United States Court of Appeals for the Federal Circuit

02-1248

INTELLECTUAL PROPERTY DEVELOPMENT, INC.
and COMMUNICATIONS PATENTS, LTD.,

Plaintiffs-Appellants,

v.

UA-COLUMBIA CABLEVISION OF WESTCHESTER, INC.
and TELE-COMMUNICATIONS, INC.,

Defendants-Appellees.

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Appealed from: United States District Court for the Southern District of New York

Judge William H. Pauley III

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Defendants-Appellees.

DECIDED: July 21, 2003

Before SCHALL, GAJARSA, and DYK, Circuit Judges.

SCHALL, Circuit Judge.

Intellectual Property Development, Inc. and Communications Patents, Ltd. appeal from the decision of the United States District Court for the Southern District of New York that granted summary judgment of non-infringement and invalidity with respect to United States Patent No. 4,135,202 ("the '202 patent") in favor of UA-Columbia Cablevision of Westchester, Inc. and Tele-Communications, Inc. Intellectual Prop. Dev., Inc. v. UA-Columbia Cablevision of Westchester, Inc., No. 94-CV-6296 (S.D.N.Y. Jan. 3, 2002) (memorandum and order granting summary judgment) ("Summary Judgment Order"). We agree with the district court's grant of summary judgment of non-infringement, but disagree with its grant of summary judgment of invalidity. Accordingly, we affirm-in-part and reverse-in-part.

BACKGROUND

I.

Communications Patents, Ltd. is the owner of the '202 patent, while Intellectual Property Development, Inc. is the exclusive licensee of the patent. We refer to Communications Patents, Ltd. and Intellectual Property Development, Inc. collectively as "IPD."

The '202 patent is directed to "Broadcasting Systems with Fibre Optic Transmission Lines."[1] The patent recognizes that conventional wired broadcasting systems are generally of two types. In the first type of system, television signals are distributed between a central station and each of a plurality of subscribers over a single signal path, usually a coaxial cable. This type of a system commonly employs frequencies between 40-300 megahertz ("MHz"). '202 patent, col. 1, ll. 9-16. In the second type of system, television signals are distributed between a central station and each of a plurality of subscribers over separate signal paths, usually twisted pairs of conductors contained within a common cable. This type of a system commonly employs frequencies between 2 and 20 MHz. '202 patent, col. 1, ll. 16-26. The '202 patent notes that the first type of system suffers from transmission losses and inter-modulation problems, while the second type of system suffers from interference, or crosstalk, as well as maintenance problems. '202 patent, col. 1, ll. 27-38.

To solve the problems with these prior art systems, the '202 patent discloses "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 . . . ." '202 patent, col. 1, ll. 42-45. The patent discloses several different embodiments of such a system. Figure 1 of the patent, which is reproduced below, illustrates one of those embodiments.

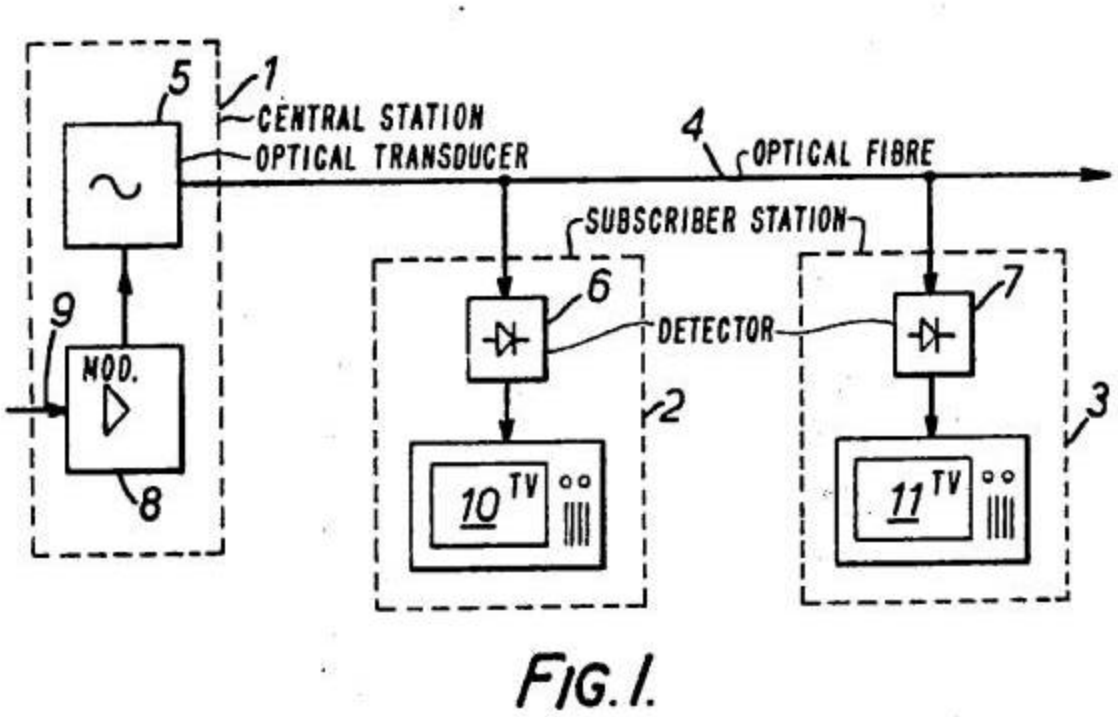

FIG. 1.

As shown in this embodiment, a central station (1) is connected to each of a plurality of subscriber stations (2 and 3) by means of an optical fiber (4). The optical fiber extends between an electro-optical transducer (5) located at the central station and a photo-sensitive detector (6 or 7) located at the subscriber station.[2] '202 patent, col. 2, ll. 28-32.

Claim 1, the only independent claim of the '202 patent and the only claim at issue in this appeal, is as follows:

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 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, ll. 6-31.

UA-Columbia Cablevision of Westchester, Inc. ("UA-Columbia") and Tele-Communications, Inc. ("TCI") own and/or operate cable television systems. UA-Columbia is related to TCI through a series of subsidiaries of TCI. We refer to UA-Columbia and TCI collectively as "Cablevision." Cablevision has systems that operate in the very high frequency ("VHF") range, i.e., 30-300 MHz.

II.

On September 1, 1994, IPD sued Cablevision for infringement of the '202 patent.[3] Cablevision answered and counterclaimed for declaratory judgments of invalidity, non-infringement, and unenforceability.

In June 1997, the district court conducted a four-day claim construction hearing. On March 26, 1998, then District Judge Sonya Sotomayor issued an opinion in which she construed claim 1 of the '202 patent, including the claim term "high frequency carrier". Intellectual Prop. Dev., Inc. v. UA-Columbia Cablevision of Westchester, Inc., No. 94-CV-6296 (S.D.N.Y. Mar. 26, 1998) ("Claim Construction Ruling"). Judge Sotomayor ruled that "high frequency as used in the '202 [p]atent 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." Id. at 10.

On September 14, 1999, the Judicial Panel on Multidistrict Litigation transferred the case to the United States District Court for the Central District of California. On June 19, 2000, however, that court granted IPD's motion for a remand and the case was returned to the Southern District of New York. At this point, the case was assigned to District Judge William H. Pauley, III, Judge Sotomayor having been elevated to the Second Circuit.

On February 9, 2001, Cablevision moved for reconsideration of Judge Sotomayor's construction of the term "high frequency carrier" in claim 1 of the '202 patent and for, inter alia, summary judgment of non-infringement and invalidity. Cablevision argued that Judge Sotomayor should have construed "high frequency" to be limited to 3-30 MHz. IPD opposed, arguing that Judge Sotomayor correctly construed the claim term "high frequency carrier" and that the district court should not reconsider her construction. In addition, IPD argued that Cablevision was not entitled to summary judgment of non-infringement or invalidity.

The district court granted both of Cablevision's motions. Summary Judgment Order at 1. Exercising its discretion to review Judge Sotomayor's construction of the term "high frequency carrier," the court concluded that a person of ordinary skill in the art of wired broadcasting systems would have understood "high frequency" to be limited to 3-30 MHz. Id. at 2. Based on this construction, the court granted summary judgment of non-infringement in favor of Cablevision, noting that since the

accused systems operate in the VHF range, i.e., 30-300 MHz, they cannot literally infringe claim 1 of the '202 patent.[4] Id. The court also granted summary judgment of non-infringement under the doctrine of equivalents in favor of Cablevision on the ground that prosecution history estoppel precluded IPD from arguing that the "transmission means" limitation of claim 1 is infringed under the doctrine of equivalents. Id. At the same time, the court granted Cablevision's motion for summary judgment on its request for a declaratory judgment of invalidity with respect to the '202 patent. It did so on the ground that claim 1 fails to meet the definiteness requirement of 35 U.S.C. § 112, paragraph 2.[5] Id. at 56. IPD timely appealed both rulings. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).

ANALYSIS

I.

Summary judgment is appropriate when there is no genuine issue as to any material fact and the moving party is entitled to judgment as a matter of law. Fed. R. Civ. P. 56(c); Johnston v. IVAC Corp., 885 F.2d 1574, 1576-77 (Fed. Cir. 1989). In determining whether there is a genuine issue of material fact, we view the evidence in the light most favorable to the party opposing the motion and resolve all doubts in favor of the non-movant. Transmatic, Inc. v. Gulton Indus., Inc., 53 F.3d 1270, 1274 (Fed. Cir. 1995). We review de novo a district court's grant of summary judgment. Conroy v. Reebok Int'l, Ltd., 14 F.3d 1570, 1575 (Fed. Cir. 1994).

II.

A. Claim Construction/Infringement

The determination of infringement is a two-step process. First, the court construes the claims at issue to determine their scope. Second, it compares the properly construed claims to the accused device. Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1454 (Fed. Cir. 1998) (en banc). Claim construction is a question of law that we review de novo. Id. at 1456. A determination of infringement is a question of fact. Insituform Techs., Inc. v. Cat Contracting, Inc., 161 F.3d 688, 692 (Fed. Cir. 1998).

As noted, the district court granted summary judgment of non-infringement on the ground, inter alia, that Cablevision's systems do not operate with a "high frequency carrier," as required by claim 1 of the '202 patent. Summary Judgment Order at 2. The court construed "high frequency" to refer to the range of 3-30 MHz. Id. Cablevision's accused systems operate in the VHF range of 30-300 MHz. On appeal, IPD does not dispute that Cablevision's systems operate in the 30-300 MHz range. Neither does IPD argue that Cablevision infringes the '202 patent if the district court's construction of the term "high frequency" stands. Accordingly, the issue of infringement turns solely on claim construction.

IPD argues that the district court erred in reconsidering Judge Sotomayor's construction of the term "high frequency carrier." Specifically, it asserts that the intrinsic evidence, including the claim language, the specification, and the prosecution history, establishes that "high frequency" encompasses any frequency at which a conventional TV receiver can receive and display a signal. It also contends that the district court erroneously resorted to selected extrinsic evidence, including dictionaries, to construe the term "high frequency."

Cablevision argues that the district court properly construed the term "high frequency carrier" in claim 1. It asserts that the intrinsic as well as extrinsic evidence supports the district court's construction. In the alternative, it argues that if IPD is correct that "high frequency" includes 3-300 MHz, then the '202 patent is invalid under 35 U.S.C. § 102(f) for lack of inventorship. As explained below, we agree with Cablevision that the district court did not err in construing "high frequency" to mean a frequency in the range of 3-30 MHz.

We begin our claim construction analysis with the words of the claim. Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996). "In construing claims, the analytical focus must begin and remain centered on the language of the claims themselves, for it is that language that the patentee chose to use to 'particularly point[ ] out and distinctly claim[ ] the subject matter which the patentee regards as his invention.'" Interactive Gift Express, Inc. v. Compuserve, Inc., 256 F.3d 1323, 1331 (Fed. Cir. 2001) (citing 35 U.S.C. § 112, ¶ 2). The words used in the claims are examined from the perspective of a person skilled in the art. Tegal Corp. v. Tokyo Electron Am., Inc., 257 F.3d 1331, 1342 (Fed. Cir. 2001). In the absence of an express intent to impart a novel meaning to claim terms, the words are presumed to take on the ordinary and customary

meanings attributed to them by those of ordinary skill in the art. See, e.g., Teleflex, Inc. v. Ficosa N. Am. Corp., 299 F.3d 1313, 1325 (Fed. Cir. 2002). The ordinary and customary meaning of a claim term may be determined by reviewing a variety of sources. Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc., No. 02-1145, slip op. at 6 (Fed. Cir. June 27, 2003). Some of these sources include the claims themselves, see Process Control Corp. v. HydReclaim Corp., 190 F.3d 1350, 1357 (Fed. Cir. 1999); dictionaries and treatises, Tex. Digital Sys., Inc. v. Telegenix, Inc., 308 F.3d 1193, 1202 (Fed. Cir. 2002); and the written description, the drawings, and the prosecution history, see, e.g., DeMarini Sports, Inc. v. Worth, Inc., 239 F.3d 1314, 1324 (Fed. Cir. 2001).

The district court noted that because claim 1 of the '202 patent does not specify a frequency range, one skilled in the art would presume that "high frequency" would have its ordinary meaning, unless the patentee clearly assigned a different meaning to the term. Summary Judgment Order at 22. Starting from that premise, the court concluded that one skilled in the art at the time of the patent application (December 2, 1974) would have understood "high frequency" in the '202 patent to mean a frequency between 3-30 MHz. Id. The court noted two dictionary definitions that defined "high frequency" as covering frequencies between 3-30 MHz:

A technical dictionary published in 1974 defines the term as "Federal Communications [C]ommission 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[l]. Ex. 4: Webster's Seventh New Collegiate Dictionary 705 (G. & C. Merriam Co. 1967) (1961).)

Id.[6]

IPD argues that the district court "put the cart before the horse" by looking at dictionary definitions first instead of the specification to determine the meaning of the term "high frequency." We disagree. As we have noted, "[c]onsulting the written description and prosecution history as a threshold step in the claim construction process, before any effort is made to discern the ordinary and customary meanings attributed to the words themselves, invites a violation of our precedent counseling against importing limitations into the claims." Tex. Digital, 308 F.3d at 1204 (citations omitted). In fact, we have noted that dictionaries, encyclopedias, and treatises, publicly available at the time the patent is issued, are objective resources that serve as reliable sources of information on the established meanings that would have been attributed to the terms of the claims by those of skill in the art:

Such references are unbiased reflections of common understanding not influenced by expert testimony or events subsequent to the fixing of the intrinsic record by the grant of the patent, not colored by the motives of the parties, and not inspired by litigation. Indeed, these materials may be the most meaningful sources of information to aid judges in better understanding both the technology and the terminology used by those skilled in the art to describe the technology.

Id. at 1202-03. Accordingly, the district court did not err in looking to dictionary definitions before consulting the written description or the prosecution history to determine the meaning of the term "high frequency." Indeed, we agree with the district court that, based on the dictionary definitions of "high frequency," one skilled in the art at the time of the patent application would have understood "high frequency" in the '202 patent to mean a frequency between 3-30 MHz.

In addition, IPD argues that the use of dictionaries as a claim construction tool in this case is inappropriate because there are different dictionary definitions of "high frequency," some of which place "high frequency" outside a range of 3-30 MHz. IPD relies on the Oxford English Dictionary and notes that it defines "high frequency" as "[a] frequency . . . having a relatively large number of cycles in a second." IPD further notes that the Oxford English Dictionary refers to the Dictionary of Electronics and that the Dictionary of Electronics defines "high frequency" as "[a] general term used to distinguish signals of radio frequency from those of audio frequency."

We have noted that "[b]ecause words often have multiple dictionary definitions, some having no relation to the claimed invention, the intrinsic record must always be consulted to identify which of the different possible dictionary meanings of the claim terms in issue is most consistent with the use of the words by the inventor." Tex. Digital, 308 F.3d at 1203 (citation omitted). In this case, as will be seen next, the dictionary definition that is most consistent with the specification and the prosecution history is the definition that defines "high frequency" as including frequencies in the range of 3-30 MHz. See

McGraw-Hill Dictionary of Scientific & Technical Terms 690 (1974) (defining "high frequency" as "Federal Communications Commission designation for the band from 3 to 30 megahertz in the radio spectrum"); Webster's Seventh New Collegiate Dictionary 705 (1967) (defining "high frequency" as "3 to 30 megacycles").[7]

The '202 patent's written description supports the district court's conclusion that "high frequency" in the claim term "high frequency carrier" refers to a frequency in the range of 3-30 MHz. The written description should be examined in every case to determine if the presumption of ordinary and customary meaning is rebutted. Brookhill-Wilk, slip op. at 6 (citing Renishaw PLC v. Marposs Societa' per Azioni, 158 F.3d 1243, 1250 (Fed. Cir. 1998)). The presumption will be rebutted where the patentee, acting as his or her own lexicographer, has clearly set forth a definition of a claim term that is different from the term's ordinary and customary meaning. Id. at 6-7 (citing In re Paulsen, 30 F.3d 1475, 1480 (Fed. Cir. 1994); Intellicall, Inc. v. Phonometrics, Inc., 952 F.2d 1384, 1387-88 (Fed. Cir. 1992)). It also will be rebutted if the inventor has disavowed or disclaimed scope of coverage, by using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope. Id. at 7 (citing Teleflex, 299 F.3d at 1324).

The district court noted that the specification of the '202 patent does not define "high frequency" in a way that is at variance with the ordinary meaning of 3-30 MHz. Summary Judgment Order at 25. The court stated that "the specification does not clearly imply or express a special definition for the term 'high frequency.'" Id. at 27. We agree. Nowhere in the specification does the patentee, acting as his or her own lexicographer, clearly set forth a definition of "high frequency" different from its ordinary and customary meaning. If anything, the specification of the '202 patent supports the ordinary meaning of "high frequency" as being 3-30 MHz. It does so because it provides a definition for very high frequency, or VHF, as 40-300 MHz. '202 patent, col. 1, ll. 14-16 (stating that "[c]ommonly the range of frequencies employed extends throughout the VHF spectrum, for example, from about 40-300 MHz" (emphasis added)). Under these circumstances, we conclude that since the patentee defined a range for VHF, it certainly could have defined a range for high frequency and that, since it did not, high frequency should be given its ordinary and customary meaning of 3-30 MHz.

We have noted that, like the specification, the prosecution history may demonstrate that the patentee intended to deviate from a term's ordinary and accustomed meaning, i.e., if it shows that the patentee characterized the invention using words or expressions of manifest exclusion or restriction before the United States Patent and Trademark Office. Teleflex, 299 F.3d at 1326. The prosecution history limits the interpretation of claims so as to exclude any interpretation that may have been disclaimed or disavowed during prosecution in order to obtain claim allowance. Id. In this case, however, nothing in the prosecution history demonstrates that the patentee intended to deviate from the term "high frequency"'s ordinary and accustomed meaning of 3-30 MHz.

Lastly, IPD argues that the following language in claim 1 supports its construction that "high frequency" also includes frequencies in the VHF range: "conventional television receivers at the subscriber stations responsive to receive said high frequency carrier modulated with video broadcast signals." '202 patent, col. 4, ll. 20-23 (emphasis added). IPD relies on Judge Sotomayor's earlier claim construction ruling in support of this argument. Judge Sotomayor stated that the use of the phrase "conventional television receivers" in connection with "high frequency transmission" would have meant to a person skilled in the art that the inventor was referring to a VHF system operating in at least a range of 54 to 216 MHz. Claim Construction Ruling at 17. Judge Sotomayor reached this conclusion by noting that a person skilled in the art in the United States would have understood a reference to a conventional television receiver in the claim to mean a VHF television receiver. Id. at 18. We do not agree. In our view, the ordinary meaning of "high frequency" helps define the term "conventional television receivers," not the inverse. That is so because claim 1 refers to "conventional television receivers at the subscriber stations responsive to receive said high frequency carrier." '202 patent, col. 4, ll. 20-23 (emphasis added). The quoted language establishes that "conventional television receivers" are properly read as a subset of all television receivers, i.e., those responsive to a high frequency signal.

In sum, we hold that the district court correctly construed "high frequency" as including only any frequency between 3-30 MHz. Because we agree with the district court's construction of the term "high frequency carrier," we affirm the court's grant of summary judgment of non-infringement in favor of Cablevision. The accused systems operate in the VHF range, i.e., in the 30-300 MHz range, and thus fall outside the literal scope of the '202 patent.[8]

B. Validity

IPD also appeals from the district court's grant of summary judgment of invalidity. Even though we conclude that the '202 patent is not infringed, we still must review the district court's holding that the '202 patent is invalid. In Cardinal Chemical Co. v. Morton International, Inc., 508 U.S. 83 (1993), the Supreme Court noted that "[t]hough the decision of non-infringement disposes of the bill and answer, it does not dispose of the counterclaim which raises the question of validity." Id. at 94 (citation omitted). Thus, our affirmance of the district court's judgment of non-infringement does not moot the

district court's ruling on Cablevision's counterclaim for a declaratory judgment of invalidity. Id. at 102-03. If we do not address the ruling on validity, we deprive IPD "of the appellate review that is a component of the one full and fair opportunity to have the validity issue adjudicated correctly." Id. at 102.

The district court held claim 1 to be invalid under 35 U.S.C. § 112, paragraph 2. Summary Judgment Order at 56. The court concluded that the '202 patent's failure to disclose a structure clearly linked to the "light beam demodulation means" rendered claim 1 indefinite. Id. at 50. The court also determined that the "common optical fibre" limitation in claim 1 was indefinite. Id. at 55.

Section 112 states, inter alia: "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. § 112, ¶ 2. A determination that a patent claim is invalid for failure to meet the definiteness requirement of 35 U.S.C. § 112, paragraph 2, is "a legal conclusion that is drawn from the court's performance of its duty as the construer of patent claims[, and] therefore, like claim construction, is a question of law that we review de novo." Atmel Corp. v. Info. Storage Devices, Inc., 198 F.3d 1374, 1378 (Fed. Cir. 1999) (emphasis in original).

1. Light beam demodulation means

Claim 1 recites, inter alia: "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 . . . ." '202 patent, col. 4, ll. 23-25 (emphases added). As the district court pointed out, the parties do not dispute, and it is clear from the specification, that the "photo-sensitive detector means" is linked to the photo-sensitive detector described in the specification and shown in the drawings of the '202 patent (for example, structure 6 in Figure 1 of the patent). Summary Judgment Order at 47-48. The court noted, however, that the parties disputed whether the specification discloses a structure associated with the "light beam demodulation means." Id. at 48. It observed that the specification contains no language that clearly links a structure to the "light beam demodulation means." Id. The court concluded that the patentee was required to disclose with particularity the structure corresponding to the "light beam demodulation means." Id. at 50. The court also concluded that since the claim language requires that the "photo-sensitive detector means" and the "light beam demodulation means" be "responsive to" each other, they could not, as urged by IPD, be contained in the same structure, i.e., the photo-sensitive detector. Id. at 51. Otherwise, according to the court, the words "responsive to" would be read out of the claim. Id. The court observed that while two limitations hypothetically could read on the same structure, such was not the case here, as no language in the specification clearly linked the photo-sensitive detector to the light beam demodulation means. Id. Accordingly, it held that the '202 patent's failure to disclose a structure clearly linked to the "light beam demodulation means" rendered claim 1 indefinite. Id.

IPD argues that the district court erred in finding that the '202 patent fails to disclose a structure that is clearly linked to the "light beam demodulation means." It asserts that the specification does disclose such a structure, i.e., the photo-sensitive detector. Moreover, IPD argues that one claim limitation (i.e., light beam demodulation means) can be responsive to another (i.e., photo-sensitive detector means) even if the two limitations exist in a single common structure. For its part, Cablevision contends that the specification of the '202 patent fails to clearly link or associate any structure with the function of light beam demodulation, thereby rendering the claim indefinite. Cablevision asserts that even assuming IPD is correct, its construction nonetheless renders the claim indefinite because IPD's construction would read "responsive to" out of the claim.

The determination of whether a claim is invalid as indefinite "depends on whether those skilled in the art would understand the scope of the claim when the claim is read in light of the specification." See N. Am. Vaccine, Inc. v. Am. Cyanamid Co., 7 F.3d 1571, 1579 (1993) (citation omitted). The limitation at issue here is written in means-plus-function format pursuant to 35 U.S.C. § 112, paragraph 6, which provides:

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

35 U.S.C. § 112, ¶ 6. In construing means-plus-function claim limitations, a court must first define the particular function claimed. Sage Prods., Inc. v. Devon Indus., Inc., 126 F.3d 1420, 1428 (Fed. Cir. 1997). Then, the court must identify "the corresponding structure, material, or acts described in the specification." 35 U.S.C. § 112, ¶ 6; see Sage Prods., 126 F.3d at 1428.

Whether a patent adequately sets forth structure corresponding to a claimed function necessitates consideration of the disclosure of the specification from the viewpoint of one skilled in the art. See Budde v. Harley-Davidson, Inc., 250 F.3d 1369, 1376 (Fed. Cir. 2001) (citing 35 U.S.C. § 112, ¶ 1; Am. Cyanamid Co., 7 F.3d at 1579). Failure to disclose adequate structure corresponding to the recited function in accordance with 35 U.S.C. § 112, paragraph 1, results in the claim being of indefinite scope, and thus invalid, under 35 U.S.C. § 112, paragraph 2. Id. (citing In re Dossel, 115 F.3d 942, 945 (Fed. Cir. 1997)).

The claims of a patent are afforded a statutory presumption of validity. See 35 U.S.C. § 282. Overcoming the presumption of validity requires that any facts supporting a holding of invalidity be proved by clear and convincing evidence. Ultra-Tex Surfaces, Inc. v. Hill Bros. Chem. Co., 204 F.3d 1360, 1367 (Fed. Cir. 2000). Thus, a challenge to a claim containing a means-plus-function limitation as lacking structural support requires a finding, by clear and convincing evidence, that the specification lacks disclosure of structure sufficient to be understood by one skilled in the art as being adequate to perform the recited function. Budde, 250 F.3d at 1377.

From the claim language, it is apparent that the claimed "light beam demodulation means" performs the function of converting the light beam into demodulated high frequency carrier radio wave signals modulated with video broadcast signals. The record reveals that the experts for both parties understood that the photo-sensitive detector disclosed in the specification and figures performs the function of demodulation. For example, Cablevision's expert testified at deposition: "The optical demodulation occurs in the photo[-]sensitive detector." Likewise, IPD's expert stated in his declaration that "a person with ordinary skill in the art would recognize that in Claim 1 . . . [the patentee] describes the detection of the light beam and the demodulation of the information on the beam, which are both performed by the photo-sensitive detector." In short, no issue of fact is presented as to whether one skilled in the art would understand that, in the broadcast system claimed in the '202 patent, the demodulation function is performed in the photo-sensitive detector.

Moreover, the prosecution history of the '202 patent clearly links the disclosed structure, i.e., a photo-sensitive detector, to the demodulation function of the light beam demodulation means. During prosecution, when describing the invention generally, the patentee stated:

> A TV broadcasting distribution system . . . [includes] photo sensing detector demodulators . . . .
>
> . . . Signals are electro-optically transduced into the fiber 4 at central station transducer 5 to produce a light beam modulated by the usual r-f carriers received by standard TV receivers 10, 11. Thus, when the local demodulating transducers 6, 7 convert light modulations, the r-f carriers carrying TV programs are received in a standard way on receivers 10, 11. No converters are necessary to use the demodulated light waves.

(emphases added). The local demodulating transducers (6, 7) in the quoted language are the photo-sensitive detectors, the structure that performs the demodulation. One skilled in the art, when reading the quoted statement, would conclude that demodulation is performed by the photo-sensitive detectors. See B. Braun Med., Inc. v. Abbott Labs., 124 F.3d 1419, 1424 (holding that "structure disclosed in the specification is 'corresponding' structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim" (emphasis added)).[9] Accordingly, we reverse the district court's grant of summary judgment of invalidity with respect to the "light beam demodulation means" limitation.[10]

2. Common optical fiber

Claim 1 recites, inter alia: "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 station." '202 patent, col. 4, ll. 8-14. Judge Sotomayor construed this claim language, noting first that the phrase "a common optical fiber in said signal path carrying signals to said plurality of subscribers from said central station" refers to "an optical fiber which is common to the plurality of subscribers -- that is, it belongs to or is shared by two or more subscribers." Claim Construction Ruling at 28 (emphases added). According to this phrase, observed Judge Sotomayor, "the common optical fiber is in the signal path, which signal path carries the signals from the central station to the subscribers." Id. (emphasis in original). Judge Sotomayor next noted that:

Claim 1 . . . 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 . . ., 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.

Id. at 28-29 (emphasis added). Judge Sotomayor observed 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.

Id. at 22-23.

Relying on Judge Sotomayor's claim construction analysis, the district court concluded that the phrase "common optical fibre" is indefinite and therefore renders claim 1 invalid. Summary Judgment Order at 55. The district court observed that the correct construction of claim 1 of the '202 patent requires that the common optical fiber extend between a transducer and a detector and that, according to that construction, one skilled in the art would understand the "common optical fibre" limitation in claim 1 to require a common optical fiber to extend between an electro-optical transducer and photo-sensitive detector, but also to do so via separate, non-common vertical splints. Id. It concluded that the internal inconsistencies of that interpretation -- the requirement of a common fiber, achieved through the use of non-common connections -- rendered the "common optical fibre" limitation indefinite. Id.

IPD argues that the district court ignored the most natural and sensible definition of the term -- the specific definition provided by the inventor in the prosecution history and the construction rendered by Judge Sotomayor -- that "common optical fibre" means a fiber that is shared by two or more subscribers. IPD asserts that in finding Judge Sotomayor's claim interpretation to be internally inconsistent, the district court misunderstood that interpretation, and misconstrued the claims so as to render them invalid. IPD contends that without explanation, the district court assumed, contrary to Judge Sotomayor's construction, that a common optical fiber "extending between" the transducer and detector must be common over the entire distance between the transducer and the detector. Cablevision responds and argues that the district court correctly found claim 1 to be indefinite because it requires a "common optical fibre . . . extending between an electro-optical transducer . . . and photo-sensitive detector." It notes that in the embodiments disclosed in the specification of the '202 patent in which a common fiber is employed, the common fiber does not extend to the photo-sensitive detector means. Rather, the photo-sensitive detector is always connected to the common fiber by a non-common fiber tap. It then argues that the claim, as written, is therefore indefinite when interpreted in light of the specification of the '202 patent.

We agree with IPD that the district court erred in holding the "common optical fibre" limitation indefinite. As noted, the determination of whether a claim is invalid as indefinite "depends on whether those skilled in the art would understand the scope of the claim when the claim is read in light of the specification." See Am. Cyanamid Co., 7 F.3d at 1579 (citation omitted). In this case, one skilled in the art would understand the scope of the claim when the claim is read in light of the specification. Judge Sotomayor stated that the common optical fiber is a fiber that carries signals for a plurality of subscribers and that it extends between the transducer and the detector. Claim Construction Ruling at 28. As noted by IPD, a single fiber extending over a large distance need not be constructed of a unitary, continuous strand of glass any more than a single pipe extending over a large distance need be so constructed. To the contrary, as IPD's expert testified at trial:

[A light beam] goes down every place it finds fibre through connectors and splitters and so forth. There will be more than one piece of fibre, just as an electrical signal goes down a wire cable, but there may be many separate pieces spliced together branching off and so forth.

Thus, even if the fiber in Figure 1 were viewed as consisting of a horizontal segment with a vertical segment of fiber branching off from it, that would not preclude a person skilled in the art from considering such a multi-segment fiber leading to the detector to be a single "optical fibre" that is common to (i.e., shared by) the end-users served by it. Accordingly, as we do in the case of the "light beam demodulation means" limitation, we reverse the district court's summary judgment of invalidity based on the "common optical fibre" limitation.

CONCLUSION

Because we conclude that the district court correctly construed the term "high frequency," we affirm the court's grant of summary judgment of non-infringement. However, because we conclude that the district court erred in finding claim 1 to be indefinite under 35 U.S.C. § 112, paragraph 2, we reverse the court's grant of summary judgment of invalidity. Accordingly, we

AFFIRM-IN-PART and REVERSE-IN-PART.

COSTS

Each party shall bear its own costs.

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[1] We note that although the '202 patent spells "fiber" as "fibre," we use "fiber" in this opinion unless we are quoting from the patent or from a source that spells "fiber" as "fibre."

[2] For many reasons, a video signal is rarely transmitted in its original form. Instead, a signal having a much higher frequency is modified to "carry" the video signal. The modified signal is then transmitted. When the modified signal is received, the modifications are detected and used to reconstruct the video signal, which then controls the television picture. The higher frequency signal that is modified is often referred to as a "carrier signal," or just a "carrier." The modification of a carrier signal with another signal is referred to as "modulation." Detecting the modification and reconstructing the carried signal is referred to as "demodulation." When fiber optic communication is involved, a light beam is used as a transmission medium. The result is a system that involves an additional layer of modulation. Thus, in optical

transmission systems, an electro-optical transducer is used to modulate the lower frequency signals onto the light beam. Then, at the receiving end, a photo-sensitive detector is used to demodulate the light beam signal.

[3] Initially, Intellectual Property Development, Inc. was the only plaintiff named in the Complaint. Communications Patents, Ltd. was added as an additional plaintiff in 2000.

[4] IPD did not argue that the "high frequency carrier" limitation is met in the Cablevision Systems through the doctrine of equivalents.

[5] After summary judgment was granted in favor of Cablevision, its counterclaim for a declaratory judgment of unenforceability was dismissed.

[6] "Sirota Decl." refers to the declaration submitted by Neil P. Sirota in support of Cablevision's summary judgment motion.

[7] We note that even the dictionaries that IPD relies on have a definition for "high frequency" that is consistent with the definition used by the district court and advanced by Cablevision. For example, the Oxford English Dictionary defines high frequency as:

A frequency (see FREQUENCY 4b) having a relatively large number of cycles in a second. Applied esp. to an electric current or voltage, an electromagnetic wave or a sound wave. Abbrev. H.F., esp. in radio and telecommunications, where it also refers specifically to electromagnetic waves of 3-30 MHz.

(emphasis added). Similarly, the Dictionary of Electronics defines "high frequency" as:

> (1) A general term used to distinguish signals of radio frequency from those of audio frequency. (2) A relative term used to describe frequencies at the upper end of a particular frequency band. (3) Term of specific application to radio waves in the frequency range between 3 and 30 Mc/s, i.e. of wavelengths from 100 m down to 10m.

(emphasis added).

[8] As noted above, the district court also granted summary judgment of non-infringement under the doctrine of equivalents in favor of Cablevision on the ground that prosecution history estoppel precludes IPD from arguing that the "transmission means" limitation of claim 1 is infringed under the doctrine of equivalents. Summary Judgment Order at 56. Because IPD has not raised infringement of the "high frequency" limitation under the doctrine of equivalents and in view of our conclusion that the district court correctly granted summary judgment of no literal infringement with respect to the "high frequency carrier" limitation, we do not reach the issue of whether the district court correctly granted summary judgment of non-infringement under the doctrine of equivalents.

[9] Contrary to Cablevision's argument, we see no reason why, as a matter of law, one claim limitation may not be responsive to another merely because they are located in the same physical structure. See In re Kelley, 305 F.2d 909, 915-16 (C.C.P.A. 1962) (noting that two limitations hypothetically can read on the same structure).

[10] We are reversing rather than vacating the grant of summary judgment of invalidity in favor of Cablevision

because indefiniteness is a question of law, there are no pertinent facts in dispute, and neither party argues otherwise. See Verve, LLC v. Crane Cams, Inc., 311 F.3d 1116, 1121 (Fed. Cir. 2002) (reversing the grant of summary judgment of invalidity on the ground of anticipation and noting that "[o]n the undisputed facts, no reasonable trier of fact could find the . . . invention anticipated by [the] . . . Japanese references"); Exxon Research & Eng'g Co. v. United States, 265 F.3d 1371 (Fed. Cir. 2001) (reversing the district court's grant of summary judgment of invalidity on the ground of indefiniteness); Atmel Corp., 198 F.3d at 1382-83 (reversing the district court's grant of summary judgment of invalidity on the ground of indefiniteness).