UNITED STATES DISTRICT COURT
DISTRICT OF CONNECTICUT

Applera Corporation and Roche Molecular Systems, Inc., plaintiffs,	:	
v.	:	**3:98cv1201 (JBA)**
MJ Research Inc. and Michael and John Finney, defendants.	:	

OPINION ON DOUBLE PATENTING

A jury trial was held from March 4 to April 2, 2004 on Plaintiffs'(collectively, "Applera") claims that defendants MJ Research Inc., Michael Finney and John Finney (collectively, "MJ") infringed its thermal cycler and PCR process patents. On April 2, 2004, the jury returned its verdict, finding that defendants induced infringement of the PCR process patents; directly infringed claim 45 of U.S. Patent No. 5,333,675 ("'675") and claims 1, 44, and 158 of U.S. Patent No. 5,475,610 ("'610"); and induced infringement of claim 16 of U.S. Patent No. 5,656,493 ("'493"), claims 17, 33, and 45 of the '675 patent, and claims 1, 44, and 158 of the '610 patent. At the time of the trial, defendants were permitted to introduce evidence in support of their contention that the asserted claims of the '675 and '493 patents were invalid for double patenting, and submitted proposed findings of fact and conclusions of law,[1] relying on the patents

[1]The Court has relied on the parties' proposed findings of fact and conclusions of law, see [Docs. ## 1013, 1130 1283], as a

at issue, prior deposition testimony not introduced at trial, and trial testimony and exhibits. Pursuant to Rule 52(a) of the Federal Rules of Civil Procedure, the Court's findings of fact and conclusions of law follow, from which the Court concludes that MJ has failed to meet its burden to prove double patenting.

In their affirmative defense to Applera's infringement claims, which if proved would render unenforceable the '675 and '493 patents which the jury found defendants infringed, defendants maintain that the asserted claims are invalid for "obviousness-type" double patenting. In particular, they contend that claim 16 of the '493 patent, and claims 17, 33, and 45 of the '675 patent, which cover thermal cyclers programmed to perform PCR, are clearly obvious variants or implementations of the invention claimed in claim 9 of the earlier '188 patent – a machine for the automation of the PCR process. Applera responds that the asserted claims of the '493 and '675 patents are not obvious implementations of claim 9 of the '188 patent, because claim 9 does not call for a thermal cycler with a metal block having at least one recess or a Peltier device, and the steps of the PCR process set forth in claim 9 do not include a post-cycling temperature step.

The PTO examined the double patenting issue during the

---

guide to both the applicable evidence and the parties' respective legal arguments.

prosecution of the patent application leading to the issuance of the '675 patent, and found the asserted claims to be valid. See Prosecution History of U.S. Patent Application Serial No. 08/021,624, October 29, 1993 Amendment [PTX 39] at 8-9 ("Applicants hereby request that the Examiner consider the issue of double patenting over the claims of the identified patents . . . . Claim 9 [of the '188 patent], for example, reads as follows . . . ."); Prosecution History of U.S. Patent Application Serial No. 08/021,624, December 6, 1993 Notice of Allowability [PTX 39]. During the reexamination of the '675 patent, the PTO confirmed the validity of the asserted claims of the '675 patent. See U.S. Patent: Reexamination Certificate C1 5,333,675 Issue, May 1, 2001 [PTX 6] at 1 ("As a result of reexamination, it has been determined that: the patentability of claim[] . . . 45 . . . is confirmed . . . . Claims 11, 22, 33 and 34 are determined to be patentable as amended. Claims 12-20, dependent on an amended claim, are determined to be patentable.").

There is a statutory presumption of validity that attaches to an issued patent. See 35 U.S.C. § 282. To overcome this presumption, an accused infringer must prove invalidity by clear and convincing evidence. See Ultra-Tex Surfaces, Inc. v. Hill Borthers Chem. Co., 204 F.3d 1360, 1367 (Fed. Cir. 2000). This burden is heavier where the asserted grounds for invalidity were reviewed by the U.S. Patent and Trademark Office. "When no prior

art other than that which was considered by the PTO examiner is relied on by the attacker, he has the added burden of overcoming the deference that is due to a qualified government agency presumed to have properly done its job, which includes one or more examiners who are assumed to have some expertise in interpreting the references and to be familiar from their work with the level of skill in the art and whose duty it is to issue only valid patents." Id. (quoting American Hoist & Derrick Co. v. Sowa & Sons, Inc., 725 F.2d 1350, 1359 (Fed. Cir. 1984)).

The Patent Act limits a patent holder's right to exclude others from practicing the claimed invention to a 20 year term, see 35 U.S.C. § 154(a)(2), and precludes a patentee from obtaining more than one patent on the same invention, see id. at § 101. To give effect to these statutory provisions, the Federal Circuit has created the doctrine of "obviousness-type" double patenting, which "preclude[s] a second patent on an invention that would have been obvious from the subject matter of the claims in the first patent . . ." Ortho Pharmaceutical Corp. v. Johnson & Johnson Corp., 959 F.2d 936 (Fed. Cir. 1992) (citation and internal quotation marks omitted). By invalidating patents that are obvious in light of prior art, this doctrine ensures that patent holders do not unduly extend their right to exclude "through claims that are not patentably distinct from claims in a commonly owned earlier patent." Eli Lilly and Co. v. Barr

Laboratories, Inc., 251 F.3d 955, 967 (Fed Cir. 2001) (citation omitted).

An analysis of obviousness-type double patenting entails two steps. First, "a court construes the claim in the earlier patent and the claim in the later patent and determines the differences." Id. at 968 (citation omitted). Next, "the court determines whether the differences in subject matter between the two claims render the claims patentably distinct." Id. The later claim is not patentably distinct if it is "obvious over, or anticipated by, the earlier claim." Id. An "obviousness" inquiry asks whether the patent claims would have been obvious to "those of ordinary skill in the art at the time the invention was made." In re Longi, 759 F.2d 887, 893 (Fed. Cir. 1985). While this inquiry is analogous to the obviousness inquiry under 35 U.S.C. § 103, it is distinct in that the "objects of comparison are very different," in that obviousness under § 103 "compares claimed subject matter to the prior art," while obviousness-type double patenting "compares claims in an earlier patent to claims in a later patent or application." Geneva Pharms., Inc. v. Glaxosmithkline PLC, 349 F.3d 1373, 1378 n. 1 (Fed. Cir. 2003). In addition, the double patenting inquiry does not include an examination of the motivation to modify the prior art, nor does it involve inquiry into objective criteria suggesting non-obviousness. See id. Instead, double patenting "depends

entirely on what is claimed in an issued patent." In re Bartfeld, 925 F.2d 1450, 1453 (Fed. Cir. 1991) (emphasis in original).

A. Relevant Claims of '188, '675, and '493 Patents

The Court construed the meaning of the asserted claims in its Ruling dated November 13, 2003. Claim 9 of the '188 patent covers the performance of PCR using a thermostable enzyme, in which the heating and cooling steps required by PCR "are automated by a machine that controls temperature levels, transitions from one temperature to another, and the timing of the temperature levels."[2] '188 Patent [PTX 4]. While claim 9 of

---

[2]Claim 9 depends from claim 1, which provides for a "process for amplifying at least one specific DNA sequence contained in a DNA or mixture of nucleic acids, wherein if the DNA is double-stranded, it consists of two separated and complementary strands of equal or unequal length, which process comprises:

(a) contacting the DNA with four different nucleoside triphosphates and two oligonucleotide primers, for each different specific sequence being amplified, wherein each primer is selected to be sufficiently complementary to different strands of each specific sequence to hybridize therewith, such that the extension product synthesized from one primer, when spearated from its complement, can serve as a template for synthesis of the extension product of the other primer, at a temperature which promotes hybridization of each primer to its complementary strand;

(b) contacting each strand, at the same time as of after step (a), with the thermostable enzyme which catalyzes combination of the nucleoside triphosphates to form primer extension products complementary to each strand of DNA;

(c) maintaining the mixture from step (b) at an effective temperature for an effective time to promote the activity of the enzyme, and to synthsize, for each different sequence being amplified, an extension product of each primer which is complementary to each strand, but not so high as to separate each extension prodct from its complementary strand;

the '188 patent thus envisions that the PCR process will be automated by a machine, it does not describe how the process would be automated.

Claim 16 of the '493 Patent covers "[a] thermal cycling system [for performing PCR] comprising a plurality of reaction mixtures and a plurality of reaction chambers, and wherein said heating and cooling system includes a metal block having a plurality of recesses shaped to fit said chambers and a Peltier device." [PTX 8]. Several features of this claim – namely, a metal block with a plurality of recesses and a Peltier device — do not appear in claim 9 of the '188 patent.

Claim 17 of the '675 Patent calls for an apparatus capable of performing PCR comprising, inter alia, a metal heat-conducting

---

(d) heating the mixture from step (c) for an effective time and at an effective temperature to separate the primer extension products from the strands on which they were synthesized to produce single-stranded molecules, but not so high as to denature irreversibly the enzyme;

(e) cooling the mixture from step (d) to an effective temperature to promote hybridization of each primer to each of the single-stranded molecules produced in step (d); and

(f) maintaining the mixture from step (e) at an effective temperature for an effective time to promote the activity of the enzyme and to synthesize, for each different sequence being amplified, and extension product of each primer which is complementary to each strand produced in step (d), but not so high as to separate each extension product from its complementary strand, wherein steps (e) and (f) are conducted simultaneously or sequentially.

Claim 9 provides that the heating and cooling steps (d)-(f) are automated by a machine which controls temperature levels, transitions from one temperature to another, and the timing of temperature levels. See '188 Patent [PTX 4].

block[3] and a Peltier device that provide the means "for heating and cooling said container to or at any of a plurality of temperatures." The metal heat-conducting block must have a reaction well, which may be either a recess machined into the metal block or a plastic container that sits in a recess formed in the block. The claim also covers a computer programmed to produce a subset of sequenced heating, cooling, and/or temperature maintaining steps in accordance with a PCR protocol where the subset can be cycled a user-defined number of times after which a post-cycling temperature step is accessed. Like claim 16 of the '493 patent, this claim includes a metal block with a recess and the use of a Peltier device — features that are not claimed in the '188 patent. In addition, this claim, unlike claim 9 of the '188 patent, requires programming for a post-cycling temperature step.[4]

---

[3]Claim 17 includes "a heat-conducting container for holding a reaction mixture." This Court noted in its claim construction that in the preferred embodiment, the heat exchanger is a metal heat-conducting block, and concluded that "as the parties' respective claim constructions agree to limit the claim to this form, the Court will adopt it as well." Claim Construction of Disputed Terms in U.S. Patents 5,333,675, 5,656,493, and 5,475,610, Nov. 19, 2003 [Doc. # 715] at 6.

[4]The post-cycling temperature step is contained in the following claim language: "wherein said computer means further comprises user-controllable means for arranging said checkpoints in a sequence in which they are to be automatically accessed upon a command from the user, and user-controllable means programmed to produce at least one subset of sequenced checkpoints defining temperatures and times for a selected cycle of thermal

Claim 33 of the '675 patent covers a thermal cycler for performing PCR that is comprised, inter alia, of a metal heat-conducting block, a reaction well, which may be either a recess machined into the metal block or a plastic container that sits in a recess formed in the block, and a computer programmed to define a subset of sequenced heating, cooling, and/or temperature maintaining steps in accordance with a PCR protocol where the subset can be cycled a number of times after which a post-cycling temperature step is accessed. This claim, too, can be distinguished from claim 9 of the '188 patent by its requirements of a metal block with a recess and programming for a post-cycling

---

denaturation of double-stranded DNA, primer-annealing to single-stranded DNA and primer extension by a DNA polymerase, where said subset is less than the total number of checkpoints which will be accessed in sequence, which can be repeated a user-defined number of times before the checkpoint following the last checkpoint in the subset of sequence checkpoints is accessed."

As this claim was construed, this calls for a subset of sequenced heating, cooling, and/or temperature maintaining steps in accordance with a PCR protocol where the subset can be cycled a user-defined number of times after which a post-cycling temperature step is accessed. Claim 9 (depending from claim 1) of the '188 patent provides for the heating, cooling, and temperature maintaining steps of the PCR protocol (see n. 1, steps (d)-(f)), but does not provide for the post-cycling temperature step, which was an innovation of the '675 patent.

MJ argues that in the claim construction, this Court determined that the claim did not require programming for a post-cycling temperature step. This is incorrect. While the Court concluded that "the claim does not impose the function of accessing the checkpoint following the subset on the user controllable means," Claim Construction [Doc. # 715] at 13, the Court found that the "corresponding structure is a computer programmed to execute the recited function," id. at 12.

temperature step.

Claim 45 of the '675 patent includes, inter alia, a metal heat-conducting block with a plurality of recesses, a computer programmed to permit a user to select a subset of sequenced steps in accordance with a PCR protocol, but not a computer programmed to perform a selected cycle of PCR. Like the other machine claims, this too is different from claim 9 of the '188 patent in calling for a metal block (with a plurality of recesses) and requiring programming for a post-cycling temperature step. This claim does not require the computer to be programmed to perform a selected cycle of PCR, only that the computer be programmable for PCR.[5]

B. Obviousness

During the prosecution of the '675 patent, Applera submitted to the PTO a declaration by Dr. John G. Atwood, an instrument engineer employed at Applera. Dr. Atwood stated the following:

> 5. I am familiar with a process known as PCR from the standpoint of an instrument engineer. I participated in the design and development of Perkin-Elmer's System

[5]Unlike claims 17 and 33 of the '675 patent, claim 45 provides that "said computer means further comprises user-controllable means for configuring said temperature cycling profile as a sequence of heating, cooling and temperature maintaining steps which are to be automatically accessed upon a command from the user, and user-controllable means for defining at least one subset of sequenced steps, where said subset is less than the total number of steps which will be accessed in sequence, which can be repeated a user-defined number of times before the step following the last step in the subset or sequenced steps if accessed." (emphasis added).

9600 Thermal Cycler, which performs automated PCR on up to 96 samples at once.

6. I have been asked to consider whether or not, in 1985, an average instrument engineer, using only his ordinary skills and a routine approach, could have put together a system to automate various PCR protocols falling within the following process criteria:

   (1) at least one liquid starting sample of 100-200 microliters;
   (2) for each sample, a separate liquid supply of enzyme solution to be added to the sample in 20-30 discrete increments of a particular volume in the range of from one to a few microliters.
   (3) on the sample, or on all of a plurality of samples, perform the following cycle of operations an adjustable number of times up to at least 30:
      (a) heat to a preselected adjustable high temperature in the range of 80-100° C and hold for a preselected time in the range of 1-10 minutes;
      (b) cool to a preselected adjustable low temperature in the range of 25-30° C;
      (c) add an increment of enzyme; and
      (d) hold the preselected adjustable low temperature for a preselected time in the range of 1-10 minutes.
   (4) after the cycling operation, heat to the preselected high temperature for a preselected time.

I have been asked to state my opinion on the matter and to explain that opinion.

7. My view is that an average instrument engineer could have done this job in a very routine way. It is a job I would have confidently assigned to an instrument engineer having a basic knowledge of available components and a feel for how to go about finding the appropriate components, such as by calling manufacturers listed in catalogs and standard references.

8. I will explain my opinion in terms of a very straightforward approach using commercially available and well-known components:
   (1) a personal computer with an input/output card,

(2) circulating water baths equipped with temperature controllers,
(3) on-off solenoid valves, and
(4) motor driven pipettes driven by stepper motors.

> All one had to do mechanically was to adapt a container to support a sample tube in contact with circulating water, hook up two water baths to circulate water through the container and put solenoid valves in the lines to and from each bath, respectively; For rapid temperature cycling the volume of the container should be small in relation to the volume of the water baths and the flow rate from the baths should be sufficient to exchange the water in the container in about one minute. A pipette or motor driven syringe pump would be mounted so as to deliver liquid to the sample tube. Programming the computer to control the valves and the pipette motor in on-off fashion during each cycle, and to repeat the cycle up to 30 times, would have been routine. So would have been controlling the valves to perform the final heating operation. To handle multiple protocols, the engineer would write a program to have the user specify the times, temperatures and number of cycles. To handle multiple samples, one would simply add a pipette or syringe pump for each sample tube. The stepper motors would be wired in parallel, requiring no change in programming or in the water system. The rate of heating and cooling could be made adjustable in a routine fashion, namely, by oversizing the system and including a hand-operated valve in the water line from each bath to adjust the flow rate.

Declaration of John Girdner Atwood, June 3, 1991 [DTX 376].

Deposition transcripts from the engineers listed as inventors of the '675 and '493 patents similarly provide that once the generic requirements for automated PCR were known, the building of a thermal cycler would have presented "ordinary engineering challenges." Deposition Transcript of Larry J. Johnson, January 21, 2000 [Doc. # 1013, Ex. 7]; see also Deposition Transcript of Richard Leath, February 3, 2000 [Doc. # 1013, Ex. 8] (agreeing that the commercially available components

in the time frame 1984 through 1986 could have been combined by an engineer using routine skill to build a machine to automate the PCR process).

MJ argues that because the Atwood Declaration and engineer declarations state that building a thermal cycler would be a routine matter for an average instrument engineer once the PCR process was known, the asserted claims of the '675 and '493 patents are obvious in view of claim 9 of the '188 patent. Neither the Atwood Declaration nor the engineer depositions, however, address the specific claims of the '675, '493, and '188 patents. These omissions are fatal to defendants' double patenting defense, because there are important distinctions between the hypothetical PCR protocol addressed in the Atwood Declaration and what is claimed in the '188 patent, and between the machines that Dr. Atwood described as requiring only ordinary skills and the machines claimed in the '675 and '493 patents. The hypothetical PCR protocol Dr. Atwood addressed, for example, includes a post-cycling temperature step, which is not included in claim 9 of the '188 patent. Further, while Dr. Atwood describes in great detail the commercially available components that could have been used to build a machine for automating the PCR process, he does not suggest that an average instrument engineer would have conceived of using a metal block with at least one recess, features that appear in all of the asserted

claims of the '493 and '675 patents, or a Peltier device, which is included in claim 16 of the '493 patent and claim 17 of the '675 patent.[6] Providing an automated means for heating and cooling and programming for PCR could take many forms, and that some generic thermal cycling machine would have been obvious to those skilled in the art does not alone prove that the actual machines claimed in the '493 and '675 patents were obvious in view of claim 9 of the '188 patent.[7] There is no evidence before

---

[6]Claim 45 of the '675 patent is further distinguishable because it does not require that the apparatus be programmed with specific PCR protocols, only that the device is programmable for PCR. Contrary to defendants' characterization, plaintiffs' counsel's statements that "the claims in which Dr. Mullis is inventor have PCR in them" Trial Tr. [Doc. # 1099] at 273, does not constitute an admission that claim 45 requires programming for the performance of PCR.

[7]In support of its argument that the use of a Peltier device was not an inventive aspect of the claim, MJ points to Dr. Mullis' deposition testimony that at the time he conceived the idea, he "wouldn't have even considered [the use of a Peltier device] an invention." Deposition Transcript of Kary Mullis, July 26, 2000 [Doc. # 1013, Ex. 11] at 221. This testimony is insufficient to meet MJ's burden. Dr. Mullis continued, "Not being a patent attorney and not knowing that you can patent all kinds of cool things, to me an invention was something was you say, 'Aha, I have got it,' and you run around the lab and tell everybody, and it's a new and exciting thing that you come up with. It's not a development in the course of the normal train of events doing science. I think I have learned over the years that my concept of an invention then and my concept of an invention now are quite different, and that I invent things all the time that I don't really think of as inventions." Id.

MJ also references deposition testimony of Ronald Fish, one of the patent attorneys who prosecuted the patents in suit, who noted that an existing Techne machine could be programmed for PCR. This prior art is not relevant to the double patenting analysis, which looks only to what was claimed in an earlier

the Court from one skilled in the art that opines that any of the asserted claims would have been obvious in view of claim 9 of the '188 patent.

MJ also argues that the '188 patent specifications disclose the metal block, Peltier device, and computer control features of the asserted claims of the '493 and '675 patents, as it describes the features of a "preferred machine," and incorporates by reference the disclosure of copending U.S. patent application Ser. No. 899,061 filed Aug. 22, 1986. See '188 Patent [PTX 4] at Col. 14, l. 1-25. These patent disclosures are not relevant to the double patenting analysis, because "the law of double patenting is concerned only with what patents claim." General Foods Corp. v. Studiengesellschaft Kohle, 972 F.2d 1272, 1275 (Fed. Cir. 1992). The disclosure, moreover, describes a structure, not a process as in claim 9 of the '188 patent, and therefore is of no assistance in determining whether a later patent claim is obvious. Compare In re Vogel, 422 F.2d 438, 442 (C.C.P.A. 1970) (permitting use of patent disclosure to aid obviousness double patenting determination where the disclosure is a "tangible embodiment within the claim"). Rather, the disclosure here refers simply to another claimed invention (the application referenced led to the issuance of the '675 patent), and it is well established that a patent disclosure may not be

---

patent.

used as "prior art." Id. at 441. The "preferred machine" referenced in the '188 specifications cannot be deemed statutory prior art in any event, because the patent applications were copending and because Dr. Mullis was the inventor of both.[8] See General Foods Corp., 972 F.2d at 1277.

Finally, defendants conceive a paradox, arguing that Applera's contention that the asserted claims of the '675 patent are not obvious over claim 9 because they require programming for a post-cycling temperature step, is inconsistent with Applera's contention that Dr. Mullis is the sole inventor of these '675 claims. According to defendants, if programming for a post-cycling temperature step is in fact a feature which patentably distinguishes the '675 patent claims from claim 9 of the '188 patent, then it necessarily follows that Dr. Mullis cannot be the sole inventor, because he testified at trial that he never programmed a computer for the post-cycling temperature step. The Court disagrees, and sees no inconsistency. The PCR process claimed in the '188 patent did not include a post-cycling

[8]Dr. Mullis testified that he conceived of automating the PCR process using a Peltier device, a metal block, and a microprocessor, and asked the Cetus instrument group to build such a device for him, which became known as "Son of Cycle". See Trial Tr. [Doc. # 1100] at 178:23-179:16. Trial testimony also showed that the time Dr. Mullis conceived of this idea, there were no other instruments automating the PCR process. See Trial Tr. [Doc. # 1105] at 877:5-10. The jury found that defendants failed to prove by clear and convincing evidence that Dr. Mullis was not the sole inventor of the asserted claims of the '493 and '675 patents. See Jury Verdict [Doc. # 1083] at 4-5.

temperature step; the asserted claims of the '675 patent undisputedly include such a step. Dr. Mullis testified that he "wrote down the steps like in English saying here is what you're supposed to do, and the people downstairs . . . actually write the [code]," Trial Tr. at 249:13-19, which supports the conclusion that he was the sole inventor of the asserted claims, because he had the idea for the additional step. In this context, whether or not the writing of computer code is itself inventive is irrelevant to the obviousness question before the Court. The post-cycling temperature step distinguishes the asserted claims of the '675 patent from claim 9 of the '188 patent, and defendants have presented no evidence from one skilled in the art that this additional step would be an obvious variant of claim 9.

Based on the foregoing, the Court concludes that defendants failed to prove by clear and convincing evidence the existence of double patenting.

IT IS SO ORDERED.

/s/

_____

Janet Bond Arterton, U.S.D.J.

Dated at New Haven, Connecticut, this 30th day of March, 2005.