United States Court of Appeals for the Federal Circuit

02-1010

ELECTRO SCIENTIFIC INDUSTRIES, INC.,

Plaintiff-Appellant,

v.

DYNAMIC DETAILS, INC. and GSI LUMONICS INC.,

Defendants-Appellees.

Harold J. McElhinny, Morrison & Foerster LLP, of San Francisco, California, argued for plaintiff-appellant. With him on the brief were Marla J. Miller, Jill D. Neiman; and Ronald P. Oines, Morrison & Forester, LLP, of Irvine, California.

Don Martens, Knobbe, Martens, Olson & Bear, LLP, of Newport Beach, California, argued for defendants-appellees. With him on the brief were Paul A. Stewart, Douglas G. Muehlhauser, and Paul D. Tripodi II.

Appealed from: United States District Court for the Central District of California

Judge Alicemarie H. Stotler

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DECIDED: October 7, 2002

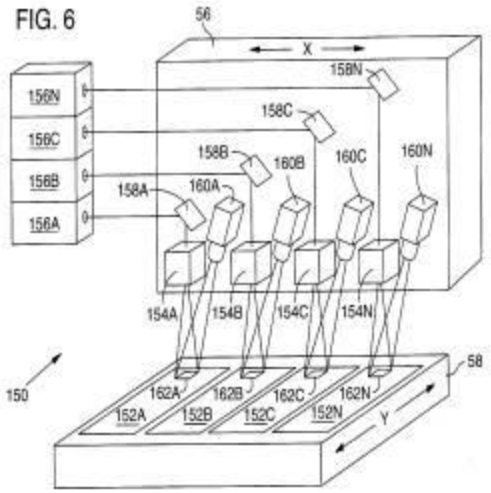
Before MICHEL, Circuit Judge, FRIEDMAN, Senior Circuit Judge, and RADER, Circuit Judge.

RADER, Circuit Judge.

The United States District Court for the Central District of California granted summary judgment that Dynamic Details, Inc. and GSI Lumonics, Inc. (collectively GSI Lumonics) do not infringe Electro Scientific Industries (ESI's) United States Patent No. 5,847,960 ('960 patent). Electro Sci. Indus. v. Dynamic Details, Inc., SA CV 00-272 AHS (Aug. 14, 2001). Because the district court granted summary judgment based on an erroneous claim construction, this court vacates and remands.

I.

ESI is the assignee of U.S. Patent No. 5,847,960 ('960 patent), which issued on December 8, 1998 with a filing date of October 10, 1996. The '960 patent teaches a method for accurate high-speed drilling of small holes (vias) in circuit boards. Fig. 6 of the '960 patent is a perspective view of a preferred embodiment:



The Fig. 6 device includes two slow stage positioners. The first, slow stage positioner 58, mounts workpieces 152A-N; the second, slow stage positioner 56, mounts fast stage positioners 154A-N. To drill the workpieces, lasers 156A-N generate laser beams. Mirrors 158A-N redirect the laser beams to the fast stage positioners. The fast stage positioners further direct the laser beams to target locations on the workpieces. The fast stage positioners direct the laser beams with great speed and accuracy, but only over small processing fields 162A-N. For this reason, the fast stage positioners alone are inadequate to target the full extent of the workpieces. To compensate, the slow stage positioners 56 and 58 move through a broad range of movement in the x and y directions, respectively. In this way, the slow stage positioners may locate the processing fields of the fast stage positioners over any workpiece area that requires drilling.

More specifically, the invention employs multiple lasers of differing wavelength to cut via holes

in etched circuit boards (ECBs). An ECB comprises alternating layers of conducting material such as copper, and dielectric material such as epoxy resin impregnated fiberglass. Cost and performance specifications generally determine an ECB's layer count and composition. The conducting layers include conducting traces to connect electrical components (e.g., resistors, capacitors, integrated circuits) that mount on the finished circuit board. To form circuits, different layer traces often must connect through an intervening dielectric layer. A via drilled through that dielectric layer and plated with conducting material facilitates that connection.

To prevent interference with other ECB layers, a via often must penetrate entirely through the circuit board. As an alternative, the '960 patent shows a blind via, i.e., a via that penetrates only partially through the ECB. For this purpose, the patent teaches use of two lasers. The first is an ultraviolet (UV) laser that cuts conducting and dielectric layers; the second is an infrared (IR) laser that cuts only dielectric layers, not conducting layers. Initially, the UV laser begins drilling vias for a first ECB. For each of those vias, the UV laser drills through the first conducting layer, and a portion of the dielectric layer. Thereafter, further use of the high energy UV laser might damage the second conducting layer of those vias. The lower energy IR laser, therefore, completes the blind vias by drilling to the second conducting layer through the remaining dielectric. At the same time the IR laser finishes the vias of the first ECB, the UV laser begins drilling the vias of a second ECB.

Numerous factors may frustrate the drilling of a blind via. For example, even a small variation in ECB thickness may cause the UV laser to penetrate inadvertently the second conducting layer. A slight rotation or offset in workpiece orientation also might drill via holes in the wrong place, causing the via to miss connection with electrical traces on the other side. In like manner, device imperfections, for example, nonlinearities in the behavior of the fast stage positioners, also may disrupt proper drilling.

To prevent these errors, the embodiment of Fig. 6 uses video cameras 160A-N to monitor actual laser beam positions relative to the targeted positions. Based on that information, the system dynamically modifies its behavior to reduce any difference between actual and targeted laser beam positions.

GSI Lumonics, Inc. manufactures and sells a high-speed laser drilling system, the GS-600H. Dynamic Details, Inc. fabricates and assembles circuit boards. In February 2000, Dynamic Details purchased a GS-600H from GSI Lumonics. Dynamic Details used the GS-600H to process circuit boards at its Anaheim, California facility. ESI asserted the '960 patent against Dynamic Details, Inc. for

direct infringement and GSI Lumonics, Inc. for indirect infringement. Following motions by the parties, the district court granted GSI Lumonics summary judgment of non-infringement. ESI appeals the district court's claim construction and summary judgment of noninfringement. This court has jurisdiction under 28 U.S.C. § 1295(a)(1) (2000).

II.

This court reviews without deference a district court's grant of summary judgment and draws all reasonable factual inferences in favor of the non-movant. Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 255 (1986); Cortland Line Co. v. Orvis Co., 203 F.3d 1351, 1355-56, 53 USPQ2d 1734, 1736 (Fed. Cir. 2000). This court decides for itself whether "the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that the moving party is entitled to a judgment as a matter of law." FED. R. CIV. P. 56 (c). This court also reviews claim construction without deference. Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1454, 46 USPQ2d 1169, 1174 (Fed. Cir. 1998) (en banc). Infringement, however, is a question of fact. Bai v. L&L Wings, Inc., 160 F.3d 1350, 1353, 48 USPQ2d 1674, 1676 (Fed. Cir. 1998). Therefore, a trial court may not resolve infringement on summary judgment unless no genuine factual issue remains. Bell Atl. Network Servs., Inc. v. Covad Communications. Group, Inc., 262 F.3d 1258, 1265, 59 USPQ2d 1865, 1869 (Fed. Cir. 2001).

Claim language defines claim scope. SRI Int'l v. Matsushita Elec. Corp., 775 F.2d 1107, 1121, 227 USPQ 577, 586 (Fed. Cir. 1985) (en banc). As a general rule, claim language carries the ordinary meaning of the words in their normal usage in the field of invention. Toro Co. v. White Consol. Indus., 199 F.3d 1295, 1299, 53 USPQ2d 1065, 1067 (Fed. Cir. 1999). Nevertheless, the inventor may act as his own lexicographer and use the specification to supply implicitly or explicitly new meanings for terms. Markman v. Westview Instruments, Inc., 52 F.3d 967, 979-80, 34 USPQ2d 1321, 1330 (Fed. Cir. 1995) (en banc). Thus, to help determine the proper construction of a patent claim, a court consults the written description, and, if in evidence, the prosecution history. Id.

To decide this appeal, this court must consider independent claims 22 and 30 and dependent

claims 23, 26-29, and 31. The language of claims 22 and 30 contains no differences relevant to this appeal. For brevity, therefore, this court focuses its analysis on claim 22:

22. In a tool positioning system that is implemented as part of a workpiece processing system in which the workpieces are electronic circuit boards, the tool positioning system carrying out a method for cutting a predetermined hole pattern in at least first and second substantially identical circuit boards each having at least a first conductor layer, a dielectric layer, and a second conductor layer, comprising:

generating at least first and second laser beams having respective first and second wavelengths;

mounting the circuit boards on a slow positioner stage that effects a large range of relative movement between the laser beams and the circuit boards;

providing at least first and second fast positioner stages that are coupled to the slow positioner stage to effect small ranges of relative movement between the laser beams and associated ones of the circuit boards; and

coordinating the large and small ranges of relative movement such that the first laser beam cuts the predetermined hole pattern in the first conductor layer of the first circuit board while the second laser beam cuts the predetermined hole pattern in the dielectric layer of the second circuit board.

‘960 patent, col. 20, ll. 15-37 (emphases added).

The district court construed the emphasized language to require simultaneous processing of "multiple, separated workpieces [but to] not claim a system for processing a single workpiece." Thus, the district court determined that the claim required separate “circuit boards,” not a single workpiece that could be separated after processing. In that determination, the district court impermissibly limited claim scope. Properly construed, the claims require processing of multiple circuit boards without regard to whether those boards are separated or not.

To determine the meaning of “circuit boards,” this court begins with the claim language. The preamble defines “circuit boards” as “at least first and second substantially identical circuit boards each having at least a first conductor layer, a dielectric layer, and a second conductor layer.” References throughout the rest of the claim to “circuit boards” rely upon and derive antecedent basis from this preamble language. Therefore, this preamble definition limits the term “circuit boards” throughout the claim. Bell Communications Research, Inc. v. Vitalink Communications Corp., 55 F.3d 615, 620, 34 USPQ2d 1816, 1820 (Fed. Cir. 1995) ("[A] claim preamble has the import that the claim as a whole suggests for it."). This preamble definition narrows the meaning of “circuit boards” to at least two substantially identical boards. Nonetheless it does not state or suggest that those circuit boards must be separated.

The specification also supports the interpretation that the term “circuit boards” does not require separated workpieces: “Multilayer ECBs are typically manufactured by registering, stacking together, laminating, and pressing multiple 0.05-0.08 millimeter thick circuit board layers. Each layer typically contains a different interconnection pad and conductor pattern, which after processing constitutes a

complex electrical component mounting and interconnection assembly." '960 patent, col. 14, l. 63 to col. 15, l. 2 (emphasis added). As the emphasized language shows, a workpiece becomes a circuit board following processing. Thus, a single workpiece could embrace multiple circuit boards. Or, in other words, the "circuit boards" need not be separate during processing.

This comports with common understanding in the field of electrical component fabrication. For example, Dr. Mark A. Shannon, expert for ESI, offered his uncontested declaration that multiple ECBs may be manufactured from a larger board or panel. Similarly, integrated circuits, such as computer processors, typically are produced many at a time from a single silicon wafer. Even before separation of the workpiece panel or wafer into separate circuit boards, design documents and software identify each ECB or integrated circuit individually, and govern their manufacture. For this same reason, a manufacturer does not separate a panel or wafer arbitrarily after processing. Having established an ECB's identity through design, the manufacturer may not ignore that identity when separating the panel without destroying the ECB.

GSI Lumonics contends, however, that the preamble and specification modify this customary meaning of ECB in this field of art to require physical separateness. Specifically, GSI Lumonics argues that the preamble defines ECBs as workpieces, '960 patent, col. 20, ll. 16-17, and that the preferred embodiment of the patent shows physically separate workpieces. '960 patent, Fig. 6.

To the contrary, neither the ordinary meaning of workpiece nor the inventor's preferred embodiment limits the claim scope. More particularly, even assuming that the preamble defines ECB as a workpiece, see Kropa v. Robie, 187 F.2d 150, 152, 88 USPQ 478, 480-81 (CCPA 1951) (Stating the preamble does not limit the claims unless it is "necessary to give life meaning and vitality" to the claims.), that definition imposes no separateness requirement. Workpiece is a broad term that means generally "the object which is worked on with a machine or tool." Oxford English Dictionary (2d ed. 1989); see also Robert C. Faber, Landis on Mechanics of Patent Claim Drafting App. E-23 (4th ed. 2000) (Defining workpiece as "[t]he thing or article operated on, altered, changed or reduced by a claimed apparatus or method."). Physical separateness, or lack thereof, simply does not enter into the ordinary meaning of workpiece. The term "workpiece" makes the ECBs the objects of work, but says nothing about physical separateness. An object may be worked upon irrespective of whether it is physically separate. The patentee has not altered this ordinary meaning. See Transclean Corp. v. Bridgewood Servs., Inc., 290 F.3d 1364, 1381, 62 USPQ2d 1865, 1877 (Fed. Cir. 2002) ("Because the patentee has not chosen to be his own lexicographer in this instance, 'resilient' should carry its ordinary meaning in the art.").

Figure 6 does depict a preferred embodiment that processes physically separate workpieces. The specification also identifies separate mounting of physically separate workpieces as one among other problems that the invention of the '960 patent is well suited to cure. See, e.g., '960 patent, col. 4, ll. 34-36, col. 13, ll. 27-28 (stating the invention "compensate[s] for . . . workpiece placement, offset, rotation, and dimensional variations among the multiple workpieces" that is "introduced by mounting position variations among [the] workpieces."). Nowhere, however, does the specification teach that physical separateness is a required limitation of the invention. Nor does the specification teach that separate workpieces are the only source of the problems that the invention cures. The specification discusses other sources of misalignment problems. The specification simply does not narrow the claim language to require separate workpieces or circuit boards. In the context of the entire specification, the depiction of separate workpieces in Figure 6 does not limit the claim language. Laitram Corp. v. NEC Corp., 163 F.3d 1342, 1347, 49 USPQ2d 1199, 1203 (Fed. Cir. 1998) ("[A] court may not import limitations from the written description into the claims."); Electro Med. Sys. S.A. v. Cooper Life Sci., 34 F.3d 1048, 1054, 32 USPQ2d 1017, 1021 (Fed. Cir. 1994) ("Particular embodiments appearing in a specification will not be read into the claims when the claim language is broader than such embodiments."); SRI Int'l v. Matsushita Elec. Corp., 775 F.2d 1107, 1121, 227 USPQ 577, 585, n.14 (Fed. Cir. 1985)

("Specifications teach. Claims claim.").

The prosecution history of the '960 patent is also not a source of a separateness requirement. The examiner rejected claims 22 and 30 as obvious over U.S. Patent No. 5,262,707 (Okazaki) in view of U.S. Patent No. 5,425,275 (Ogawa). In response, the inventors amended their claims. Apart from those amendments, they explained that the "independent claims repeatedly recite multiple elements," including "circuit boards, lasers, and laser wavelengths." The inventors then argued that neither Okazaki nor Ogawa "describe or suggest any of the multiple elements and are completely silent regarding cutting holes in circuit boards, using laser beams as a hole cutting tool, and employing multiple laser wavelengths." Claims 22 and 30 clearly require multiple circuit boards in view of their plural language and this prosecution history. The claimed references to multiple circuit boards and other components, however, does not require separate workpieces or separated circuit boards at the time of processing. A single workpiece can encompass multiple circuit boards. Or, in other words, the claimed system can produce multiple circuit boards by processing a single panel or wafer that later separates into the multiple ECBs.

The ordinary meaning of "multiple" and the specification's treatment of that term show that multiplicity and separateness are not synonymous. Specifically, to be "multiple" is to "[c]onsist[ ] of or [be] characterized by many parts, elements, or individual components." Oxford English Dictionary (2d ed. 1989). The meaning of "separate" is narrower: "Parted, divided, or withdrawn from others; disjoined, disconnected, detached, set or kept apart." Id. The human body, for example, comprises multiple individual cells. Those cells remain multiple though not separated or detached from other cells within the body. Similarly, the specification teaches that the invention uses multiple lasers to process multiple workpieces. The language of multiplicity does not require separateness. In sum, claims 22 and 30 do not require physically separate circuit boards.

After claim construction, the infringement inquiry shifts to a comparison of the claim with the allegedly infringing device. Kemco Sales, Inc. v. Control Papers Co., 208 F.3d 1352, 1359, 54 USPQ2d 1308, 1312 (Fed. Cir. 2000). To prove infringement, the patentee must show that the accused device contains each limitation of the asserted claim, Mas-Hamilton Group v. LaGard, Inc., 156 F.3d 1206,

1211, 48 USPQ2d 1010, 1014 (Fed. Cir. 1998), or an equivalent of each limitation, Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 40, 137 L. Ed. 2d 146, 117 S. Ct. 1040 (1997). This comparison is a question of fact. Bai v. L&L Wings, Inc., 160 F.3d 1350, 1353, 48 USPQ2d 1674, 1676 (Fed. Cir. 1998). Because this appellate court possesses no tools or mandate for fact-finding, a change in the claim construction at the appellate level generally necessitates a remand to the district court to resolve any new factual issues raised by the new claim construction, except, of course, in the rare instance that the record on appeal leaves no genuine issues of material fact and entitles the movant to judgment as a matter of law. FED. R. CIV. P. 56(c); Celotex Corp. v. Catrett, 477 U.S. 317, 322 (1986).

Dynamic Details has used the accused GS-600H device predominantly to process small circuit boards for cellular telephones. Although the GS-600H processes only a single panel of circuit board material at a time, that panel may include up to 36 identical ECBs. After the GS-600H drills via holes in the circuit boards, processing is completed by plating the vias, separating the boards, and mounting components to form a functional assembly.

In granting summary judgment of non-infringement, the district court determined, based on its erroneous claim construction, that the GS600H does not process multiple circuit boards simultaneously. Under a correct claim construction, the undisputed evidence shows literal satisfaction of that limitation. Nevertheless, the parties dispute other claim limitations not construed by the district court. This court, therefore, vacates the district court's judgment of non-infringement and remands for additional claim construction on other limitations of the claims, and for a determination of infringement based on a complete claim construction.

CONCLUSION

Because the district court improperly granted summary judgment that GSI Lumonics did not infringe the '960 patent, this court vacates and remands.

COSTS

Each party shall bear its own costs.

VACATED and REMANDED