United States District Court,
E.D. Texas, Marshall Division.

Carl B. COLLINS and Farzin Davanloo,
Plaintiffs.
v.
The GILLETTE COMPANY,
Defendant.

Civil Action No. 2-04-CV-38 (TJW)

June 22, 2005.

David E. Killough, Microsoft Corporation, Redmond, WA, Otis W. Carroll, Jr., Collin Michael Maloney, Ireland Carroll & Kelley, Tyler, TX, Sidney Calvin Capshaw, III, Capshaw Derieux, LLP, Longview, TX, William B. Dawson, Vinson & Elkins, Dallas, TX, Franklin Jones, Jr., Jones & Jones, Marshall, TX, for Plaintiffs.

Jack Baldwin, Baldwin & Baldwin, Marshall, TX, William C. Slusser, Slusser Wilson & Partridge, Keith Duane Jaasma, Patterson & Sheridan, Houston, TX, for Defendant.

MEMORANDUM OPINION AND ORDER

T. JOHN WARD**, District Judge.**

After considering the submissions and the arguments of counsel, the court issues the following order concerning the claim construction issues:

I. Introduction

In this patent infringement suit, Plaintiffs Carl Collins and Farzin Davanloo accuse The Gillette Company of infringing two United States patents. The plaintiffs are research scientists at the University of Texas at Dallas as well as the inventors and owners of U.S. Patent Nos. 5,411,797 ("the '797 patent") and 5,478,650 ("the '650 patent"). The plaintiffs have asserted claims 1-4 of the '797 patent and claims 1, 2, and 4 of the '650 patent against the defendant. The patents-in-dispute are titled "Nanophase Diamond Films." Both patents disclose films of nanometer-scale nodules of diamond-bonded carbon structures. The invention claimed is "an amorphous or ultra fine-grained, diamond-like material that is substantially free of graphite and hydrogen, and is deposited in a film on a substrate in the form of nanometer-sized, tightly packed nodules of sp ^{3}-bonded carbon, hereinafter referred to as 'nanophase diamond.' " '797 patent, col. 1, ll. 16-21.

II. Law Governing Claim Construction

"A claim in a patent provides the metes and bounds of the right which the patent confers on the patentee to exclude others from making, using or selling the protected invention." Burke, Inc. v. Bruno Indep. Living Aids, Inc., 183 F.3d 1334, 1340 (Fed.Cir.1999). Claim construction is an issue of law for the court to decide. Markman v. Westview Instruments, Inc., 52 F.3d 967, 970-71 (Fed.Cir.1995) (en banc), *aff'd,* 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996).

To ascertain the meaning of claims, the court looks to three primary sources: the claims, the specification, and the prosecution history. Markman, 52 F.3d at 979. Under the patent law, the specification must contain a written description of the invention that enables one of ordinary skill in the art to make and use the invention. A patent's claims must be read in view of the specification, of which they are a part. *Id*. For claim construction purposes, the description may act as a sort of dictionary, which explains the invention and may define terms used in the claims. *Id*. "One purpose for examining the specification is to determine if the patentee has limited the scope of the claims." Watts v. XL Sys., Inc., 232 F.3d 877, 882 (Fed.Cir.2000).

Nonetheless, it is the function of the claims, not the specification, to set forth the limits of the patentee's claims. Otherwise, there would be no need for claims. SRI Int'l v. Matsushita Elec. Corp., 775 F.2d 1107, 1121 (Fed.Cir.1985) (en banc). The patentee is free to be his own lexicographer, but any special definition given to a word must be clearly set forth in the specification. Intellicall, Inc. v. Phonometrics, 952 F.2d 1384, 1388 (Fed.Cir.1992). And, although the specification may indicate that certain embodiments are preferred, particular embodiments appearing in the specification will not be read into the claims when the claim language is broader than the embodiments. Electro Med. Sys., S.A. v. Cooper Life Sciences, Inc., 34 F.3d 1048, 1054 (Fed.Cir.1994).

To assess the ordinary meaning of terms used in a patent claim, a court may properly rely on dictionary definitions. The Federal Circuit has noted that "[i]t has long been recognized in the precedent of our predecessor court, the Court of Customs and Patent Appeals, that dictionaries, encyclopedias and treatises are particularly useful resources to assist the court in determining the ordinary and customary meaning of claim terms." Texas Digital Sys.,. Inc. v. Telegenix, Inc., 308 F.3d 1193, 1202 (Fed.Cir.2002). The court reasoned that such sources 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. Id. at 1202-03. According to the court, dictionaries, encyclopedias, and treatises "constitute 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." Id. at 1203. Bearing these standards in mind, the court now turns to the task of construing the claims in this case.

III. Discussion

A. Disputed terms in the '797 patent FN1

FN1. Several of the disputed terms in the '797 patent also appear in the '650 patent. The court construes these terms consistently.

1. A nanophase diamond film

The plaintiffs contend that "nanophase diamond film" should be construed to mean "a film having some of the physical characteristics of diamond." The defendant urges, however, that nanophase diamond film is "a

non-columnar diamond-like carbon film having at least 75% sp ^{3} bonded carbon." The term "nanophase diamond" is expressly defined in the specification of the '797 patent. "The specification acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication." Vitrionics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed.Cir.1996). Accordingly, the court construes "nanophase diamond film" to mean "a film having nanometer-scale nodules of diamond-bonded carbon displaying characteristics similar to that of diamond." *See* '797 patent, col. 7, ll. 19-22.

2. Nodules of carbon bonded predominately in three dimensional sp ^{3} bonds

The plaintiffs argue that this disputed phrase should be construed to mean "crystal-like clusters of carbon atoms wherein the most common bonds between the carbon atoms in each cluster are three dimensional sp ^{3} bonds." The defendant proposes that the disputed phrase means "non-columnar rounded clusters of 95% or more sp ^{3} bonded carbon." Primarily at issue here is the meaning of the term "predominantly."

The plaintiffs urge that "predominantly" should be given its ordinary meaning. The dictionary defines "predominantly" as "for the most part: MAINLY" and defines "predominant" as "being most frequent or common." Ninth New Collegiate Dictionary (1988). On the other hand, the defendant argues that in the context of the '797 patent, "predominately" means that the nodules have at least 95% sp ^{3} bonding. According to the defendant, the plaintiffs are contending that the patent discloses nodules that are only 50% sp ^{3} bonded, which position is not supported by the specification.

The defendant's argument is persuasive. To understand what is disclosed in the '797 patent, it is necessary to refer to the specification, particularly the Summary of the Invention. The patentees have disclosed the results of scientific testing which show that "estimates supported by measurements of mass densities and soft x-ray (*ka*) emission spectra suggest that the sp ^{2} content within the nodules is less than 5% and perhaps even as low as 2% indicating a 'diamond-like' material. Between the nodules is found an amorphous mixture of carbons and void." '797 patent, col. 4, ll. 37-43. In addition, the specification incorporates by reference an article authored by the plaintiffs and others titled "The Bonding of Protective Films of Amorphic Diamond to Titanium." '797 patent, col. 2, ll. 18-21. "When a document is 'incorporated by reference' into a host document, such as a patent, the referenced document becomes effectively part of the host document as if it were explicitly contained therein." Telemac Cellular Corp. v. Topp Telecom., Inc., 247 F.3d 1316, 1329 (Fed.Cir.2001). This article explains that "the sp ^{2} content within the nodules is less than 5% and perhaps even as low as 2%." C.B. Collins, *et al., The Bonding of Protective Films of Amorphic Diamond to Titanium,* 71 J.App. Phys. 3260 (1992). Thus, one ordinarily skilled in the art reading the specification would understand that the nodules are comprised of at least 95% sp ^{3} bonded carbon.

The specification of the '797 patent also incorporates by reference an article titled "Low Pressure, Metastable Growth of Diamond and 'Diamondlike' Phases." This article underscores that one ordinarily skilled in the art would understand that "[t]he key to understanding the structure and properties of the diamondlike carbons ... is the ratio of sp ^{3} to sp ^{2} sites." John C. Angus & Cliff C. Hayman, *Low Pressure, Metastable Growth of Diamond and "Diamondlike" Phases,* 241 Science 914, 920 (1988). The patentees, having incorporated the article by reference, disclosed to the public that the ratio of sp ^{3} to sp ^{2} sites is an important aspect of their invention because the percentage of sp ^{3} bonded carbon in the nodules is what gives the film its diamond-like characteristics. *See* '797 patent, col. 1, ll. 58-63. Likewise, in the Summary of the Invention, the patentees stated that "the basic unit of construction of the nanophase diamond of the

present invention is the sp ^{3}-bonded nodule." '797 patent, col. 4, ll. 27-29.

A second issue is whether "nodules" must be rounded and non-columnar in shape. The plaintiffs contend that the defendant's proposed construction is not supported by the intrinsic record. The defendant, however, relies on the specification of the '797 patent and the ordinary meaning of the term "nodules" to support its construction. A picture is worth a thousand words. Figure 6 of the '797 patent is such a picture, and it depicts "nodules," many of which are clearly rounded in shape and others that are irregular in shape. The court therefore construes "nodules of carbon bonded predominately in three dimensional sp ^{3} bonds" to mean "clusters of carbon atoms of rounded or irregular shape wherein approximately 95% or more of the bonds between the carbon atoms in each cluster are three dimensional sp ^{3} bonds."

3. An optical quality capable of providing a visual appearance of Newtons' [sic] rings of interference

The plaintiffs urge that the disputed phrase should be construed to mean "optical characteristics such that the material is capable of exhibiting visible dark, bright, and/or colored rings or lines." The plaintiffs submit that the specification and the prosecution history teach that the appearance of these interference patterns arises from the *internal* reflection of light within the films. The defendant proposes that the disputed phrase should be construed to mean that "the film taken as is at its actual thickness and on its actual substrate has optical characteristics such that the film is capable of exhibiting multiple alternating, visible dark and bright (or colored) interference rings or lines." The defendant contends that a film is not capable of providing a visual appearance of Newton's rings of interference if that film cannot display bands of interference colors at the film's actual thickness and on the film's actual substrate.

The court is persuaded that the plaintiffs are correct. The defendant does not provide any support for the limitations it attempts to read into the claims. The court therefore adopts the plaintiffs' construction of the disputed phrase. Accordingly, the court construes "an optical quality capable of providing a visual appearance of Newtons' [sic] rings of interference" to mean "optical characteristics such that the material is capable of exhibiting visible dark, bright, and/or colored rings or lines."

B. Disputed terms in the '650 patent

1. Said film is chemically bonded with a substrate

The plaintiffs submit that "said film is chemically bonded with a substrate" should be construed as follows: "a chemical bond (i.e ., the attractive force that holds together atoms in molecules and crystalline salts) is formed between at least a portion of the film and at least a portion of an adjacent, underlying material." In support of their position, the plaintiffs assert that their proposed construction reflects the ordinary meanings of the terms "chemical bond" and "substrate." A "bond" or "chemical bond" is defined as "the strong attractive force that holds together atoms in molecules and crystalline salts." McGraw-Hill Dictionary of Scientific and Technical Terms (4th ed.1989). A "substrate" is defined as "[a]ny underlying bulk phase, layer, etc., on which something is deposited." The Compact Oxford English Dictionary (2d ed.1989).

The defendant urges that the disputed phrase means "a chemical compound consisting of carbon and an element of the substrate that chemically bonds the nanophase diamond film to the substrate." The defendant contends that the plaintiffs' construction, which includes "crystalline salts," is improper. According to the defendant, the bonds at issue are covalent bonds, and not ionic or "salt" bonds as the plaintiffs contend. The defendant also emphasizes that carbon must be part of the chemical bond, which holds the film onto the

substrate creating a carbon-substrate bond.

At issue here is whether carbon must be a part of the chemical bond and whether only covalent bonds hold the film onto the substrate. After considering the submissions of counsel and the intrinsic record, the court is persuaded that the plaintiffs are correct. Neither the claim language nor the specification require that carbon be a part of the chemical bond. There is also no support for the defendant's proposed limitation that only covalent bonds can be formed to bond the film to the substrate. The court therefore adopts the plaintiffs' construction of "said film is chemically bonded with a substrate" and construes this phrase accordingly.

2. A substrate with an alloyed layer

The plaintiffs argue that "a substrate with an alloyed layer" should be construed to mean "an adjacent, underlying material which includes a layer that is a mixture of a metal and one or more different metals or non-metallic elements." The plaintiffs submit that their proposed construction is consistent with the specification and reflects the ordinary meanings of the terms "substrate" and "alloy." As mentioned above, "substrate" is defined as an "adjacent, underlying material." "Alloy" is defined as "a solid or liquid mixture of two or more metals, or of one or more metals with certain nonmetallic elements, as in carbon steels." Hawley's Condensed Chemical Dictionary (1993).

The defendant proposes that the disputed phrase be construed to mean "a physical mixture of carbon and an element of the substrate that bonds the nanophase diamond film to the substrate without chemically reacting carbon with an element of the substrate." The defendant contends that the alloyed layer is a mechanical bond, and not a chemical bond to the substrate as the plaintiffs suggest. The defendant further contends that the plaintiffs' proposed construction adds an intermediate layer between the nanophase diamond film and the substrate, which is not supported by the specification.

At issue here is whether the nanophase diamond film can be chemically bonded to "a substrate with an alloyed layer." The phrase "a substrate with an alloyed layer" is recited in dependent claim 2 of the '650 patent. Claim 2 provides that "said film is bonded to a substrate with an alloyed layer." '650 patent, col. 16, ll. 34-35. Claim 2 depends from claim 1, which provides that "said film is chemically bonded with a substrate." Id. at col. 16, ll. 32-33. "A dependent claim, by nature, incorporates all the limitations of the claim to which it refers." Jeneric/ Pentron, Inc. v. Dillon Co., Inc., 205 F.3d 1377, 1383 (Fed.Cir.2000) (citing 35 U.S.C. s. 112, para. 4 (1994)). Here, the defendant's proposed construction eliminates the limitation that the film be chemically bonded to the substrate.

The court is persuaded that the plaintiffs' proposed construction is correct. The language of claim 2 and the specification refer to a substrate that has an alloyed layer. '650 patent, col. 16, ll. 34-35; col. 16, ll. 1-3 ("substrate with an alloyed layer of a thickness between about 5 and 50 nm.") It appears from the specification that in cases where the nanophase diamond film cannot be bonded directly to the "ordinary" substrate, the film is bonded to a substrate that has an alloyed layer. *See* '650 patent, col. 15, l. 46-col. 16, l. 3. As the plaintiffs underscore, the substrate referred to in claim 1 is any adjacent, underlying material, and the substrate of claim 2 is a substrate that includes an alloyed layer. Claim 2 only mentions that "said film is bonded to a substrate with an alloyed layer"; it does not refer to this bonding as chemical or mechanical. Because claim 2 depends from claim 1 and incorporates by reference the limitations of claim 1, claim 2 must be read to provide for chemical bonding of the film to the substrate with an alloyed layer. Accordingly, the court adopts the plaintiffs' construction of "a substrate with an alloyed layer" and construes this phrase accordingly.

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