

United States District Court,  
S.D. New York.

**SCANNER TECHNOLOGIES CORP,**  
Plaintiff.

v.

**ICOS VISION SYSTEMS CORP., N.V,**  
Defendant.

No. 00 CIV. 4992(DC)

**March 25, 2003.**

Patent holder brought infringement action against competitor over patents involving technology and processes to inspect electronic components, such as "ball array devices," which are used to conduct electrical impulses in electronic devices. On parties' motions for summary judgment, the District Court, Chin, J., held that: (1) fact issue existed as to whether patents were invalid for insufficient written description; (2) fact issue existed as to whether patents satisfied enablement requirement; (3) fact issue existed as to whether subjective prong of best mode requirement was satisfied; (4) fact issue existed as to whether claim limitations were disclosed by prior art, precluding summary judgment on issue of whether patents were invalid as anticipated; (5) fact issue existed as to whether patents were obvious in light of prior art teachings; (6) fact issue existed as to whether accused product literally infringed upon patent; and (7) fact issue existed as to whether accused product infringed patent under doctrine of equivalents.

Motions denied.

6,064,756, 6,064,757. Construed.

Roberts Abokhair & Mardula, LLC by Jon L. Roberts, Esq., John F. Mardula, Esq., Shauna M. Wertheim, Esq., Reston, VA, Bondy & Schloss by Jacqueline I. Meyer, Esq., New York City, for Plaintiff.

Brown Rudnick Freed & Gesmer, P.C. by Brian L. Michaelis, Esq., James W. Stoll, Esq., Boston, MA, for Defendant.

### ***OPINION***

**CHIN, District Judge.**

In this patent case, plaintiff Scanner Technologies Corp. ("Scanner") alleges that defendant ICOS Vision Systems Corp., N.V. ("ICOS") infringes the claims of two of Scanner's patents: U.S. Patent No. 6,064,756 (the " '756 Patent") and U.S. Patent No. 6,064,757 (the " '757 Patent"). The case involves technology and processes to inspect electronic components, such as "ball array devices," which are used to conduct

electrical impulses in electronic devices. Scanner contends that ICOS's CyberSTEREO system, a ball array device inspection system, infringes the claims of the Scanner patents.

Scanner moves for partial summary judgment as to literal infringement. ICOS moves for summary judgment as to patent invalidity and non-infringement. ICOS's assertion of invalidity rests on three grounds: 1) failure to comply with the requirements set forth in 35 U.S.C. s. 112, para. 1-written description, best mode, and enablement, 2) anticipation, and 3) obviousness. Its claim of non-infringement is based on two theories: 1) literal infringement and 2) infringement under the doctrine of equivalents. For the reasons set forth below, the motions are denied.

## ***BACKGROUND***

### ***A. The Patents***

The '756 Patent is an apparatus patent entitled "Apparatus for Three Dimensional Inspection of Electronic Components." The '757 Patent is a method patent entitled "Process for Three Dimensional Inspection of Electronic Components." (Michaelis Decl. Exs. 1, 2).

Applications for the '756 and '757 Patents were filed on May 28, 1999, and the patents themselves were issued on May 16, 2000, to Elwin M. Beaty and David P. Mork-the two inventors of the apparatus and method in question. ( Id.; Beaty Decl. para. para. 3-5). Mork assigned his rights in the patents to Beaty, the CEO and majority shareholder of Scanner. Beaty then granted Scanner an exclusive right to the patents. (Beaty Decl. para. para. 2, 3).

The patents relate to the three-dimensional inspection of electronic components, such as ball array devices, ball grid arrays ("BGAs"), chip scale packages ("CSPs"), and bump on wafers ("Bump on Wafers"). (Michaelis Decl. Ex. 3 para. 4). These electronic components comprise an array of balls on a plane or substrate that conduct electrical impulses. (Smeyers Decl. para. 3; Michaelis Decl. Ex. 3 para. 5).

BGAs are used in computer chips and can be found in devices such as personal computers, cellular telephones, electronic organizers, and compact disc players. It is important that all solder balls are positioned precisely at the same height. A minute difference in height, even as small as a human hair, could render the BGA useless. Because the economics involved render repairs impractical, a defective BGA usually means the entire electronic device must be discarded. As a result, the industry has sought to develop an inspection machine to enable manufacturers of ball array devices to inspect BGAs and Bump on Wafers in a fast and efficient manner. The patents at issue pertain to such an inspection device and method.

### ***B. The Dispute***

Scanner alleges that ICOS infringes the claims of both the '756 and '757 Patents by selling, offering for sale, and servicing a device called CyberSTEREO. (Compl. para. para. 9-12). To date, ICOS continues to market and sell the CyberSTEREO systems. (Beaty Decl. para. 18).

Scanner developed its ULTRAVIM PLUS Vision Integration Module-the commercial embodiment of the '756 and '757 Patents-by July 1, 1998. (Michaelis Decl. Ex. 3 para. 12; Beaty Decl. para. para. 2, 7). The ULTRAVIM PLUS was on display at trade shows in July and December of 1998. (Beaty Decl. para. para. 8, 9, 11; Michaelis Decl. Ex. 3 para. 13). ICOS management saw Scanner's display and, by letter dated December 22, 1998, expressed interest in acquiring Scanner's BGA 3D inspection technology. (Beaty Decl.

para. 11-12 & Ex. C).

ICOS's BGA inspection technology was also developing during that time. From approximately 1993 to 1996, ICOS developed an inspection system called the Projector system. (Smeyers Decl. para. 2). In response to market demands for more speed and less accuracy, however, ICOS created its CyberSTEREO system by removing the projector from the Projector system and converting to pure stereovision. The CyberSTEREO system was first announced on January 26, 1999 and introduced to the public in March 1999. ( Id. para. 4; Beaty Decl. para. 13 & Ex. D). ICOS subsequently developed its CyberSTEREO II and 3D Stereo systems, available in September 1999 and May 2000, respectively. (Mundy Report Ex. 3; *see also* Fantone Supplemental Decl. Exs. H-L).

After the Scanner patents were filed on May 28, 1999, and before they issued on May 16, 2000, ICOS filed an international patent application on March 1, 2000, under the Patent Cooperation Treaty, entitled "Measuring Positions or Coplanarity of Contact Elements of an Electronic Component with a Flat Illumination and Two Cameras." (Michaelis Decl. Exs. 1, 2, 23). ICOS's patent application discloses a "method for measuring positions of a set of contact elements of an electronic component." ( Id. Ex. 23).

### ***C. The Claims***

Scanner alleges that ICOS's CyberSTEREO system infringes all the claims of the '756 and '757 Patents. (Compl. para. 9). As the parties have previously agreed in this case, construction of the disputed terms in claim 1 of the '756 Patent is controlling with regard to the language in the remaining claims. *Scanner Techs. Corp. v. ICOS Vision Sys. Corp.*, No. 00 Civ. 4992(DC), 2002 WL 44135, at n. 1 (S.D.N.Y. Jan. 11, 2002). ( *See* Def.'s Opp'n at 12 n. 7). Claim 1 of the '756 Patent is therefore used as a representative claim. Additionally, as the language in the Scanner patents is nearly identical, references are to the '756 Patent, unless otherwise specified.

Claim 1 of the '756 Patent reads as follows:

1. A three dimensional inspection apparatus for ball array devices having a plurality of balls, wherein the ball array device is positioned in a fixed optical system, the apparatus comprising:

a) an illumination apparatus positioned for illuminating the ball array device; FN1

FN1. Claim 1(a) of the '757 Patent reads instead: "the process comprising the steps of: a) illuminating the ball array device...."

b) a first camera disposed in a fixed focus position relative to the ball array device for taking a first image of the ball array device to obtain a characteristic circular doughnut shape image from at least one ball;

c) a second camera disposed in a fixed focus position relative to the ball array device for taking a second image of the ball array device to obtain a side view image of the at least one ball; and

d) a processor, coupled to receive the first image and the second image, that applies triangulation calculations on related measurements of the first image and the second image to calculate a three dimensional position of the at least one ball with reference to a pre-calculated calibration plane.

(Michaelis Decl. Ex. 1 at Col. 18:34-53).

Certain claim terms have been construed by the Court in prior proceedings in this case as follows:

A. *Illumination source*: The invention has only one illumination source.

B. *Side View*: Side view as used in claim 1 is not limited to a view that produces a crescent shape; the viewing angle is not a 90 degree angle, a top view angle, or an angle identical to the one created by the first camera; and the viewing angle is not limited to a "low angle."

C. *Triangulation Calculation*: The Court adopts the definition of triangulation set forth in *The Photonics Dictionary* and adds that triangulation calculation involves the use of trigonometric principles.

D. *Three Dimensional Position*: The term is defined as the X, Y, and Z values for the top of at least one ball of a ball grid array.

E. *Pre-calculated Calibration Plane*: The term is construed to define the X and Y world coordinates and the Z=0 world plane.

Scanner, 2002 WL 44135, at \*8.

#### **D. Procedural History**

Scanner filed the complaint in this action on July 7, 2000, alleging two counts of patent infringement. On November 7-8, 2001, I held a *Markman* hearing and construed the disputed claim terms in a memorandum decision dated January 10, 2002. The parties simultaneously submitted these motions on May 1, 2002- Scanner's partial summary judgment motion for infringement, and ICOS's summary judgment motion for invalidity and non-infringement. ICOS submitted three separate motions for summary judgment on that date. By order dated May 7, 2002, the motions were rejected without prejudice to the filing of one summary judgment motion by May 14, 2002. ICOS duly filed its consolidated motion.

### ***DISCUSSION***

Scanner's motion for partial summary judgment on the issue of infringement is based solely on the argument that ICOS's product literally infringes the claims of the '756 and '757 patents. ICOS moves for summary judgment as to both patent invalidity and non-infringement. ICOS's invalidity claims are premised on three main grounds: 1) the inventors failed to comply with the written description, enablement, or best mode requirements of 35 U.S.C. s. 112, para. 1, 2) the patent is invalid as anticipated, under 35 U.S.C. s. 102, and 3) the patent is invalid as obvious, under 35 U.S.C. s. 103. ICOS also moves for summary judgment of non-infringement on the grounds of both literal infringement and infringement under the doctrine of equivalents.

First, I discuss the standards generally applicable to summary judgment motions. Second, I address the issue of patent invalidity. Third, I discuss infringement.

#### **A. Summary Judgment**

Summary judgment will be granted when "there is no genuine issue as to any material fact and ... the moving party is entitled to a judgment as a matter of law." Fed.R.Civ.P. 56(c); *see* Matsushita Elec. Indus. Co. v. Zenith Radio Corp., 475 U.S. 574, 585-87, 106 S.Ct. 1348, 89 L.Ed.2d 538 (1986). Accordingly, the

Court's task is not to "weigh the evidence and determine the truth of the matter but to determine whether there is a genuine issue for trial." *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 249, 106 S.Ct. 2505, 91 L.Ed.2d 202 (1986). Summary judgment is inappropriate if, resolving all ambiguities and drawing all inferences against the moving party, there exists a dispute about a material fact "such that a reasonable jury could return a verdict for the nonmoving party." *Id.* 477 U.S. at 248, 106 S.Ct. 2505; *see Bay v. Times Mirror Magazines, Inc.*, 936 F.2d 112, 116 (2d Cir.1991).

To defeat a motion for summary judgment, the nonmoving party "must do more than simply show that there is some metaphysical doubt as to the material facts." *Matsushita*, 475 U.S. at 586, 106 S.Ct. 1348. The nonmoving party "must present concrete particulars and cannot succeed with purely conclusory allegations." *Fitch v. R.J. Reynolds Tobacco Co.*, 675 F.Supp. 133, 136 (S.D.N.Y.1987) (citation omitted). There is no issue for trial unless there exists sufficient evidence in the record favoring the party opposing summary judgment to support a jury verdict in that party's favor. *Anderson*, 477 U.S. at 249-50, 106 S.Ct. 2505. As the Court held in *Anderson*, "[i]f the evidence is merely colorable, or is not significantly probative, summary judgment may be granted." *Id.* (citations omitted).

## **B. Patent Invalidity**

[1] Patents issued by the Patent and Trademark Office are presumed valid. 35 U.S.C. s. 282 (2002). To overcome this presumption of validity, the party challenging the patent bears the burden of proving invalidity by clear and convincing evidence. *Oakley, Inc. v. Sunglass Hut Int'l*, 316 F.3d 1331, 1339 (Fed.Cir.2003); *Apotex USA, Inc. v. Merck & Co.*, 254 F.3d 1031, 1036 (Fed.Cir.2001); *Johns Hopkins Univ. v. Cellpro, Inc.*, 152 F.3d 1342, 1359 (Fed.Cir.1998); *Engel Indus., Inc. v. Lockformer Co.*, 946 F.2d 1528, 1531 (Fed.Cir.1991). On a motion for summary judgment, where the evidence is construed in favor of the nonmovant, "[t]he burden of proving invalidity ... is high." *Schumer v. Lab. Computer Sys.*, 308 F.3d 1304, 1316 (Fed.Cir.2002); *see also Levi Strauss & Co. v. Golden Trade*, Nos. 92 Civ. 1667, 90 Civ. 6291, 90 Civ. 6292(RPP), 1995 WL 710822, at (S.D.N.Y. Dec. 1, 1995) (collecting cases).

In this section, I first discuss 35 U.S.C. s. 112, para. 1, and its three requirements for patent specifications—written description, enablement, and best mode. I then turn to the topic of anticipation as a basis for patent invalidity and finish the invalidity analysis with a discussion of obviousness.

### **1. 35 U.S.C. s. 112, para. 1**

The first paragraph of 35 U.S.C. s. 112 sets forth three requirements of a patent specification: 1) written description, 2) enablement, and 3) best mode. The statute requires that

[t]he specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

35 U.S.C. s. 112, para. 1. Failure to comply with the requirements of the statute may result in an invalid patent.

#### **a. Written Description**

##### **i. Applicable Law**

[2] A patent's specification must "contain a written description of the invention, and of the manner and process of making and using it." *Id.* The purpose of the written description requirement is to ensure that an inventor sets forth his invention in detail so he may not, in the future, claim that he invented more than he actually did. *Amgen, Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1330 (Fed.Cir.2003). The inventor must show that he possesses the invention claimed in the patent, and the written description requirement requires him to "recount his invention in such detail" as to "guard[ ] against ... overreaching." *Vas Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1561 (Fed.Cir.1991) (internal quotations omitted). Additionally, "the written description warns competitors of infringing" and informs the public of what the inventor is claiming. *Levi Strauss*, 1995 WL 710822, at \*10.

[3] [4] The sufficiency of a patent's written description is a question of fact, *Hoechst Marion Roussel*, 314 F.3d at 1330; *Enzo Biochem, Inc. v. Gen-Probe Inc.*, 296 F.3d 1316, 1324 (Fed.Cir.2002), necessarily decided on a case-by-case basis. *Novo Nordisk A/S v. Becton Dickinson & Co.*, 96 F.Supp.2d 309, 314 (S.D.N.Y.2000); *Levi Strauss*, 1995 WL 710822, at \*11. A patent's written description is evaluated as of the date the application was filed and is examined in the context of what the person of ordinary skill in the art would have known at the time. *Hoechst Marion Roussel*, 314 F.3d at 1330; *see also Mahurkar*, 935 F.2d at 1563-64 ("[T]he applicant must ... convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of *the invention*."). Because each case is decided on its individual facts and circumstances, "the precedential value of cases in this area is extremely limited." *Mahurkar*, 935 F.2d at 1562 (quoting *In re Driscoll*, 562 F.2d 1245, 1250 (Cust. & Pat.App.1977)).

[5] In some instances, "under proper circumstances," the drawings of a patent may satisfy the written description requirement of s. 112, para. 1. *Mahurkar*, 935 F.2d at 1565; *see also Wang Labs., Inc. v. Toshiba Corp.*, 993 F.2d 858, 866 (Fed.Cir.1993). On the other hand, the Federal Circuit has held that a recitation of function alone, in the context of biotechnology patents, is not enough to constitute an adequate written description. *Gen-Probe Inc.*, 296 F.3d at 1324. "It is not correct, however, that all functional descriptions of genetic material fail to meet the written description requirement." *Id.* A written description that discloses a function may comply with s. 112, para. 1 if there is knowledge in the art that a specific structure is correlated with that function. *Hoechst Marion Roussel*, 314 F.3d at 1332; *Gen-Probe*, 296 F.3d at 1324-25.

## **ii. Application**

[6] After reviewing the evidence in the record, I conclude that questions of fact exist that preclude summary judgment on the basis of invalidity for insufficient written description.

ICOS argues that Scanner's patents contain no description of the structure of the claimed illumination apparatus, but merely refer to its function, which is insufficient to fulfill the written description requirement of s. 112, para. 1. Scanner asserts, however, that figures 7A and 7B of the patent, along with relevant portions of the specification, provide a written description adequate to communicate the structure of the illumination apparatus to those of ordinary skill in the art.

[7] Determining whether the written description requirement has been met involves examining what an ordinarily skilled artisan would have known at the time the patent was filed. *Hoechst Marion Roussel*, 314 F.3d at 1330. Here, the parties' experts disagree on the scope of the knowledge that a person of ordinary skill in the art would possess. "Thus, if there is conflicting evidence as to what one of ordinary skill in the art would have known, resolution of that conflict is not appropriate on a motion for summary judgment."

Levi Strauss, 1995 WL 710822, at \*11. Scanner's expert, Dr. Fantone, points to Figures 7A and 7B of the Scanner patents and concludes that they "do, in fact, suggest to one skilled in the art the illumination system required ... because one skilled in the art would have known about these types of illumination." (Fantone Decl. in Opp'n para. 9). Fantone goes on to say that "Figures 7A, 7B, and 8B and the associated text of the specifications in the Scanner Patents describe the desired result of the illumination system to one of ordinary skill in the art sufficiently to convey generally acceptable illumination configurations." ( *Id.* para. 7). ICOS's expert, Dr. Mundy, refutes Fantone's assertions: "This is simply not true." (Mundy Supplemental Decl. para. 5). He further states that "Dr. Fantone's assertions" that the structure of the illumination apparatus "can be discerned from the *results* shown in the patent and from the prior art" are "incorrect." ( *Id.* para. 4).

There is additional disagreement between the experts. Fantone's opinion is that "Scanner's illumination structure is described to one of ordinary skill in the art by the desired result in figures 7A and 7B and the associated text." (Fantone Decl. in Opp'n para. 6). Mundy says: "Neither Figure 7A nor 7B (or the associated text) compels a conclusion as to the structure of the required illumination source." (Mundy Supplemental Decl. para. 4).

[8] The credibility of competing expert witnesses is a matter for the jury, and not a matter to be decided on summary judgment. *Anderson*, 477 U.S. 242 at 255, 106 S.Ct. 2505, 91 L.Ed.2d 202; *Lucente v. Int'l Bus. Machs., Inc.*, 310 F.3d 243, 254 (2d Cir.2002). Here, the parties' experts dispute the sufficiency of the Scanner patents' written description and provide conflicting evidence on what a person of ordinary skill in the art would know. Hence, disputed issues of material fact exist for trial as to Scanner's alleged failure to comply with the written description requirement.

## **b. Enablement**

### **i. Applicable Law**

[9] [10] The patent statute sets forth the enablement requirement:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same.

35 U.S.C. s. 112, para. 1. Although the written description and enablement requirements seem intertwined, they are in fact separate requirements. *Gen-Probe*, 296 F.3d at 1324; *Mahurkar*, 935 F.2d at 1563. The written description requirement focuses on disclosing the manner and process of making the invention for purposes of ensuring that the inventor was in possession of the invention and warning competitors of infringing, while enablement looks to whether a person of ordinary skill in the art could actually make and use the claimed invention. *Mahurkar*, 935 F.2d at 1561; *Levi Strauss*, 1995 WL 710822, at \*10. While "[t]ossing out the mere germ of an idea does not constitute enabling disclosure," *Genentech, Inc. v. Novo Nordisk, A/S*, 108 F.3d 1361, 1366 (Fed.Cir.1997), the disclosure of *any* mode of making and using the invention is sufficient to satisfy the enablement requirement. *Johns Hopkins*, 152 F.3d at 1361; *Glaxo Wellcome, Inc. v. Eon Labs Mfg., Inc.*, No. 00 Civ. 9089(LMM), 2002 WL 1874830, at (S.D.N.Y. Aug. 13, 2002). There is, however, no requirement that the specification disclose what is well-known in the art. *Genentech*, 108 F.3d at 1366.

[11] [12] Enablement is a question of law that is based on underlying factual inquiries. *Durel Corp. v.*

Osram Sylvania Inc., 256 F.3d 1298, 1307 (Fed.Cir.2001); Johns Hopkins, 152 F.3d at 1354. For a specification to be enabling, a person of ordinary skill in the art must be able to make and use the invention without "undue experimentation" as of the date the patent application was filed. Enzo Biochem, Inc. v. Calgene, Inc., 188 F.3d 1362, 1371 (Fed.Cir.1999); Genentech, 108 F.3d at 1365. "The fact that some experimentation is necessary does not preclude enablement, but if unduly extensive experimentation is necessary, the claim will fail." Glaxo, 2002 WL 1874830, at \*2.

[13] The existence of undue experimentation may be determined by considering the following factors:

(1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.

Calgene, 188 F.3d at 1371 (quoting *In re Wands*, 858 F.2d 731, 737 (Fed.Cir.1988)). While the *Wands* factors may provide guidance in an enablement inquiry, they are "illustrative, not mandatory." Amgen, Inc. v. Chugai Pharm. Co., 927 F.2d 1200, 1213 (Fed.Cir.1991); *see also* Calgene, 188 F.3d at 1371 ("We have also noted that all of the factors need not be reviewed when determining whether a disclosure is enabling.").

[14] In essence,

the relevant inquiry lies in the relationship [among] the specification, the claims, and the knowledge of one of ordinary skill in the art. If, by following the steps set forth in the specification, one of ordinary skill in the art is not able to replicate the claimed invention without undue experimentation, the claim has not been enabled as required by s. 112, paragraph 1.

Nat'l Recovery Techs., Inc. v. Magnetic Separation Sys., Inc., 166 F.3d 1190, 1196 (Fed.Cir.1999).

## **ii. Application**

[15] Upon reviewing the evidence before me, I conclude that questions of fact exist, and therefore ICOS's motion for summary judgment, to the extent it is based on invalidity due to lack of enablement, is denied.

ICOS argues that the claims of the Scanner patents are not enabled with respect to the terms illumination apparatus, side view image, and/or triangulation calculations/method. As noted above with respect to the written description requirement, ICOS asserts that there is not sufficient structure disclosed in the patent for an ordinarily skilled artisan to make and use the illumination apparatus. Additionally, ICOS contends that there is no teaching in the specification as to what angle, or range of angles, is best to obtain a "side view image." Finally, although admitting that some triangulation calculations are well known in the art, ICOS argues that the particularities of lighting, camera, and optics in Scanner's specific system require triangulation calculations that are not sufficiently discussed in the specification. Thus, according to ICOS, a person of ordinary skill in the art would have to engage in undue experimentation to make and use the claimed invention.

[16] Scanner's response to ICOS's lack of enablement claim improperly combines the enablement and best mode elements of s. 112, para. 1. Scanner asserts that its patents are enabled because undue experimentation is not required to arrive at a best mode, when the standard for enablement requires merely the disclosure of

any mode of practicing the invention, not necessarily the best mode. Johns Hopkins, 152 F.3d at 1361; Glaxo Wellcome, 2002 WL 1874830, at \*3.

First, as discussed above in conjunction with the written description requirement, the parties' experts disagree as to what a person of ordinary skill in the art would know, with respect to the illumination apparatus. The experts also disagree about whether an ordinarily skilled artisan would be able to calculate the geometry of the "region of interest," which provides information about the coordinates of the ball being inspected. Fantone opines that "[o]ne skilled in the art could experiment to find the best geometry, but finding the geometry that is adequate can be determined from the example images." (Fantone Decl. in Opp'n para. 13). Mundy disagrees, however: "[T]his superficial assertion is not correct." (Mundy Supplemental Decl. para. 7). "In effect, one skilled in the art would have to invent the configuration(s) and algorithms that should have been described in the Scanner Patents." ( *Id.* para. 6). Considering the skill of persons in the relevant art is one of the *Wands* factors for determining undue experimentation. In re *Wands*, 858 F.2d at 737. Because the credibility of the parties' experts is in issue here, summary judgment is inappropriate. *Anderson*, 477 U.S. 242 at 255, 106 S.Ct. 2505, 91 L.Ed.2d 202; *Lucente*, 310 F.3d at 254.

Second, there is a genuine dispute as to how much experimentation was actually done by both co-inventor Beaty and ICOS's expert Mundy. ICOS contends that Beaty engaged in "[m]any, many experiments over some period of time" with respect to "changing the position of the curvilinear light source with reference to the ball grid array device." (Beaty Dep. at 169). Scanner, on the other hand, asserts that Beaty's experimentation before the patent was filed amounted to "a few hours' total time," and that the deposition testimony cited by ICOS referred to post-patent experimentation specifically for a Japanese customer. (Beaty Decl. in Opp'n para. 4). In his deposition testimony, however, Beaty does not explain his reference to "[m]any, many experiments." Hence, this question of fact remains unresolved at this stage.

The record is also unclear as to the amount of experimentation Mundy would have needed to make the invention at issue. Although Mundy testified at his deposition that he spent approximately 100 hours all told on this case, it is unclear whether Mundy actually made the invention at issue, or if he did, how much experimentation it took. (Mundy Dep. at 5). Mundy "opines that undue experimentation would be required to develop a useful apparatus or method from the inadequate specification of the Scanner Patents." (Def.'s Reply Mem. at 7).

With the existence of these questions of fact, summary judgment is improper, and ICOS's motion for summary judgment is denied to the extent it is based on invalidity due to lack of enablement.

### **c. Best Mode**

#### **i. Applicable Law**

[17] [18] By statute, a patent's specification must "set forth the best mode contemplated by the inventor of carrying out his invention." 35 U.S.C. s. 112, para. 1. In other words, if an inventor has a way of practicing the invention that is better than all other ways, it must be disclosed in the patent specification. *See N. Telecom Ltd. v. Samsung Elecs. Co.*, 215 F.3d 1281, 1286 (Fed.Cir.2000). The best mode requirement illustrates the *quid pro quo* nature of the patent system—an inventor receives patent protection in exchange for disclosure to the public of the best mode of practicing the invention. *Eli Lilly & Co. v. Barr Labs., Inc.*, 251 F.3d 955, 963 (Fed.Cir.2001); *Evans Med. Ltd. v. Am. Cyanamid Co.*, 11 F.Supp.2d 338, 359 (S.D.N.Y.1998). " 'The best mode requirement ... is intended to ensure that a patent applicant plays fair and square with the patent system,' " *Evans Med.*, 11 F.Supp.2d at 359 (quoting *Amgen Inc. v. Chugai Pharm.*

Co., 927 F.2d 1200, 1209-10 (Fed.Cir.1991)), and does not "conceal [ ] from the public preferred embodiments of [his] invention which [he] ha[s] in fact conceived." *Evans Med.*, 11 F.Supp.2d at 359.

[19] Compliance with the best mode requirement is a two-pronged, factual inquiry. First, it must be determined whether the inventor had a best mode of practicing the invention at the time the patent application was filed. *Nobelpharma AB v. Implant Innovations, Inc.*, 141 F.3d 1059, 1064 (Fed.Cir.1998); *United States Gypsum Co. v. Nat'l Gypsum Co.*, 74 F.3d 1209, 1212 (Fed.Cir.1996). This is a subjective inquiry, which examines "the inventor's state of mind at the time of filing." *Eli Lilly*, 251 F.3d at 963. Second, it must be determined whether the best mode was disclosed in enough detail for a person of ordinary skill in the art to practice it. *Nobelpharma*, 141 F.3d at 1064; *United States Gypsum*, 74 F.3d at 1212. This inquiry is objective and looks to the "scope of the claimed invention and the level of skill in the art." *Eli Lilly*, 251 F.3d at 963.

## **ii. Application**

ICOS argues that the inventors of the '756 and '757 Patents had a best mode of practicing the invention at the time the patent applications were filed but failed to disclose it in the specifications. First, ICOS relies, in part, on the deposition testimony and laboratory notebooks of the inventors to show that they had a best mode of practicing the illumination apparatus of the invention. ICOS then cites to statements made by Scanner's attorney at the *Markman* hearing as further evidence of the existence of a best mode. For the reasons set forth below, I conclude that a reasonable jury could find that ICOS has not sustained its burden of proving Scanner's noncompliance with the best mode requirement.

[20] First, I address the subjective prong of the best mode inquiry, which hinges on what was in the inventors' minds when the patent application was filed. *See Eli Lilly*, 251 F.3d at 963. The inventors' state of mind at the time of filing is not clear from the record before me. Construing the evidence in favor of Scanner, I conclude that a reasonable jury could find that the inventors were still experimenting with different types of illumination at the time the patent application was filed.FN2 ( *See generally* Michaelis Decl. Exs. 6-11). For example, in Beaty's laboratory notes, there is an entry dated September 18, 1997, that states: "Best results were attained with diffuse light." This sentence was immediately followed by: "Not sure if LEDs will be bright enough." ( *Id.* Ex. 10). The next day, it appears Beaty conducted more experiments that "look[ed] very promising." ( *Id.*). Subsequent entries reflect further experimentation, but do not conclusively establish that the inventors had a best mode of illumination with respect to type, position, and intensity. ( *Id.* Exs. 10-11).

FN2. I reach this conclusion, despite the fact that Scanner does not seem to dispute ICOS's assertion that the first prong of the best mode requirement is met here.

Similarly, the deposition testimony of the inventors does not establish the existence of a best mode prior to the filing of the patent application. Although Mork testified to engaging in experimentation with different types of illumination prior to filing, his testimony could lead a reasonable juror to conclude that he did not have a best mode:

Q: And at the time in September of 1997, September 18 of 1997, did one of the two light sources experimented with provide better results than the other?

A: No.

(Mork Dep. at 40; *see id.* at 31-33). The inventors experimented with both fluorescent and LED lighting, finding advantages and disadvantages to both, but did not conclude that either type of lighting was the best:

The Scanner inventors did not conclude that LEDs were the *best* lighting prior to filing the patent. In fact, they also used a fluorescent tube and found that it was more diffuse but could not be turned off and on quickly. The LEDs could be turned off and on quickly, but were not as diffuse as the fluorescent tube.

(Fantone Decl. in Opp'n para. 10).

Finally, ICOS's assertion that the statements of Scanner's attorney at the *Markman* hearing constitute a party admission proving the existence of a best mode does not establish the inventors' state of mind at the time the patent application was filed, particularly in light of the inventors' own testimony. This evidence, in combination with the rest of the record, fails to fulfill the first prong of the best mode inquiry.

Because I find that a reasonable jury could conclude that ICOS has not sustained its burden of proof with respect to the first prong of the best mode inquiry, I do not reach the second prong. Summary judgment is therefore denied to the extent it is based on invalidity for failure to disclose the best mode.

## **2. Anticipation**

### **a. Applicable Law**

[21] [22] A patent is rendered invalid for anticipation if there exists one prior art reference that discloses every single element of the claimed invention. *ATD Corp. v. Lydall, Inc.*, 159 F.3d 534, 545 (Fed.Cir.1998); *see also* 35 U.S.C. s. 102. This disclosure does not have to be expressly stated: " 'To anticipate a claim, a prior art reference must disclose every limitation of the claimed invention, either explicitly or inherently.' " *Atlas Powder Co. v. Ireco Inc.*, 190 F.3d 1342, 1346 (Fed.Cir.1999) (quoting *In re Schreiber*, 128 F.3d 1473, 1477 (Fed.Cir.1997)). To inherently disclose patent limitations for purposes of anticipation, the prior art reference in question must operate according to the claim limitations it allegedly anticipates. *MEHL/Biophile Int'l Corp. v. Milgraum*, 192 F.3d 1362, 1365 (Fed.Cir.1999); *Atlas Powder*, 190 F.3d at 1347.

Inherency ... may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient. If, however, the disclosure is sufficient to show that the natural result flowing from the operation as taught would result in the performance of the questioned function, it seems to be well settled that the disclosure should be regarded as sufficient.

*MEHL/Biophile*, 192 F.3d at 1365.

[23] [24] [25] Anticipation of a patent is a question of fact, as is the question of whether a prior art reference inherently discloses a patent claim limitation. *Atlas Powder*, 190 F.3d at 1346; *Hazani v. United States Int'l Trade Comm'n*, 126 F.3d 1473, 1477 (Fed.Cir.1997). In evaluating allegations of anticipation, the relevant question is whether a patent claim "reads on" the prior art. *Atlas Powder*, 190 F.3d at 1346 (citing *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 781 (Fed.Cir.1985)). The question is whether all the claim limitations in the patent at issue were, expressly or inherently, present in a single prior art reference, as understood by a person of ordinary skill in the art, at the time the patent application was filed. In re

Omeprazole Patent Litig., 222 F.Supp.2d 423, 517 (S.D.N.Y.2002). "For summary determination to be proper, there must be no genuine dispute whether the limitations of the claimed invention are disclosed, either explicitly or inherently, by an allegedly anticipating prior art reference." Hazani, 126 F.3d at 1477.

### **b. Application**

[26] ICOS argues that the Scanner patents are invalid as anticipated because each element of the allegedly infringing claims was present in two prior art references: 1) United States Patent No. 5,574,801 (the "Collet-Beillon patent"), entitled "Method of Inspecting an Array of Solder Ball Connections of an Integrated Circuit Module," and 2) the ICOS Projector system, sold for the first time in November 1996. Because there are genuine disputes between the parties as to what claim limitations were disclosed by the prior art, summary judgment is inappropriate. *See id.*

The parties' experts provide conflicting evidence of what the allegedly anticipatory prior art discloses. Mundy details the difference of opinion he has with Scanner's expert:

Dr. Fantone issued specific rejections to my assessments of the prior art that I believe render[ ] the Scanner claims anticipated and/or obvious to one of ordinary skill in the art.... I generally disagree with Dr. Fantone's characterizations and assessments related to the prior art references, what they teach and how one skilled in the art would view them as anticipating and/or rendering obvious the "invention" claimed in the Scanner Patents.

(Mundy Supplemental Decl. para. 18). For example, Fantone states that "Collet-Beillon does not calculate a pre-calculated calibration plane" (Fantone Decl. in Opp'n para. 20), while Mundy claims "Dr. Fantone's assertion here is erroneous." (Mundy Supplemental Decl. para. 14). Mundy continues: "Collet-Beillon clearly states that a reference for the Z axis is calculated during calibration. The resulting calibration plane is completely determined by this Z reference value since the plane is assumed to be perpendicular to the view direction of the top camera." ( *Id.*). Fantone also claims that "the Collet-Beillon Patent will *not* produce a doughnut-shaped image. Collet-Beillon expressly teaches away from the notion of a doughnut-shaped image...." (Fantone Decl. in Opp'n para. 21). Mundy, on the other hand, "do[es] not agree that the illustrated configuration fails to produce a doughnut-shape." (Mundy Supplemental Decl. para. 13). Finally, Fantone asserts that the ICOS Projector system does not establish a pre-calculated calibration plane (Fantone Decl. in Opp'n para. 29), while ICOS counters with Mundy's opinion that the "z caliber was utilized to create the pre-calculated reference or calibration plane" (Mundy Decl. para. 46), and the view of Gust Smeyers, Vice-President of ICOS, that "the calibration process includes the calculation of a reference plane." (Smeyers Decl. para. 14).

The parties' conflicting expert witness opinions regarding, *inter alia*, what the prior art discloses and how a person of ordinary skill in the art would interpret it preclude a finding of summary judgment. A reasonable jury could find that ICOS has not proven anticipation by clear and convincing evidence. I therefore deny summary judgment to the extent it is based on invalidity for anticipation.

### **3. Obviousness**

#### **a. Applicable Law**

[27] A patent may be invalid if there are prior art references that motivate a person of ordinary skill in the art to make the claimed invention:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

35 U.S.C. s. 103(a). Unlike anticipation, where every claim limitation in the patent at issue must be present in a single piece of prior art, an obviousness inquiry involves examining the combination of elements in multiple prior art references.

[28] Obviousness is ultimately a question of law that is based on underlying facts. *Sandt Tech. Ltd. v. Resco Metal & Plastics Corp.*, 264 F.3d 1344, 1354 (Fed.Cir.2001); *ATD*, 159 F.3d at 546. The fact finder must consider: "1) the scope and content of the prior art; 2) the differences between the prior art devices and the claimed invention; 3) the level of ordinary skill in the art; and 4) objective considerations, such as commercial success, long felt need, failure of others, and copying." *Sandt*, 264 F.3d at 1354 (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 86 S.Ct. 684, 15 L.Ed.2d 545 (1966)); *see also ATD*, 159 F.3d at 546. These factual inquiries must be considered from the perspective of a person with ordinary skill in the relevant art. *Ecolochem, Inc. v. S. Cal. Edison Co.*, 227 F.3d 1361, 1371 (Fed.Cir.2000); *Al- Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308, 1323 (Fed.Cir.1999); *In re Rouffet*, 149 F.3d 1350, 1357 (Fed.Cir.1998).

[29] [30] Additionally, for a patent to be obvious in light of the prior art teachings, the party challenging patent validity must show some motivation or suggestion to combine the various references. *Display Techs., Inc. v. Paul Flum Ideas, Inc.*, 282 F.3d 1340, 1346-47 (Fed.Cir.2002); *Al- Site*, 174 F.3d at 1323-24. The motivation to combine prior art references need not be explicit but may be inferred from three possible sources: "the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art." *In re Rouffet*, 149 F.3d at 1357; *see also Display Techs.*, 282 F.3d at 1346-47. In some situations, where the prior art and the invention at issue are relatively straightforward, the motivation to combine may be "apparent without more." *Display Techs.*, 282 F.3d at 1347.

### **b. Application**

[31] Questions of fact exist as to what the prior art discloses and how a person of ordinary skill in the art would interpret it in the context of obviousness. I therefore deny summary judgment to the extent it is based on invalidity for obviousness.

ICOS argues that Scanner's patents are invalid as obvious in light of four prior art references: 1) a 1993 article by George Schurr entitled *Basics of Stereoscopic Machine Vision for 3D Gauging*, 2) the Collet-Beillon patent, 3) the Projector system, and 4) United States Patent No. 5,039,868, entitled "Method of and Apparatus for Inspecting Printed Circuit Boards and the Like" (the "Kobayashi patent"). ICOS contends that these four pieces of prior art are in the same field and that therefore a person skilled in the art would have been motivated to combine the Schurr article with the Collet-Beillon patent, the Projector system, or the Kobayashi patent.

Scanner disputes ICOS's contentions and argues that the Schurr article is not in the same field of art as the Collet-Beillon patent, the Projector system, or the Kobayashi patent. As a result, Scanner contends, a person of ordinary skill in the art would not have been motivated to combine the Schurr article with the other prior art to produce Scanner's patented invention.

[32] As discussed above in the context of anticipation, there are questions of fact regarding the scope and content of the prior art. For example, Mundy articulated his disagreement with Fantone's "characterizations and assessments related to the prior art references, what they teach and how one skilled in the art would view them as ... rendering obvious" Scanner's claimed invention. (Mundy Supplemental Decl. para. 18). Conflicts in the evidence on a factual issue, including dueling expert witness opinions, may not be resolved on summary judgment, as the evaluation of competing expert opinions falls to the jury. *See* Anderson, 477 U.S. 242 at 255, 106 S.Ct. 2505, 91 L.Ed.2d 202; Lucente, 310 F.3d at 254. ICOS's motion for summary judgment is therefore denied to the extent its claim of invalidity is based on obviousness.

A reasonable jury could find that ICOS has failed to overcome the high burden of proof required for summary judgment on the basis of patent invalidity. Because numerous disputed questions of fact exist, ICOS has not demonstrated that a reasonable jury could only find invalidity by clear and convincing evidence on any of its asserted grounds. As a result, ICOS's motion for summary judgment is denied to the extent it relies on patent invalidity.

### ***C. Patent Infringement***

#### ***1. Applicable Law***

[33] A two-step analysis is required to determine patent infringement. *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454 (Fed.Cir.1998). First, the court construes the patent by determining the scope and meaning of the patent claims asserted. *Id.* (citing *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 371-73, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996)). Second, the properly-construed claims are compared with the accused device to determine if an infringement occurred. *Id.*; see also *Hoechst Marion Roussel*, 314 F.3d at 1324. Claim construction is a question of law for the court, while the determination of infringement in the second step of the analysis is a question of fact, both for literal infringement and infringement under the doctrine of equivalents. *Bai v. L & L Wings, Inc.*, 160 F.3d 1350, 1353 (Fed.Cir.1998); *In re Omeprazole*, 222 F.Supp.2d at 503.

[34] [35] To prove literal infringement, the patentee must demonstrate that the accused product or method includes each and every element or limitation of the claims in question. *See Transmatic, Inc. v. Gulston Indus., Inc.*, 53 F.3d 1270, 1277 (Fed.Cir.1995); *Baxter Healthcare Corp. v. Spectramed, Inc.*, 49 F.3d 1575, 1582 (Fed.Cir.1995). A device that does not literally infringe a claim may nonetheless infringe under the doctrine of equivalents if every element of the claimed invention, or its "equivalent," is found in the accused product or method. *Eagle Comtronics, Inc. v. Arrow Communication Labs.*, 305 F.3d 1303, 1315 (Fed.Cir.2002); *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 21, 117 S.Ct. 1040, 137 L.Ed.2d 146 (1997). "The scope of a patent is not limited to its literal terms but instead embraces all equivalents to the claims described." *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd.*, 535 U.S. 722, 122 S.Ct. 1831, 1837, 152 L.Ed.2d 944 (2002). Claimed limitations are considered "equivalent" if there is only an "insubstantial difference" between the claim element and the corresponding element in the accused device. *Sage Prods., Inc. v. Devon Indus., Inc.*, 126 F.3d 1420, 1423 (Fed.Cir.1997). To infringe under the doctrine of equivalents, the accused product or method must perform substantially the same function, in substantially the same way, to achieve substantially the same result as the patented product or method. *Eagle Comtronics*, 305 F.3d at 1315 (quoting *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 608, 70 S.Ct. 854, 94 L.Ed. 1097 (1950)); *Dolly, Inc. v. Spalding & Evenflo Cos.*, 16 F.3d 394, 397 (Fed.Cir.1994).

## 2. Application

[36] [37] Because I have already construed the claim terms in question, I focus on the second part of the infringement analysis. Here, that analysis must be performed twice: first, to determine whether there is literal infringement, and second, to determine whether there is infringement under the doctrine of equivalents. In both cases, I conclude that summary judgment must be denied.

Scanner argues that ICOS's accused device literally infringes all claims of the Scanner patents, while ICOS asserts that there is no infringement, either literally or under the doctrine of equivalents.<sup>FN3</sup> ICOS's argument for non-infringement points out the claim limitations in the Scanner patents that are not present in the CyberSTEREO system. ICOS contends that the accused device does not meet the following limitations of the Scanner patents: "an illuminating apparatus," "pre-calculated calibration plane," or "determining a three dimensional position of at least one ball."

FN3. Scanner neither moves for summary judgment of infringement under the doctrine of equivalents nor responds to ICOS's assertions of doctrine of equivalents infringement, other than to incorporate the arguments in its motion for partial summary judgment. (Pl.'s Partial Summ. J. Mem.; Pl.'s Reply Mem. at 29). Nevertheless, construing the evidence in favor of Scanner on the issue of infringement under the doctrine of equivalents, I find that genuine issues of material fact exist.

There are genuine issues of material fact in dispute here. Again, the parties' experts provide conflicting evidence, this time with respect to factual inquiries necessary for infringement. Because a determination of infringement, whether literal or under the doctrine of equivalents, requires that the properly-construed claims be compared with the accused device, contradictory evidence regarding aspects of the CyberSTEREO system creates disputed issues inappropriate for resolution on summary judgment.

For example, the parties' experts provide conflicting evidence about whether the CyberSTEREO system has a pre-calculated calibration plane. Fantone says: "The ICOS system stores a pre-calculated calibration plane. The Court has ruled that the pre-calculated calibration plane is the X and Y world coordinates and the Z=0 world plane." (Fantone Decl. para. 16). By contrast, Mundy says: "I conclude that the ICOS CyberStereo product does not calculate any plane during calibration, and clearly that the ICOS CyberStereo product does not calculate X and Y world coordinates and the Z=0 world plane during calibration." (Mundy Decl. para. 59).

There is additional disagreement about whether the camera-to-camera calibration utilized in the CyberSTEREO system is the same as the claimed pre-calculated calibration plane. Mundy claims that the CyberSTEREO "never pre-calculates a calibration plane with this device," but instead "conduct[s] what is known as camera-to-camera ("ctc") calibration ... [which] is entirely different [from] the Scanner process and is used for an entirely different purpose." (*Id.* para. 51-52; *see also* Mundy Report at 13). Fantone, on the other hand, states that "[t]he camera-to-camera calibration that Dr. Mundy describes is the same as the pre-calculated calibration plane taught by the patents-in suit." (Fantone Decl. para. 36).

Another example of factual conflict between the parties is: "ICOS does not do 'triangulation' calculations, as defined in the Beaty Patents. ICOS uses linear interpolation calculations so substantially different from the Scanner triangulation calculations that the resulting ICOS 3D run-time measurement is, in my opinion, inferior to that determined using the triangulation calculations in the Beaty specification." (Mundy Report at

14). On the other hand, Fantone asserts that the "triangulation calculations performed by the ICOS systems are the same as those described in the patents-in-suit as someone skilled in the art would understand them." (Fantone Decl. para. 7).

Finally, Scanner itself admits that "there has been some conflicting testimony" from expert witnesses regarding the use of trigonometric principles to determine ball location in the accused device. (Pl.'s Partial Summ. J. Mem. at 11). Due, in part, to "the fact that the parties' experts offer at least what appears to be conflicting testimony," Scanner goes on to suggest that the Court may appoint its own expert or advisor. (Pl.'s Reply Mem. at 15).

A determination of infringement, literally and under the doctrine of equivalents, is a question of fact that requires a comparison of properly construed claims with the allegedly infringing device. Because the parties' experts vigorously dispute key characteristics of the CyberSTEREO system and provide conflicting evidence to support their assertions, there exist genuine issues of material fact that preclude summary judgment on the issue of infringement. I therefore deny Scanner's motion for partial summary judgment of infringement and ICOS's motion for summary judgment on the basis of non-infringement.

### *CONCLUSION*

For the foregoing reasons, the parties' motions for summary judgment are denied in all respects. Counsel for Scanner and ICOS shall appear for a pretrial conference in Courtroom 11A of the United States Courthouse at 500 Pearl Street, on April 3, 2003, at 11:00 a.m.

SO ORDERED.

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