforations)." *Id.; See also* York Products, Inc. v. Central Tractor Farm & Family Center, 99 F.3d 1568, 1574 (Fed.Cir.1996) (the word "means" "protrud[e] from the liner sidewall portions and form[ ] load locks" did not invoke section 112 para. 6).

25. In Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 1582 (Fed.Cir.1996) the Court held that the claim element "a cooperating detent mechanism defining the conjoint rotation of said shafts in predetermined intervals" was not a means-plus-function" element. The Federal Circuit pointed out that claim drafters "conventionally use the preface 'means for' (or 'step for') when they intend to invoke section 112(6), and there is seldom any confusion about whether section 112(6) applies to a particular element." After noting that the particular mechanism in question-detent mechanism-was defined in functional terms, the court held that was not sufficient to convert it into a means-plus-function element.

First, the fact that a particular mechanism-here detent mechanism-is defined in functional terms is not sufficient to convert a claim element containing that term into a "means for performing a specified function" within the meaning of section 112(6).

91 F.3d at 1583. The Federal Circuit also noted that the claim element there in question did not use means plus function language. *Id*. at 1584. In that regard, the Court set forth two inter-related rules of claim construction for section 112 para. 6:

The use of the term means is not always necessary to trigger the application of section 112para. 6.Because "the use of the term "means" has come to be so closely associated with 'means-plus-function' claiming[,] *it is fair to say that the use of the term 'means'* (particularly as used in the phrase 'means for') *generally invokes* section 112(6) *and that the use of a different formulation generally does not*.

Id. at 1584.

26. The "adapted ... for" and "adapted ... to" clauses of the preamble of the '685 patent do not use the phrase "means for ." Because the "use of a different formulation [than "means for"] generally does not invoke section 112, para. 6, this Court presumes that the "adapted" clauses in the preamble do not invoke section 112, para. 6. Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d at 1584.

27. Further, the body of the claim describes the second threaded bore: in claim element [d] it describes the "second portion" that "defines a second threaded bore" and in which both the second threaded bore and the second portion form an acute angle with respect to the through bore in the first portion. The function of the second threaded bore is to accept the screw that supports the dental prosthesis on the abutment-the same as the function recited in the adapted... to clause of the preamble. Because "the alleged means-plus-function claim element must not recite a definite structure which performs the described function." Cole v. Kimberly-Clark Corp., 102 F.3d at 531, this is a further indication that the "adapted... to" clause in the preamble is not a means-plus-function element.

28. F inally, the Court looks to the '200 patent, which is related to the '685 patent, since it resulted from a patent application that was a continuation of the patent application for the '685 patent, and it thus has the same drawings and written specification. Clauses [a], [b], and [c] of claim 1 of the '200 patent are identical to the same clauses in claim 1 of the '685 patent. Clause [d], however, is different.

29. Clause [d] of the '200 patent includes a means-plus-function clause, "means for supporting and securing to said unitary member said dental prosthesis." That means-plus-function clause uses the classic language "means for" and shows that the inventors were capable of drafting a means-plus-function element when they intended to do so. Moreover, the function of "supporting ... said dental prosthesis" in the means-plus-

function clause of the '200 patent is the same as the function of the "adapted... to support a dental prosthesis" in the preamble. If the "adapted ... to" clause in the '200 patent were construed to be a means-plus-function element, then the means-plus-function element in clause [d] of the 200 patent would be superfluous. The Court will not construe the meaning of a claim to render an element superfluous. Further, as a matter of common sense, the "adapted ... for" and "adapted ... to" clauses in the '685 and '200 patents must have the same meaning, since the specifications and drawings in the two patents are identical.

30. For the foregoing reasons, the "adapted... for" and "adapted... to" clauses of the preamble are not means-plus-function elements under section 112, para. 6.

2. The '685 patent **-Element [b]**

31. There is no disagreement between the parties as to the meaning of element [b], which describes the angled abutment as a "unitary member." The parties agree that "unitary member" means that the angled abutment is a formed in one piece.

3. The '685 patent**-**the '685 patent **-Element [c]-The "First Portion"**

32. There appears to be no dispute as to the meaning of element [c], the first portion. The parties agree that it is the portion that attaches to the implant. It includes "an end surface ... permitting abutting engagement with the protruding end of the implanted fixture," and a "through bore defining an internal ledge to enable a screw to pass through said bore, abut said ledge and threadably engage the threaded aperture in the fixture."

4. The '685 patent**-Element [d]-The "Second Portion"**

33. Element [d], the "second portion" is defined in terms of two structural elements: it has a second threaded bore, and the second portion and the second threaded bore form an angle with respect to the through bore in the first portion.

34. The Court rejects 3I's argument that there is an additional limitation. 3I argues that,

"[t]his 'second portion' thus appears to be the upper portion of the spacer element which forms the recess for receiving the bottom of a gold cylinder and the short screw for holding the gold cylinder on the spacer element."

3I Amended and Supplemental Interrogatory Answers Relating to Claim Construction and Infringement ("*3I's Interrogatory Answers* "), at page 3. Nowhere in the claim, however, is the "recess for receiving the bottom of a gold cylinder" mentioned.

35. 3I also argues that

The claim defines the upper end of the spacer element solely by the use of functional language, '*adapted at its other [upper] end to support a* dental prosthesis.' Because this claim language defines the upper end of spacer element solely by its function, this part of the claim language must be construed as 'means-plus-function' language under 35 USC s. 112, para. 6, which states that such language covers only the specific structure described in the patent and its equivalents.

Id. (emphasis supplied). 3I's argument is without merit for the reasons discussed in connection with the

preamble.

5. The '200 patent

36. The '200 patent resulted from a further continuation of the application which resulted in the '685 patent. There are five claims in the '200 patent-one independent claim and four dependant claims. Claim 1 of the '200 patent, which is set forth below, covers a specific type of an angled abutment. The clauses in the claim are labeled with bold letters in brackets.

1. [a] An angulated spacer element adapted at its one end for attachment to a fixture defining therein a threaded aperture, said fixture being intended for implantation in the maxillary, and said spacer element being adapted at its other end to support a dental prosthesis, said spacer element comprising:

[b] a unitary member

[c]having a first portion with an end surface thereof permitting abutting engagement with the protruding end of the implanted fixture, said first portion also having a through bore defining an internal ledge to enable a screw to pass through said bore, abut said ledge, and threadably engage the threaded aperture in the fixture;

[d and said unitary member having a second portion having means for supporting and securing to said unitary member said dental prosthesis, said second portion forming an acute angle with respect to said through bore.

6. The '200 patent**-the preamble**

37. The preamble [a] of Claim 1 of the '200 patent is the same as the preamble of Claim 1 of the '685 patent. The construction of the preamble of Claim 1 of the '200 patent is the same as the construction of the preamble of Claim 1 of the '685 patent, for the reasons explained above.

7. The '200 patent**-Elements [b] and [c]**

38. Of the three subparagraphs that define the invention of Claim 1 of the '200 patent, the first two of them, [b] and [c] are the same as the first two subparagraphs of Claim 1 of the '685 patent. The construction of those claim elements for the '200 patent is the same as the construction of the same elements in the '685 patent, for the reasons described above.

8. The '200 patent**-Element [d]**

39. Unlike the preamble, the last subparagraph [d] of the '200 patent is a "means plus function" claim element because it uses the words "means for." Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580 (Fed.Cir.1996). Thus, clause [d] recites that the second portion has "means for supporting and securing to said unitary member said dental prosthesis," which, under 35 U.S.C. s. 112, para. 6, is the second threaded bore shown in Fig. 2. The second portion, including the second threaded bore, is at an angle with the through bore in the first portion.

40. 3I argues that Section 112 requires that a means plus function element cover "only the specific structure described in the patent and its equivalents." *3I's Interrogatory Answers, at 7*. 3I then argues that

The patent describes, at the upper end of the spacer element, a shallow recess in the top surface of the spacer element for receiving the bottom of a gold cylinder so that an artificial tooth cast around the gold cylinder can be perched on top of the spacer element. This leaves the major portion of the body of the spacer element exposed between the top surface of the gum and the lower end of the artificial tooth. To cover up this large body of exposed metal and make the spacer element more cosmetically appealing, the patent teaches the use of a ceramic or porcelain sleeve 12 that covers most of the body of the spacer element. The ceramic or porcelain has a light color that is not as noticeable as the dark color of the metal of the spacer element.

3I misinterprets the "function" set forth in the "means plus function" element at issue. The claim requires "means for supporting and securing to the unitary member said dental prosthesis ." The means for doing that is clearly the screw hole, which receives a screw that supports and secures the dental prosthesis to the unitary member. Indeed, the specification describes the function of the screw in prior art abutments as follows: "the dental prosthesis proper-in the form of a bridge construction-is united to the fixture by means of a fixing screw ...." Neither the ceramic sleeve nor the specific shape of the second portion relates to the function of the fixing screw. 3I is attempting to restrict the scope of the claim to require that clause [d] be construed to include all of the features of the specific embodiment shown in Fig. 2. 3I's arguments fail, because nothing in the patent or prosecution history suggests that the "shallow recess" or "ceramic sleeve" relate in any way to the function of supporting and securing a dental prosthesis.

9. The '622 Patent**-Claim 1**

40. There are three independent claims in the '622 patent. Claim 1 of the '622 patent is set forth below. The elements of the claim have been labeled with bold letters in brackets for ease of reference.

1. [a] An angulated spacer element adapted at its one end for attachment to a fixture having a threaded aperture and implanted in the jaw bone, said spacer element being adapted at its other end to support a dental prosthesis, comprising:

[b] said spacer element being a unitary member;

[c] said spacer element having a first portion with an end surface thereof permitting abutting engagement with the protruding end of the implanted fixture, said first portion also having a through bore aligned with said threaded aperture in the fixture and defining an internal ledge to enable a screw to pass through said bore, abut said ledge, and threadably engage the threaded aperture in the fixture;

[d] said first portion having means for locking said spacer element in a selectable one of a plurality of rotational, fixed positions in relation to said protruding portion of said fixture;

[e] said spacer element having a second portion for supporting the dental prosthesis on the spacer element, said second portion forming an acute angle with respect to said through bore of said first portion; and

[f] wherein said locking means is adapted to cooperate with an interlocking means provided on the protruding portion of the fixture and wherein one of said means is an n-sided polygon and the other means is a 2n-sided polygon.

Col. 3, line 55 to Col. 4, line 14.

10. The '622 Patent**-Claim 1-The Preamble**

41. The first claim element [a] is the preamble. This preamble is similar to the preamble of the '685 patent, and does not limit the claim, for the reasons discussed in connection with claim 1 of the '685 patent.

11. The '622 Patent**-Claim 1-Element [b]**

42. The second claim element requires that the abutment be a unitary member. The term "unitary member" means that the angled abutment is formed in one piece.

12. The '622 Patent**-Claim 1-Elements [c] and [d]**

43. The "first portion" defined in clause [c] includes those specific features that are recited in clauses [c] and [d].

13. The '622 Patent**-Claim 1-Elements [d] and [f]**

44. Elements [d] and [f] of Claim 1 recite that the spacer element includes a "locking means" to interlock with "an interlocking means provided on the protruding portion of the fixture," where "one of said means is an n-sided polygon and the other means is a 2n-sided polygon."

45. The parties disagree on the meaning of the term "polygon" in element [f] of claim 1. Neither the word "polygon" nor the phrases "n-sided polygon" or "2n-sided polygon" are found in the specification.

46. "Without an express intent to impart a novel meaning to claim terms, an inventor's claim terms take on their ordinary meaning." York Prods., Inc. v. Central Tractor Farm and Family Center, 99 F.3d 1568, 1572 (Fed.Cir.1996). To find the ordinary meaning of a word, the Federal Circuit has reviewed dictionary definitions. *See, e.g., Id.*

47. The term polygon is defined in RANDOM HOUSE DICTIONARY OF THE ENGLISH LANGUAGE, Unabridged Edition (1979), p. 1115, as follows:

Pol-y-gon ... n. a figure, esp. a closed plane figure, having three or more, usually straight, sides. [<L *polygon(um)* <Gk *polygonon,* neut. Of *polygonos* many-angled. See POLY -,-GON]

Thus, by definition, the term "polygon" does not require that the sides be straight.

48. Element [f] was added during the prosecution of the '622 patent. An element of a claim that is added by amendment during the prosecution of a patent application must have support in the drawings or the specification. 35 U.S.C. s. 132; Kolmes v. World Fibers Corp., 107 F.3d 1534, 1539 (Fed.Cir.1997). The specification describes the "means for locking the spacer element" in the preferred embodiment as follows:

"The base portion is further designed so as to have *interior dodecagonal geometrical configuration* 2 which fits the hexagon of the fixture, implying that the spacer, on being turned, will have 30 (deg.) instead of 60 (deg.)>> between the directions of deviation...."

Col. 2, lines 42-46. Emphasis supplied.

"The *dodecagonal* "*star* " 2 constitutes a rotational lock and provides twelve fixed directions for the spacer."

Col. 2, lines 52-53. Emphasis supplied.

49. Thus, the specification discloses that a "dodecagonal geometrical configuration" or "dodecagonal star" fits over the hexagon of the fixture and constitutes a rotational lock. "Dodecagon" is defined as "a polygon having 12 angles and 12 sides." RANDOM HOUSE DICTIONARY OF THE ENGLISH LANGUAGE, Unabridged Edition (1979), p. 422. "Hexagon" is defined in the same dictionary as having six angles and six sides." *Id.,* at 668. The addition of the suffix "al" to dodecagon changes it from a noun to an adjective. *Id.,* at 33. Thus, the phrase "dodecagonal geometrical configuration" means a configuration with 12 angles or 12 sides that do not necessarily need to be straight.

50. The word "star" is defined, among other things, as "6. A conventionalized figure usually having five or six *points* radiating from or disposed about a center." *Id.* at 1387. (Emphasis supplied.) In common usage, the "conventionalized figures" of stars referred to in the definition do not have straight lines connecting the points. Thus, "dodecagonal star" must mean a twelve-pointed star, which does not have straight sides. FN1

FN1. This is consistent with the correct translation of the Swedish term, "tolvuddig" in the original Swedish application, which was translated into "dodecagonal 'star." '

51. A further understanding of the term "dodecagonal" can be obtained by reviewing the original Swedish application. A copy of the original Swedish application is included in the prosecution history of the '622 application (DX 10, pages N04861-71), along with a translation (DX 10, pages N04850-60). 3I has argued that the Court should ignore the original Swedish application. 3I's argument is misplaced. The original Swedish application is a part of the prosecution history of the U.S. patent, *Id.,* and, as such, it is "intrinsic evidence" that may be considered in order to interpret the meaning of the claims. Vitronics, Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1996).

52. NAB has pointed out, and 3I has not disputed, that the term "dodecagonal" in the '622 patent is a translation of the words "tolvuddig" and "tolvuddiga," which appear in the original Swedish application. NAB has demonstrated that, in Swedish, the word "tolv" means "twelve" and the word "udd" translates into "point." *Lexin Swedish-English Dictionary,* DX 12. So, "tolvudd" would translate literally into "twelve point." "Tolvudd *ig* " is the word "tolvudd" with the suffix " *ig* " added. It is clear from the context in which the word is used that the Swedish suffixes "-ig" and "-iga" translate into the English suffix "-ed." Similarly, the word "dodeca" is defined in the RANDOM HOUSE DICTIONARY OF THE ENGLISH LANGUAGE, Unabridged Edition (1979), page 422, as "a learned borrowing from Greek meaning 'twelve' ...." "Gon" translates into "angle."

53. Since "tolvudd" means "twelve point," "tolvuddig" must mean "twelve pointed." That would make sense in the context of the phrases in which "tolvuddig" and "tolvuddiga" are used in the patent. If "twelve pointed" were substituted for "dodecagonal" in the first phrase at issue: that phrase would read "interior twelve pointed geometrical configuration 2." The same is true for the second phrase, which would read "twelve pointed 'star'."

54. Further, from an engineering point of view, it is the 12 points of the "dodecagonal 'star" ' which

interface with the 6 points of the hex on top of the implant to provide for the 12 rotational positions described in the patent, not the sides. Thus, a fair interpretation of the claim is that the term "2n-sided polygon" refers to anything that has twice as many locking points as the points to be locked on the mating portion of the implant.

55. For the foregoing reasons, Nobelpharma has argued that the phrase "2n-sided polygon" includes a twelve sided polygon in which the lines are not necessarily straight. 3I, on the other hand, has argued that the sides of the "2n-sided polygon" must be straight. 3I also argues that the "locking means" is defined only in functional terms, and thus must be construed to cover only the "specific structure shown in the patent and equivalents thereof." 3I argues that "in the structure described and illustrated in the patent, the locking means on the spacer element is the twelve-sided polygonal socket 2 shown in Fig. 2 of the drawings, and the interlocking means on the implant is a protruding hex on the top of the implant." *3I's Interrogatory Answers, at 11*.3I's argument is wrong because it focuses only on the drawings, ignoring the language in the specification.

14. The '622 Patent**-Claim 1-Element [e]**

56. The "second portion" of the angled spacer element is set forth in element [e]. Structurally, the second portion "form[s] an acute angle with respect to the through bore of said first portion." The purpose of the second portion is "for supporting the dental prosthesis on the spacer element."

57. The parties dispute whether element [e] is a means-plus-function element. NAB argues, and the Court agrees, that since the term "means for" is not used in element [e], it is presumptively not a means-plus-function element. Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 1584 (Fed.Cir.1996). Although the recitation that the second portion is "for supporting the dental prosthesis on the spacer element may be considered functional, a claim element is not necessarily a means-plus-function element merely because it contains some functional language. Moreover, the phrase "said second portion forming an acute angle" defines the second portion in structural terms. The fact that the second portion is defined in terms of structural elements is further evidence that it is not a means plus function element. "To invoke [Section 112, para. 6], the alleged means-plus-function claim element must not recite a definite structure which performs the described function." Cole v. Kimberly-Clark Corp., 102 F.3d 524, 531 (Fed.Cir.1996).

58. 3I, however, contends that the second portion of the spacer element is defined in functional terms, namely, "for supporting the dental prosthesis on the spacer element. 3I contends that shoulder 10 provides such support. 3I goes on to argue that "[t]his supporting second portion is further defined in the claim as "forming an acute angle with respect to said through bore of said first portion."

59. The doctrine of claim differentiation, however, precludes 3I's argument. Under the doctrine of claim differentiation, "Where some claims are broad and others narrow, the narrow claim limitations cannot be read into the broad whether to avoid invalidity or to escape infringement." D.M.I., Inc. v. Deere & Co., 755 F.2d 1570, 1574 (Fed.Cir.1985). "[T]he patentee clearly did not intend to limit the definition" of the independent claim to include the limitations in the dependent claims. Transmatic, Inc., v. Gulton Industries, Inc., 53 F.3d 1270, 1277 (Fed.Cir.1995). Modine Mfg. Co. v. U.S.I.T.C., 75 F.3d 1545, 1551 (Fed.Cir.1996).

60. Dependent claims 2, 3, 4 and 5 each add a structural limitation to the second portion. Claim 2 adds the limitation that the second portion "comprises a substantially conical upper portion," and that " *an intermediate portion is provided between said first and said second portions*." Claim 3 adds the limitation

that the angle formed by the second portion is within the range of 25 (deg.) to 40 (deg.).

61. Claim 4 adds the limitation that a connection sleeve is insertable between the second portion and the dental prosthesis and is adapted to cover the first through bore. Claim 5 adds the limitation that the connection sleeve " *rests against a shoulder provided on said intermediate portion*."

62. Since claim 2 provides that the intermediate portion is not part of the "second portion," and claim 5 provides that the shoulder is "provided on said intermediate portion," then, under the doctrine of claim differentiation, the "second portion" defined in claim element [e] cannot include the shoulder, as 3I argues.

63. Under the doctrine of claim differentiation, "[w]hen a limitation is included in several claims but is stated in terms of apparently different scope, there is a presumption that a difference in scope is intended and is real. Tandon Corp. v. United States Int'l Trade Comm'n, 831 F.2d 1017, 1023, 4 USPQ2d 1283, 1288 (Fed.Cir.1987). Such a presumption can be overcome, but the evidence must be clear and persuasive." Modine Mfg. Co. v. U.S.I.T.C., 75 F.3d 1545, 1551 (Fed.Cir.1996). One example of "clear and persuasive" evidence overcoming a presumption of claim differentiation is O.I. Corp. v. Tecmar Co., 115 F.3d 1576, 1582 (Fed.Cir.1997). In *O.I. Corp*. the accused device had a smooth-walled passage. The issue was whether the word "passage" in the independent claim was limited to non-smooth-walled passages. A dependent claim further defined "passage" to be a structure that was not smooth-walled. The patentee argued, based the doctrine of claim differentiation, that the "passage" in the independent claim must include smooth-walled structures. The Court disagreed because the specification of the patent stated "that the structure for the passage includes non-smooth geometries" and because the specification "expressly distinguishe[d] over prior art passages by stating that those passages are generally smooth-walled." 115 F.3d at 1581. Thus, the Court concluded that the specification "provides a clear meaning for the language of the claim in this case and that it trumps the doctrine of claim differentiation." 115 F.3d at 1582.

64. In contrast, in this case, there is no "clear and persuasive" evidence to overcome the presumption of claim differentiation with respect to claim element [e] of the '622 patent. The specification neither describes the invention nor distinguishes over prior art in a manner which precludes claim differentiation, as was the case in *O.I. Corp*.

65. For the reasons stated above, the Court concludes that the "second portion" of claim element [e] is not a means-plus-function element under Section 112, para. 6. The Court further concludes that the "second portion" does not include the shoulder, and that the shoulder is part of the intermediate portion.

15. The '622 patent**-Claim 6**

66. Claim 6 is set forth below, with its elements designated by bold letters in brackets.

6. [a] An angulated spacer for connecting a dental prosthesis to a fixture adapted for implantation in the jaw bone, said spacer comprising:

[b] a single member having a lower portion and an angulated portion extending from said lower portion,

[c] said lower portion including locking means adapted to cooperate with the upper portion of the fixture for locking said member in a selected one of a plurality of fixed rotational positions relative to the fixture,

[d] said lower portion also including a first through bore having an axis aligned with the longitudinal axis of the fixture, said bore being adapted for receiving a first fastening means for fixing said member to the fixture in said selected rotational position,

[e] said angulated portion having an outer surface configured for receiving and supporting the dental prosthesis, said angulated portion including a second threaded through bore extending therein and having an axis forming a fixed angle with the axis of the first through bore, said second bore being adapted for receiving a second fastening means for securing the dental prosthesis to said angulated portion.

Col. 4, lines 33-54.

16. The '622 patent**-Claim 6 -Elements [a] and [b]**

67. There is no dispute about elements [a] and [b]. The first element is simply a preamble. The second describes the abutment as being a single member.

17. The '622 patent**-Claim 6-Element [c]**

68. Claim element [c] includes "locking means ... for locking said member in a selected one of a plurality of fixed rotational positions relative to the fixture." Because the term "means ... for" is used in this claim element, it is a means-plus-function element under section 112, para. 6.. Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 1584 (Fed.Cir.1996).

69. The locking means described in the specification includes a "dodecagonal star" that can be secured to a hex or similar element on the head of the implant to lock the abutment in one of a number of fixed, rotational positions. As is discussed above in connection with claim 1, in the description of the preferred embodiment, the specification discloses that a "dodecagonal geometrical configuration" or "dodecagonal star" fits over the hexagon of the fixture and constitutes a rotational lock. "Dodecagon" is defined as "a polygon having 12 angles and 12 sides." RANDOM HOUSE DICTIONARY OF THE ENGLISH LANGUAGE, Unabridged Edition (1979), p. 422. "Hexagon" is defined in the same dictionary as having six angles and six sides." *Id.,* at 668. The addition of the suffix "al" to dodecagon changes it from a noun to an adjective. *Id.,* at 33. Thus, the phrase "dodecagonal geometrical configuration" means a configuration with 12 angles or 12 sides that do not necessarily need to be straight. Further, the word "star" is defined, among other things, as "6. A conventionalized figure usually having five or six *points* radiating from or disposed about a center." *Id*. at 1387. (Emphasis supplied.) In common usage, the "conventionalized figures" of stars referred to in the definition do not have straight lines connecting the points. Thus, "dodecagonal star" must mean a twelve-pointed star, which does not have straight sides. 70. Consequently, the "means ... for locking" in claim element [c] constitutes a geometrical configuration that is capable of locking onto a hexagon, such as a 12-pointed star, or equivalents thereof.

18. The '622 patent**-Elements [c] and [d]**

71. The "lower portion is defined in elements [c] and [d] in a manner similar to the "first portion" in claim 1, i.e., the "lower portion" includes the features specifically described in those claim elements. Thus, the lower portion includes the "locking means," and "a first through bore."

19. The '622 patent**-Element [e]**

72. Element [e] defines the "angulated portion" as including an outer surface, a second threaded bore "extending therein" having an axis forming a fixed angle with the axis of the first through bore and adapted to receive a fastening means for securing the dental prosthesis.

73. The phrase "an outer surface configured for receiving and supporting the dental prosthesis" is presumptively *not* a means plus function element because it does not use the phrase "means for ." Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 1584 (Fed.Cir.1996). Further, the phrase "configured for" has not been treated as a means-plus-function element by the Federal Circuit. For example, in National Presto Industries, Inc. v. The West Bend Company, 76 F.3d 1185, 1189 (Fed.Cir.1996), the Court did not treat the phrase "retention chamber which is configured for reception within the retention compartment" as a means-plus-function element. In this case, the angulated portion is defined in terms of its structural features, since the "outer surface" and second threaded bore at an angle to the first threaded bore both define structure.

74. When this claim element is read as a whole, it is clear that the part of the outer surface which is configured for receiving and supporting the dental prosthesis is the part which defines the second threaded through bore, which receives the screw which fastens the dental prosthesis to the abutment.

20. The '622 patent**-Claim 9**

75. In many respects, Claim 9 of the '622 patent is identical to claim 1. Claim 9 is set forth below, with the elements designated with bracketed letters.

9. [a] An angulated spacer element adapted at its one end for attachment to a fixture having a threaded aperture and implanted in the jaw bone, said spacer element being adapted at its other end to support a dental prosthesis, comprising:

[b] said spacer element being a unitary member;

[c] said spacer element having a first portion with an end surface thereof permitting abutting engagement with the protruding end of the implanted fixture, said first portion also having a through bore aligned with said threaded aperture in the fixture and defining an internal ledge to enable a straight screw to pass through said bore, abut said ledge, and threadably engage the threaded aperture in the fixture;

[d] said spacer element having a second portion for supporting the dental prosthesis on said spacer element, said second portion forming an acute angle with respect to said through bore of said first portion;

[e] and wherein said first portion comprises a substantially conical base portion which cooperates with the protruding portion of the fixture, and said second portion comprises a substantially conical upper portion.

Col. 4, line 63-Col. 6, line 12.

76. Elements [a], [b], and [c] of Claim 9 are virtually identical to the same elements of Claim 1, so the discussion with respect to them is the same.

77. Element [d] of Claim 9 is identical to element [e] of Claim 1. There is no limitation at all with respect to the locking means in this claim. Instead, this claim includes element [e], which describes the first portion as comprising "a substantially conical base portion" and a second portion which "comprises a substantially

conical portion."

78. The word "comprise" means "include." RANDOM HOUSE DICTIONARY OF THE ENGLISH Language, page 303. Thus, the phrase, "comprises a substantially conical base portion," means that the first portion includes a base portion mostly but not necessarily perfectly conical in any cross section. Similarly, "comprises a substantially conical upper portion" means that the second portion includes an upper portion that is mostly but not necessarily perfectly conical in any cross section.

79. The word "conical" is defined in THE RANDOM HOUSE DICTIONARY OF THE ENGLISH LANGUAGE as follows:

Con-ic (kon' ik), *adj*. 1. Also con'-i-cal. Having the form of, resembling, or pertaining to a cone....

Thus, the word conical does not require that the form be exactly in the shape of a cone.

21. The '870 patent

80. The expression in claim 1 of the '870 patent that the socket section is dimensioned to "fit snugly over" the mount section, or in claim 14 that the connecting section is dimensioned to "interfit snugly with" the mount section, does not require actual contact between those sections. The claim language "fit snugly over" or "interfit snugly with" is simply to be given its ordinary meaning in the English language. Defendant did not present any evidence that these expressions have any special meaning in the field of dental implantology, nor does the '870 patent or its prosecution history indicate that the expressions have any special or unusual meaning.

81. The dictionary meaning of "snug" is "fitting closely and comfortably <a ~ coat>." *Webster's Ninth New Collegiate Dictionary* (1990); "fitting closely: *That coat is a little too snug*." *The World Book Dictionary* L-Z Volume Two (1971) (Clarence L. Barnhart ed.). Using the ordinary dictionary meaning of" snug," the '870 claims are construed to mean that the inside surface of the socket section is located close to the outside surface of the mount section. There is no requirement that they touch, nor is there any requirement for a precision fit along the length of the mount section.

82. The '870 patent indicates that the fit can vary along the length of the two sections. Thus, the patent shows in Fig. 4 a preferred embodiment in which at least major portions of the mount and socket sections do *not* touch (the width of the screw head 148 that forms part of the mount section is smaller than the width of the socket 166 in the coping 160).

83. There is no need for the mount and socket sections to touch unless they are also serving to prevent relative rotation between the two members, and the patent makes it clear that the anti-rotation feature is optional. In col. 4, lines 1-6, the patent states:

When two or more abutments are available on which to construct a restoration, there is no need to provide anti-rotation between the restoration and the abutments, or between the restoration components. In such a situation, the post, coping and implant may be free to rotate around a common axis relative to each other.

Consequently, construing the claims to require "touching" would be contrary to the express teachings found in the patent itself.

84. The '870 patent also suggests that the term "fit snugly" should not be construed to require a precision fit between the mount and socket sections along the entire length of the mount section. For example, Fig. 4 of the patent shows a hexagonal socket section 166 which is shorter than the combined lengths of the hexagonal sections of the abutment post 130 and the screw 134 that combine to form the mount section. Thus, part of the hexagonal section of the post 130 will be within the socket 166, but another part will lie within the tapered conical cavity 162 of the coping 160, which is not a precision fit. The term "precision fit" does not appear anywhere in the '870 patent.

85. The expression in claim 1 of the '870 patent that the mount section extends "supragingivally from said second end on a substantially uniform cross-section," or in claim 14 that the mount section is "of substantially uniform cross-section at said second end," does not require a cross-section having exactly the same cross-sectional shape and dimensions along the entire length of the mount section. The word "substantially" is commonly used in patent claims for the purpose of avoiding overly restrictive constructions. The Federal Circuit has expressly approved the use of the word "substantially" in patent claims, and has specifically addressed the ordinary meaning of this word, as follows:

Ordinarily, therefore, "substantially" means "considerable in ... extent," *American Heritage Dictionary Second College Edition* 1213 (2d ed.1982), or "largely but not wholly that which is specified," *Webster's Ninth New Collegiate Dictionary* 1176 (9th ed.1983). Thus, the modifier "substantially" conveys that the ridge members extend over most of the "entire height" of the sidewall portions.

York, 99 F.3d at 1573.

86. Applying the above ordinary meaning of "substantially" to that word as used in the '870 claims, it is clear that the claims should *not* be construed as being restricted to a mount section that has the same cross-section along its entire length. The term "substantially" should be given its ordinary meaning so that the claim requires only that the similarity of cross-sections through the mount section be "considerable in ... extent," or "largely but not wholly" uniform.

87. The claim language does not require that the "substantially uniform cross-section" be present continuously all the way along the entire length of the mount section from one end to the other. The claims simply say that the mount section extends "from said second [upper] end [of the supragingivally-extending section] *on a substantially uniform cross-section*." The claims do *not* say that the "substantially uniform cross-section" extends along the entire length, or from end to end.

88. Nor is there any evidence of any functional or technical reason for construing the claims to require that the "substantially uniform cross-section" extend along the entire length of the mount section. As can be seen in the drawings of the '870 patent, the mount section is an extension of the supragingivally-extending section. One of the functions of this mount section is to receive the screw that attaches the coping to the abutment post, and another function is to receive a tool such as a wrench for rotating, or preventing rotation of, the abutment post during installation. Neither of these functions requires that the "substantially uniform cross-sections" extend along the entire length of the mount section.

89. The expression in claims 1 and 14 of the '870 patent that the supragingivally extending section "tapers in cross-section from said trans-tissue section to a smaller cross-section at its second end," does not require that the taper be continuous and uninterrupted along the entire length of the section. The portion of the post

above the gum line ("supragingivally extending") generally "tapers" so that the top end of the post has a smaller diameter than the bottom of the post. A taper as a matter of simple use of the English language does not require that the taper be continuous and smooth, but simply that the shape has a wide end and a narrow end. Looking at the matter as one skilled in the art, a variety of tapers, some continuous and some interrupted, would be recognized.

90. *Webster's New Collegiate Dictionary* defines "tapers" as meaning "to become progressively smaller toward one end" or "to diminish gradually." There is no requirement in the definition that the reduction in size proceed in any particular manner. A candle, for example, can be tapered and yet have steps or rings or spirals along the way. It still "diminishes gradually."

91. Nor is there any evidence that any technical justification exists for superimposing additional requirements on the ordinary dictionary definition of the word "tapers." The only reason for the taper in the supragingival section of the '870 abutment is to enable that portion of the abutment to fit within the flared portion of the coping. When the flare angle of the coping is smaller than the taper angle of the abutment, as in the embodiments of Figs. 1 and 2, there is actually a gap between the opposed surfaces of these two members. Thus, the shape of the taper is obviously not critical. The only technical requirement is that the size of the abutment diminish fast enough that it is always at least as small as the internal size of the coping, so that the abutment and the coping can telescope over each other with enough clearance to permit sealing contact between them at the wide end of the coping.

92. The expression in claims 1 and 14 of the '870 patent that the coping includes a "socket ['connecting' in claim 14] section at the smaller end of said flaring section" does not require separate socket and flaring sections. The "socket section" and the "hollow flaring section" in the '870 patent are merely different regions of the hollow coping or sleeve. In column 3, lines 1-5, the '870 patent explicitly states that "The coping 60 is a generally cone-shaped hollow body *having a flaring section 62* ... and at its narrower end 64 a *socket section 66* ...."

CONCLUSION

For the reason stated herein, this constitutes the Court's Findings of Fact and Conclusions of Law.

N.D.Ill.,1998.
Implant Innovations, Inc. v. Nobelpharma AB

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