

UNITED STATES DISTRICT COURT  
DISTRICT OF CONNECTICUT

ON-LINE TECHNOLOGIES, INC. :  
Plaintiff, :  
 :  
v. : Civil No. 3:99cv2146 (JBA)  
 :  
PERKIN-ELMER CORP., et al., :  
Defendants. :

Ruling on Defendants' Motion for Summary Judgment  
on Patent Invalidity [Doc.# 224]

In this patent case, plaintiff On-Line Technologies ("OLT") alleges that defendants Perkin-Elmer Corporation and associated entities (collectively "PE"), infringed U.S. Patent No. 5,440,143 ("`143 Patent") for improvements to a device known as a White cell or a long-path gas cell, the function of which was described in the Federal Circuit's prior ruling on appeal in this case. See On-Line Techs., Inc. v. Perkin-Elmer Corp., 386 F. 3d 1133, 1135-36 (Fed. Cir. 2004).

Following remand, the parties have stipulated that all of defendants' "MCS100E instruments sold in the United States include gas cells that include all of the elements of Claim 1 of the `143 Patent, as that Claim was construed by the United States Court of Appeals for the Federal Circuit in its decision dated October 13, 2004, and that would infringe Claim 1 of the `143 Patent, if that claim is valid and enforceable." Stip. [Doc. # 229] at ¶ 1. Therefore the only remaining question with respect

to Claim 1 of the '143 Patent is whether that claim is valid and enforceable. Currently before the Court is defendants' Motion for Summary Judgment that Claim 1 of the '143 Patent is invalid [Doc. # 224] as anticipated by prior art under 35 U.S.C. §§ 102(a), (b) and (e); as obvious in light of prior art under 35 U.S.C. § 103; and as failing to name a co-inventor under 35 U.S.C. §§ 102(f), 116 and 256. For the reasons that follow, defendants' motion is denied.

### **I. Standard**

Summary judgment is appropriate "if the pleadings, depositions, answers to interrogatories, and admissions on file, together with affidavits ... 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). A party seeking summary judgment "bears the burden of establishing that no genuine issue of material fact exists and that the undisputed facts establish [its] right to judgment as a matter of law." Rodriguez v. City of New York, 72 F.3d 1051, 1060-1061 (2d Cir. 1995) (citing Adickes v. S.H. Kress & Co., 398 U.S. 144, 157 (1970)). "Where the record taken as a whole could not lead a rational trier of fact to find for the nonmoving party, there is no genuine issue for trial." Matsushita Elec. Indus. Co. v. Zenith Radio Corp., 475 U.S. 574, 586 (1986). In making this determination, the Court views the evidence and draws all

reasonable inferences in the light most favorable to the party opposing the motion. Id. at 587.

"A patent is presumed to be valid, 35 U.S.C. § 282 (1994), and this presumption can only be overcome by clear and convincing evidence to the contrary." Bristol-Myers Squibb Co. v. Ben Venue Labs. Inc., 246 F.3d 1368, 1374 (Fed. Cir. 2001).

## **II. Background and Discussion**

The '143 Patent was issued to Robert Carangelo and David Wright on August 8, 1995. Claim 1 of the patent provides for:

A folded-path radiation absorption gas cell comprising: an enclosure having first and second ends, and defining a substantially closed chamber therewithin; spaced input radiation and output radiation windows formed through said first end of said enclosure and aligned on a first axis; a concave reflective field surface extending at least partially between said windows at said first end of said enclosure; a pair of substantially spherical, concave reflective objective surfaces at said second end of said enclosure disposed in confronting relationship to said field surface, said objective surfaces being aligned side-by-side on an axis parallel to said first axis and in optical registry with said windows, at least one of said objective surfaces having a cylindrical component added thereto to increase coincidence of focii in two orthogonal planes, thereby to maximize the energy throughput characteristic of said cell; and means for the introduction and withdrawal of gas into and from said chamber of said enclosure.

One issue on appeal was whether objective mirrors with toroidal surfaces<sup>1</sup> are within the scope of Claim 1's phrase

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<sup>1</sup>"A toroidal (or toric) surface is defined as a surface that is 'generated if an arc is rotated about an axis which lies in the same plane as the arc, but which does not pass through its centre of curvature.' M. Jolie, *The Principles of Ophthalmic Lenses* 31 (3d ed. 1977). The classic example of a toroid is the

"substantially spherical, concave reflective objective surfaces ... having a cylindrical component...." The Federal Circuit answered in the affirmative, holding that this description applies to toroidal surfaces. On Line Techs., 386 F.3d at 1138-40.

**A. Anticipation Under 35 U.S.C. § 102**

Defendants now argue that the Federal Circuit's broader construction of Claim 1 renders that claim obvious or anticipated in light of prior art under 35 U.S.C. § 102(a)(a), (b) and (e).<sup>2</sup> Specifically, defendants point to U.S. Patent No. 5,009,493, issued to Edmund Koch and Dieter Pruss of Germany on April 23, 1991 ("Koch Patent"). See Tropp Decl. [Doc. # 228] Ex. B. Plaintiffs acknowledge that the Koch Patent is prior art to the

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shape generated when a circle is rotated about a line that does not intersect the circle, which describes a torus, a figure resembling a doughnut or tire. A toroidal surface is the shape of a segment of the surface of a toroid." On Line Techs., 386 F.3d at 1137.

<sup>2</sup>"A person shall be entitled to a patent unless--  
(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or  
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, or  
...  
(e) the invention was described in ... (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent  
..."

35 U.S.C. § 102.

'143 Patent that was not of record before the Patent and Trademark Office ("PTO") during the prosecution of the application for the '143 Patent. Pl. L.R. 56(a)2 Stmt. ¶¶ 2-3.

The Koch Patent summarizes its invention as follows:

The mirror arrangement of the invention defines a beam path in a multiple-reflection cell for measuring the absorption of light in a measuring gas, the cell having an entrance aperture and an exit aperture separated from each other by a predetermined distance. The mirror arrangement includes: an entrance aperture mirror and an exit aperture mirror having respective reflective surfaces approximating respective ellipsoids; the entrance aperture mirror defining first and second focal points ( $F_1$ ,  $F_2$ ) and the exit aperture mirror defining third and fourth focal points ( $F_3$ ,  $F_4$ ); a field mirror disposed opposite the aperture mirrors so as to define a beam path for a beam which permits the entrance aperture to be imaged into the exit aperture via the aperture mirrors and the field mirror ....

[T]he form of the aperture mirrors is configured to approximate an ellipsoid with the focal point spacing being approximately equal to half the distance between the entrance aperture and the exit aperture.

By relativizing the focal point distance of the ellipsoid to the distance between the entrance aperture and the exit aperture, the astigmatic imaging errors for sequential imaging by means of the aperture mirrors are reduced to a value which is not disturbing.

Koch Patent col. I, ll. 36-66, Tropp Decl. Ex. B.

"A claim is anticipated if each and every limitation is found either expressly or inherently in a single prior art reference." Bristol-Myers, 246 F.3d at 1374 (internal quotation marks and citation omitted). "A reference is no less anticipatory if, after disclosing the invention, the reference then disparages" or "teaches away" from the invention or shows it

"to be less than optimal." Celeritas Techs. Ltd. v. Rockwell Int'l. Corp., 150 F.3d 1354, 1361 (Fed. Cir. 1998), cert. denied, 525 U.S. 1106 (1999).

Here, defendants argue that the Koch Patent anticipated the '143 Patent. They argue that "all the elements of Claim 1 except the corrections to the objective mirrors were known in the art and part of a standard White cell," and thus the only invention in the '143 Patent is the mirror configuration. Def. Mem. in Support [Doc. # 225] at 11. The Federal Circuit has interpreted Claim 1 to encompass toroidal mirrors, and the Koch Patent explicitly claims toroidal objective mirrors. See Koch Patent Col. 2 ll. 6-10 "([I]t is advantageous to configure the ellipsoid as a portion of a toroid ... with the toroid having radii of curvature which are equal to those which determine the planar center point of the particular ellipsoid."). Thus, defendants argue, Claim 1 was anticipated by the Koch Patent.

The Court rejects defendants' claim because two areas of material fact remain disputed: first, whether defendants' evidence can support a conclusion that the Koch Patent alone anticipated Claim 1 of the '143 Patent; and second, whether Koch, which utilizes "first order" optimization techniques, can be found to anticipate the "third order" ray tracing technique utilized for optimization of the mirror arrangement in the '143 Patent.

Defendants' expert, Duncan Moore, Ph.D., stated in his expert report that a combination of references would render the '143 Patent obvious. Moore Report ¶ III(7), Tropp Decl. Ex. H. While obviousness is a slightly different inquiry from anticipation, his opinion remains extremely relevant, because it was based on his conclusion that "Koch describes a mirror arrangement in a White Cell where the objective mirrors ... have been made from portions of a toroid. [And] Chernin teaches a toroid in a gas cell." Dr. Moore did not render an opinion with respect to whether the '143 Patent was anticipated by Koch alone. However, his conclusion that a combination of the Koch and Chernin references would render '143 obvious at least shows that there is a disputed issue of material fact concerning whether Koch alone anticipated the '143 Patent as required in an anticipation analysis under § 102. See Bristol-Myers, 246 F.3d at 1374. Aside from their interpretation of the Koch Patent in their memorandum of law, defendants have proffered no evidence suggesting that Koch anticipated the '143 Patent.

The second disputed area of fact is the role that Wright's ray tracing computer program plays in the invention claimed in Claim 1 of the '143 Patent. The Koch device, as tested by Wright and Carangelo, allowed only sixteen passes of light between the mirrors, while OLT's invention permits up to 216. See Wright Aff. ¶ 7. Plaintiff argues that this difference is due to the

fact that the Koch invention relies on simple "first-order optical theory," whereas the '143 Patent relies on Wright's ray tracing computer program, a "third order" optimization technique, which leads to vastly improved throughput of light. See Pl. Mem. of Law in Opp. [Doc. # 232] at 9-10. Claim 1 of the '143 Patent claims a mirror shape and alignment "to increase coincidence of focii in two orthogonal planes...." '143 Patent col. 5 ll. 51-52 (emphasis supplied). In contrast, the Koch Patent does not claim optimization in more than one plane.

Defendants argue, and the Court agrees, that Claim 1 does not claim a "method," i.e., does not patent the ray tracing computer program itself. Nonetheless, plaintiff's expert, Warren Vidrine, Ph.D., testified that production of a working model of the invention in Claim 1 requires utilization of a ray tracing technique, which is capable of "optimization of the whole ray bundle in all dimensions (which also minimizes distortions due to second and third-order effects.)" Vidrine Aff. ¶ 3(a), Berg Decl. Ex. 12. By contrast, Vidrine stated, the Koch Patent only claims a mirror arrangement that "is selected using simple first-order optical theory" and does not claim to increase coincidence of focii in more than one plane. Id. That patent in fact does not claim to increase the coincidence of the foci in more than one dimension or plane, distinguishing it from the '143 Patent. Thus a dispute of material fact remains with respect to whether



the Claim 1 of the '143 Patent reads on every element of the Koch Patent, given the differences in optimization technology and theory between the two.<sup>3</sup>

Because plaintiff's expert testimony and a reading of the language of the patents indicate that Claim 1's claim of increasing coincidence of foci in two orthogonal planes results from ray tracing techniques not involved in the Koch Patent, and because defendants' position that Koch alone anticipated the '143 Patent is not substantiated by their expert witness, defendants

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<sup>3</sup>The Court rejects plaintiff's other asserted differences between Claim 1 of the '143 Patent and the Koch Patent. Plaintiff argues that Claim 1 covers the entire gas cell, including mirrors fixed into the ends of the cell with entry and exit apertures drilled through the "first end" of the cell, see '143 Patent col. 5 ln. 41; Vidrine Aff. ¶ 3(b), whereas the Koch Patent claims only the "mirror arrangement," not the entire cell, and utilizes entry and exit apertures outside the mirror apparatus. However, the machined mirrors in the endplates are covered in dependent Claim 5 of the '143 Patent, not in Claim 1.

Additionally, plaintiff argues that the Koch Patent allows entrance and exit foci in the plane of the field mirror surface, whereas the '143 Patent describes a cell with the entrance and exit foci behind the plane of the field mirror surface. See Pl. Mem. of Law at 11; Vidrine Aff. ¶ 3(c). This aspect of the invention is claimed in dependent Claim 2. Therefore these differences do not show that the Koch Patent did not anticipate Claim 1 of the '143 Patent. See 35 U.S.C. § 282 ("Each claim of a patent (whether independent, dependent, or multiple dependent form) shall be presumed valid independently of the validity of other claims; dependent or multiple dependent claims shall be presumed valid even though dependent upon an invalid claim."); 35 U.S.C. § 253 ("Whenever, without any deceptive intention, a claim of a patent is invalid the remaining claims shall not thereby be rendered invalid."); see also Ortho Pharmaceutical Corp. v. Smith, 959 F.2d 936, 942 (Fed. Cir. 1992) (holding each claim of a patent must be separately evaluated when conducting obviousness inquiry).

are not entitled summary judgment of invalidity on the basis that Koch anticipated Claim 1.

**B. Obviousness Under 35 U.S.C. § 103**

Defendants argue they are entitled to summary judgment because Claim 1 of the '143 Patent was obvious in light of prior art. "A claimed invention is unpatentable due to obviousness if the differences between it 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.'" Ruiz v. A.B. Chance Co., 234 F.3d 654, 662 (Fed. Cir. 2000) (quoting 35 U.S.C. § 103(a)).

In order to determine obviousness as a legal matter, four factual inquiries must be made concerning: 1) the scope and content of the prior art; 2) the level of ordinary skill in the art; 3) the differences between the claimed invention and the prior art; and 4) secondary considerations of nonobviousness, which in case law is often said to include commercial success, long-felt but unresolved need, failure of others, copying, and unexpected results.

Id. at 662-63 (citing Graham v. John Deere Co., 383 U.S. 1, 17-18 (1966)). A court must conduct this so-called Graham analysis before holding a patent invalid for obviousness. Id. at 663.

Under the first Graham factor, the "relevant inquiry for determining the scope and content of the prior art is whether there is a reason, suggestion, or motivation in the prior art or elsewhere that would have led one of ordinary skill in the art to combine the references." Id. at 664. The mere existence of old

elements is insufficient for a finding of obviousness, "absent some teaching or suggestion, in the prior art, to combine the elements." Arkie Lures, Inc. v. Gene Larew Tackle, Inc., 119 F.3d 953, 957 (Fed. Cir. 1997).

Defendants argue that a mirror artisan suggested that Wright use toroidal mirrors, and that "[t]his communication constituted ... prior art." Def. Mem. of Law at 21.<sup>4</sup> They further argue that the only invention in Claim 1 is the toroidal mirror shape to correct for astigmatic diffusion, and that once the mirror artisan suggested manufacturing the mirrors in a toroidal shape, Wright's invention became obvious.

The evidence in the record shows that David Wright approached several diamond machining companies about producing the "c-sphere" design, which involved a spherical lens with a cylindrical component. Wright Depo. at 178, Berg Decl. [Doc. # 234] Ex. 8. Eventually he went to Optical Filter Corporation ("OFC") in Keene, New Hampshire, where he spoke with Daryl Schillemat. Id.; Wright Aff. at ¶ 3, Berg Decl. Ex. 5. Schillemat informed Wright that the computer program for his diamond cutting machinery did not contain a formula for a c-

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<sup>4</sup>See OddzOn Prods., Inc. v. Just Toys, Inc., 122 F.3d 1396, 1403-04 (Fed. Cir. 1997) (holding that non-public confidential disclosures, "when combined with other prior art, may make a resulting obvious invention unpatentable to [the party receiving the disclosure] under a combination of [35 U.S.C.] §§ 102(f) and 103.").

sphere and suggested other possible shapes including generalized polynomial aspheres, conic sections and toroids, which Wright modeled mathematically through his ray tracing computer program to see if they would be as effective in focusing the light as the c-sphere. Wright Depo. at 180-81; Wright Aff. ¶ 5. Wright stated that Schillemat "was not involved in the testing to confirm whether the shapes he recommended would work in my particular application." Wright Aff. ¶ 5.

Based on this record, defendants' argument oversimplifies the evidence. First, there is no evidence in the record that Schillemat suggested only toroidal mirrors; Wright stated that Schillemat suggested a number of conic section shapes, which Wright plugged into his ray tracing program until finding one that approximated his c-sphere concept. Second, there is no evidence on whether Schillemat's suggestion was made with knowledge of its effect on Wright's desired outcome or on the prior art. The evidence shows that Schillemat was merely suggesting a variety of potential shapes mathematically similar to what Wright requested. Thus defendants have not shown absence of disputed material facts concerning whether there was "a reason, suggestion, or motivation" on Schillemat's part to advise combining a toroidal lens with the overall gas cell design.

Finally, as plaintiffs argue, and the Court previously found, see supra p. 8, Claim 1 is directed to increasing

"coincidence of focii in two orthogonal planes...," see '143 Patent col. 5 ll. 51-52 (emphasis supplied), and thus Claim 1 claims Wright's ray tracing method for detecting and eliminating second- and third-order diffusion. The ultimate decision to use toroidal mirror sections was made only after Wright modeled the results with his ray tracing program, and it is undisputed that Schillemat did not participate in that work. Thus a reasonable factfinder could conclude that Schillemat's suggestion alone was not sufficient to lead one skilled in the art to use a toroidal mirror for the purpose set forth in Claim 1, because there remained the essential step of testing to decide whether that shape would fulfill that purpose. For these reasons, disputed issues of material fact remain concerning the obviousness of Claim 1 of the '143 Patent in light of Schillemat's suggestions and other prior art, and defendants are not entitled to summary judgment on this basis.

### **C. Failure to Name Co-Inventor**

Defendants argue that the entire '143 Patent is invalid for failure to name a co-inventor, namely OFC's mirror engineer, Daryl Schillemat. "A patent is invalid if more or fewer than the true inventors are named." Gemstar-TV Guide Int'l., Inc. v. Int'l Trade Commn., 383 F.3d 1352, 1381 (Fed. Cir. 2004) (citation omitted). However, "[b]ecause a patent is presumed valid under 35 U.S.C. § 282, there follows a presumption that

the named inventors on a patent are the true and only inventors.”  
Id. “Alleged co-inventors must establish their co-inventorship  
by facts supported by clear and convincing evidence.” Id. at  
1382.

“An inventor may solicit the assistance of others when  
perfecting the invention without ‘losing’ any patent rights.”  
Gemstar, 383 F.3d at 1381 (quoting Troyan, Ltd. v. Sokymat SA,  
229 F.3d 1291, 1302 (Fed. Cir. 2002)). “The determination of  
whether a person is a joint inventor is fact specific, and no  
bright-line standard will suffice in every case.... However, a  
joint inventor must contribute in some significant manner to the  
conception of the invention. As such, each inventor must  
contribute to the joint arrival at a definite and permanent idea  
of the invention as it will be used in practice.” Fina Oil &  
Chem. Co. v. Ewen, 123 F.3d 1466, 1473 (Fed. Cir. 1997) (internal  
quotation marks and citations omitted).

Because conception is the touchstone of inventorship,  
each joint inventor must generally contribute to the  
conception of the invention. ... Conception is defined  
as the formation in the mind of the inventor, of a  
definite and permanent idea of the complete and operative  
invention, as it is hereafter to be applied in practice.  
Conception is complete when the idea is so clearly  
defined in the inventor's mind that only ordinary skill  
would be necessary to reduce the invention to practice,  
without extensive research or experimentation.

Stern v. Trustees of Columbia Univ., 434 F.3d 1375, 1378 (Fed.  
Cir. 2006) (internal quotation marks and citations omitted)  
(emphasis supplied).

"The basic exercise of the normal skill expected of one skilled in the art, without an inventive act, ... does not make one a joint inventor. Therefore, a person will not be a co-inventor if he or she does no more than explain to the real inventors concepts that are well known and the current state of the art." Fina, 123 F.3d at 1473 (citations omitted). In other words, "[o]ne who simply provides the inventor with well-known principles or explains the state of the art without ever having a firm and definite idea of the claimed combination as a whole does not qualify as a joint inventor." Ethicon, Inc. v. United States Surgical Corp., 135 F.3d 1456, 1460 (Fed. Cir. 1998) (citation omitted). In addition, "one does not qualify as a joint inventor by merely assisting the actual inventor after conception of the claimed invention." Id.

David Wright testified that he approached OFC about making a c-sphere, and was told that their computers were not programmed to construct a lens of this shape. Wright Depo. at 180.

Q. And they [OFC] suggest how about other conic sections. How did you decide which other conic section you would ask them to machine?

A. By simulation. We modeled them mathematically and ran it through the ray tracing program and looked for the convergence and used that.

Id. at 181. Wright further stated that Schillemat "was not involved in the testing to confirm whether the shapes he recommended would work in my particular application," nor was he

involved in "using the ray-tracing program [Wright] had written from scratch to optimize the gas cell...." Wright Aff. ¶¶ 4, 5.

Defendants argue that Schillemat's contribution was conceiving of toroidal mirrors, and Wright immediately "recognized that a toroidal correction would work. No undue experimentation was required." Def. Mem. of Law at 18. Defendants mischaracterize Wright's testimony. Wright testified that he had already conceived of the c-sphere invention before speaking with Schillemat. Thus the key aspect of Claim 1 of the '143 Patent already was developed in Wright's mind. Schillemat merely explained the state of the art to Wright, including that his existing computer program could not manufacture a c-sphere but could make several similar alternative shapes. Defendants have not shown that Schillemat actually concluded that the toroidal shape, or any other conic section that he suggested to Wright, would work in Wright's gas cell, and thus they have not shown that Schillemat "conceived" of the toroidal embodiment of the invention so as to be entitled to summary judgment on this basis. Wright testified that Schillemat only recommended various conic sections that were mathematically similar to what he initially requested, and left it to Wright to choose, based on the ray tracing program he developed. No evidence in the record shows that Schillemat understood the invention as a whole.

In Hess v. Advanced Cardiovascular Systems, 106 F.3d 976



(Fed. Cir. 1997), a materials engineer claimed joint inventorship of a balloon angioplasty device for use in cardiac procedures, based on his suggestion to the doctors who consulted him that they try his company's heat shrinkable tubing for purposes of inflating the balloon. The Federal Circuit held that because the engineer had no initial knowledge of angioplasty, and served more as a customer service representative in offering his company's available materials to the doctors based on the properties they desired, the engineer was not a co-inventor. Id. at 981.

Here, a reasonable inference could be drawn that Schillemat did not possess a "firm and definite idea of the claimed combination as a whole...." Ethicon, 135 F.3d at 1460. Schillemat only explained the state of the art of mirror engineering to Wright after Wright conceived the c-sphere improvement. Like the engineer in Hess, Schillemat acted in a customer service capacity, informing Wright that his company could not manufacture the shape Wright requested, but had other shapes available. Because defendants have not established the absence of any genuine dispute of material fact concerning whether Schillemat was a co-inventor, they are not entitled to a summary judgment of invalidity on this ground.

**IV. Conclusion**

Accordingly, defendants' motion for summary judgment [Doc. # 224] is DENIED.

IT IS SO ORDERED.

/s/

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JANET BOND ARTERTON  
United States District Judge

**Dated at New Haven, Connecticut, this 23rd day of March, 2006.**