United States District Court,
S.D. New York.

INTELLECTUAL PROPERTY DEVELOPMENT, INC., and COMMUNICATIONS PATENTS, LTD,
Plaintiffs.
v.
UA-COLUMBIA CABLEVISION OF WESTCHESTER, INC. and TELE-COMMUNICATIONS, INC,
Defendants.

No. 94 CIV. 6296(WHP)

Jan. 3, 2002.

MEMORANDUM AND ORDER

PAULEY**, District J.**

This is a patent infringement action involving United States Patent No. 4,135,202, which claims an invention for "Broadcasting systems with fibre optic transmission lines." U.S. Patent No. 4,135,202 (issued January 16, 1979) ("the '202 patent"). Defendants Tele-Communications, Inc. ("TCI") and UA Columbia Cablevision of Westchester, Inc. ("Cablevision") move for summary judgment. Defendants' motion also includes an application for reconsideration of a Markman claim interpretation. For the reasons detailed below, defendants' motion for summary judgment and their application for reconsideration are granted.

This Court exercises its discretion to review the prior Markman construction of the term "high frequency," and concludes that a person of ordinary skill in the art of wired broadcasting systems would have understood "high frequency" to encompass 3-30 MHz. Based on this finding, summary judgment of noninfringement of the "high frequency" limitation is granted to defendants, as the accused systems operate in the very high frequency MHz range. Summary judgment of noninfringement of the "transmission means" limitation is denied as to literal infringement and granted to defendants under the doctrine of equivalents based on prosecution history estoppel. This Court also concludes that the '202 patent is invalid.

I. *PROCEDURAL HISTORY*

This action has meandered along a labyrinthine path before arriving in this Court. Plaintiff Intellectual Property Development, Inc. ("IPD") filed this patent infringement action in this District on September 1, 1994. Early in the proceedings, the case was bifurcated into liability and damages phases, and a stay was ordered on certain damages discovery. *See Intell. Prop.* Dev. Corp. v. UA-Columbia Cablevision of Westchester, Inc. et al., No. 94 Civ. 6296(SS), 1995 WL 81276 (S.D.N.Y. Feb. 28, 1995) (hereinafter " *IPD I*".) On October 16, 1995, defendants moved for summary judgment on the grounds of claim interpretation and noninfringement. That motion was denied on February 2, 1996. The District Court conducted a four-day

Markman hearing in June 1997, and subsequently received further evidence. On March 26, 1998, then District Judge Sotomayor issued a claim construction ruling. *See Intell. Prop.* Dev., Inc. v. UA-Columbia Cablevision of Westchester, Inc. et al., No. 94 Civ. 6296(SS), 1998 WL 142346 (S.D.N.Y. March 26, 1998) (hereinafter *IPD II*). Due to Judge Sotomayor's elevation to the court of appeals, this action was reassigned to another district judge and thereafter to this Court on July 29, 1999. On September 14, 1999, the Judicial Panel on Multidistrict Litigation transferred this action to a multidistrict litigation consolidation in the Central District of California. In June 2000, that district court granted IPD's motion for remand and the action was returned to the Southern District of New York. Discovery continued until January 2001. (Order dated Dec. 28, 2000.)

On September 20, 2000, defendants moved to dismiss for lack of standing, while plaintiff simultaneously moved to amend the complaint to join patent owner Communications Patents, Limited ("CPL") as an additional plaintiff. This Court granted plaintiff's motion to amend, and denied defendants' motion to dismiss. On December 15, 2000, plaintiffs filed their second amended complaint. Defendants each filed amended answers and counterclaims and thereafter moved for summary judgment.

II. *FACTUAL BACKGROUND*

A. *The Patent at Issue*

On January 16, 1979 the United States Patent and Trademark Office ("PTO") issued U.S. Patent No. 4,135,202 to Albert E. Cutler, who assigned it to Communications Patents Limited of London. The patent expired in 1996. The specification provides four figures, and describes the claimed invention as an improvement over prior wired broadcasting systems. FN1 Those systems either (1) used a single coaxial cable to distribute a plurality of television signals between a central station and a plurality of subscribers, employing frequency ranges "from about 40-300 MHz," ('202 patent, col. 1, 11. 9-16) or (2) distributed a plurality of television signals on separate signal paths by using twisted pairs of conductors within a common cable between a central station and a plurality of subscribers, commonly using frequencies between 2 and 20 MHz ('202 patent, col. 1, 11. 16-26). Problems associated with those systems include transmission losses requiring multiple amplifiers in the first system, and crosstalk between the separate signal paths in the second system. ('202 patent, col. 1, 11. 27-38.)

FN1. *See* Appendix A for Figures 1-4.

The '202 patent's improvement over the prior art consists of "a wired broadcasting system in which a signal path between a central station and at least some of a plurality of subscribers includes an optical fibre extending between an electro-optical transducer and a photo-sensitive detector." ('202 patent, col. 1, 11. 42-46.) Alternative arrangements of the claimed invention include systems where (1) the optical fiber spans the entire length between the central station and each of the subscribers; (2) the optical fiber extends between the central station and a distribution point from which conventional conductive paths distribute the signals; or (3) an optical fiber extends between each subscriber and a program exchange at which point the subscriber selects the program signal for input into his or her optical fiber. ('202 patent, col. 1-2 11. 48-5.) FN2 The specification also notes that "the signals transmitted over the optical fibres may comprise a light beam modulated in respect of video frequency signals, one or more high frequency modulated carrier waves of different carrier frequency or a combination of video frequency signals and one or more high frequency modulated carrier waves." ('202 patent, col. 2, 11. 2-8.)

FN2. Although the '202 patent employs the British spelling of "fibre", this opinion, like Judge Sotomayor's earlier memoranda, uses the American Heritage Dictionary spelling of "fiber" when not quoting directly from the patent. *See American Heritage Dictionary of the English Language* 654 (Joseph P. Pickett ed., Houghton Mifflin Co. 4th ed.2000.)

Claim 1 is the only independent claim in the '202 patent, with claims two through five depending thereon. It claims:

A broadcasting system conveying signals by a signal path between a central station and a plurality of subscribers, comprising in combination, a common optical fibre in said signal path carrying signals to said plurality of subscribers from said central station, said fibre extending between an electro-optical transducer at said central station producing a light beam and photo-sensitive detector means at a reception position *near* the subscribers [sic] station, transmission means at the central station modulating the light beam for transmission through said optical fibre, said transmission means including modulation means producing a light beam modulated by a *high frequency* carrier which itself is modulated with video broadcast signals, conventional television receivers at the subscriber stations responsive to receive said *high frequency* carrier modulated with video broadcast signals, light beam demodulation means at said reception position responsive to said photo-sensitive detector means to convert said light beam into demodulated high frequency carrier radio wave signals modulated with video broadcast signals, and means coupling said demodulated signals from said reception position to said subscriber stations in a form suitable for direct application to said conventional television receivers *without further signal processing*.

('202 patent, col. 4, 11. 5-31)(emphases added.)

B. *The Pleadings*

Plaintiffs allege that Cablevision has directly infringed the '202 patent by "making, using and/or selling apparatus employing the invention disclosed and claimed in the '202 patent" and/or has contributorily infringed or induced infringement of the '202 patent. (Second Amended Complaint for Patent Infringement ("Sec.Am.Compl.") para. 7). Plaintiffs also allege that TCI infringed the '202 patent by "causing indirectly owned and/or operated cable systems", such as Cablevision, to infringe the patent. (Sec.Am.Compl.para. 10). IPD and CPL assert claims 1 and 5 of the '202 patent. IPD II, 1998 WL 142346, at n. 2.

Defendants contend, *inter alia,* that the '202 patent is invalid and unenforceable due to inequitable conduct. (Defendant UA-Columbia Cablevision of Westchester, Inc.'s Amended Answer to Plaintiff's Second Amended Complaint ("Cablevision Answer") para.para. 16-18, and Defendant Tele-Communications, Inc.'s Amended Answer to Plaintiff's Second Amended Complaint ("TCI Answer") para.para. 16-18.) Defendants also assert counterclaims for a declaratory judgment of invalidity, noninfringement and unenforceability. (Cablevision Answer pp. 10-11, para.para. 1-8 and TCI Answer pp. 10-11, para.para. 1-8.)

C. *The Accused Systems*

The accused systems include cable television systems that use AT & T LaserLink II optical transmitters. The accused systems operate in the "very high frequency" (VHF) range. (Defs.' 56.1 Stmt. para. 3 .)

D. *The Markman Claim Interpretations*

The claim construction in this action addressed three limitations of Claim 1: (1) the meaning of "high frequency"; (2) the meaning of the word "near" as it describes the photo-sensitive detector means' position relative to the subscriber's station; and (3) the meaning of the phrase "without further signal processing" as it describes the suitability of a signal's application to a "conventional television receiver." IPD II, 1998 WL 142346, at *3-4.

Judge Sotomayor held that "high frequency as used in the '202 patent would have been understood by a person skilled in the art to mean the VHF range, 54 to 216 MHz, received by conventional television receivers of the time." IPD II, 1998 WL 142346, at *5. That definition refers to television receivers of the time in the United States. *See* IPD II, 1998 WL 142346, at *9 ("[A] person in the United States would still have understood a reference to a conventional television receiver in [Claim 1] to mean a VHF television receiver.").

The decision defined "near" as follows: "In the context used, 'near' would be measured by a person skilled in the art by the performance criteria necessary to ensure that a strong signal with a reasonable number of channels could be brought to a small group of subscribers with minimum noise ratios and distortions." IPD II, 1998 WL 142346, at *16. Thus, Judge Sotomayor reasoned that "[o]nce geography was established and the number of subscribers established, 'near' could mean the use of a conductive network with a relatively small number of amplifiers, i.e., 2 or 3, necessary to reach the subscribers within the set performance criteria." IPD II, 1998 WL 142346, at *16.

The third limitation, "without further signal processing" was defined to mean that "[a]s long as the signals coming out of the demodulation means (detector [18]) can be applied to a television receiver without further signal processing being required, this limitation is met. Thus, whether signal processing such as amplification is in fact performed after the demodulation occurs is irrelevant to the limitation set forth in the Claim." IPD II, 1998 WL 142346, at (describing Figure 2.) The claim construction decision interpreted patent applicant Cutler's use of the phrase "without other signal processing devices" as a way to distinguish the application from prior art that required the use of further devices to convert a demodulated signal to a television signal. IPD II, 1998 WL 142346, at *19 (comparing '202 patent to U.S. Patent No. 3.751,670 (the "Grodner patent")).

III. *DISCUSSION*

A. TCI and Cablevision's Application for *Reconsideration of the Markman Ruling*

Judge Sotomayor construed "high frequency" to encompass the VHF range from 54 to 216 Mhz. IPD II, 1998 WL 142346, at *5. TCI and Cablevision move for reconsideration of the Markman decision's definition of "high frequency." (Defs.' Br. at 3.) Based on evidence that surfaced after that decision and on the Federal Circuit's clarification of the role of extrinsic evidence's in claim construction, this Court concludes that "high frequency" encompasses the high frequency range of 3-30 Mhz.

TCI and Cablevision contend that this Court should revisit the meaning of "high frequency" on three grounds. First, in discovery subsequent to the hearing, TCI and Cablevision received documents relevant to the '202 patent' s prosecution history. (Defs' Br. at 3.) Second, defendants contend that the Federal Circuit's decision in Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushisi Co., Ltd., 234 F .3d 558 (Fed.Cir.2000) (*en banc*), *cert. granted,* 121 S.Ct. 2519 (June 18, 2001), employs a rationale that should be applied to claim interpretation. (Defs.' Br. at 3.) Third, defendants assert that the Federal Circuit has clarified the role of extrinsic evidence in claim construction since the claim construction decision issued in this action. *See e.g.*

Pitney Bowes, Inc. v. Hewlett-Packard Co., 182 F.3d 1298 (Fed.Cir.1999) (*en banc*).

IPD and CPL contend that the new evidence is merely cumulative of extrinsic evidence presented at the claim construction hearing. (Plaintiffs' Memorandum of Law in Opposition to Defendants' Motion for Summary Judgment "Pls.' Br." at 2.) They also assert that Judge Sotomayor based the definition of "high frequency" on intrinsic evidence alone. (Pls.' Br. at 3.) Thus, plaintiffs contend, because extrinsic evidence should not disturb a claim interpretation based on intrinsic evidence, the new evidence should not disturb the meaning of "high frequency." (Pls.' Br. at 2.) Plaintiffs also contend that the *Festo Corp*. decision did not change the law such that the definition of "high frequency" should be revisited. (Pls.' Br. at 2.) IPD and CPL further argue that reconsideration would constitute an improper appellate review. (Pls.' Br. at 7,9.)

1. ***Claim construction***

Markman decisions are interlocutory. Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1479 (Fed.Cir.1998) (*en banc*), Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc., 997 F.Supp. 93, 95 (D.Mass.1997) (stating that an order determining claim construction is "provisional in the sense that it is interlocutory"). Interlocutory decisions are subject to revision any time before a final judgment is rendered. Fed.R.Civ.P. 54(b). Thus, this Court has the inherent discretion to reconsider the claim construction in this action.

It is well established that revisiting Markman rulings conducted prior to the completion of discovery is especially appropriate. *See, e.g.,* Nova Biomedical Corp. v. i-STAT Corp., 980 F.Supp. 614, 616 (D.Mass.1997), *rev'd in part on other grounds,* 215 F.3d 1351 (Fed.Cir.1999); Vivid Techs., Inc., 997 F.Supp. 93. The Federal Circuit has held that claim construction performed at the preliminary injunction stage may be revisited after the resolution of " 'substantial open issues and questions that must be litigated." ' *See* Int'l Comm. Materials, Inc. v. Ricoh Co., Ltd., 108 F.3d 316, 318 (Fed.Cir.1997); *see also* Sofomar Danek Group, Inc. v. DePuy-Motech, Inc., 74 F.3d 1216, 1221 (Fed.Cir.1996) (noting that "Markman does not obligate the trial judge to conclusively interpret claims at an early stage in a case. A trial court may exercise its discretion to interpret the claims at a time when the parties have presented a full picture of the claimed invention and prior art.") (citations omitted); Sport Squeeze, Inc. v. Pro-Innovative Concepts Inc., 51 U.S.P.Q.2d 1764, 1770-71 (S.D.Cal.1999) (noting *in dicta* that previous claim construction would not preclude court from revisiting interpretations, especially where new evidence and arguments were presented).

Here, Judge Sotomayor construed the disputed claim limitations without the benefit of a complete record. Discovery continued for over three and one-half years after she held the claim construction hearing in June 1997. (Order dated December 28, 2000, 94 Civ. 6296, Docket Item No. 178.) The hearing was held shortly after the Supreme Court affirmed *Markman,* at a time when both courts and counsel struggled with implementing the Court's findings- *e.g.,* when in the course of litigation to hold the hearing, and how best to structure the proceedings. Even today, the appropriate timing for Markman hearings continues to generate much debate. *See, e.g.,* William F. Lee & Anita K. Kruf, Still Adjusting to Markman: A Prescription for the Timing of Claim Construction Hearings, 13 Harv. J.L. & Tech. 55 (1999).

It is almost certain that Judge Sotomayor would have examined the new evidence, had it been available in June 1997. During the prosecution of the '202 patent, Cutler amended Claim 1 to recite "a high frequency carrier in the range of 40-300 MHz", but then retracted the amendment days later. *See* IPD II, 1998 WL 142346, at n. 3. The claim construction decision concluded that the purpose behind Cutler's August 1977 amendment was unclear. IPD II, 1998 WL 142346, at n. 3 ("What Cutler meant by this amendment and

retraction is unclear.") Cablevision and TCI allege that their new evidence sheds light on the reasoning behind the amendment.

The prior claim construction took place long before discovery was complete, and Cablevision and TCI's new evidence is directly relevant to the meaning of "high frequency". In addition, as discussed below, the Federal Circuit's clarification of the proper role of extrinsic evidence in claim interpretation occurred after the Markman hearing in this action. *See generally* Pitney Bowes, 182 F.3d at 1308 (noting that Vitronics Corp. v. Conceptronic, Inc ., 90 F.3d 1576, 1582 (Fed.Cir.1996) did not prohibit courts from examining extrinsic evidence "even when the patent document is itself clear"). That decision issued subsequent to the Markman order in this action. Accordingly, this Court will exercise its discretion to reconsider the definition of "high frequency."

Defendants contend that the Federal Circuit's decision in *Festo Corp*. supports reconsideration. (Defs.' Br. at 10.) While *Festo Corp*. dramatically alters the contours of prosecution history estoppel, it does not change the law of claim construction. Prosecution history estoppel and claim construction are two separate concepts: "[t]he limit on the range of equivalents that may be accorded a claim due to prosecution history estoppel is simply irrelevant to the interpretation of those claims." Read Corp. v. Portec, Inc., 970 F.2d 816, 823 (Fed.Cir.1992) *abrogated on other grounds,* Markman v. Westview Inst., Inc., 52 F.3d 967 (Fed.Cir.1995) (*en banc*) *aff'd,* 517 U.S. 370 (1996); *accord* Southwall Techs., Inc. v. Cardinal IG Co., 54 F.3d 1570 (Fed.Cir.1995), *cert. denied,* 516 U.S. 987 (1995). *Festo Corp*. cites to a decision that states that claim amendments "must be strictly construed against the inventor and in favor of the public, and looked upon as in the nature of disclaimers." Festo Corp. 234 F .3d 558 at 576, *citing* Hubbell v. U.S., 179 U.S. 77, 82 (1900). Contrary to defendants' assertion, *Festo Corp*. merely highlights a well-established claim construction precedent. Accordingly, this Court's decision to revisit the definition of "high frequency" does not rely on *Festo Corp*.

2. *Tenets of Claim Interpretation*

Claim interpretation is a matter of law for the court to determine. Markman, 52 F.3d at 979. In construing a claim, "the court should look first to the intrinsic evidence of record, *i.e*. the patent itself, including the claims, the specification, and, if in evidence, the prosecution history." Vitronics Corp., 90 F.3d at 1582 (citation omitted). Courts should first look to the intrinsic evidence because it is the public record; public policy dictates that competitors should be able to ascertain the metes and bounds of patent claims by reviewing the public record, thus encouraging design-around inventions and further technological advances. *See* Caterpillar Tractor Co., v. Berco S.P.A., 714 F.2d 1110, 1115 n. 2 (Fed.Cir.1983)("Bona fide attempts to design a non-infringing product are one of the beneficial results of the incentive-to-disclose system established by the patent statute."); *see also* Vitronics Corp., 90 F.3d at 1583, Southwall Techs., 54 F.3d at 1578.

In reviewing the intrinsic evidence, the court should first consider the actual words of the claims, including both the asserted and nonasserted claims. Vitronics Corp., 90 F.3d at 1582. A word in a claim is given its customary meaning, and a "court must construe the claim language according to the standard of what these words would have meant to one skilled in the art as of the application date." Weiner v. NEC Electronics, Inc., 102 F.3d 534, 539 (Fed.Cir.1996) *overruled on other grounds,* Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448 (Fed.Cir.1998). "[A] court must presume that the terms in the claim mean what they say, and, unless otherwise compelled, give full effect to the ordinary and accustomed meaning of claim terms." Johnson Worldwide Assocs., Inc. v. Zebco Corp., 175 F.3d 985, 989 (Fed.Cir.1999). If the patent applicant

acts as her own lexicographer, she must clearly state the special definition of the term in the patent specification or file history. Vitronics Corp., 90 F.3d at 1582 (citing Hoescht Celanese Corp. v. BP Chems. Ltd., 78 F.3d 1575, 1578 (Fed.Cir.1996)).

The court must consider the patent specification, "to determine whether the inventor has used any terms in a manner inconsistent with their ordinary meaning. The specification acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication." Vitronics Corp., 90 F.3d at 1582.

Next, the court may consider the prosecution history of the patent, if in evidence. The prosecution history consists of the complete record of the proceedings before the PTO. Vitronics Corp., 90 F.3d at 1582. Once a patent applicant disclaims an interpretation during patent prosecution, he cannot reclaim that interpretation during subsequent claim construction. *See* Southwall Techs., 54 F.3d at 1576.

Courts first must consider intrinsic evidence, and rely on extrinsic evidence only in "instances in which intrinsic evidence is insufficient to enable the court to determine the meaning of the asserted claims". Vitronics Corp., 90 F.3d at 1584. In those circumstances, extrinsic evidence "may also properly be relied on to understand and to construe the claims." Vitronics Corp., 90 F.3d at 1584. It is improper to rely on extrinsic evidence to interpret a term that is clear from a careful reading of the patent. Vitronics Corp., 90 F.3d at 1584.

Significantly, however, the Federal Circuit has drawn a distinction between relying on evidence and examining it: " *Vitronics* does not prohibit courts from examining extrinsic evidence, even when the patent document is clear." Pitney Bowes, 182 F.3d at 1308. "Thus, under *Vitronics,* it is entirely appropriate, perhaps even preferable, for a court to consult trustworthy extrinsic evidence to ensure that the claim construction it is tending to from the patent file is not inconsistent with clearly expressed, plainly apposite, and widely held understandings in the pertinent technical field. This is especially the case with respect to technical terms ...." Pitney Bowes, 182 F.3d at 1309.FN3 Extrinsic evidence can be an "aid to the court in coming to a correct conclusion as to the true meaning of the language employed in the patent." Cybor Corp., 138 F.3d at 1455 n. 3 (citation omitted).

FN3. As discussed above, the Markman claim construction in this action occurred before the Federal Circuit issued the *Pitney Bowes* decision.

Extrinsic evidence includes technical dictionaries, prior art, technical treatises and articles, expert testimony, and inventor testimony. Vitronics Corp., 90 F.3d at 1584. Prior art and technical dictionaries are preferred over opinion testimony because they are more objective and reliable than expert opinion, and they are available to the public in advance of litigation. Vitronics Corp., 90 F.3d at 1585; *accord* Cybor Corp., 138 F.3d at 1459.

3. ***Application to the Instant Action***

Judge Sotomayor construed "high frequency' to encompass 54 to 216 MHz, "received by conventional television receivers of the time ." The opinion indicates that the "conventional television receivers" meant in the definition were those found in the United States. IPD II, 1998 WL 142346, at *5. Cablevision and TCI assert that "high frequency" means 3 to 30 MHz. (Defs.' Br. at 5.) In short, defendants' interpretation is based on the assertions that (1) the ordinary and accustomed meaning of "high frequency" is 3-30 MHz; (2)

the specification is consistent with that definition; (3) the prosecution history confirms the definition; and (4) the Canadian prosecution history and other evidence affirm that definition.

IPD and CPL contend that "high frequency" should maintain the definition as construed: 54-216 MHz. (Pls.' Br. at 1.) IPD and CPL assert that Judge Sotomayor interpreted the claim based upon intrinsic evidence, yet also assert that the Court relied on the testimony of the parties' experts. (Pls.' Br. at 3.) FN4 Plaintiffs also contend that "Judge Sotomayor's interpretation was based primarily on the language of the claim as interpreted by those of ordinary skill in the art" and also on the prosecution history. (Pls.' Br. at 3.) IPD and CPL conclude that because the definition was based on intrinsic evidence, it should not be altered by Cablevision and TCI's new extrinsic evidence.

FN4. To the extent that IPD and CPL assert that expert testimony is intrinsic evidence, they are incorrect. *See* Vitronics Corp., 90 F.3d at 1584.

4. ***The Intrinsic Evidence***

a. ***The '202 Patent Claims***

The '202 patent never defines "high frequency." Although Claim 1 employs the phrase three times, it does not provide a definition. ('202 Patent, col. 4, ll. 18, 22, 26.) Nor does Claim 1 imply which frequency range was meant by "high frequency." For example, Claim 1 states that the "high frequency carrier radio wave signals modulated with video broadcast signals" are applied to a "conventional television receiver without further processing" by way of a "means coupling" the signals from the receptor position to the subscriber stations. ('202 patent, col. 4 ll. 24-31.) This phrase is ambiguous because the claim fails to specify the frequencies such a television could receive, and whether the term "conventional television" refers to one found in the United States or in England, where Mr. Cutler and IPD resided and the invention originated. A person skilled in the art would recognize that while the patent was prosecuted in the United States, the claims might refer to an English television.

In addition, it is unclear whether the word "receiver" is used to indicate that the television acts as a device that "receives" the signal, or, alternatively, that the signal is applied to a receiver device in the television itself.

b. ***The Ordinary Meaning of "High Frequency"***

Because the claims do not specify the frequency range, one skilled in the art would presume that "high frequency" would have its ordinary meaning, unless the patent applicant clearly assigns a different meaning to the term. *See* Vitronics Corp., 90 F.3d at 1582 (citing Hoescht Celanese Corp., 78 F.3d at 1578). Thus this Court reviews "the specification to determine whether the inventor has used [the term] in a manner inconsistent with [its] ordinary meaning." Vitronics, 90 F.3d at 1582 (citing Markman, 52 F.3d at 979.

One skilled in the art at the time of the application would have understood "high frequency" in the '202 patent to mean 3-30 MHz. A technical dictionary published in 1974 defines the term as "Federal Communications commission designation for the band from 3 to 30 MHz in the radio spectrum. Abbreviated HF." (Sirota Decl. Ex. 4: *Dictionary of Scientific and Technical Terms* 690 (Daniel N. Lapedes ed., McGraw-Hill 1974).) Similarly, a radio frequencies table lists high frequency as covering 3 to 30 megacycles. (Sirota Dec. Ex. 4: *Webster's Seventh New Collegiate Dictionary* 705 (G. & C. Merriam

Co.1967)(1961).)

In addition, CPL's statements to the Canadian patent examiner provide further understanding of how one skilled in the art would regard the term "high frequency" in 1976. Although varying legal and procedural requirements for obtaining patent protection in foreign countries might render consideration of certain types of representations inappropriate, instructions to foreign counsel and representations to foreign patent offices must be considered when such matters comprise relevant evidence. Caterpillar Tractor Co., 714 F.2d at 1116 (citing Stratoflex, Inc. v. Aeroquip Corp., 713 F.2d. 1530, 1538-39 (Fed.Cir.1983)); *see also* Tanabe Seiyaku Co. Ltd. v. U.S. Int'l Trade Com'n., 109 F.3d 726, 733 (Fed.Cir.1997) (noting that statements made to foreign patent examiner by inventor were indicative of understanding of one skilled in the art).

Both the Canadian Patent Office and the U.S. PTO require an applicant to distinguish the claimed invention from the prior art. (*See* Sirota Decl. Ex. 14: Canadian Patent Office Examiner's Report at 2 (rejecting claims as obvious in light of prior art); 28 U.S.C. s. 102.) IPD's patent application in Canada as of November 7, 1977 corresponded with the '202 patent's application in the United States. (*See* Sirota Decl. Ex. 15: Nov. 7, 1977 Response.) Thus, the discussion of prior art in the Canadian prosecution is relevant to claim interpretation in the instant action. *See* Caterpillar Tractor Co., 714 F.2d at 1116.

In its communications with the Canadian patent examiner, CPL made it clear that one skilled in the art would understand "high frequency" to mean 3-30 MHz. In response to an Office Action rejecting Claim 1, IPD referred to its invention as "h-f", (Sirota Decl. Ex. 17: May 31, 1978 Response), and classified high frequency as 3-30 MHz. (Sirota Decl. Ex. 19: Oct. 3, 1978 Response.) While distinguishing its invention from U.S. Patent No. 3,617,750 ("the Walker patent"), IPD represented that

[t]hese systems must be in the very high or ultra high frequency range in view of the bandwidth occupied by a single television signal. The F.C.C. Official designation of frequencies classifies high frequency as covering 30-300 MHz [*sic,* 3-30 MHz] and classifies very high frequency as covering 30 to 300 MHz. Thus, the system set forth by Walker is completely different in its conception from that of the present invention.

(Sirota Dec. Ex. 19: Oct. 3, 1978 Response.) FN5 Moreover, to avoid rejection based on obviousness in light of the very high frequencies employed by the prior art, IPD defined the range denoted by "high frequency" as that pertaining to televisions receptive to the 3-30 MHz range, such as the "HF systems which have found wide application in, for example, the United Kingdom.... Persons experienced in the wired CATV business would not however fail to appreciate the significance of the term 'high frequency" ' (Sirota Decl. Ex. 19: Oct. 3, 1978 Response.) Lastly, to distinguish itself from the prior art, CPL advised the Canadian examiner that "[t]he new claims are distinguished from the prior art which does not suggest H.F. carry a modulation." (Sirota Decl. Ex. 15: Nov. 7, 1977 Response.) In sum, in prosecuting its patent in Canada, CPL asserted that the ordinary meaning of "high frequency" was 3-30 MHz, and relied upon that definition to demonstrate that one skilled in the art would understand the invention of the '202 patent to employ carriers with a frequency of 3-30 MHz.

FN5. IPD later corrected the phrase to define high frequency as 3-30 MHz. (*See* Sirota Decl. Ex. 20: Letter.)

c. *The Specification*

The '202 patent does not define "high frequency" at variance with the ordinary meaning of 3-30 MHz. In describing the prior art upon which the '202 patent improves, the specification states that in one wired broadcasting system, "[c]ommonly the range of frequencies employed extends throughout the VHF spectrum, for example, from about 40-300 MHz." ('202 patent at col. 1, ll. 14-16.) Thus the patent equates VHF, or very high frequency, with frequencies from about 40 to 300 MHz. In the following description of prior art, the specification states that "[c]ommonly the signals all have the same nominal carrier frequency somewhere in the range 2-20 MHz." ('202 patent col. 1, ll. 24-26.) Thus the patent does not equate the 2-20 MHz range with VHF. In its critique of the prior art operating in the 40-300 MHz range, the patent attributes "relatively high" transmission losses to the "frequencies involved," ('202 patent col. 1, ll. 29-31), and then asserts that the invention in the '202 patent is an improvement that minimizes "the disadvantages of the currently known systems." ('202 patent col. 1, ll. 39-41.) Thus, the VHF range, with its attendant transmission losses will be improved upon in the '202 patent. One skilled in the art could interpret this stated improvement over the prior art to mean that the disclosed invention would not use the VHF 40-300MHz range, as a way to avoid the transmission losses. Thus, the specification loosely implies that "high frequency" would not be 40-300 MHz.

In explaining Figure 1, the specification notes that " *[i]n the event* that said signals are high frequency modulated carrier waves the output signals provided by the photosensitive detectors 6, 7, *may* be of a form suitable for direct application to the television receivers 10, 11 *if* these are of a type designed for use in high frequency wired broadcasting systems." ('202 patent col. 2, ll. 53-58)(emphases added.) That tentative language, including "in the event," "may" and "if," provides no guidance; the sentence fails to clarify whether the television receiver is "conventional" as described in Claim 1, or to state the frequency range for the television receivers.

The description of Figure 2 contains similarly indefinite language: "In this system it is convenient to arrange that the modulation signals applied to the line 15 comprise high frequency modulated carrier waves. *In this event,* the launching amplifier 19 and receivers 21, 22 *may* be of the kind presently employed in high frequency wired broadcasting systems." ('202 patent col. 3, ll. 6-11.)(emphases added). That language of contingency makes it difficult to determine the MHz range of "high frequency." By referring back to the patent's description of the prior art, one might speculate that Cutler is referring to frequencies outside the 40-300 MHz range. But language inviting conjecture does not clearly define the term such that one skilled in the art would disregard the term's customary meaning. *See* Vitronics Corp., 90 F.3d at 1582 (citing Hoescht Celanese Corp., 78 F.3d at 1578).FN6 In sum, the specification does not clearly imply or express a special definition for the term "high frequency."

FN6. In other instances, the specification uses the term "high frequency" without adding further clarification of its meaning. (*See* '202 patent col 2, 11. 4-6, 35-36, 49.)

d. *The Prosecution History*

During the prosecution of the '202 patent, Cutler, through his attorney, amended Claim 1 to include the phrases "a high frequency carrier in the range 40-300 MHz" and "conventional television receivers at the subscriber stations responsive to receive high frequency carriers in the range of 40-300 MHz." (Declaration of Neil P. Sirota in Support of Defendants Telecommunications, Inc.'s and UA-Columbia Cablevision of Westchester, Inc.'s Omnibus Motion for Summary Judgment ("Sirota Decl.") Ex. 5: August 10, 1977 Amendment at 2.) The Remarks portion of the amendment does not directly discuss that new definition.

(Sirota Decl. Ex. 5: Amendment at 3-6.) Nine days later, Cutler retracted the amendment by deleting "in the range of 40-300 MHz." (Sirota Decl. Ex. 6: August 19, 1977 Supplemental Amendment at 2.) The Remarks section states "[u]pon review of the amendment filed August 11, 1977, it is not seen that the Specification would adequately support the particular frequency range stated.... It is not seen that this specific change will affect the patentability other than as above stated." (Sirota Decl. Ex. 6: Supplemental Amendment at 2.) For purposes of patentability, then, Cutler disclaimed the 40-300 MHz frequency range. During claim construction, a patent owner cannot expand the meaning of a claim to recapture subject matter disclaimed during prosecution. *See* Southwall Techs., 54 F.3d at 1576, Festo Corp., 234 F.3d at 576 (claim amendments "must be strictly construed against the inventor and in favor of the public, and looked upon as in the nature of disclaimers." (citing Hubbell, 179 U.S. at 82). Therefore, in the '202 patent, "high frequency" does not include 40-300 MHz.

The prior Markman decision in this action acknowledged the ambiguity surrounding Cutler's retraction of 40-300 MHz; the Remarks do not provide a detailed rationale for the retraction, nor do they specify which MHz range corresponds with the specification. IPD II, 1998 WL 142346, at n. 3. Indeed, "the Remarks standing alone do not definitively answer what 'high frequency' means as recited in Claim 1." IPD II, 1998 WL 142346, at n. 3. However, the new evidence related to the August 1977 amendment and retraction, and the clarification of extrinsic evidence's role in claim construction as set forth in *Pitney Bowes* confirm that "high frequency" means 3-30MHz in the '202 patent.

5. ***The New Extrinsic Evidence***

In an effort to clarify the definition of "high frequency", TCI and Cablevision offer evidence regarding the prosecution of the '202 patent that surfaced after the Court issued its claim construction. (Defs.' Br. at 7-9.) CPL directed the prosecution of the '202 patent, (Sirota Decl. Ex. 21: Kenneth C. Quinton Depo. at 116: 11-19), by directing its U.S. patent prosecutor through its British patent agent. In a letter to its British patent attorney, CPL explained the invention as "having a particular frequency related to [Rediffusion's] HF receivers," and that "the HF carriers were chosen to minimize the patterning effects overcome by our previous inventions." (Sirota Dec. Ex. 8: Letter.) The U.S. patent prosecutor submitted the August 10, 1977 amendment that added "40-300MHz" without CPL's prior approval. After reviewing the amendment, CPL advised its British patent agent that (1) the frequency range should have been defined as 3-30 MHz, not 40-300 MHz and (2) Claim 1 should read "conventional HF television receivers." (Sirota Dec. Ex. 10 Telex.) The British patent agent responded that "[h]opefully it will be fairly easy to make the necessary corrections as the frequency range given is clearly at variance with the words 'a high frequency carrier' to which the range is intended to relate." (Sirota decl. Ex. 11 Letter.) Collectively, that evidence demonstrates that (1) the "conventional" televisions in the specification refer to Rediffusion's HF televisions and (2) the Supplemental Amendment disclaimed the 40-300 MHz range because the 3-30 MHz range complied with the specification. This new evidence confirms that 3-30 MHz is the range in the '202 patent. *See* Cybor Corp., 138 F.3d at 1455; Pitney Bowes, 182 F.3d at 1309.

The parties have submitted expert testimony concerning how one skilled in the art would have interpreted "high frequency" in the '202 patent. The experts present varied definitions of "high frequency." *See, e.g.,* Decl. of Bernard J. Lechner dated February 7, 1997 at para. 38; Decl. of Archer S. Taylor dated March 24, 1997 at para. 21.) Thus, this claim construction relies on more objective evidence as described in *Vitronics Corp.,* which states that expert testimony

may only be relied upon if the patent documents, taken as a whole, are insufficient to enable the court to

construe disputed claim terms. Such instances will rarely, of ever, occur.... Even in those rare instances, prior art documents and dictionaries, although to a lesser extent, are more objective and reliable guides. Unlike expert testimony, these sources are accessible to the public in advance of litigation. They are to be preferred over opinion testimony.

Vitronics Corp., 90 F.3d at 1585 (citing Markman, 52 F.3d at 983). This opinion does not rely on the experts to explain the underlying technology of frequency ranges; understanding the difference between frequency ranges is not difficult, and the expert reports provide little technical information to explicate frequencies generally. Moreover, this Court's claim interpretation does not adopt any expert's legal conclusion, but rather considers both intrinsic evidence and other more objective extrinsic evidence.

Finally, IPD and CPL submit numerous patents and articles to demonstrate that engineers used the terms "high frequency" or "very high frequency" as "generic, context-dependant" terms. (Plaintiff's Trial Memorandum of Law; Markman Hearing, at 21-22.) As Judge Sotomayor observed, however, "[t]hese materials clearly specified the frequency range the author intended by the use of high frequency and Cutler did not. A person skilled in the art, however, would have understood to look to the context of Cutler's use of high frequency within the claim and prosecution history ...." IPD II, 1998 WL 142346, at *9. Accordingly, this Court finds that "high frequency" in the '202 patent encompasses a range of 3-30 MHz, based on the intrinsic evidence as confirmed by the extrinsic evidence.

B. ***Defendants' Summary Judgment Motion***

TCI and Cablevision move for summary judgment of noninfringement on the grounds that the accused device does not contain a "high frequency" carrier or a "transmission means," and for invalidity. (Defs.' Br. at 2, 18, 25.) They further allege that summary judgment is warranted because TCI is not a direct infringer of the '202 patent, and is not liable for inducing infringement. (Defs.' Br. at 39, 45.) Finally, TCI and Cablevision seek a declaratory judgment denying liability for acts prior to June 30, 1993, the date that CPL licensed the '202 patent to IPD. (Defs.' Br. at 53.)

1. ***Noninfringement***

Summary judgment must "be rendered forthwith if the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that the moving party is entitled to a judgment as a matter of law." Fed.R.Civ.P. 56(c); Celotex Corp. v. Catrett, 477 U.S. 317, 322 (1986). The burden is on the party moving for summary judgment to establish the absence of any genuine issues of material fact, *see* Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 256 (1986), and all ambiguities must be resolved and all inferences drawn in the light most favorable to the non-movant, *see* Matsushita Elec. Indus. Co. v. Zenith Radio Corp., 475 U.S. 574, 587 (1986). Once the movant has met its burden, the non-movant must present affirmative evidence to defeat a properly supported motion for summary judgment. *See* Fed.R.Civ.P. 56(e); Anderson, 477 U.S. at 256-57. To survive a motion for summary judgment, the "non-moving party may not rely on conclusory allegations or unsubstantiated speculation." Scotto v. Almenas, 143 F.3d 105, 114 (2d Cir.1998). Rather, the non-movant must present "concrete evidence from which a reasonable juror could return a verdict in his favor." Anderson, 477 U.S. at 256.

Courts use a two-step analysis to determining whether literal infringement exists. Markman, 52 F.3d at 976. First, the court must construe the meaning and scope of the claims. Second, the construed claims are compared to the accused device. Markman, 52 F.3d at 976 (citation omitted). Claim construction is a matter

of law for the court to decide. Markman, 52 F.3d at 979. Literal infringement exists where every limitation of a claim appears in the accused device, such that "the properly construed claim reads on the accused device exactly." *See* Amhil Enters., Ltd. v. Wawa, Inc ., 81 F.3d 1554, 1562 (Fed.Cir.1996). The determination of whether infringement occurs, either literally or under the doctrine of equivalents, is reserved for the finder of fact. *See* Southwall Techs., Inc., 54 F.3d at 1575 (citation omitted.) Since the disputed claims have been construed, this Court next must determine whether a genuine issue of material fact exists as to whether TCI and Cablevision's accused systems infringe either Claim 1 or 5 of the '202 patent.

a. ***The "High Frequency" Limitation***

CPL and IPD do not contest the fact that TCI and Cablevision's accused systems operate using carriers in the VHF, or 30-300 MHz range. (*See* Defs.' 56.1 Stmt. para. 3; Pls.' 56.1 Stmt. para. 3.) Claim 1 of the '202 patent contains the element of "high frequency carrier." ('202 Patent, col. 4, 11. 18, 21, 26.) This Court construes "high frequency" to encompass frequencies from 3-30 MHz. Thus, TCI and Cablevision's accused systems do not literally infringe the '202 patent because they do not meet the "high frequency" limitation in Claim 1. Thus, the defendants' motion for summary judgment as to noninfringement is granted.

b. ***The "Transmission Means" Limitation***

TCI and Cablevision alternatively move for summary judgment of noninfringement on the ground that their accused systems do not meet Claim 1's "transmission means" limitation. Claim 1 describes a "transmission means at the central station modulating the light beam for transmission through said optical fibre, said transmission means including modulation means producing a light beam modulated by a high frequency carrier which itself is modulated with video broadcast signals." ('202 patent col. 4, 11. 14-16.) "Transmission means" is a means-plus-function limitation. *See* Sage Prod., Inc. V. Devon Indus., Inc., 126 F.3d 1420, 1427 (Fed.Cir.1997).

TCI and Cablevision contend that the "transmission means" limitation cannot be met by their accused systems, the AT & T Laserlink II optical transmitters ("Laserlink"), because the laser diode contained in the accused system was created in the 1980's. (Defs.' Br. at 20.) They assert that the unavailability of the Laserlink's laser diode in 1976 when the '202 patent issued precludes a finding of literal infringement. (Defs.' Br. at 21, 22.) IPD and CPL counter that the Laserlink's laser is not "later developed," and thus the Laserlink contains a structure equivalent to the "transmission means" limitation in Claim 1. (Pls. Br. at 26, 29.)

Means-plus-function claims are authorized in 28 U.S.C. s. 112 para. 6:

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.

A party alleging literal infringement of a means-plus-function claim must demonstrate that the accused device performs the identical function to that disclosed in the limitation, "with a structure that is the same or equivalent to that disclosed in the specification." Micro Chemical, Inc. v. Great Plains Chem. Co., Inc., 103 F.3d 1538, 1547 (Fed.Cir.1997), *abrogated on other grounds by* Pfaff v. Wells Electronics, Inc., 525 U.S. 55 (1998). If the accused device does not use an identical structure, the device infringes the means-plus-

function limitation if "the difference between the structure in the accused device and any disclosed in the specification are insubstantial." Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc., 145 F.3d 1303, 1309 (Fed.Cir.1998.) The structure of an accused device cannot be equivalent pursuant to 35 U.S.C. s. 112 para. 6 if that structure was not available at the time of the issuance of the claim. *Al-* Site Corp. v. VSI Int'l, Inc., 174 F.3d 1308, 1320 (Fed.Cir.1999) ("An equivalent structure or act under s. 112 cannot embrace technology developed after the issuance of the patent because the literal meaning of a claim is fixed upon its issuance"); *see also* Schering Corp. v. Amgen Inc., 222 F.3d 1347, 1352 (Fed.Cir.2000).

Here, the parties dispute whether the technology of the Laserlink's laser diode was available in 1976. (*See* Defs.' 56.1 Stmt. para.para. 23-27; Pls.' 56.1 Stmt. para.para. 23-27.) That question of fact precludes summary judgment on literal infringement of the "transmission means" limitation.

c. Infringement of "Transmission Means" ***under the Doctrine of Equivalents***

TCI and Cablevision assert that prosecution history estoppel precludes IPD and CPL from asserting infringement of the "transmission means" under the doctrine of equivalents. (Defs.' Br. at 23-25.) Defendants contend that Cutler added the "transmission means" limitation to Claim 1 to preclude rejection based on prior art, and further assert that subsequent amendments to the "transmission means" limitation were made for reasons of patentability. (Defs.' Br. at 24.) Relying on the decision in *Festo Corp.,* TCI and Cablevision assert that any amendment that narrows a claim for reasons related to patentability gives rise to prosecution history estoppel for that amended claim limitation. (Defs.' Br. at 23.) IPD and CPL counter that *Festo Corp*. is inapplicable because Culter's amendment adding the "transmission means" limitation did not narrow the claim, but merely "identified a higher level structure" comprised of the already-included electro-optical transducer and modulation amplifier. (Pls.' Br. at 36-37.) Plaintiffs also assert that defendants' Laserlink II Optical Transmitter corresponds with the electro-optical transducer, not the "transmission means" limitation. (Pls.' 56.1 Stmt. para. 28.)

Under the doctrine of equivalents, "a product or process that does not literally infringe upon the express terms of a patent claim may nonetheless be found to infringe if there is 'equivalence' between the elements of the accused product or process and the claimed elements of the patented invention." Warner-Jenkinson Co., Inc. v. Hilton Davis Chem. Co., 520 U.S. 17, 20 (1997) (citing Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 609 (1950)). Equivalence is determined at the time of the alleged infringement. Warner-Jenkinson Co., Inc., 520 U.S. at 19. Courts may focus on the function of an element, "the way the element serves that function, and the result thus obtained," or whether "insubstantial differences" exist between the accused device and the asserted claim limitation. Warner-Jenkinson Co., Inc. 520 U.S. at 39-40 (emphases omitted). In order to find infringement under the doctrine of equivalents, each claim limitation must be infringed either literally or by an equivalent element in the accused device. *See,* Warner-Jenkinson Co., 520 U.S. at 29.

The doctrine of prosecution history estoppel acts to limit the range of equivalents afforded to the asserted claim. Festo Corp. 234 F.3d at 564 (citations omitted.) "Prosecution history estoppel precludes a patentee from obtaining under the doctrine of equivalents coverage of subject matter that has been relinquished during the prosecution of its patent application." Pharmacia & Upjohn Co. v. Mylan Pharms., Inc., 170 F.3d 1373, 1376-77 (Fed.Cir.1999). When a limitation is amended for reasons of patentability, such that the claim is narrowed, prosecution history estoppel precludes the patent owner from asserting infringement of that limitation under the doctrine of equivalents. Festo Corp., 234 F.3d at 569. Here, the crux of the parties' dispute is whether the addition and subsequent amendment of the "transmission means" limitation narrowed

Claim 1. Prosecution history estoppel and the available range of equivalents is a question of law. Cybor Corp., 138 F.3d at 1460.

Cutler added the "transmission means" limitation in a pre-examination amendment submitted at the beginning of the continuation application. (Sirota Decl. Ex. 29: Pre-Examination Amendment dated March 2, 1976.) That addition narrowed Claim 1 because it added a new component-the transmission means-to modulate a light beam:

A wired broadcasting system in which a signal path between a central station and [at least some of] a plurality of subscribers includes [an] *a common* optical fibre *carrying signals for said plurality of subscribers* extending between an electro-optical transducer and a photo-sensitive detector, *including transmission means modulating a light beam transmitted through said optical fiber with a high frequency carrier modulated with video broadcast signals, ...*

(Sirota Decl. Ex. 29: Pre-Examination Amendment dated March 2, 1976 at 1 (emphases in original).) By adding the transmission means limitation, Cutler narrowed the claim by excluding inventions that met the previous incantation of the claim, but did not contain a "transmission means" to modulate a light beam. Moreover, Cutler submitted this amendment in response to the examiner's rejection under 35 U.S.C. s. 102. (Sirota Decl. Ex. 30: Amendment After Final Rejection dated February 4, 1976 at 3.) Thus, the amendment was made for purposes of patentability.

Cutler then amended the "transmission means" limitation to include a " *means producing a light beam incorporating* [with] a high frequency carrier...." (Sirota Decl. Ex. 31: Amendment dated December 27, 1976 at 1-2 (emphasis in original).) That amendment responded to the Examiner's rejection in light of the prior art. (Sirota Decl. Ex. 31: Amendment dated December 27, 1976 at 4.) By adding a new function to the transmission means, this amendment narrows Claim 1: only transmission means that also produce a light beam read on the claim.

In response to a rejection on the grounds of indefiniteness, Cutler again amended the limitation by specifying its location "at the central station." (Sirota Decl. Ex. 5: Amendment dated August 10, 1977 at 1-2; Ex. 7: Office Action dated May 26, 1977 at 3.) That amendment also narrowed the claim because it excluded transmission means not located at the central station.

In addition, Cutler also altered the modulation means included within the transmission means: "said transmission means including modulation means producing a light beam [incorporating] *modulated by* a high frequency carrier *which itself is* modulated with video broadcast signals ..." (Sirota Dec. Ex. 33: Amendment dated February 8, 1978 at 2 (emphases in original).) This amendment clarifies and does not narrow the limitation.

The addition of the "transmission means" limitation and the December 27, 1976 and August 10, 1977 amendments thereto narrowed Claim 1. As described above, these amendments were made for reasons of patentability. Thus, prosecution history estoppel precludes plaintiffs from asserting that limitation as a basis for infringement under the doctrine of equivalents. Accordingly, defendants' motion for summary judgment is also granted as to noninfringement of the "transmission means" element under the doctrine of equivalents.

2. *Validity*

TCI and Cablevision move for summary judgment on the ground that the '202 patent is invalid because it is indefinite under 35 U.S.C. s. 112 para. 2. (Defs.' Br. at 25.) Although this decision grants summary judgment on noninfringement, this Court retains jurisdiction to decide TCI and Cablevision's invalidity counterclaim. *See* Cardinal Chem. Co. v. Morton Int'l, Inc., 508 U.S. 83, 96 (1993); *see also* Aqua Marine Supply v. AIM Machining, Inc., 247 F.3d 1216, 1220 (Fed.Cir.2001). This action has been pending since 1994. Through reconstruing the claim term "high frequency" and adjudicating defendants' summary judgment motion for noninfringement, this Court has become intimately familiar with the facts of this case. Under these circumstances, and in the interest of judicial economy and the "public interest in the finality of judgments in patent litigation", Cardinal Chem. Co., 508 U.S. at 100, it is the "better practice" to adjudicate defendants' invalidity counterclaim. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327 (1945).

TCI and Cablevision assert invalidity on three grounds that are considered *in seriatim*. Defendants first contend that Claim 1 fails for indefiniteness because it sets forth two separate means-plus-function limitations without corresponding structures in the specification that are separately and distinctly identified. (Defs.' Br. at 27-33.) The relevant claim language is " *light beam demodulation means* at said reception position responsive to said *photo-sensitive detector means*." ('202 patent col. 4, ll. 23-25) (emphases added). They contend that the "light beam demodulation means" does not have a corresponding structure that is separate and apart from the structure corresponding to the "photo sensitive detector means" in the specification, as required under 35 U.S.C. s. 112 para. 6. (Defs.' Br. at 28, 30.) TCI and Cablevision do not dispute that the photo-sensitive detector means has a corresponding structure in the specification. (Defs.' Br. at 29.) Thus TCI and Cablevision argue that a single structure cannot provide the corresponding structure for two separate claim limitations. In support of this assertion, they describe a portion of the Canadian prosecution history in which Cutler amended Claim 1 to remove the light beam demodulation means in response to the Canadian examiner's objection that it did not have support in the disclosure. (Defs.' Br. at 32.) TCI and Cablevision also contend that one structure cannot be responsive to itself, and that to find otherwise would amount to reading the words "responsive to" out of the claim. (Defs.' Br. at 32.)

Plaintiffs respond with several arguments. First, IPD and CPL counter that TCI and Cablevision fail to establish invalidity by clear and convincing evidence. (Pls.' Br. at 14.) Plaintiffs assert that a person of ordinary skill in the art would understand that demodulation takes place at the photo-sensitive detector. (Pls.' Br. at 15-16.) In support of that contention, plaintiffs point out that both parties' experts understood the claim to mean that demodulation occurs at the photo-sensitive detector. IPD and CPL further assert that Judge Sotomayor's description of Figure 2 supports their position, and offer bolstering expert testimony. (Pls.' Br. at 15-16 .) Second, IPD and CPL contend that "photo-sensitive detector means" is not a means-plus-function element because it lacks a corresponding structure in the specification. (Pls.' Br. at 17-18.) Third, plaintiffs contend that even if "photo-sensitive detector means" were a means-plus-function limitation, one structure can support two claim limitations. (Pls.' Br. at 18.) Fourth, IPD and CPL assert that the phrase "responsive to" describes the proportional relationship between the intensity of the light detected and the resulting electrical signal, as opposed to defining the relationship of two limitations. (Pls.' Br. at 19-20.) Plaintiffs contend that the Canadian prosecution history supports their position, because the examiner understood the photo-sensitive detector and the demodulator means to be the same structure. (Pls.' Br. at 18.)

Once the PTO issues a patent, it is presumed valid, and the accused infringer bears the burden of demonstrating invalidity by clear and convincing evidence. North Am. Vaccine, Inc. v. Am. Cyanamid Co., 7 F.3d 1571, 1579 (Fed.Cir.1993). If possible, claims should be construed to sustain their validity. ACS Hosp. Systems, Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577 (Fed.Cir.1984). The issue of indefiniteness is

a question of law. Miles Labs., Inc. v. Shandon, Inc., 997 F.2d 870, 874 (Fed.Cir.1993).

The Patent Act authorizes applicants to draft claim limitations in means-plus-function language:

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 (emphasis added.). Pursuant to that provision, "[t]he structure disclosed in the specification is [a] 'corresponding' structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim." B. Braun Med. Inc., v. Abbott Labs., 124 F.3d 1419, 1424 (Fed.Cir.1997). Patent applicants have a duty to link or associate structure to function in exchange for the convenience of drafting means-plus-function claims under 35 U.S.C. s. 112 para. 6. B. Braun Med. Inc., 124 F.3d at 1424 (citation omitted).

In addition to this disclosure requirement, a patent must be definite: "The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." 35 U.S.C. s. 112 para. 2. Failure to link a means-plus-function limitation to the necessary structure, material or acts in the specification is a failure to comply with s. 112 para. 2's requirements that a claim particularly point out and distinctly claim the invention. *See* In re Dossel, 115 F.3d 942, 946 (Fed.Cir.1997); *see also* In re Donaldson Co., Inc., 16 F.3d 1189, 1195 (Fed.Cir.1994) (The specification must contain adequate disclosure of what is meant by means-plus-function claim.). The test for invalidity under 35 U.S.C. s. 112 para. 2 is "whether those skilled in the art would understand what is claimed when the claim is read in light of the specification." Orthokinetics, Inc. v. Safety Travel Chairs, Inc., 806 F.2d 1565, 1576 (Fed.Cir.1986) (citations omitted).

The parties do not dispute, and it is clear from the specification, that the "photo-sensitive detector means" is linked to structure 18 in Figure 2. Judge Sotomayor construed Claim 1 to read on Figure 2, but all of the Figures contain a "photo-sensitive detector." IPD II, 1998 WL 142346, at *14. Moreover, in describing Figure 1, the specification notes that the photo-sensitive detectors "may comprise PN photo-diodes associated with low noise pre-amplifier devices." ('202 patent, col. 2, ll. 45-47.)

The parties dispute whether the specification discloses a structure associated with the "light beam demodulation means." The specification contains no language that discusses, much less clearly links, a structure to the light beam demodulation means. At the points where the specification would most logically discuss a light beam demodulator, it does not. For example, in an overview of the invention, the specification states, "each subscriber being able to select a desired programme signal on any one of the optical fibres *by deriving the signals from a photo-sensitive detector* associated with the said one optical fibre." ('202 patent, col. 1, ll. 53-57 (emphasis added).) Similarly, the description of Figure 2 concludes, "[e]ach distribution station is provided with a *photo-sensitive detector 18, output signals from which are passed* to a launching amplifier 19 from which a conductive network 20 extends to the receivers 21, 22. ('202 patent, col. 3, ll. 1-4 (emphasis added).) Both of those examples represent the specification's failure to set forth a structure separate from the photo-sensitive detector to demodulate the light beam. Thus, Claim 1 fails to comply with the disclosure requirement of 35 U.S.C. s. 112 para. 6, rendering the claim indefinite.

IPD and CPL maintain that a person of ordinary skill in the art would nevertheless understand the "photo-

sensitive detector" to perform the function of demodulation. In order to make that connection, one must assume that the demodulation occurs at this point because the specification does not clearly link the photo-sensitive detector and the light beam demodulation means. IPD and CPL's expert assumes that the photo-sensitive detector also contains a structure to demodulate the beam. That assumption is reflected in his statement that "[a] photodetector can detect a light beam without demodulating the signal on the beam. Only when the photodetector is connected to an electric circuit will the photodetector demodulate the signal on the beam." (Pls.' Decls.: Lechner Decl. dated March 22, 2001 at para. 14.) Thus, Dr. Lechner reads into the photo-sensitive detector a separate and additional structure, *i.e.* an electric circuit, to enable demodulation.

Dr. Lechner's assumptions, however, constitute the type of specific information required in the patent under the Patent Act. In the case of means-plus-function claims, that requirement includes disclosure of a structure to perform the function of the claim. In this instance, Cutler was required to disclose with particularity the structure to demodulate the light beam. However, plaintiffs' reliance on the potentially varying assumptions of persons skilled in the art does not meet that exacting standard, and their implication that due to the absence of a structure corresponding to the demodulation means the light detector by necessity performs demodulation are unavailing. The '202 patent's failure to disclose a structure clearly linked to the "light beam demodulation means" renders Claim 1 indefinite. Of note, the Canadian patent examiner, a person of ordinary skill in the art, rejected Claim 1 for indefiniteness because the specification did not support the "light beam demodulation means." (Sirota Decl. Ex. 18 at 2.)

Finally, TCI and Cablevision contend that the "light beam demodulation means" cannot read on the photo-sensitive detector because "photo-sensitive detector means" and "light beam demodulation means" are two separate limitations "responsive to" one another. IPD and CPL counter that two limitations can read on the same structure, and interpose a strained interpretation of "responsive to" such that the demodulation means is included within the light-detector means.

The two disputed limitations are separate and "responsive to" one another. To read them as one contained within the other would impermissibly require reading the words "responsive to" out of the claim. While two limitations hypothetically can read on the same structure, *see* In re Kelley, 305 F.2d 909, 915 (C.C.P.A.1962), such is not the case here, as no language in the specification clearly links the photo-sensitive detector to the light beam demodulation means. Moreover, Figure 1's definition of the photo-sensitive detector, "PH photo-diodes associated with low noise pre-amplifier devices" has no structure to implement demodulation. ('202 patent, col. 2, ll. 45-47.) Thus, Claim 1 is invalid for lack of definiteness under 35 U.S.C. s. 112 para. 6.

Defendants' second ground for asserting invalidity is that Claim 1 improperly combines two separately recited limitations. (Defs.' Br. at 34, 35.) Those limitations are " *an electro-optical transducer* at said central station *producing a light beam* " and "transmission means at said central station modulating the light beam for transmission through said optical fibre, said transmission means including *modulation means producing a light beam* modulated by a high frequency carrier which itself is modulated with video broadcast signals." ('202 patent at col. 4, ll. 11-20 (emphases added).) Defendants further assert that the "electro-optical transducer" and the "transmission means" each produce a light beam. (Defs.' 56.1 Stmt. para. 38.) Plaintiffs counter that the specification makes it clear that there is only one light beam, thus one skilled in the art would understand the electro-optical transducer to be a part of the modulation means. (Pls.' Br. at 21, Pls.' 56.1 Stmt. para. 38.) Plaintiffs further counter that the transmission means includes the electro-optical transducer and the modulation means. (Pls.' Br. at 22.)

Again, invalidity is determined based on whether one skilled in the art would understand what is claimed when the claim is read in light of the specification. Orthokinetics, Inc., 806 F.2d at 1576. Here, summary judgment is improper because defendants have not provided clear and convincing evidence that one skilled in the art would not understand whether the "electro-optical transducer" and "transmission means" limitations create one or two light beams. FN7 Thus, summary judgment of invalidity based on allegations that "transmission means" and "electro-optical transducer" limitations are indefinite is denied.

FN7. At oral argument, counsel for the defendants conceded that this argument is the weakest of the three bases defendants assert to allege indefiniteness. *See* Transcript of Oral Argument on May 4, 2001 at 45:3-6, 94 Civ. 6296, Docket Item No. 209.

Finally, TCI and Cablevision contend that the "common optical fiber" limitation is indefinite. They assert that, as interpreted by Judge Sotomayor, the "common optical fiber" is indefinite because it does not extend "between an electro-optical transducer at said central station ... and photo-sensitive detector means at a reception position near the subscribers station", ('202 pat. col. 4, ll. 7-14), as Claim 1 requires. (Defs.' Br. at 36.) Defendants contend that Judge Sotomayor's interpretation is irreconcilable with that limitation. The claim construction states

Claim 1 next recites "said fiber extending between an electro-optical transducer at said central station producing a light beam and photo-sensitive detector means at a reception position near the subscribers station ...." This phrase first requires the fiber, i.e. the common optical fiber, to extend between a transducer and a detector. As noted in paragraph 52 supra, however, in neither FIG. 1 nor 2 does a "common optical fiber" extend directly either to the subscribers or a detector. The common optical fiber, i.e., the fiber that carries signals for a plurality of subscribers, extends between the transducer [13] and detector [18] in FIG. 2 by way of a vertical fiber that extends from the optical fiber [16] to the detector [18]. Similarly, the common optical fiber in Figure 1 does not extend between the transducer [15] and detectors [6] and [7], but is taken to the detector by an off-shoot fiber from the optical fiber.

IPD II., 1998 WL 142346, *14. IPD and CPL counter that a person of ordinary skill in the art would understand that an optical fiber extending between the central station and a photodetector, from which a conductive network served subscribers, would meet the common optical fiber limitation of Claim 1. (Pls.' Br. at 23.) Plaintiffs further argue that the specification describes a common optical fiber that extends between the central station and a distribution point, and also dispute defendants' interpretation of Judge Sotomayor's claim construction. (Pls.' Br. at 23, 24.) They assert that Judge Sotomayor construed the limitation to mean that the common optical fiber need not extend all the way from the transducer to the detector, because she held that " 'the common optical fiber ... extends between the transducer [13] and the detector [18] in FIG. 2 *by way of* a vertical fiber ... that extends between the transducer [13] and the detector [18]." (Pls.' Br. at 24, quoting IPD II, 1998 WL 142346, at *14 (plaintiffs' emphases).)

Judge Sotomayor construed the "common optical fiber" limitation in the '202 patent as one skilled in the art would understand it. In reaching the conclusions described above, she noted that "[n]one of FIGS. 1-4 of the '202 Patent depict a 'common' optical fiber extending the whole length between an electro-optical transducer and a plurality of subscribers. Rather, in each of FIGS. 1-4, the optical fiber includes a horizontal segment from which vertical segments are 'tapped.' The horizontal and vertical segments of fiber are not 'common' with one another." IPD II, 1998 WL 142346 at *11. Yet the claim construction holds that the common optical fiber must extend between a transducer and a detector. IPD II., 1998 WL 142346, at *14. Thus,

according to the claim construction, one skilled in the art would understand the "common optical fiber" limitation to require a common optical fiber to extend between an electro-optical transducer and photo-detector, but also to do so via separate, non-common vertical splints. The internal inconsistencies of that interpretation-the requirement of a common fiber, achieved through the use of non-common connections-render the "common optical fiber" limitation indefinite; the claim interpretation illustrates that one skilled in the art would not understand the claim in light of the specification. Thus, the indefiniteness of the "common optical fiber" limitation also renders the '202 patent invalid.

CONCLUSION

For the reasons detailed above, this Court construes "high frequency" in the '202 patent to encompass 3-30 MHz. On the basis of that claim construction, TCI and Cablevision's summary judgment motion for noninfringement due to the absence of "high frequency" carrier waves in the accused systems is granted. Summary judgment of noninfringement of the "transmission means" limitation under the doctrine of equivalents is also granted on the grounds that prosecution history estoppel precludes assertion of the "transmission means" limitation. Since there is a genuine issue of material fact concerning literal infringement of the "transmission means" limitation, summary judgment on that issue is denied. Finally, because this Court finds Claim 1 to be indefinite under 35 U.S.C. s. 112 para. 2, the '202 patent is invalid. This Court declines to address defendants' other requests for relief, as each of them is predicated on a finding of infringement.

Accordingly, IPD and CPL's second amended complaint is dismissed with prejudice and judgment is awarded to defendants Cablevision and TCI. The Clerk of the Court is directed to close this case.

SO ORDERED:

APPENDIX A

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