United States Court of Appeals for the Federal Circuit

2008-1029, -1030, -1031, -1032, -1059

COHESIVE TECHNOLOGIES, INC.,

Plaintiff-Appellant,

v.

WATERS CORPORATION,

Defendant-Cross Appellant.

Robert H. Stier, Jr., Pierce Atwood LLP, of Portland, Maine, argued for plaintiff-appellant. With him on the brief were Michael J. Sullivan and Sean L. Sweeney.

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Appealed from: United States District Court for the District of Massachusetts

Judge Douglas P. Woodlock

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COHESIVE TECHNOLOGIES, INC.,

Plaintiff-Appellant,

v.

WATERS CORPORATION,

Defendant-Cross Appellant.

Appeal from the United States District Court for the District of Massachusetts in case nos. 98-CV-12308, 99-CV-11528, and 01-CV-12307, Judge Douglas P. Woodlock.

DECIDED: October 7, 2008

Before MAYER, LINN, and PROST, Circuit Judges.

Opinion for the court filed by Circuit Judge LINN. Dissenting opinion filed by Circuit Judge MAYER.

LINN, Circuit Judge.

This is a patent infringement case. Cohesive Technologies, Inc. ("Cohesive") brought three related actions accusing Waters Corporation ("Waters") of infringing U.S. Patent No. 5,772,874 (the "'874 patent") and U.S. Patent No. 5,919,368 (the "'368 patent"). In the first action, No. 98-CV-12308, Cohesive accused Waters's 30 μm Oasis high-performance liquid chromatography ("HPLC") columns (the "30 μm columns") of infringing the '874 patent. See Cohesive Techs., Inc. v. Waters Corp., 526 F. Supp. 2d 84, 88 (D. Mass. 2007). In the second action, No. 99-CV-11528, Cohesive accused the same 30 μm columns of infringing the '368 patent. See id. In the third action, No. 01-

CV-12307, Cohesive accused Waters's 25 µm Oasis HPLC columns (the "25 µm columns") of infringing both patents. See id.

A jury in the first action found that the '874 patent was not invalid, and that the 30 µm columns infringed the '874 patent. See id. The district court then held a combined bench trial and hearing on damages, willful infringement, and inequitable conduct in the first action, and on preliminary injunction and summary judgment motions in the second and third actions. The district court entered judgment in favor of Cohesive in the first action, granted Cohesive's motion for summary judgment of infringement and no invalidity in the second action, and awarded damages. Id. at 126. However, in the third action, the district court granted Waters's motion for summary judgment of noninfringement, concluding that the 25 µm products did not infringe either patent. Id. Both parties appeal numerous aspects of the judgment.

As to the 30 µm products, we conclude that the district court correctly construed the term "rigid" and properly denied Waters's motion for judgment of noninfringement as a matter of law. We further conclude that the district court committed no clear error in concluding that Waters failed to prove the deceptive intent necessary to sustain its claim of inequitable conduct. However, we agree with Waters that the district court was wrong to enter judgment as a matter of law on anticipation without submitting the issue to the jury.

As to the 25 µm products, we disagree with the district court's construction of "greater than about 30 µm." Under the correct construction, Waters was not entitled to summary judgment of no literal infringement. The district court was, however, correct to

grant Waters's motion for summary judgment of no infringement under the doctrine of equivalents, though not for the reasons that the district court articulated.

As to damages, because the district court incorrectly considered the 25 µm product as an acceptable noninfringing substitute, and because it is unclear whether the other available product, standing alone, would have been an acceptable substitute, we vacate the district court's judgment that Cohesive was not entitled to lost profits and remand for reconsideration by the district court in the first instance. We find no clear error in the district court's conclusion that Waters's infringement was not willful. Finally, we decline Cohesive's request to assign this matter to a different district court judge on remand. Accordingly, we affirm-in-part, reverse-in-part, vacate-in-part, and remand.

I. BACKGROUND

The '874 and '368 patents both relate to HPLC. HPLC is a process for separating, identifying, and measuring compounds contained in a liquid. Pharmaceutical companies often use HPLC in drug testing to separate absorbed compounds from blood. In HPLC, a liquid containing the compounds to be measured is passed under pressure through a packed column of chromatographically active particles. See '874 patent col.1 ll.24-28. Because the different molecular components in the liquid have different affinities for the particles in the column, each component is extracted from the liquid at a different rate and, therefore, at a different location along the column. See id. col.1 ll.28-32. The effectiveness of HPLC at separating molecules from the liquid depends on several variables, including the size and structure of the particles in the column. See id. col.2 ll.3-19.

The '368 patent issued from a divisional application of the application that resulted in the '874 patent, and the patents share the same specification. Cohesive

asserted claims 1, 3, 7, 9, 15, 16, and 20 of the '874 patent and claims 1, 3, and 8 of the '368 patent. See Cohesive, 526 F. Supp. 2d at 107. Claim 1 of the '874 patent recites:

> Chromatography apparatus comprising, in combination,
>
> > a chromatographic body formed as a substantially uniformly distributed multiplicity of rigid, solid, porous particles with chromatographically active surfaces, said particles having average diameters of greater than about 30 μm, the interstitial volume between said particles being not less than about 45% of the total volume of said column; and
> >
> > means for loading said surfaces with at least one solute that is reactive with said surfaces, by flowing a liquid mixture containing said solute through said body at a velocity sufficient to induce flow of said mixture within at least a substantial portion of said interstitial volume at a reduced velocity greater than about 5,000.

'874 patent col.20 ll.20-34. Each of the asserted claims requires essentially the same two key limitations at issue in this appeal: particles that are "rigid" and have average diameters "greater than about 30 μm." See id. col.20 ll.38-42, 54-56, 60-65 (claims 3, 7, and 9 depending from claim 1); id. col.21 l.36-col.22 l.8 (claim 15 requiring "rigid solid particles" having "substantially uniform mean diameters of not less than about 30 μm"); id. col.22 ll.9-21 (claim 16 requiring "rigid, solid, porous particles" with "substantially uniform average diameters in the range between about 30 to about 500 μm"); id. col.22 ll.33-35 (claim 20 depending from claim 16); '368 patent col.20 ll.14-28 (claim 1 requiring step of "packing . . . rigid, solid, porous particles" with "average diameters of not less than about 30 μm"); id. col.20 ll.32-36, 53-56 (claims 3 and 8 depending from claim 1).[1]

[1] Although "greater than" and "between" 30 μm and a larger number would not encompass exactly 30 μm, while "not less than" 30 μm would, this distinction is not relevant for our analysis in this case.

Cohesive brought its first infringement action against Waters in 1998, alleging that the 30 µm columns infringed the '874 patent. In 1999, while the first action was pending, the '368 patent issued. Cohesive then filed a second infringement action against Waters, asserting that use of the same 30 µm columns infringed the method claims of the '368 patent.

In 2001, the district court held a sixteen-day jury trial in the first action. During trial, Waters alleged and presented evidence that the claims of the '874 patent were anticipated by seven separate prior art references. Waters also alleged that the claims of the '874 patent were obvious, both in light of each reference independently, and in light of various combinations of the references. Over Waters's objection, the district court chose not to submit anticipation to the jury, because Waters had alleged obviousness, and the district court "[thought] of anticipation as being a subset of obviousness." J.A. 5710. Accordingly, the district court sua sponte entered a directed verdict in favor of Cohesive, finding that the '874 patent was not anticipated. Cohesive, 526 F. Supp. 2d at 89.

The jury returned a verdict finding that the 30 µm columns infringed the '874 patent and that the '874 patent was not obvious. By the time of the verdict, Waters had stopped selling the 30 µm columns, and instead was selling a replacement product with smaller particles—the 25 µm columns. Cohesive then filed its third infringement action, alleging that the replacement 25 µm columns infringed both the '874 and the '368 patents. Cohesive moved for a preliminary injunction against the 25 µm columns.

The district court held a combined bench trial and hearing in 2002. At that proceeding, the court heard evidence and argument on the issues of inequitable

conduct, willful infringement, and damages in the first case. Id. at 88. The district court also considered the parties' cross-motions for summary judgment in the second case, concerning whether those same 30 μm columns infringed the '368 patent. Id. at 89. Additionally, at the request of the district court, Cohesive presented its motion for a preliminary injunction in the third case (concerning the replacement 25 μm columns) in the form of a motion for summary judgment, and Waters made an oral cross-motion for summary judgment of noninfringement at the hearing.

Five years later, the district court entered a memorandum and order disposing of all issues in all three cases. In the first case, concerning infringement of the '874 patent by the 30 μm columns, the district court: (1) denied Waters's post-trial motions for judgment as a matter of law on infringement and invalidity, id. at 95; (2) found that Waters had failed to meet its burden to prove inequitable conduct, id. at 103; and (3) found that Waters's infringement was not willful, id. at 106-07. In the second case, concerning infringement of the '368 patent by the 30 μm columns, on cross-motions for summary judgment, the district court: (1) granted Cohesive's motion for summary judgment of direct and indirect infringement, id. at 112; and (2) granted Cohesive's motion for summary judgment of no invalidity, id. at 113. In the third case, concerning infringement of both patents by the 25 μm columns, the district court granted summary judgment of noninfringement in favor of Waters, finding that the 25 μm columns did not meet, either literally or by equivalents, the claim limitations requiring particle size greater than "about 30 μm." Id. at 116. Finally, as to damages, the district court held that Cohesive was not entitled to lost profits as a matter of law, id. at 121, and ordered payment of a reasonable royalty on sales of the 30 μm columns, id. at 125.

Cohesive timely appealed on the issues of: (1) claim construction of the term "about 30 μm"; (2) summary judgment of noninfringement by the 25 μm columns; (3) lost profits; (4) willful infringement; and (5) enhanced damages. Cohesive also requested that the case be assigned to a different district judge on remand. Waters timely cross-appealed on the issues of: (1) claim construction of the term "rigid"; (2) denial of judgment as a matter of law of noninfringement by the 30 μm columns; (3) grant of judgment as a matter of law on anticipation; and (4) inequitable conduct. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).

II. DISCUSSION

A. The 30 μm Columns

We first address whether the district court properly concluded that the '874 patent was infringed by the 30 μm columns, not invalid, and not unenforceable.

1. Claim Construction

Waters challenges the district court's construction of the term "rigid," which is common to all asserted claims. The district court construed "rigid" to mean "an object's capacity to maintain substantially zero changes in density and volume under packing pressure of at least about 5000 psi and as a consequence substantially to resist plastic deformation under such pressure." Cohesive, 526 F. Supp. 2d at 89. The district court construed "rigid" so that it did not "exclude polymeric particles (as opposed to the monomeric particles referred to in the preferred embodiment of the '874 patent)." Id. Waters argues that the failure to exclude polymeric particles in the construction of "rigid" was error, because, during prosecution, Cohesive disclaimed polymeric particles as not being rigid.

Claim construction is an issue of law, Markman v. Westview Instruments, Inc., 52 F.3d 967, 970-71 (Fed. Cir. 1995) (en banc), that we review de novo, Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1456 (Fed. Cir. 1998) (en banc). We determine the ordinary and customary meaning of undefined claim terms as understood by a person of ordinary skill in the art at the time of the invention, using the methodology in Phillips v. AWH Corp., 415 F.3d 1303, 1312-19 (Fed. Cir. 2005) (en banc). "[T]he court looks to those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean. Those sources include the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art." Id. at 1314 (internal quotation marks and citations omitted).

Here, there is no argument that the ordinary meaning of the word "rigid" itself requires that a particle be monomeric, rather than polymeric. Likewise, although the embodiments of the invention described in the specification all disclose only monomeric particles, see, e.g., '874 patent col.13 ll.29-32, col.14 l.58, col.18, l.21, those embodiments cannot limit the otherwise broad claim term "rigid." See Phillips, 415 F.3d at 1323 ("[A]lthough the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments.").

Waters argues, however, that Cohesive disclaimed polymeric particles during prosecution. The examiner rejected the claims of the '874 patent as anticipated by or obvious over U.S. Patent No. 5,019,270, issued to Noubar B. Afeyan et al. ("Afeyan").

In response, Cohesive argued that, unlike Afeyan, the claims required "truly rigid" particles. J.A. 418. Additionally, Cohesive submitted to the examiner the declaration of chromatography expert George Guiochon, pursuant to 35 C.F.R. § 1.132. In his declaration, Guiochon distinguished between the particles in the claimed invention and the particles described in Afeyan:

> While Afeyan et al mention that they desire their particles to be rigid solids, such comment can be read best in the light of their teachings . . . that mention only polymeric materials such as divinylbenzene and the like. Such polymeric material cannot be expected to maintain the requisite rigidity to withstand the pressure required to obtain a reduced velocity of 5000 or higher through a chromatographic column with particles of the diameter disclosed by Afeyan et al, so cannot be considered to be a teaching of rigid solid particles within the meaning of the claims . . . .

J.A. 430. Waters contends that the Guiochon declaration resulted in a disclaimer of "polymeric material" as not "rigid" within the meaning of the claims.

"[A] patentee may limit the meaning of a claim term by making a clear and unmistakable disavowal of scope during prosecution." Computer Docking Station Corp. v. Dell, Inc., 519 F.3d 1366, 1374 (Fed. Cir. 2008) (quoting Purdue Pharma L.P. v. Endo Pharms., Inc., 438 F.3d 1123, 1136 (Fed. Cir. 2006)). In this case, the Guiochon declaration does not distinguish the Afeyan particles because they are polymeric; instead, it distinguishes the particular polymeric materials taught in Afeyan—"divinylbenzene and the like"—because "[s]uch polymeric materials" are not sufficiently rigid when exposed to the relevant level of pressure. The Guiochon declaration may, therefore, be a clear and unmistakable disavowal of the particular particles used in Afeyan, but it is not a disavowal of all polymeric particles.

Waters argues further that, even if the prosecution history cannot be read to have disclaimed all polymeric particles, it nonetheless disclaimed the particular type of

polymeric particles used in the accused 30 μm columns. We disagree. The polymeric particles disclaimed in the Guiochon declaration were "divinylbenzene and the like." J.A. 430. The Afeyan patent that the Guiochon declaration distinguishes describes the composition of the particles as follows:

> The particles are fabricated from polymers such as, for example, styrene cross-linked with divinylbenzene, or various related copolymers including such materials as p-bromostyrene, p-styryldiphenylphosphine, p-amino sytrene, vinyl chlorides, and various acrylates and methacrylates, preferably designed to be heavily cross-linked and derivatizable, e.g., copolymerized with a glycidyl moiety or ethylenedimethacrylate.

Afeyan col.16 l.67-col.17 l.7. By contrast, the particles in the 30 μm columns are copolymers of divinylbenzene and n-vinylpyrrolidone. A copolymer of divinylbenzene and n-vinylpyrrolidone is not one of the polymers described in Afeyan and was not specifically disclaimed in the Guiochon declaration.

Waters argues that the specific disclaimer of divinylbenzene should suffice to disclaim the polymers in the particles of the 30 μm columns, because those particles are "made from 80% divinylbenzene." Br. of Defendant-Cross Appellant Waters Corp. at 42. But Waters ignores the fact that a divinylbenzene molecule alone and a copolymer containing 80% divinylbenzene are different chemical compounds, with different properties—including different rigidities. By analogy, if a patentee disclaims "flammable substances like hydrogen" during prosecution, the patentee has not disclaimed the nonflammable compound H_2O, just because it is two-thirds hydrogen.

In sum, we agree with the district court that the proper construction of "rigid" in the asserted claims does not require that the particles be monomeric. We affirm the district court's construction of "rigid" as "an object's capacity to maintain substantially

zero changes in density and volume under packing pressure of at least about 5000 psi and as a consequence substantially to resist plastic deformation under such pressure."

2. Infringement

Waters argues that the district court erred by denying it judgment as a matter of law, because the evidence was insufficient to prove infringement even under the district court's claim construction. "The grant or denial of a motion for judgment as a matter of law is a procedural issue not unique to patent law, reviewed under the law of the regional circuit in which the appeal from the district court would usually lie." Summit Tech., Inc. v. Nidek Co., 363 F.3d 1219, 1223 (Fed. Cir. 2004). The First Circuit reviews the district court's grant or denial of judgment as a matter of law de novo. Espada v. Lugo, 312 F.3d 1, 2 (1st Cir. 2002); Larch v. Mansfield Mun. Elec. Dept., 272 F.3d 63, 67 (1st Cir. 2001). We therefore consider whether the evidence, when viewed in the light most favorable to Cohesive, would permit a reasonable jury to find in favor of Cohesive on any permissible claim or theory. Larch, 272 F.3d at 67.

Waters argues that the evidence at trial was insufficient to permit a reasonable jury to conclude that the particles of the 30 μm columns were rigid. The district court's construction of "rigid" required that the particles: (1) "maintain substantially zero changes in density and volume under packing pressure of at least about 5000 psi"; and (2) "substantially resist plastic deformation under such pressure." At trial, Cohesive's expert gave his understanding of the terms "substantially zero changes in density and volume," and "substantially resist plastic deformation." He further testified that he had tested the particles of the 30 μm columns by packing them at 5000 psi, that he observed "substantially zero changes in density and volume," and that the particles did not "exhibit any plastic deformation." J.A. 1463-64. Thus, in response to the question, "If

rigid means an object's capacity to maintain substantially zero changes in density and volume, under a packing pressure of at least about 5,000 psi, and as a consequence, substantially to resist plastic deformation under such pressure, do the Waters' particles qualify as rigid?," Cohesive's expert answered, "Yes, they do." J.A. 1462. This is sufficient evidence to permit a reasonable jury to conclude that the 30 μm columns were rigid. The district court therefore properly denied Waters's motion for judgment as a matter of law of noninfringement.

3. Invalidity

Waters argues that the district court erred by granting a directed verdict—i.e., judgment as a matter of law—for Cohesive on the issue of anticipation, rather than allow the jury to decide the issue. "In reviewing the district court's ruling, we apply the same standards as the district court, meaning that we examine the evidence and all fair inferences in the light most favorable to [Waters] and may not consider the credibility of witnesses, resolve conflicts in testimony, or evaluate the weight of the evidence." Guilloty Perez v. Pierluisi, 339 F.3d 43, 50 (1st Cir. 2003) (internal quotation marks and citations omitted). If a reasonable jury could have found that any of the asserted references anticipated the patent, then judgment as a matter of law was improper. See Wilson v. Moreau, 492 F.3d 50, 52 (1st Cir. 2007); see also Guilloty Perez, 399 F.3d at 50 ("If we conclude that 'fair-minded persons could draw different inferences from the evidence presented at trial, the matter is for the jury,' and judgment as a matter of law was improperly granted." (quoting Espada, 312 F.3d at 2)).

The circumstances that led to the grant of judgment as a matter of law in this case were unusual. At a charge conference near the end of trial, the district court indicated that it did not intend to charge the jury on anticipation. Specifically, after

reviewing Waters's evidence and argument on anticipation and obviousness, the district court concluded that "the contentions that the defendant is making [are] best captured by obviousness," rather than anticipation. J.A. 2654. The district court commented that, "[u]nder a strict reading, [it did not] see the proof of anticipation in any of the prior art publications," that Waters's anticipation case was "iffy," and that its "gut response is that none of [the prior art references] are winners." J.A. 5680, 5704, 5720. Moreover, the district court commented that declining to charge on anticipation would not cause "any real harm to the defendant," and would not "make very much difference because it comes in in obviousness" J.A. 5680, 5703. The district court expressly stated that it did not understand, as a matter of "strategic judgment," why a defendant "would want [a] charge on anticipation when they get one on obviousness." J.A. 5719, 5717. The district court concluded that it could not "find here that the requirements of anticipation have been met" in the submitted prior art references, and it therefore directed a verdict of no anticipation. J.A. 2654.

The district court erred by granting judgment as a matter of law on the issue of anticipation before the jury was allowed to consider the claim. The district court did not make a finding that no reasonable jury could conclude that the asserted references anticipated. Rather, the district court itself characterized the anticipation case as "iffy." An "iffy" anticipation case, however, does not foreclose a favorable verdict. See Fed. R. Civ. P. 50 (requiring that the court find "that a reasonable jury would not have a legally sufficient evidentiary basis" to find for a party before granting judgment as a matter of law).

Moreover, the district court was wrong to conclude that granting judgment as a matter of law on anticipation would not harm Waters, simply because the jury had the opportunity to consider the same references for purposes of obviousness. Despite the often quoted maxim that anticipation is the "epitome of obviousness," In re Kalm, 378 F.2d 959, 962 (CCPA 1967), novelty under 35 U.S.C. § 102 and nonobviousness under 35 U.S.C. § 103 are separate conditions of patentability and therefore separate defenses available in an infringement action. See 35 U.S.C. § 282 (2000); Jones v. Hardy, 727 F.2d 1524, 1529 (Fed. Cir. 1984) ("[T]hough anticipation is the epitome of obviousness, [they] are separate and distinct concepts."); see also Mendenhall v. Cedarapids, Inc., 5 F.3d 1557, 1563 (Fed. Cir. 1993) (holding that verdict of nonobviousness was not inconsistent with verdict of anticipation by prior public use, despite "legal homily" that anticipation is the epitome of obviousness); In re Meyer, 599 F.2d 1026, 1031 (CCPA 1979) (holding that rejection under § 102 was new ground following previous rejection under § 103, despite maxim that "anticipation is the epitome of obviousness").

While it is commonly understood that prior art references that anticipate a claim will usually render that claim obvious, it is not necessarily true that a verdict of nonobviousness forecloses anticipation. The tests for anticipation and obviousness are different. See, e.g., Duro-Last, Inc. v. Custom Seal, Inc., 321 F.3d 1098, 1107-08 (Fed. Cir. 2003) ("Succinctly put, the various unenforceability and invalidity defenses that may be raised by a defendant—inequitable conduct, the several forms of anticipation and loss of right under § 102, and obviousness under § 103—require different elements of proof.") Obviousness can be proven by combining existing prior art references, while

anticipation requires all elements of a claim to be disclosed within a single reference. Compare MEHL/Biophile Int'l Corp. v. Milgraum, 192 F.3d 1362, 1365 (Fed. Cir. 1999) ("To anticipate, a single reference must teach every limitation of the claimed invention."), with Scripps Clinic & Research Found. v. Genentech, Inc., 927 F.2d 1565, 1577 (Fed. Cir. 1991) ("If it is necessary to reach beyond the boundaries of a single reference to provide missing disclosure of the claimed invention, the proper ground is not § 102 anticipation, but § 103 obviousness."). Moreover, obviousness requires analysis of secondary considerations of nonobviousness, while secondary considerations are not an element of a claim of anticipation. Compare King Instrument Corp. v. Otari Corp., 767 F.2d 853, 857 (Fed. Cir. 1985) ("In a § 103 obviousness analysis, Graham [v. John Deere Co., 383 U.S. 1 (1966)] requires that the trier assess certain underlying facts: (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) the so-called 'secondary considerations.'"), with Hakim v. Cannon Avent Group, PLC, 479 F.3d 1313, 1319 (Fed. Cir. 2007) ("'Anticipation' means that the claimed invention was previously known, and that all of the elements and limitations of the claim are described in a single prior art reference."). And although anticipation can be proven inherently, proof of inherent anticipation is not the same as proof of obviousness. See Perricone v. Medicis Pharm. Corp., 432 F.3d 1368, 1375 (Fed. Cir. 2005) ("[A] prior art reference without express reference to a claim limitation may nonetheless anticipate by inherency."); Trintec Indus., Inc. v. Top-U.S.A. Corp., 295 F.3d 1292, 1296 (Fed. Cir. 2002) ("[O]bviousness is not inherent anticipation."). Thus,

"it does not follow that every technically anticipated invention would also have been obvious." In re Fracalossi, 681 F.2d 792, 796 (CCPA 1982) (Miller, J., concurring).[2]

A court cannot refuse to submit the issue of anticipation to the jury simply because the accused infringer has also asserted an obviousness defense. It is for the litigants—not the court—to make the strategic decision as to whether to assert one, both, or neither of these defenses in a jury trial. An accused infringer that introduces a prior art reference and makes a non-frivolous argument that "each and every limitation of a claim is found, expressly or inherently, in [that] single prior art reference" generally

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[2] The dissent claims categorically that "every anticipated claim is obvious." Post at 3. But this is not correct. Consider, for example, a claim directed toward a particular alloy of metal. The claimed metal alloy may have all the hallmarks of a nonobvious invention—there was a long felt but resolved need for an alloy with the properties of the claimed alloy, others may have tried and failed to produce such an alloy, and, once disclosed, the claimed alloy may have received high praise and seen commercial success. Nevertheless, there may be a centuries-old alchemy textbook that, while not describing any metal alloys, describes a method that, if practiced precisely, actually produces the claimed alloy. While the prior art alchemy textbook inherently anticipates the claim under § 102, the claim may not be said to be obvious under § 103.

This is precisely why our precedent has rejected reliance on the "legal homily" that "anticipation is the epitome of obviousness." Mendenhall, 5 F.3d at 1563. We have expressly upheld a jury verdict of anticipation under § 102(b), even when the same jury found the patent nonobvious under § 103. Id. Though the dissent argues that a "long line of precedent" supports its argument that every anticipated claim is obvious, not a single one of the cases it cites actually holds that the "epitome" maxim precludes a jury from finding a patent invalid under § 102, simply because it is nonobvious under § 103. See Johns Hopkins Univ. v. Cellpro, Inc., 152 F.3d 1342, 1357 n.21 (Fed. Cir. 1998) (remarking in footnote that trial court did not err in allowing parties to present argument on anticipation during trial on obviousness); Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 1548 (Fed. Cir. 1983) (prefacing quoted discussion of relationship between anticipation and obviousness with "it is never necessary to so hold"); Fracalossi, 6 F.2d at 794 (addressing whether specific anticipation rejection was sufficient evidentiary support for obviousness rejection); In re Pearson, 494 F.2d 1399, 1402 (CCPA 1974) (affirming § 103 rejection when § 102 rejection would also have been appropriate); In re Kalm, 378 F.2d 959, 963 (CCPA 1967) (reversing anticipation rejection). We cannot conclude—as the dissent's reasoning implies—that the novelty requirement of § 102 is mere surplussage, subsumed by the nonobviousness requirement of § 103.

is entitled to have anticipation decided by the finder of fact. See Planet Bingo, LLC v. GameTech Int'l, Inc., 472 F.3d 1338, 1346 (Fed. Cir. 2006). That is precisely what Waters did in this case. We therefore reverse the district court's grant of judgment as a matter of law on the issue of anticipation, and remand for further proceedings consistent with this opinion.

4. Inequitable Conduct

Waters argues that the district court clearly erred by failing to find the deceptive intent necessary to sustain a finding of inequitable conduct and erroneously applied a "but for" test in determining materiality. "We review the district court's findings on the threshold issues of materiality and intent for clear error. . . . We review the ultimate decision regarding inequitable conduct for abuse of discretion." Cargill, Inc. v. Canbra Foods, Ltd., 476 F.3d 1359, 1364-65 (Fed. Cir. 2007).

Waters argued to the district court that Cohesive committed inequitable conduct by submitting the Guiochon declaration but failing to disclose to the United States Patent and Trademark Office (the "Patent Office") that Guiochon did not believe that the invention generated "turbulent flow" as distinguished from "laminar" or "smooth" flow. Cohesive, 526 F. Supp. 2d at 95 & n.2. Cohesive admitted that its inventors believed that the flow generated by the invention of the '874 and '368 patents was best characterized as "turbulent" and that Guiochon disagreed. Id. at 99. However, Cohesive argued that its prosecuting attorney did not believe this distinction to be material, because the term "turbulent flow" does not appear in any of the claims of either patent and is not defined in the specification. Id. The district court "credit[ed] Cohesive's testimony that it did not believe Guiochon's definitional distinction was

material to the ultimate conclusion of his declaration" and accordingly found no intent to deceive the Patent Office. Id.

"With regard to the deceptive intent prong [of inequitable conduct], we have emphasized that 'materiality does not presume intent, which is a separate and essential component of inequitable conduct.'" Star Scientific, Inc. v. R.J. Reynolds Tobacco Co., 537 F.3d 1357, 1366 (Fed. Cir. 2008) (quoting GFI, Inc. v. Franklin Corp., 265 F.3d 1268, 1274 (Fed. Cir. 2001)). To prove the intent prong of inequitable conduct, "the accused infringer must prove by clear and convincing evidence that the material information was withheld with the specific intent to deceive the [Patent Office]." Id.

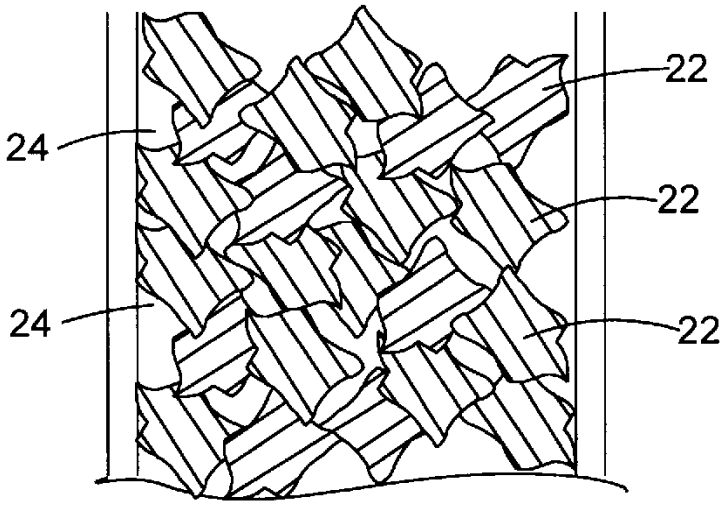
Waters has cited no independent evidence of specific intent to deceive. Instead, it argues that Cohesive's failure to disclose Guiochon's belief that the flow generated by the claimed invention was not properly characterized as "turbulent" "can have been nothing other than intentional." Reply Br. of Defendant-Cross Appellant Waters Corp. at 20; see also Br. of Defendant-Cross Appellant Waters Corp. at 75. But the district court expressly credited the testimony of the prosecuting attorney and Guiochon that they believed the distinction was not material, and concluded that there was no "clear and convincing evidence that Cohesive's omission constituted intentional deceit." Cohesive, 526 F. Supp. 2d at 100. Waters has offered no reason for us to disturb these findings.

We therefore conclude that the district court did not clearly err in its determination that Waters had failed to meet its burden of establishing inequitable conduct. See, e.g., Star Scientific, 537 F.3d at 1365.

B. The 25 μm Columns

We turn next to Cohesive's appeal of the grant of summary judgment of noninfringement by the 25 μm columns.

Preliminarily, we note that the name "25 μm columns" is somewhat deceiving. Apart from the size of the particles that make up the column, the 25 μm columns are identical to the infringing 30 μm columns. Cohesive, 526 F. Supp. 2d at 114. In both, the particles themselves are irregular in shape, as best shown in figure 3 of the '874 patent, reproduced below:



Because the shape of the particles is not a uniform sphere, the particles in the accused 25 μm columns do not actually have diameters of 25 μm. Moreover, the parties dispute the average size of the particles in the accused 25 μm columns. According to Cohesive, the particles in the 25 μm columns have an average diameter of 29.01 μm. Id. However, according to Waters, the particles have an average diameter of either 25.22 or 25.16 μm, depending on the method of calculation. Id.

1. Claim Construction

All of the asserted claims of both patents included limitations requiring in effect that the column particles have average diameters "greater than about 30 μm." See, e.g., '874 patent col.20 ll.25-26 (requiring "average diameters of greater than about 30 μm"); see also supra n.1. Faced with an accused product (the 25 μm columns) that

was identical to an infringing product (the 30 μm columns) in all respects except for particle size, the district court properly focused on the "about 30 μm" limitation of the claims. However, the district construed "greater than about 30 μm" expressly with reference to the alleged average diameter of the particles in the accused 25 μm columns:

> I construe the language ''greater than about 30 microns'' to exclude 29.01 microns.

Cohesive, 526 F. Supp. 2d at 115.

Although "it is appropriate for a court to consider the accused device when determining what aspect of the claim should be construed," it is not appropriate for the court to construe a claim solely to exclude the accused device. Exigent Tech., Inc. v. Atrana Solutions, Inc., 442 F.3d 1301, 1310 n.10 (Fed. Cir. 2006). A "claim is construed in the light of the claim language . . . not in light of the accused device." Id. (quoting SRI Int'l v. Matsushita Elec. Corp. of Am., 775 F.2d 1107, 1118 (Fed. Cir. 1985) (en banc)) (alteration and emphasis in the original). Rather, once the district court identified that "greater than about 30 μm" was the language that should be construed, its task was to determine the ordinary and customary meaning of that term as understood by a person of ordinary skill in the art at the time of the invention, following the guidance of Phillips.

The district court erred not only by construing the claim merely to exclude the accused device, but also by reading the term "about" out of the claim. The district court stated that it "d[id] not hesitate in construing 'about 30 microns' to exclude a magnitude of 29.01 microns," because the patentee "could have applied for a patent that included particles of 'greater than 29 microns'" if that is what it had intended. Cohesive, 526 F. Supp. 2d at 115. But the patentee likewise could have drafted the limitation as "greater

than 30 μm"—rather than "greater than about 30 μm"—if it had intended the narrow scope that the district court gave to the claim. "[C]laims are interpreted with an eye toward giving effect to all terms in the claim." Bicon, Inc. v. Straumann Co., 441 F.3d 945, 950 (Fed. Cir. 2006). Here, by including the word "about," the patentee plainly intended the limitation "greater than about 30 μm" to encompass columns with particles with average diameters that are less than 30 μm, but are still greater than "about" 30 μm. Cf. Quantum Corp. v. Rodime, PLC, 65 F.3d 1577, 1581 (Fed. Cir. 1995) ("The addition of 'approximately' which means 'reasonably close to,' eliminates the precise lower limit of [a] range, and, in so doing extends the scope of the range." (footnote omitted)).

"[T]he word 'about' does not have a universal meaning in patent claims, and [its] meaning depends on the technological facts of the particular case." Pall Corp. v. Micron Separations, Inc., 66 F.3d 1211, 1217 (Fed. Cir. 1995). When "about" is used as part of a numeric range, "the use of the word 'about,' avoids a strict numerical boundary to the specified parameter. Its range must be interpreted in its technologic and stylistic context." Id. In determining how far beyond the claimed range the term "about" extends the claim, "[w]e must focus . . . on the criticality of the [numerical limitation] to the invention." Ortho-McNeil Pharm., Inc. v. Caraco Pharm. Labs., Ltd., 476 F.3d 1321, 1327 (Fed. Cir. 2007). In other words, we must look to the purpose that the "about 30 μm" limitation serves, to determine how much smaller than 30 μm the average particle diameter can be and still serve that purpose. To be clear, it is the purpose of the limitation in the claimed invention—not the purpose of the invention itself—that is

relevant. Thus, we ask what function the "about 30 μm" low-end limit on particle size plays in the operation of the claimed apparatus and method.

Here, the reason that the claims place a low-end limit on particle size is clear from the specification. The specification of the '874 patent shows that the function of the low-end limit on particle size relates to the ability of the column to capture compounds from the liquid at high flow rates. Specifically, the specification teaches that "it is believed that the turbulence engendered by . . . high speed flow enhances the loading of the solute molecules onto the derivatized surfaces in the pores of the particles in the column." '874 patent col.17 ll.48-51. The specification describes three examples, in which particles of "nominal averaged diameters" of 50 μm, 20 μm, and 10 μm were evaluated at different flow rates. Id. col.15 ll.18-62. It concludes that the desired "turbulence could not be attained" using particles of nominal average diameters of 20 μm or 10 μm, but was attained using particles of nominal average diameters of 50 μm. Id. col.10 ll.1-19; see also id. figs.5-7.

The specification also teaches that the particles need not be the same size or shape. See id. col.8 ll.62-63 ("[The] particles are shaped and selected in a range of sizes and shapes . . . ."). In fact, non-spherical and differently shaped particles are expressly taught as preferred. See id. col.11 ll.19-28 (teaching that mean or average diameter is "not to be construed as limited to particles that are necessarily spherical or regular solids" and that "a preferred aspect of the present invention is the irregularity of particles' shape"); id. col.9 ll.2-5 ("In a preferred embodiment, particularly where the particles of the column are near the lower end of the acceptable range of cross-section dimensions, the particles are irregular . . . ."); id. fig.3 (illustrating irregularly shaped

particles). Moreover, the specification makes clear that even the average diameter of the particles cannot be measured with certainty. See id. col.11 ll.25-26 (describing measurement of mean diameters with 95% confidence). Because the particles are not spherical, not uniformly shaped, and not precisely measureable, it is not surprising that the patent would claim a low-end threshold of "about 30 μm," rather than precisely "30 μm." Notably, it is the nominal diameter of particles that the specification uses when it concludes that the desired level of turbulence cannot be attained when the average particle size is too small. See id. col.10 ll.8-19. Thus, the low-end limit on particle size performs its function when the nominal average diameter of the particles is above the limit (30 μm), even if the actual average diameter varies.

The specification contains two relevant statements that bear on the range that "about" was intended to encompass in the context of the patents in suit. First, the specification makes clear that particles with nominal 50 μm diameters attain the desired turbulence, while "that turbulence could not be attained with particles" of 20 μm diameters. Id. col.10 ll.1-13. Thus, "about 30 μm" cannot include 20 μm. Otherwise, the purpose of the "about 30 μm" limitation would not be achieved.

Second, in describing an analysis of the porosity of columns, the specification states:

> To measure porosity, a number of batches of particles were examined, the first being a batch (designated herein as CT-50A1-002) of uncoated, unfunctionalized highly irregularly shaped, porous alumina particles having a nominal diameter of 50μ, but an actual mean diameter, as determined by Coulter analysis, of 42.39μ within a 95% confidence factor.

Id. col.14 ll.22-28 (emphases added). Thus, according to the specification, a batch of particles with an actual mean diameter of 42.39 μm may still qualify as having a nominal diameter of 50 μm. In other words, the specification treats an average diameter of

42.39 μm as an average diameter of about 50 μm. This represents an acceptable variance of at least 15.22% from the 50 μm nominal diameter. It is therefore reasonable to conclude that "about 30 μm" encompasses at least a 15.22% variance from 30 μm. Thus, "about 30 μm" should encompass at least 30 μm ± 15.22%, i.e., between 25.434 μm and 34.566 μm.

Likewise, the nominal 20 μm particles that do not permit the required level of turbulence presumably have actual diameters of 20 μm ± 15.22%, i.e., between 16.956 μm and 23.044 μm. Thus, our construction of "about 30 μm" should not encompass actual diameters of 23.044 μm or less.

From the intrinsic evidence in the specification, we therefore conclude that "about 30 μm" should include particles with 25.434 μm diameters and larger, but should exclude particles with 23.044 μm diameters and smaller.[3] The specification does not, however, provide any concrete guidance as to whether a column with particles with measured diameters between 23.044 μm and 25.434 μm meets the "about 30 μm" limitation. Absent any such guidance, we neither can nor should draw a hard and fast numeric line. Rather, we construe "about 30 μm" to accomplish the function of the low-end limit on particle size described in the specification. From that, we conclude that, for particles between 23.044 μm and 25.434 μm, "about 30 μm" means a particle of sufficiently large size to assure that a column containing the particles is capable of attaining turbulence. This functional approach is necessary and appropriate, because

[3] Neither party has pointed to any relevant part of the prosecution history that bears on the meaning of "about." Cohesive points to one useful piece of extrinsic evidence—an internal Waters analysis document indicating that Waters considered particles as small as 25 μm to be within the range of acceptable measured average diameters for a nominally 30 μm product. This evidence is generally consistent with our conclusion that "about 30 μm" must encompass 25.434 μm.

the deliberate imprecision inherent in the word "about" makes it impossible to "capture the essence" of the claimed invention in strict numeric terms. Cf. Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd., 535 U.S. 722, 731 (2002) (remarking in discussion of purpose of doctrine of equivalents that "the nature of language makes it impossible to capture the essence of a thing in a patent application").

Waters makes two arguments in favor of the district court's construction, both of which we reject. First, Waters argues that the "about 30 μm" limitation applies to the average diameter of a single particle, not to the average diameter of all of the particles in the column. Thus, according to Waters, an individual, non-spherical particle may have an average diameter that is "about"—but less than—30 μm, but the average of all of the average diameters of all of the particles in the column must be greater than 30 μm. We disagree. The specification makes clear that when it refers to an average diameter, it is referring to an average diameter of multiple particles in a given configuration, not the average diameter of a single particle. Id. col.11 ll.19-28 ("The term 'mean diameter' as used herein is intended to mean the average (mean) diameter or cross-section dimension of the particles regardless of particle configuration and is not to be construed as limited to particles that are necessarily spherical or regular solids . . . ." (emphases added)).

Second, Waters claims that "[t]he file history establishes conclusively that the inventor intended and understood that his invention required particles with a minimum average diameter of 30 μm." Br. of Defendant-Cross Appellant Waters Corp. at 10. Waters points to various statements in the prosecution history that refer to "30 μm particles" without the modifier "about." But Waters ignores that the word "about"

appears in each of the claims. The claim term "about" cannot be eliminated by the prosecution history, unless Cohesive made "a clear and unmistakable disavowal of scope during prosecution." Computer Docking Station Corp., 519 F.3d at 1374. Simply using the phrase "30 μm particles" without the qualifier "about" during prosecution is not such a clear and unmistakable disavowal.

Thus, applying the principles articulated in Phillips, 415 F.3d at 1312-19, we conclude that the proper construction of "greater than about 30 μm" in claim 1 of the '874 patent is: either (1) greater than 25.434 μm, or (2) both greater than 23.044 μm and of sufficiently large size to assure that the column is capable of attaining turbulence. The same construction is applicable to the terms "not less than about 30 μm" and "in the range between about 30 to about 500 μm" in the other asserted claims of both patents.

2. Literal Infringement

Based on its erroneous claim construction, the district court concluded that, as a matter of law, the 25 μm columns could not infringe, even if they contained particles with an average diameter of 29.01 μm, as Cohesive argued. Cohesive, 526 F. Supp. 2d at 115. Applying the correct construction, if the particles in the 25 μm columns have an average diameter of 29.01 μm, they would literally infringe. Summary judgment of noninfringement must therefore be reversed.

However, the district court was correct to deny Cohesive's motion for summary judgment of infringement. Taken in the light most favorable to Waters, the 25 μm columns have average diameters of 25.16 μm. Id. at 114. Under the proper claim construction, if the average diameter of the 25 μm columns were found to be 25.16 μm, they would only infringe if the columns were capable of attaining the desired turbulence. Both the actual average diameter of the 25 μm columns and their ability to attain

turbulence are disputed issues of material fact, making summary judgment on literal infringement inappropriate.

3. Doctrine of Equivalents

The district court granted summary judgment in favor of Waters, finding no infringement under the doctrine of equivalents. Specifically, the district court held that "Cohesive has carved out a substantial set of diameters for particle structure, and cannot now use the doctrine of equivalents to broaden patent language which specifically limits its property rights to a set of particles sized 'not less than' a certain amount." Id. at 116.

We agree that the doctrine of equivalents is not available to Cohesive in this case, but for different reasons than those provided by the district court. The district court's analysis was incorrect for several reasons. First, as discussed above, the district court incorrectly construed the claim term "about 30 μm" in its analysis of literal infringement, and this error also infected its equivalents analysis. Second, the district court's argument, that the breadth of Cohesive's claim—i.e., that it literally encompasses "a substantial set of diameters"—somehow limits its ability to claim infringement by equivalents, is wrong as a matter of law. We have never held that the doctrine of equivalents is inapplicable to broad claims; to the contrary, we have emphasized that pioneering inventions often, by their very nature, result in broader application of the doctrine of equivalents. See, e.g., Augustine Med., Inc. v. Gaymar Indus., Inc., 181 F.3d 1291, 1301-02 (Fed. Cir. 1999). Finally, the district court's analysis suggests that the doctrine of equivalents cannot be used to broaden a numeric range. But as we have repeatedly held, "the fact that a claim recites numeric ranges does not, by itself, preclude . . . [reliance] on the doctrine of equivalents." U.S. Philips

Corp. v. Iwasaki Elec. Co. Ltd., 505 F.3d 1371, 1378 (Fed. Cir. 2007) (quoting Abbott Labs. v. Dey, L.P., 287 F.3d 1097, 1107-08 (Fed. Cir. 2002)) (alterations in the original).

Nevertheless, we conclude that the doctrine of equivalents is not available to Cohesive here, for a different reason. The limitation to which Cohesive seeks to apply the doctrine of equivalents is the "about 30 μm" limitation. As we have held, because of the way that the patentee has used the word "about" in the context of the written description and the claims in this case, construction of the term "about 30 μm" requires consideration of the purpose or "criticality" of the limitation to the invention. See Ortho-McNeil, 476 F.3d at 1327. As our construction makes clear, "about 30 μm" encompasses particle diameters that perform the same function, in the same way, with the same result as the 30 μm particles, as long as those diameters are within the range left open by the specific disclosures of the specification. Thus, by electing to include the broadening word "about" in the claim, the patentee has in this case already captured what would otherwise be equivalents within the literal scope of the claim. Cf. Warner-Jenkinson Co., Inc. v. Hilton Davis Chem. Co., 520 U.S. 17, 40 (1997) ("An analysis of the role played by each element in the context of the specific patent claim will thus inform the inquiry as to whether a substitute element matches the function, way, and result of the claimed element, or whether the substitute element plays a role substantially different from the claimed element.") The patentee here has, by its choice of claim language, captured the same "range of novelty" that typically justifies application of the doctrine of equivalents. See Festo, 535 U.S. at 731 (holding that "[t]he scope of a patent is not limited to its literal terms but instead embraces all equivalents to the claims described," because "[t]he language in the patent claims may

not capture every nuance of the invention or describe with complete precision the range of its novelty.").

Where, as here, a patentee has brought what would otherwise be equivalents of a limitation into the literal scope of the claim, the doctrine of equivalents is unavailable to further broaden the scope of the claim. In these circumstances, a patentee cannot rely on the doctrine of equivalents to encompass equivalents of equivalents. Here, because the "about 30 μm" limitation already literally encompasses diameters that are equivalent to 30 μm in the context of the patent, any particle diameter that performs the same function, in the same way, with the same result as a 30 μm diameter is already within the literal scope of the claim. Cohesive therefore cannot rely on the doctrine of equivalents for that limitation. Since the "about 30 μm" limitation was the only disputed limitation, the district court was correct to grant summary judgment in favor of Waters on the issue of infringement by equivalents.

C. Damages

1. Lost Profits

Following a bench trial, the district court, applying the so-called Panduit test, concluded that Cohesive failed to prove that it was entitled to lost profits as a result of infringement by Waters's 30 μm columns. Cohesive, 526 F. Supp. 2d at 118; see generally Panduit Corp. v. Stahlin Bros. Fibre Works, 575 F.2d 1152 (6th Cir. 1978). The district court found both that the 25 μm columns were an "acceptable yet noninfringing substitute" for the 30 μm columns and that a separate Waters product—the Waters 2.1 × 20 mm columns—were "a reasonably acceptable substitute." Id. at 119-20. Cohesive appeals, arguing that neither product is an acceptable noninfringing substitute. Although "[a]vailability of lost profits is a question of law reviewed without

deference," Mars, Inc. v. Coin Acceptors, Inc., 527 F.3d 1359, 1365 (Fed. Cir. 2008), "[t]he existence of a noninfringing substitute is a question of fact, reviewable under the clearly erroneous standard," Minn. Min. & Mfg. Co. v. Johnson & Johnson Orth., Inc., 976 F.2d 1559, 1577 (Fed. Cir. 1992).

To recover lost profits under the Panduit test, "the patent owner must prove (1) a demand for the patented product, (2) an absence of acceptable noninfringing substitutes, (3) the manufacturing and marketing capability to exploit the demand, and (4) the amount of profit the patent owner would have made." Standard Havens Prods., Inc. v. Gencor Indus., Inc., 953 F.2d 1360, 1373 (Fed. Cir. 1991); see also Panduit, 575 F.2d at 1156. Standard Havens explains the "acceptable noninfringing substitutes" analysis as follows:

> [T]he mere existence of a competing device does not necessarily make that device an acceptable substitute. A product on the market which lacks the advantages of the patented product can hardly be termed a substitute acceptable to the customer who wants those advantages. Accordingly, if purchasers are motivated to purchase because of particular features available only from the patented product, products without such features—even if otherwise competing in the marketplace—would not be acceptable noninfringing substitutes.
>
> Thus, to prove that there are no acceptable noninfringing substitutes, the patent owner must show either that (1) the purchasers in the marketplace generally were willing to buy the patented product for its advantages, or (2) the specific purchasers of the infringing product purchased on that basis.

Id. (citations omitted).

As discussed above, we have concluded that the district court erred in granting summary judgment that the 25 μm columns did not infringe the '874 and '368 patents. Consequentially, the district court erred in concluding that the 25 μm columns were a reasonable noninfringing substitute. The availability of the 25 μm columns cannot

preclude Cohesive from obtaining lost profits, unless and until the district court determines that the 25 μm columns are not infringing under the correct claim construction.

It is unclear from the record whether the district court's findings as to the 2.1 × 20 mm columns alone would satisfy the Panduit test. The district court made the following limited findings as to the 2.1 × 20 mm columns:

> The 2.1 x 20mm, of course, is also a differently-sized column than the accused column. Although it is only slightly larger, it would likely not be a fully-acceptable substitute for those customers would rather elute their compounds over a smaller 1 × 50mm column. Nevertheless, I find it a reasonably acceptable substitute.

Cohesive, 526 F. Supp. 2d at 119. We do not know what the district court means by "fully-acceptable substitute" or "reasonably acceptable substitute." The district court's finding—that the 2.1 × 20 mm columns were not "a fully-acceptable substitute" but were nevertheless "a reasonably acceptable substitute"—does not resolve one way or another whether they are an acceptable noninfringing substitute under the Standard Havens test.

Thus, we vacate the district court's determination that Cohesive is not entitled to lost profits, and remand for reconsideration based upon its determination of: (1) whether the 25 μm columns infringe under the correct claim construction; and (2) whether the 2.1 x 20 mm columns are acceptable noninfringing substitutes as that term is used in Standard Havens.

2. Willful Infringement

Applying the standard that we articulated in In re Seagate Technology, LLC, 497 F.3d 1360, 1371 (Fed. Cir. 2007) (en banc), the district court concluded that Waters's infringement of the '874 and '368 patents was not willful. Cohesive, 526 F. Supp. 2d at

103, 107. "[T]o establish willful infringement, a patentee must show by clear and convincing evidence that the infringer acted despite an objectively high likelihood that its actions constituted infringement of a valid patent. . . . If this threshold objective standard is satisfied, the patentee must also demonstrate that this objectively-defined risk (determined by the record developed in the infringement proceeding) was either known or so obvious that it should have been known to the accused infringer." Seagate, 497 F.3d at 1371. "The court's finding [on] willful infringement is one of fact, subject to the clearly erroneous standard of review." Stryker Corp. v. Intermedics Orths., Inc., 96 F.3d 1409, 1413 (Fed. Cir. 1996).

As discussed in detail above, the proper construction of "rigid" was in dispute. According to Waters, Cohesive had disavowed all polymeric particles as not "rigid" during prosecution based on the Guiochon declaration. While we, like the district court, have concluded that the Guiochon declaration did not disavow all polymeric particles, see Cohesive, 526 F. Supp. 2d at 106 n.6, we nonetheless agree with the district court that Waters could reasonably have read the "rigid" limitation, in light of the specification and prosecution history, to require polymeric particles. See id. at 106 & n.6. Because "rigid" was susceptible to a reasonable construction under which Waters's products did not infringe, there was not an objectively high likelihood that Waters's actions constituted infringement. See Seagate, 497 F.3d at 1371. The district court's finding of no willful infringement was therefore not clearly erroneous.[4]

[4] Because we conclude that the proper claim construction was a sufficiently close question to foreclose a finding of willfulness, we need not address Cohesive's arguments concerning the district court's factual errors in describing the testing that Waters performed to assess whether its particles resisted plastic deformation.

3. Enhanced Damages

Cohesive argues that the district court erred in declining to award enhanced damages, even in the absence of a finding of willfulness. Specifically, relying on the analysis in Judge Gajarsa's concurring opinion in Seagate, Cohesive asks the court to overrule Beatrice Foods Co. v. New England Printing & Lithographing Co., in which we held that "enhancement of damages must be premised on willful infringement or bad faith." 923 F.2d 1576, 1578 (Fed. Cir. 1991) (quoting Yarway Corp. v. Eur-Control USA, Inc., 775 F.2d 268, 277 (Fed. Cir. 1985)); see also Seagate, 497 F.3d at 1377 (Gajarsa, J., concurring) (urging that Beatrice Foods be overruled). The majority of the en banc court in Seagate did not elect to overrule Beatrice Foods, and we therefore remain bound by that decision. See, e.g., Hometown Fin., Inc. v. United States, 409 F.3d 1360, 1365 (Fed. Cir. 2005) ("[W]e are bound to follow our own precedent as set forth by prior panels. . . .").

D. Reassignment

Cohesive requests that this case be assigned to a different district court judge on remand, pursuant to 28 U.S.C. § 2106. "The reassignment of a case to a new district court judge after remand is a procedural question that is not unique to this court's exclusive jurisdiction. Accordingly, regional circuit law governs reassignment questions." Eolas Techs., Inc. v. Microsoft Corp., 457 F.3d 1279, 1282 (Fed. Cir. 2006). The First Circuit uses a three-part inquiry to determine whether reassignment is appropriate:

> (1) whether the original judge would reasonably be expected upon remand to have substantial difficulty in putting out of his or her mind previously-expressed views or findings determined to be erroneous or based on evidence that must be rejected,

> (2) whether reassignment is advisable to preserve the appearance of justice, and
>
> (3) whether reassignment would entail waste and duplication out of proportion to any gain in preserving the appearance of fairness.

Maldonado Santiago v. Velazquez Garcia, 821 F.2d 822, 832 (1st Cir. 1987).

Cohesive makes a single argument in favor of reassignment: that the six year delay between the jury's verdict of infringement and the district court's judgment on the remaining issues shows that the district court judge has a "clear antipathy for this matter," so that reassignment is necessary to preserve the appearance of justice. Br. of Plaintiff-Appellant Cohesive Techs., Inc. at 54-55. Waters has not indicated whether it favors or opposes reassignment.

We agree with Cohesive that there was an unreasonable and unacceptable delay between the conclusion of the bench trial in August 2002 and the district court's judgment in August 2007. Even more disturbing is the fact that Cohesive moved for a preliminary injunction against the 25 μm columns on March 7, 2002, that Cohesive converted that motion to a motion for summary judgment at the district court's suggestion, and that the district court still did not rule on the motion for five years, despite repeated status inquiries. See 526 F. Supp. 2d at 114.

Despite our displeasure with the delays in this case, we decline to order reassignment. Cohesive makes no argument—and we see no reason—that the district court judge would have substantial difficulty putting his previously expressed views or findings out of his mind. Moreover, reassignment would necessarily entail a great deal of waste and duplication of effort. We have affirmed much of the district court's judgment in this case, and the limited issues on which we have remanded will be most easily addressed by the judge who presided over the earlier jury and bench trials and is

already familiar with the case. On balance, we conclude that no reassignment is necessary and expect that the issues remaining on remand will be addressed without undue delay.

III. CONCLUSION

For the foregoing reasons, we reject the district court's construction of the term "about 30 μm" and construe the term as described above. We reverse the district court's grant of summary judgment of no literal infringement by the 25 μm columns, reverse the district court's grant of judgment as a matter of law on the issue of anticipation, vacate the district court's judgment that Cohesive is not entitled to actual damages, and remand. In all other respects, the judgment of the district court is affirmed.

AFFIRMED-IN-PART, REVERSED-IN-PART, VACATED-IN-PART, AND REMANDED

COSTS

Each party shall bear its own costs.

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

2008-1029,-1030,-1031,-1032,-1059

COHESIVE TECHNOLOGIES, INC.,

Plaintiff-Appellant,

v.

WATERS CORPORATION,

Defendant-Cross Appellant.

Appeal from the United States District Court for the District of Massachusetts in case nos. 98-CV-12308, 99-CV-11528, and 01-CV-12307, Judge Douglas P. Woodlock.

MAYER, Circuit Judge, dissenting.

I dissent from the majority's decision to remand the issue of anticipation to the district court. See ante at 12-17. The jury having found that U.S. Patent No. 5,772,874 is not obvious under 35 U.S.C. § 103, remanding the case for "further proceedings" on whether the patent is anticipated is a waste of time and resources.

It is true that the tests for obviousness and anticipation are distinct, and that a district court should not refuse to submit a claim of anticipation to the jury merely because an accused infringer also asserts an obviousness defense. It does not follow, however, that if a jury has already determined that an invention is not obvious, remand is required so that it can consider whether the invention is anticipated. The jury here considered all of the allegedly anticipating prior art references, but nonetheless returned a verdict that the asserted claims are non-obvious. If a series of prior art references did not render the claimed invention obvious, how could one of those references contain

each and every element of the claimed invention so as to render it anticipated? See Schering Corp. v. Geneva Pharms., Inc., 339 F.3d 1373, 1379 (Fed. Cir. 2003) (a claim is anticipated if each and every limitation is found in a single prior art reference). *

Although a claimed invention can be obvious but not anticipated, it "cannot have been anticipated and not have been obvious." In re Fracalossi, 681 F.2d 792, 794 (CCPA 1982) (emphasis added). Indeed, this court has repeatedly emphasized that "a disclosure that anticipates . . . also renders the claim invalid under § 103, for anticipation is the epitome of obviousness." Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 1548 (Fed. Cir. 1983) (citations and internal quotation marks omitted); see Johns Hopkins Univ. v. Cellpro, Inc., 152 F.3d 1342, 1357 n.21 (Fed. Cir. 1998) (a disclosure that anticipates also renders a claim obvious); In re Pearson, 494 F.2d 1399, 1402 (CCPA 1974) (anticipation is "the ultimate . . . obviousness") (citations and internal quotation marks omitted); In re Kalm, 378 F.2d 959, 962 (CCPA 1967) ("Necessarily, a description in a reference which is insufficient as a matter of law to render a composition of matter obvious to one of ordinary skill in the art would a fortiori be insufficient to 'describe' the composition as that term is used [for purposes of establishing anticipation], a complete description being but the ultimate or epitome of obviousness."). The majority's assertion that a claim can be anticipated but not obvious, flies in the face of a long line of precedent to the contrary. Not surprisingly, it is unable to cite a case

* The majority cites Trintec Indus., Inc. v. Top-U.S.A. Corp., 295 F.3d 1292, 1296 (Fed. Cir. 2002) for the proposition that "obviousness is not inherent anticipation." Ante at 15. Trintec held that an invention is not inherently anticipated merely because it is obvious. That, however, is a wholly separate issue from the issue presented here, which is whether claims that are not obvious can ever be anticipated. Trintec does not state that non-obvious claims can be inherently anticipated.

remanding to the district court for consideration of anticipation, while at the same time sustaining a determination that claims at issue are not obvious. **

The fallacy of the majority's approach can be illustrated by a simple example. Every apple is a fruit. It follows, therefore, that if something is not a fruit, it cannot be an apple. Similarly, since our precedent makes clear that every anticipated claim is obvious, it follows that if a claim is not obvious, it cannot be anticipated.

The present dispute has already dragged on for nearly a decade and I see no reason to burden the district court and the parties with additional proceedings. Although the majority sends the anticipation issue back to the district court for "further proceedings consistent with [its] opinion," ante at 17, one wonders what it expects the court to do. Given the prior non-obviousness determination, it can hardly expect the district court to conclude that there is sufficient evidence of anticipation to send the issue to a new jury. I would affirm the district court's directed verdict on anticipation.

** The majority's reliance on Mendenhall v. Cedarapids, Inc., 5 F.3d 1557, 1563 (Fed. Cir. 1993), is unsupportable. That case held that a district court did not abuse its discretion in refusing to set aside a jury verdict of non-obviousness even though the jury also returned a verdict of anticipation by prior public use. The issue here, however, is not whether a verdict finding both anticipation by prior public use and non-obviousness can be sustained, but whether remand is required to consider anticipation even after the jury has determined the claims are not obvious.