

United States District Court,
D. New Hampshire.

POLYCLAD LAMINATES, INC., and Fry Metals, Inc., d/b/a PC Fab Division of Alpha Metals, Inc,
Plaintiffs.

v.

MacDERMID, INC,
Defendant.

No. CIV. 99-162-M

Sept. 12, 2001.

ORDER

MCAULIFFE, District J.

This is an action for patent infringement in which plaintiffs, Polyclad Laminates, Inc. and Fry Metals, Inc. (collectively, "Polyclad") claim that a manufacturing process employed by MacDermid, Inc. violates United States Patent No. 5,800,859 (the " '859 patent"). On August 27 and 28, 2001, the court conducted a *Markman* hearing, at which the parties presented evidence and argument in support of their respective constructions of various terms used in claim 1 of the '859 patent. *See* *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996).

Discussion

I. *The* '859 Patent.

The '859 patent teaches a process for copper coating printed circuit boards, in which a metal surface is treated in a manner that promotes the adhesion of alternating layers of conducting (e.g., copper) and non-conducting materials. It consists of 1 independent claim and 31 dependent claims. Claim 1, the sole independent claim, teaches:

A process for treating a metal surface to promote adhesion thereto, comprising contacting the metal surface with an adhesion promotion composition comprising 0.1 to 20% by weight hydrogen peroxide, an inorganic acid, an organic corrosion inhibitor, and a *surfactant* to form a *microroughened* conversion-coated surface, and adhering a material to the microroughened conversion coated surface.

The '859 patent, claim 1 (column 9, lines 60-67) (emphasis supplied).

The parties disagree as to the meaning of the terms "surfactant" and "microroughened," as they are used in claim 1. Additionally, although claim 1 specifies the use of a generic "surfactant," MacDermid says it implicitly requires the use of a *cationic* surfactant—that is, a surfactant bearing a positive ionic charge.

II. *Applicable Legal Standard Governing Claim Construction.*

Patent infringement analysis involves two steps: first, the proper construction of the asserted claim; and second, a determination as to whether the accused method or device infringes the asserted claim as properly constructed. *See Vitronics Corp. v. Conceptoronic, Inc.*, 90 F.3d 1576, 1581-82 (Fed.Cir.1996) (citing *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed.Cir.1995), *aff'd*, 517 U.S. 370 (1996)). Step one of that process-claim construction-is a question of law to be resolved by the court. *See Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1304 (Fed.Cir.1999). The second step-the determination of whether the accused process or device infringes the patent-is a question of fact. *Id.* At this stage of the litigation, the court is focused exclusively on the first step: properly construing the meaning and scope of claim 1 of the '859 patent.

To construe patent claims generally means to ascertain the meaning of those claims in light of the intrinsic evidence of record, which includes: the claims, the specification, and the prosecution history. *See Vitronics*, 90 F.3d at 1582. Occasionally, extrinsic evidence may be considered as well. Extrinsic evidence is external to the patent, "such as expert testimony, inventor testimony, dictionaries, and technical treatises and articles." *Pitney-Bowes*, 182 F.3d at 1308 (citing *Vitronics*, 90 F.3d at 1584).

To give proper effect to disputed technical terms in a patent, a court must construe them in the same manner that they would be construed by those skilled in the art. *See Hoechst Celanese Corp. v. BP Chemicals Ltd.*, 78 F.3d 1575, 1578 (Fed.Cir.1996) ("A technical term used in a patent document is interpreted as having the meaning that it would be given by persons experienced in the field of the invention, unless it is apparent from the patent and the prosecution history that the inventor used the term with a different meaning."). Here, nothing suggests that the term "surfactant" is used in the '859 patent in any way other than as it is commonly understood by those skilled in the relevant art. The parties agree that a person skilled in the relevant art would hold a basic degree in chemistry or chemical engineering, or have equivalent work experience in the printed circuit board field on the chemical formulation side.

In *Vitronics*, the court observed that, "In most situations, an analysis of the intrinsic evidence alone will resolve any ambiguity in a disputed claim term. In such circumstances, it is improper to rely on extrinsic evidence." *Id.*, at 1583. Nevertheless, even when the patent language itself is unambiguous, the court may still consider extrinsic evidence for certain limited purposes.

Vitronics does not prohibit courts from examining extrinsic evidence, *even where the patent document is itself clear*. Moreover, *Vitronics* does not set forth any rules regarding the admissibility of expert testimony into evidence. Certainly, there are no prohibitions in *Vitronics* on courts hearing evidence from experts. Rather, *Vitronics* merely warned courts not to rely on extrinsic evidence in claim construction to contradict the meaning of claims discernible from thoughtful examination of the claims, the written description, and the prosecution history-the intrinsic evidence.

Pitney Bowes, 182 F.3d at 1308 (citations omitted) (emphasis supplied). Consequently, the court concluded:

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 the clearly expressed, plainly apposite, and widely held understandings in the pertinent technical field. *This is especially the case with respect to technical terms*, Indeed a patent is both a technical and a legal document. While a judge is well-equipped to interpret the legal aspects of the document, he or she must

also interpret the technical aspects of the document, and indeed its overall meaning, from the vantage point of one skilled in the art. Although the patent file may often be sufficient to permit the judge to interpret the technical aspects of the patent properly, *consultation of extrinsic evidence is particularly appropriate to ensure that his or her understanding of the technical aspects of the patent is not entirely at variance with the understanding of one skilled in the art.*

Id., at 1309 (emphasis supplied). *See also* Key Pharmaceuticals v. Hercon Labs. Corp., 161 F.3d 709, 716 (Fed.Cir.1998). In this case, the court has relied upon the expert testimony presented by the parties to provide a general understanding of the chemical processes at work in the '859 patent, as well as information regarding how surfactants function and how they are typically used in industrial chemistry and, more particularly, in the field of printed circuit board manufacturing.

III. Claim Construction.

A. Surfactant.

Broadly speaking (and with some discrete exceptions), a surfactant is any substance that, when added to a liquid, operates to reduce the liquid's surface tension to any degree. The question presented in this case is whether the term, as used in the '859 patent, has a more limited and functional definition. Polyclad says it does not and urges the court to adopt something akin to the broad definition set forth above or a similarly all-inclusive definition that one might find in almost any non-technical dictionary.

MacDermid, on the other hand, says that to those skilled in the relevant art, the word "surfactant" has a generally accepted meaning, and reliance upon a non-technical dictionary to ascertain that meaning would be inappropriate. It argues that while many additives of varying types will reduce the surface tension of a liquid, when the word "surfactant" is used in this particular field (and in industrial chemistry generally), it has a more focused (and widely understood) meaning. FN1 Accordingly, MacDermid urges the court to adopt a technical definition that specifically identifies several essential characteristics it says are shared by all industrial surfactants, and which are generally understood by those skilled in the relevant art to be possessed by industrial surfactants. Under MacDermid's proposed definition, a surfactant must, among other things, have an amphipathic structure, form micelles at sufficiently high concentrations, and adsorb or concentrate at phase interfaces. At a minimum, says MacDermid, the court should construe the term surfactant in a manner that, unlike Polyclad's proposed construction, adequately distinguishes between: (1) substances that are widely known and employed in the relevant field to dramatically reduce the surface tension of aqueous solutions; and (2) the universe of substances which, when added to an aqueous solution (in sufficiently high concentrations), will operate to lower the solution's surface tension to some measurable degree (including, for example, routine impurities or contaminants).

FN1. For example, at the *Markman* hearing, coffee was repeatedly discussed as a substance that will reduce the surface tension of an aqueous solution. Ethanol is another example. Critically, however, neither works to dramatically reduce the surface tension when introduced in very low concentrations. Consequently, while both exhibit "surfactant-like" behavior in that they reduce the surface tension of an aqueous solution by some modest (though measurable) amount when added in sufficient quantities, neither falls within the scope of the term "surfactant" as it is used in the '859 patent.

While both parties have presented plausible, well-supported arguments, the court concludes that the proper construction of the term lies closer to the position advocated by MacDermid. As used in the '859 patent,

"surfactant" plainly has a meaning that is more focused than that ascribed to it in non-technical dictionaries, and more precise than a hyper technical construction that would include virtually any additive that has any propensity to lower the surface tension of any solution. *See generally* Bell Atlantic Network Service, Inc. v. Covad Communications Group, Inc., 262 F.3d 1258, 2001 WL 931103 at (Fed.Cir. Aug. 17, 2001) ("[W]e have previously cautioned against the use of non-scientific dictionaries 'lest the dictionary definitions ... be converted into technical terms of art having legal, not linguistic significance.' ") (quoting *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1478 (Fed.Cir.1998)). Having reviewed the intrinsic evidence of record and having considered the expert testimony presented by the parties to inform its understanding of the field of chemistry as it relates to the printed circuit board manufacturing industry, the court concludes that the term "surfactant," as used in the '859 patent and as properly construed, means and would be understood by a person skilled in the relevant art to mean:

a substance that, when introduced into a liquid solution at comparatively low concentrations, dramatically reduces the surface tension of that solution or the interfacial tension between the solution and another surface. Typically, though not necessarily, surfactants have an amphipathic structure-that is, a hydrophobic tail and a hydrophilic head-and, at equilibrium, the concentration of the surfactant at a phase interface is greater than its concentration in the bulk of the solution. By way of example, when introduced at concentrations of less than one percent, "surfactants," as that term is used in the '859 patent, will reduce the surface tension of pure water (at room temperature) to at least 45 dynes/cm or less.

The essential characteristic of a surfactant, then, is its effect, at *low* concentrations, of *dramatically* reducing surface tension (i.e., by an amount substantially greater than would be expected based solely on its concentration)-a characteristic that is most typically the product of an amphipathic structure.

B. *Microroughened.*

The parties also disagree as to the meaning of the word "microroughened," as it is used in the '859 patent. As noted above, claim 1 of the patent teaches a means by which to treat a metal surface to promote adhesion. It provides that by exposing a metal surface to certain specified chemicals, a "microroughened, conversion-coated surface" is created. The parties agree that "conversion coated" means "a superficial layer on a metallic surface, formed by a chemical reaction of the surface metal, which is a complex of the metal and some portion of the reacting media, and has altered physical and chemical properties." *See* Plaintiffs' claim construction memorandum (document no. 132) at 59. The '859 patent repeatedly refers to this "conversion coat" as a "film" that is formed on the surface of the underlying metal substrate. *See, e.g.*, '859 patent, column 8, lines 41-47.

MacDermid argues that microroughened should be construed to mean, "a metallic surface on a circuit board that has undergone some chemical *removal of the surface metal*, for a time less than would remove all of the metal from the surface." Defendant's claim construction memorandum (document no. 131) at 22 (emphasis supplied). That construction of the term is, however, at odds with the plain and unambiguous language of the '859 patent. While MacDermid urges the court to essentially equate "microroughened" with "microetched," the terms are not synonymous, and the '859 patent unequivocally distinguishes the two concepts. *See, e.g.*, '859 patent, column 8, lines 35-51 (describing the microetching process taught by prior art and noting that the "mechanism of the process described in the present invention is quite different.").

Rather than *removing* a portion, but not all, of the metal's surface (i.e., "etching"), the process taught by the '859 patent: (1) creates a conversion-coated surface (i.e., film) on the metal; and (2) that film is

characterized by a microroughened topography, which the patent describes as having the appearance of "cracked mud" when viewed under magnification. '859 patent, column 8, line 46. Thus, the term "microroughened," as used in the '859 patent and as properly construed, describes the roughened topography of the film or "conversion coat" that is formed on the surface of the underlying metal. Contrary to MacDermid's suggestion, it does not describe the topography of the underlying metal itself.

C. The Surfactant's Ionic Charge.

Finally, although it did not press the argument at the *Markman* hearing, MacDermid says (in its claim construction memorandum) that the process taught by the '859 patent implicitly requires the use of a *cationic* surfactant. The court disagrees. Claim 1 of the patent (the sole independent claim) teaches the use of a surfactant with a non-specified ionic charge (i.e., the surfactant might be negatively charged or "anionic," positively charged or "cationic," or non-ionic). While a few of the dependent claims teach the use of a cationic surfactant and the preferred embodiment of the patent uses a cationic surfactant, those references do not serve to limit the scope of claim 1, which plainly does not require the use of a cationic surfactant. *See, e.g.,* Aromed Corp. v. Sofamor Danek Group, Inc., 253 F.3d 1371, 1383 (Fed.Cir.2001) ("This court will not limit a patent to its preferred embodiments in the face of evidence of broader coverage by the claims."); *The Toro Company v. White Consolidated Indus., Inc.*, 199 F.3d 1295, 1301 (Fed.Cir.1999) ("It is well established that the preferred embodiment does not limit broader claims that are supported by the written description."); *Laitram Corp. v. Cambridge Wire Cloth Co.*, 863 F.2d 855, 865 (Fed.Cir.1988) ("References to a preferred embodiment, such as those often present in a specification, are not claim limitations.").

Conclusion

For purposes of this litigation, the disputed terms of the '859 patent shall be construed to have the meanings ascribed to them in this order.

SO ORDERED.

D.N.H.,2001.

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