United States District Court,
W.D. Texas, Austin Division.

MINNESOTA MINING AND MANUFACTURING COMPANY,
v.
MOLEX, INC. and.

No. A 00 CA 201 SS

Nov. 16, 2000.

ORDER

SAM SPARKS**, District Judge.**

BE IT REMEMBERED that on the 4th day of August 2000 the Court, in accordance with *Markman v. Westview Instruments, Inc.,* 52F.3d 967 (Fed.Cir.1995), *aff'd,* 116 S.Ct. 1384 (1996), held a hearing at which the parties appeared by representation of counsel and made oral arguments on their proposed claims construction for U.S. Patent No. 5,351,327 ("the '327 patent") and U.S. Patent No. 5,458,528 ("the '528 patent"). After considering the briefs, the arguments of counsel, the case file as a whole, and the applicable law, the Court enters the following opinion and order.

I. Standard for Claims Construction

The construction of claims, or the definition of the terms used in the claims, is a matter of law for the Court. When adopting a claim construction, the Court should first consider the intrinsic evidence, which includes the claims, the specification, and the prosecution history. *See* Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1996) (explaining that intrinsic evidence is "the most significant source of the legally operative meaning of disputed claim language"). Not surprisingly, the starting point is always "the words of the claims themselves." *Id.; see also* Comark Communications, Inc. v. Harris Corp., 156 F .3d 1182, 1186 (Fed.Cir.1998). The words of the claims are generally given their ordinary and customary meaning, unless the patentee intended to use a "special definition of the term clearly stated in the patent specification or file history." Vitronics, 90 F.3d at 1582. Thus, the Court must review the specification and file history to determine whether the patentee intended to use any such "special" definitions. *See id.* The specification and file history may also be consulted as general guides for claim interpretation. *See* Comark, 156 F.3d at 1186.

The specification and file history, however, are not substitutes for the plain language of the claims. The specification is not meant to describe the full scope of the patent-it includes only a written description of the invention, sufficient to enable a person skilled in the art to make and use it, as well as the invention's "best mode." *See* 35 U.S.C. s. 112. Thus, the claims may be broader than the specification, and generally should not be confined to the examples of the invention set forth in the specification. *See* Comark, 156 F.3d at 1187 ("Although the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read

into the claims."). Indeed, the Federal Circuit has repeatedly emphasized that "limitations from the specification are not to be read into the claims." Id. at 1186.

In addition to examining the intrinsic evidence the Court may, in its discretion, receive extrinsic evidence regarding the proper construction of the patent's terms. *See* Key Pharmaceuticals v. Hercon Labs. Corp., 161 F.3d 709, 716 (Fed.Cir.1998) ("[T]rial courts generally can hear expert testimony for background and education on the technology implicated by the presented claim construction issues, and trial courts have broad discretion in this regard."). Prior to the *Markman* hearing, the plaintiff, Minnesota Mining and Manufacturing Company ("3M"), provided an expert affidavit and defendant Molex provided excerpts from several dictionaries as extrinsic evidence.

II. The '327 Patent

A. "chamfered surface"

The '327 Patent generally describes a fiberoptic cable connector, and more specifically the cylindrical casing that houses the end of the cable to be connected. This casing is often referred to as a "ferrule" in the '327 Patent. The phrase "chamfered surface" is used in claims 1 and 7 of the '327 Patent, to generally describe a portion of the ferrule surface. 3M argues the surface referred to by this phrase should be restricted to a specific location on the ferrule, and proposes the following definition: "beveled surface between the side wall and spherical end face of the ferrule." Molex contends the phrase should be defined as "beveled surface on an otherwise sharp edge or corner," Finally, the other defendant, Seiko Instruments ("Seiko"), proposes the phrase be defined simply as "beveled surface." The Court agrees with Seiko.

The phrase "chamfered surface" is not expressly defined in the specification of the '327 Patent. However, in several places the specification refers to the ferrule as having a "beveled or chamfered" surface. *See* '327 Patent, at 2:18 and 4:32. Moreover, contrary to 3M's proposed definition, there is nothing in the '327 Patent requiring this surface to be "between the side wall and spherical end face of the ferrule." The Court declines to read this restriction into the claims. Indeed, the claim language itself adequately describes the location of this surface, by stating the chamfered surface is located at the distal end of the ferrule and is adjacent to the generally spherical end face of the ferrule. *See* '327 Patent, Claim 1. Finally, contrary to Molex's argument, there is nothing in the claim language or the rest of the '327 Patent that necessarily restricts the chamfered surface to being "on an otherwise sharp edge or corner." Molex's proposed restriction comes solely from a dictionary; the Court declines to adopt this restriction. Therefore, the Court will adopt Seiko's proposed definition and construe the phrase "chamfered surface" in claims 1 and 7 of the '327 Patent to mean "chamfered or beveled surface."

B. "generally spherical"

This phrase is used in claims 1, 5 and 7 of the '327 Patent, to describe the rounded "end face" of the ferrule. The end face is basically the surface of the ferrule that is designed to connect with another ferrule, to make the fiberoptic link. For the phrase "generally spherical," 3M proposes the following definition: "approximating a spherical surface such that one skilled in the art may identify an apex." Molex contends the phrase should be defined only as "approximates a spherical surface." Seiko proposes no definition for this phrase. The Court agrees with 3M's proposed definition.

3M's definition is taken straight from the specification of the '327 Patent, which states "the term 'spherical' should be construed as including" a surface that "sufficiently approximates a spherical surface to enable one

skilled in the art to identify its apex." *See* '327 Patent, at 6:29-6:35. Accordingly, the Court will construe the phrase "generally FN1 spherical" in claims 1, 5 and 7 of the ' 327 Patent to mean "approximating a spherical surface such that one skilled in the art may identify an apex."

FN1. The claims of the '327 Patent are permeated with the term "generally." The Court notes that using this term repeatedly to "specify" a claimed invention is like boxing with one arm.

C. "adjacent"

This term is used in claims 1 and 7 of the '327 Patent, to describe the location of the chamfered surface relative to the end face. 3M claims the term should be defined as "right next to and in contact with." Molex claims it should mean "next to," while Seiko argues the term "adjacent" really means "intersects."

The Court continues to be amazed that parties in patent litigation feel the need to re-define straightforward, simple terms. The term "adjacent" is used in the claims of the '327 Patent in its ordinary, everyday manner, and the specification contains no special definition of this term. Asking the Court to define "adjacent" is akin to asking the Court to define "is." The Court declines to play this game of semantics, and will not further define the term "adjacent" as used in the '327 Patent.

D. "apex" and "angle of inclination"

The term "apex" is used in independent claim 1 and dependent claims 2 and 6 of the '327 Patent, to describe a point on the rounded, slightly tilted end face of the ferrule. The term "angle of inclination" is used to define the slight tilt of the ferrule's end face. This is one of the main areas of contention between the parties, and the dispute boils down to whether the tangent of the apex must be "absolutely" parallel to the angle of inclination (as Seiko argues) or whether it can be "generally" parallel to this angle (as 3M and Molex argue).

3M initially proposed one definition of "apex" in its claim construction brief and then, for the convenience of the Court, decided to change its definition of "apex" on the morning of the hearing. 3M's current proposed definition is: "a point on the generally spherical end face whose tangent is generally parallel with the general plane of inclination of the spherical end face and whose tangent is parallel to the precise place of inclination." FN2 Molex proposes the following definition: "that point on a spherical surface whose tangent is generally parallel with the angle of inclination, where the angle of inclination is defined as the angle between a plane normal to the axis of the ferrule and a line between diametrically opposed points where the spherical surface intersects the chamfered surface of the ferrule." Seiko's proposal is as follows: "the point in the spherical endface whose tangent is parallel with the angle of inclination of the spherical surface, the angle of inclination being defined by the points A and B in Fig. 4 where the spherical surface intersects the chamfered surface." The Court finds none of these definitions completely accurate, and instead adopts the definition expressly provided in the specification.

FN2. The terms "general plane of inclination" and "precise place of inclination" appear nowhere in the patent, the prosecution history, or the briefs. For whatever reason, 3M waited until the morning of the *Markman* hearing to introduce these novel terms.

The specification states "the term 'apex' as used herein refers to that point on [a] spherical surface whose

tangent is generally parallel with the angle of inclination of [the] spherical surface." *See* '327 Patent, at 2:28-2:31. The specification further defines "angle of inclination" as "the line formed between the diametrically opposed points A and B [of Figure 1] where [the] spherical surface intersects the chamfered surface." *See id*. at 2:32-2:35. Thus, the patentee chose to use "generally parallel" to define the apex and to specifically define the angle of inclination using Figure 1 of the '327 Patent; the Court therefore will adopt these special definitions. *See* Vitronics, 90 F.3d at 1582 (holding that, when patentee intended to use a "special definition of the term clearly stated in the patent specification or file history," Court should adopt this definition). The Court further notes the patentee made clear that generally parallel does not mean absolutely parallel, as Seiko argues. In the next sentence of the specification, the patentee explained "the tangent at [the] apex may not be perfectly parallel with the line between points A and B." *See* '327 Patent, at 2:39-2:40.

Despite the plain language of the claims and the specification, Seiko argues the phrase "generally parallel" is "hopelessly ambiguous" and would cause the '327 Patent to encompass prior art .FN3 Specifically, Seiko contends the ' 327 Patent was distinguished from prior art by having the bore (the hole where the fiberoptic cable is placed) centered on the apex, and more specifically by placing the bore within 50 microns of this apex. Seiko argues the term "generally parallel" will broaden the scope of the ' 327 Patent, so that "the apex could be found anywhere along the spherical endface." While this may be true, it has no bearing on the 50-micron issue-no matter where the apex is, the bore still may be within 50 microns of it.FN4 The relationship of the bore to the apex is described in the next section.

FN3. In general, "claims should be read in a way that avoids ensnaring prior art if it is possible to do so." Harris Corp. v. IXYS Corp., 114 F.3d 1149, 1153 (Fed.Cir.1997).

FN4. Indeed, to avoid reading upon prior art, the bore must be within this distance, as discussed in the following section.

Accordingly, the Court will construe "apex" to mean "that point on a spherical surface whose tangent is generally parallel with the angle of inclination of the spherical surface" and will further construe "angle of inclination" to mean "the line formed between the diametrically opposed points A and B of Figure 1 of the '327 Patent, where the spherical surface intersects the chamfered surface."

E. "approximately coincides with said bore"

This phrase is used in claim 1 of the '327 Patent, to describe the location of the apex. 3M proposes the phrase be defined as: "the apex is at least within 50 micrometers ((mu) m) of the axis of the bore." Similarly, Seiko proposes it be defined as: "within 50 microns of the fiber axis." Molex takes a different approach-supported only by a dictionary reference-and argues the phrase should be defined as: "comes close to coinciding with the bore." The Court agrees with Seiko's definition.

As noted in the discussion of "apex," to avoid ensnaring prior art, this phrase must be defined so that the apex is within 50 microns of the bore. 3M and Seiko agree on this issue, although they differ slightly on whether the 50 microns should be measured from the center of the bore or the center of the fiberoptic cable.FN5 Either point of measurement should yield the same result, since, as 3M explains, "[t]he fiber is, during use, centered in the bore." *See* Plaintiff's Claim Construction Brief, at 13. In addition, the specification refers to both "an apex which is approximately centered on the bore (at least within 50 (mu)m,

and typically within 10 (mu) m" and the "centering of the apex to within 50 (mu)m of the fiber axis." *See* '327 Patent, at 3:9-3:10 and 4:23. Thus, the Court will construe the phrase "approximately coincides with said bore" to mean "within 50 microns of the fiber axis." FN6

FN5. Seiko and 3M also differ on their precise unit of measurement-Seiko uses the term "micron" while 3M uses the term "micrometer." The parties did not address this issue in their briefs or at the hearing, and the Court will assume that both units of measurement are interchangeable.

FN6. As noted, this construction addresses Seiko's prior art concerns. Under the plain language of the claims, no matter where the apex is, it will have to "approximately coincide" with the bore. Because the Court defines "approximately coincides" to mean within 50 microns, the apex described in claims 1, 2 and 6 of the '327 Patent must be within 50 microns of the bore.

F. "of said bore"

This phrase is used in claims 2 and 6 of the '327 Patent to describe whether a specified distance between the apex and the bore is measured from the center (or axis) of the bore, or whether it is measured from any part of the bore. 3M claims it should be measured from the center, and proposes the phrase be defined as: "of the axis of the bore." Molex argues the measurement can be made from anywhere on the bore, and therefore makes the monumental suggestion that "said" be changed to "the," such that the phrase is defined as: "of the bore." Seiko offers no proposal for this phrase. The Court agrees with 3M.

Claim 2 refers to the apex being "within 50 (mu)m of said bore" and claim 6 refers to the apex being "within 10 (mu)m of said bore." For the reasons discussed above, because the specification repeatedly refers to the "axis" and "center" of the bore or fiber, and because it would make no sense to align the apex with the outer edge of the bore rather than its center, the Court will construe the phrase "of said bore" in claims 2 and 6 of the '327 Patent to mean "of the axis of the bore."

G. "a tangent at said bore which is generally parallel with said plane of inclination"

This phrase is used in claim 7 of the '327 Patent. The issue here is the same as discussed above for the terms "apex," "angle of inclination" and "approximately coincides with said bore"-namely, whether the tangent is "generally" parallel or absolutely parallel to the angle of inclination. Once again, 3M changed its proposed definition on the morning of the *Markman* hearing. 3M's current proposed definition is: "tangent is generally parallel with the general plane of inclination of the spherical end face, tangent is parallel to the precise place of inclination, and is within 50 micrometers of the fiber axis of the bore." Seiko proposes the following definition: "a tangent within 50 microns of the fiber axis that is parallel to the plane of inclination defined by the line formed between the points A and B where the spherical surface intersects the chamfered surface." Molex has no proposed definition for this term. The Court agrees, generally, with Seiko's definition. (Yes, the pun was intended.)

For the reasons presented in the preceding discussions, the tangent must be within 50 microns of the optical fiber's center (again, the fiber's center should be the same as the bore's center), and must be "generally" parallel with the angle of inclination. Therefore, the Court will construe the phrase "a tangent at said bore which is generally parallel with said plane of inclination" in claim 7 of the '327 Patent to mean "a tangent within 50 microns of the fiber axis that is generally parallel to the plane of inclination defined by the line

formed between the points A and B of Figure 4 of the '327 Patent where the spherical surface intersects the chamfered surface."

III. The '528 Patent

The '528 Patent describes the method of making the connector claimed in the '327 Patent. As an initial matter, four of the phrases the Court has defined for the '327 Patent are used in the '528 Patent. The Court therefore will give these terms the same definitions for the '528 Patent. *See* Abtox, Inc. v. Exitron Corp ., 131 F.3d 1009, 1010 (Fed.Cir.1997) (stating that identical or similar claim terms contained in related patents must be interpreted consistently). Specifically, the Court will construe the terms "chamfered surface," "adjacent," "angle of inclination" and "at said bore" as used in claims 1, 5-6, 13 and 16-18 of the '528 Patent, to mean the same as those terms have been construed (or, in the case of "adjacent," not construed) in the '327 Patent.

A. "a tangent at said bore which is parallel with the angle of inclination"

This phrase is used in claims 1, 13 and 16-18 of the '528 Patent. The issue here is the same as discussed above, in analyzing the phrase "a tangent at said bore which is generally parallel with said plane of inclination" for claim 7 of the '327 Patent. This dispute presents one of the wonderful foibles of the patent application process. It appears the '528 Patent and the '327 Patent were handled by different patent examiners. As noted, the examiner for the '327 Patent allowed the term "generally parallel" in the above phrase as used in claim 7 of the '327 Patent. However, the examiner for the '528 Patent rejected the use of "generally parallel" in the same phrase as too indefinite, and told the patentee it needed to "disclose the confines of the term 'generally.' " *See* Plaintiff's Claim Construction Brief, Ex. 5, at 4. The patentee then removed the term "generally" from claims 1, 13 and 16-18 of the '528 Patent, and the claims were accepted by the examiner and ultimately by the patentee. In light of this contradictory language, the Court must now construe the term "parallel" in claims 1, 13, and 16-18 of the ' 528 Patent.FN7

FN7. The Court presumes the patent examiner for the '528 Patent had access to the earlier-filed '327 Patent. The prosecution history does not indicate, however, why the '528 Patent examiner decided to interpret the related patents in an inconsistent manner.

3M contends the term "parallel" in claims 1, 13 and 16-18 of the '528 Patent should mean "approximately parallel." Seiko contends the term should mean what it says-absolutely parallel. Molex proposes the term should mean "equal distance apart everywhere, and not generally parallel."

As noted, identical or similar claim terms contained in related patents generally must be interpreted consistently. *See* Abtox, Inc. v. Exitron Corp., 131 F.3d 1009, 1010 (Fed.Cir.1997). Thus, under this general principle, the Court generally would interpret the phrase at issue in the '528 Patent to mean "generally" parallel, to be generally consistent with the earlier-filed and accepted '327 Patent. However, this is not the general situation. This is a case where the Patent Office expressly rejected the use of "generally" in a second, related patent application, even though it had adopted an identical use of "generally" in the earlier-filed application. The patentee then accepted this as the final claim language. Under these circumstances, the Court sees no option but to accept the language unambiguously adopted by the Patent Office and the patentee for each patent, however inconsistent the language may seem. FN8 Accordingly, the Court will construe the phrase "a tangent at said bore which is parallel with the angle of inclination" in the ' 528 Patent as not including a tangent at said bore which is only "generally parallel" with the angle of inclination.

FN8. The Court does note 3M's argument, that the specification of the '528 Patent discloses "the tangent at [the] apex may not be perfectly parallel with the line between points A and B." *See* '528 Patent, at 2:39-2:40. As stated, however, the patent examiner expressly rejected the phrase "generally parallel" in the claim language for this patent. Neither 3M nor the other parties have presented any authority for the Court to overturn the express intent of the Patent Office in this case.

B. "polishing the ferrule at an angle (psi) = (theta) f(theta) ..."

This phrase is used in claims 5 and 16 of the '528 Patent. The Court is hard pressed to determine the exact nature of the dispute here. Apparently, 3M and Molex disagree on whether the angle (psi) first must be calculated as a separate step, then followed by a second polishing step. 3M contends the phrase should not be "limited to intentionally first calculating the angle [(psi)] using the formula set forth [in claims 5 and 16] and then using the angle in the polishing step." *See* Plaintiff's Claim Construction Brief, at 17. However, 3M proposes no further definition of this phrase. Molex contends a multi-step process is involved, and proposes the following definition: "(1) determining an angle of inclination (theta), (2) measuring the end face VR and distances 'a' and 'b' from the chamfered ferrule to be polished, (3) determining the parameters f(theta), fs, VP and PQ, based upon Fig. 8, (4) calculating the angle (psi) from the recited formula, and (5) polishing the ferrule while maintaining the ferrule at the angle (psi) to the polishing surface." Seiko did not address this phrase in its claim construction brief.

After all parties expressed general confusion at the *Markman* hearing regarding the meaning of this phrase and precisely what issues were in dispute, the Court ordered the parties to file supplemental expert affidavits defining the phrase. Each party filed supplemental affidavits on August 14, 2000. The affidavits, while generally describing how the angle (psi) is calculated, are not particularly helpful in identifying or resolving the areas of dispute between the parties. In essence, both 3M and Seiko appear to agree on how the angle (psi) is calculated-namely, a person skilled in the art decides what angle of inclination he or she would like to use (the angle (theta)), measures (or calculates, using a blueprint) the diameter and radius of the end face, and measures (or calculates) the height and width of the chamfered surface, plugs these numbers into the formula, and out pops the angle (psi). *See* Declaration of Dr. A. Bruce Buckman, at para.para. 3-6; Affidavit of Matt Young, at para.para. 6-14. In this respect the affidavits of Seiko's and 3M's experts do no more than repeat in detail the formula provided in claims 5 and 16.FN9 The Court sees no need to further define this formula.

FN9. Molex's expert did not fare quite as well-after reading claims 5 and 16, he apparently threw his hands in the air and declared the claims hopelessly "incomplete and unclear." *See* Declaration of Igor Grois, at para. 11. For this reason, Molex argues the language of claims 5 and 16 is so confusing that it "preclude[s] giving the claims ... a definite meaning." Id. at para. 4.

With respect to the actual issue here-the entire process of "polishing" the ferrule at angle (psi)-3M's expert does not address whether the angle calculation and polishing is a two-step process; he first explains how the angle (psi) is calculated, then concludes only with "[t]he claim is infringed if one polishes ferrules using an angle (psi)." *See* Buckman Declaration, at para. 6. Seiko's expert, after describing in detail how to calculate the formula listed in claims 5 and 16, concludes that, once the angle (psi) is calculated, then the ferrule "should be polished at this constant angle (psi)>>>>>>, in a single step process." *See* Young Affidavit, at

para. 15. He further contends the ferrule starts with a "blank" or unpolished face, and the "single step" is to polish the blank ferrule at angle (psi). *See* id. at para.para. 7 and 11. Molex's expert contends the processes in claims 5 and 16 could involve either the single step of polishing a blank ferrule at the angle (psi), or could involve the multi-step process of first polishing the ferrule to create a flat, angled end face, and then polishing this end face again at the angle (psi)>>>>>> to create a rounded end. *See* Grois Declaration, at para. 12.

The Court agrees that, as a matter of common sense, the angle (psi) must first be determined before a person skilled in the art can begin polishing at that angle. However, the Court does not agree with Seiko and Molex's argument that claims 5 and 16 be limited solely to a "single polishing step." Claim 5 is dependent on claim 1. Claim 1 clearly discloses a two-step process, of first "forming a flat surface at the distal end of the ferrule, oriented with respect to ... the angle of inclination," and then of "polishing the flat surface" at an "oblique angle [ ] greater than the angle of inclination." *See* '528 Patent, at 8:29. Thus, claim 5 does not involve the "single step" of polishing a "blank" ferrule at the angle (psi)-it is a multi-step polishing process. Claim 16 is an independent claim. It does not describe the first step of polishing the ferrule end to form a flat, angled surface. Rather, it describes simply polishing the ferrule end (whether it is "blank" or prepolished) at the angle (psi) to form a rounded surface. *See* '528 Patent, at 11:15. Thus, the method of claim 16 is broad enough to encompass either single-step or multi-step polishing, in forming the rounded end of the ferrule. This construction comports with the specification, which discloses "a single polishing step" as one possible method of polishing to form the rounded end face. *See* '528 Patent, at 6:58.

Accordingly, the Court will construe the phrase "polishing the ferrule at an angle (psi) = (theta) f(theta) ..." in claims 5 and 16 of the ' 528 Patent to first require a person skilled in the art to calculate the polishing angle, (psi), before polishing the ferrule end at that angle. The Court will further construe this phrase as used in claim 5 to include a multi-step polishing process as described in claim 1. The Court will finally construe this phrase as used in claim 16 to include either a multi-step or a single-step polishing process.FN10

FN10. The Court notes the ill-conceived nature of requiring a federal judge to construe a phrase such as "polishing the ferrule at an angle (psi)psi>> > > > > > = (theta) f(theta) ..." solely by reading affidavits, articles or patent applications that most federal judges cannot understand. Unfortunately, this problem will continue until Congress or the Supreme Court realizes that, for the same reason the Federal Circuit was established, a separate federal district court should be established for patent cases.

C. "oblique angle (phi) is approximately determined according to the equation ..."

This phrase is used in claim 6 of the '528 Patent, to calculate the angle of the polishing pad used to form a rounded surface on the ferrule end. As with the above phrase, the parties' arguments on this issue are not models of clarity. It appears, however, that the parties generally dispute whether claim 6 requires a person skilled in the art to first calculate the angle (phi) before polishing the ferrule end at that angle.FN11 3M contends it does not; Seiko and Molex contend otherwise.

FN11. The parties apparently do not dispute whether the polishing described in claim 6 can be achieved in a "single step." Claim 6, like claim 5, is dependant on claim 1. Therefore, it is clear that a multi-step polishing process is involved in claim 6.

Molex proposes the following definition for this phrase: "(1) determining a desired angle of inclination, (2) determining the distances BF and AF, based upon Fig. 4 of the patent, (3) calculating a polished angle (phi), greater than the angle of inclination, based upon the formula set forth in the claim, and (4) polishing the flat surface of the ferrule while maintaining the ferrule at the determined angle (phi) greater than the angle of inclination." The other parties provide no proposed definitions.

For the same reasons as discussed in the analysis of claims 5 and 16 of the ' 528 Patent, the Court will construe the phrase "oblique angle (phi) is approximately determined according to the equation ..." in claim 6 of the ' 528 Patent to first require a person skilled in the art to calculate the polishing angle, (phi), before polishing the ferrule end at that angle.

D. "maintaining the ferrule at an oblique angle with respect to the pad"

This phrase is used in claims 1, 13 and 17-18 of the '528 Patent. Seiko argues this phrase should be defined as: "keeping the ferrule at a constant unvarying angle that is oblique." At the *Markman* hearing, 3M's counsel indicated 3M agrees with Seiko's definition. Molex offers no proposed definition for this phrase. The Court will adopt Seiko's definition. As Seiko correctly points out, the specification always refers to the polishing angle in the singular, and nowhere does it talk about the oblique angle continuously varying over a range of angles. Therefore, the Court will construe the phrase "maintaining the ferrule at an oblique angle with respect to the pad" in claims 1, 13 and 17-18 of the '528 Patent to mean "keeping the ferrule at a constant unvarying angle that is oblique."

E. "forming a convex surface"

This phrase is used in claims 13 and 18 of the '528 Patent. Molex proposes this phrase be defined as: "forming a convex surface in a manner other than polishing the ferrule on a polishing surface at the oblique angle specified in the final paragraph of the claim." Seiko offers no proposed definition. At the *Markman* hearing, 3M's counsel agreed to Molex's proposed definition. Therefore, the Court will construe the phrase "forming a convex surface" in claims 13 and 18 of the '528 Patent to mean "forming a convex surface in a manner other than polishing the ferrule on a polishing surface at the oblique angle specified in the final paragraph of the claim."

F. process of creating the spherical end in claim 16

Finally, the parties disagree on whether the process described in claim 16 is limited to a single step. 3M claims it is not. Seiko argues "the imparting step in claim 16 requires that it be performed in a single step without the formation of a temporary surface and further requires that the angle (psi) be constant and unvarying." Molex does not directly address this issue.

Claim 16 discloses a method "comprising the steps of" obtaining the ferrule and then polishing the ferrule, to form a rounded end face. *See* '528 Patent, at Claim 16. The Court has already determined the process of polishing the ferrule end face in claim 16 can comprise either a one-step or multi-step process. Therefore, the Court agrees with 3M on this issue. In addition, as noted 3M's counsel at the *Markman* hearing agreed the polishing for several claims, including claim 16, involves "keeping the ferrule at a constant unvarying angle that is oblique." Therefore, the Court has already decided this issue as well.

In accordance with the foregoing, the Court enters the following order:

IT IS ORDERED that the attached construction of the patent claims will be incorporated into any jury instructions given in this cause and will be applied by the Court in ruling on the issues raised in summary judgment.

CONSTRUCTION OF CLAIMS

U.S. PATENT NO. 5,458,528

Disputed Terms

The phrase "chamfered surface" means chamfered or beveled surface.

The phrase "angle of inclination" means the line formed between the diametrically opposed points A and B of Figure 1 of the '327 Patent, where the spherical surface intersects the chamfered surface.

The phrase "at said bore" means within 50 microns of the fiber axis.

The phrase "a tangent at said bore which is parallel with the angle of inclination" does not include a tangent at said bore which is only "generally parallel" with the angle of inclination.

The phrase "polishing the ferrule at an angle (psi) = (theta) f(theta)>>>>>> ..." first requires a person skilled in the art to calculate the polishing angle, (psi), before polishing the ferrule end at that angle. As used in claim 5, this phrase refers to a multi-step polishing process. As used in claim 16, this phrase includes either a multi-step or a single-step polishing process.

The phrase "oblique angle (phi) is approximately determined according to the equation ..." first requires a person skilled in the art to calculate the polishing angle, (phi), before polishing the ferrule end at that angle.

Stipulated/Undisputed Terms

The phrase "maintaining the ferrule at an oblique angle with respect to the pad" means keeping the ferrule at a constant unvarying angle that is oblique.

The phrase "forming a convex surface" means forming a convex surface in a manner other than polishing the ferrule on a polishing surface at the oblique angle specified in the final paragraph of the claim.

CONSTRUCTION OF CLAIMS

U.S. PATENT NO. 5,351,327

The phrase "chamfered surface" means chamfered or beveled surface.

The phrase "generally spherical" means approximating a spherical surface such that one skilled in the art may identify an apex.

The term "apex" means that point on a spherical surface whose tangent is generally parallel with the angle of

inclination of the spherical surface.

The phrase "angle of inclination" means the line formed between the diametrically opposed points A and B of Figure 1 of the '327 Patent, where the spherical surface intersects the chamfered surface.

The phrase "approximately coincides with said bore" means within 50 microns of the fiber axis.

The phrase "of said bore" means of the axis of the bore.

The phrase "a tangent at said bore which is generally parallel with said plane of inclination" means a tangent within 50 microns of the fiber axis that is generally parallel to the plane of inclination defined by the line formed between the points A and B of Figure 4 of the '327 Patent where the spherical surface intersects the chamfered surface.

W.D.Tex.,2000.
Minnesota Min. and Mfg. Co. v. Molex, Inc.