

United States Court of Appeals for the Federal Circuit

99-1262, -1263, -1264, -1303

ELI LILLY AND COMPANY,

Plaintiff-Cross Appellant,

v.

BARR LABORATORIES, INC.,

and

APOTEX, INC. and BERNARD C. SHERMAN,

and

GENEVA PHARMACEUTICALS, INC.,

Defendants-Appellants,

and

INTERPHARM, INC.,

Defendant.

Charles E. Lipsey, Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P., of Washington, DC, argued for plaintiff-cross appellant, Eli Lilly and Company. With him on the brief were Allen M. Sokal, Kenneth M. Frankel, and David S. Forman. Of counsel was L. Scott Burwell. Of counsel on the brief were Douglas K. Norman, and James P. Leeds, Eli Lilly and Company, of Indianapolis, Indiana.

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Appealed from: United States District Court for the Southern District of Indiana

Chief Judge Sarah Evans Barker

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Defendants-Appellants,

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DECIDED: May 30, 2001

ON PETITION FOR REHEARING EN BANC

Before MAYER, Chief Judge, FRIEDMAN, Senior Circuit Judge, and GAJARSA, Circuit Judge.
GAJARSA, Circuit Judge.

ORDER

On the petition for rehearing or rehearing en banc, the court accepted the petition for rehearing en banc. Acting en banc, the court vacated the panel's original opinion entered on August 9, 2000, which is reported at 222 F.3d 973, 55 USPQ2d 1609 (Fed. Cir. 2000). The en banc court reassigned the opinion to the panel for a specific revision of the double patenting section. Based on the conclusions of the panel, the panel's original judgment affirming the district court's determination on the issue of best mode is reaffirmed. The panel's original judgment, which reversed the district court's determination that claim 7 of U.S. Patent No. 4,626,549 ("the '549 patent") is not invalid for double patenting, is reaffirmed, but on a different legal basis.

In December 1995, Barr Laboratories, Inc. ("Barr") filed an Abbreviated New Drug Application ("ANDA") under the Hatch-Waxman Act, see 21 U.S.C. § 355(j)(2)(A)(vii)(IV) (1994), seeking approval from the Food and Drug Administration ("FDA") to market fluoxetine hydrochloride as an antidepressant. Fluoxetine hydrochloride is the active ingredient in Eli Lilly and Company's ("Lilly's") antidepressant drug Prozac. Lilly, on April 10, 1996, pursuant to 35 U.S.C. § 271(e) (2)(A) (1994), brought an infringement action in the United States District Court for the Southern District of Indiana, alleging that Barr's ANDA application infringed claim 5 of U.S. Patent No. 4,314,081 ("the '081 patent") and claim 7 the '549 patent. Lilly subsequently brought infringement actions against Geneva Pharmaceuticals, Inc., Apotex, Inc., and Bernard C. Sherman, all of whom had also filed ANDA applications with the FDA, and the actions were consolidated.

Barr and the other defendants (collectively "Barr") argued, inter alia, that claim 5 of the '081 patent and claim 7 of the '549 patent are invalid for failure to comply with the best mode requirement and that claim 7 of the '549 patent is invalid for double patenting. On cross-motions for summary judgment, the district court held in favor of Lilly, concluding that neither claim violates the best mode requirement and that no double patenting exists. Barr appeals the district court's summary judgment rulings, and Lilly cross-appeals the district court's ruling that Barr was entitled to a jury trial on its invalidity counterclaims. Because we hold that both claims comply with the best mode requirement but that claim 7 of the '549 patent is invalid for obviousness-type double patenting, we affirm-in-part and reverse-in-part. Accordingly, we also vacate the district court's ruling that Barr is entitled to a jury trial because we dispose of the validity issues on appeal.

I. BACKGROUND

The present appeal concerns the validity of claim 5 of the '081 patent, which covers the pharmaceutical compound fluoxetine hydrochloride—the active ingredient in Lilly's antidepressant drug Prozac—and claim 7 of the '549 patent, which covers the administration of fluoxetine hydrochloride to inhibit serotonin uptake in an animal's brain neurons.

On January 10, 1974, Lilly filed application Serial No. 432,379 ("the '379 application") containing claims for a class of compounds, therapeutic methods of using those compounds, and pharmaceutical compositions comprising those compounds. The '379 application named Bryan B. Molloy ("Molloy") and Klaus K. Schmiegel as inventors. After its filing, the '379 application engendered a progeny of divisional applications, continuation applications, and patents that rivals the Hapsburg legacy. When the last patent stemming from the '379 application issued in December 1986, the application had spawned four divisional applications, three continuation applications, and six patents. During that twelve-year period, Lilly obtained six patents relating to fluoxetine hydrochloride—the '081 and '549 patents, as well as U.S. Patent Nos. 4,018,895 ("the '895 patent"), 4,194,009 ("the '009 patent"), 4,590,213 ("the '213 patent"), and 4,329,356 ("the '356 patent"). The '213 and '356 patents did not stem from the '379 application, and during the course of this litigation, Lilly disclaimed those patents.

The '009 patent, which expired in April 1994, claimed a class of pharmaceutical compounds, including fluoxetine hydrochloride, for administration in psychotropically effective amounts. The '895, '213, and '356 patents related to methods for treating particular ailments by administering a pharmaceutical compound within a class of compounds that includes fluoxetine hydrochloride. Specifically, the '895 patent, which expired in April 1994, concerned the treatment of humans suffering from depression; the '213 patent concerned the treatment of humans suffering from anxiety; and the '356 patent concerned the treatment of animals suffering from hypertension.

In December 1995, pursuant to a Paragraph IV certification under the Hatch-Waxman Act, see 21 U.S.C. § 355(j)(2)(A)(vii)(IV), Barr filed an ANDA application seeking FDA approval to market fluoxetine hydrochloride as an antidepressant. Lilly responded by bringing an action in district court under 35 U.S.C. § 271(e)(2)(A), asserting that Barr's ANDA application infringed claim 7 of the '549 patent and claim 5 of the '081 patent.

At the district court, Barr argued that both claims are invalid for failure to comply with the best mode requirement and that claim 7 of the '549 patent is invalid for obviousness-type double patenting. With regard to the best mode issue, Barr advanced two independent arguments. First, Barr argued that the claims are invalid because the patents failed to disclose Molloy's preferred method for synthesizing p-trifluoromethylphenol—a starting material necessary to make fluoxetine hydrochloride. Second, Barr argued that the claims are invalid because the patents failed to disclose Molloy's preferred solvent for recrystallizing fluoxetine hydrochloride. With regard to the issue of double patenting, Barr advanced three independent arguments, contending that claim 7 of the '549 patent is invalid in light of (1) the '356 and '213 patents, (2) the '895 and '009 patents, and (3) the '081 patent.

On cross motions for summary judgment, the district court held in favor of Lilly, concluding that claim 5 of the '081 patent and claim 7 of the '549 patent do not violate the best mode requirement and that claim 7 is not invalid for double patenting under any of Barr's theories. The district court recognized that Barr contended that claim 7 of the '549 patent is invalid for

double patenting over, *inter alia*, the '213 patent because it merely sets forth the "scientific explanation" for the subject matter of that and other Lilly patents. Yet, the district court determined that Barr failed to provide any authoritative, reliable scientific opinion to establish that claim 7 of the '549 patent constitutes merely the scientific explanation of what was already claimed in the patents that came before it, including the '213 patent.

This appeal followed. Because these issues concern disparate parts of the record evidence, we describe separately the background relevant to each argument.

The Claims at Issue

A. Claim 5 of the '081 patent

Stemming directly from the '379 application, the '081 patent issued on February 2, 1982. Claim 5 of the '081 patent, which depends from claim 1, covers the compound N-methyl 3-(p-trifluoromethylphenoxy)-3-phenylpropylamine hydrochloride—commonly referred to as fluoxetine hydrochloride—and pharmaceutically-acceptable acid addition salts thereof formed with non-toxic acids. Claim 1, in turn, provides as follows:

A compound of the formula

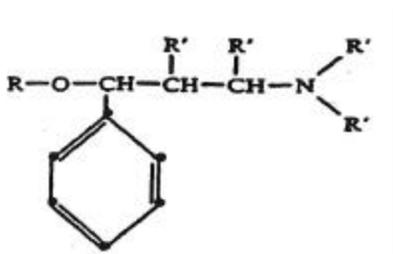
wherein each R' is independently H or CH₃ and R is m- or p-chlorophenyl, o-, m-, or p-methoxyphenyl, phenyl, o- or m-fluorophenyl, o- or p-tolyl, 2,4-difluorophenyl or p-trifluoromethylphenyl and acid addition salts formed with pharmaceutically-acceptable acids.

B. Claim 7 of the '549 patent

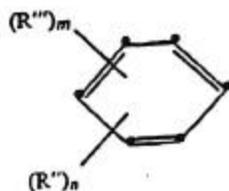
On March 31, 1986, Lilly filed continuation-in-part application Serial No. 846,448, claiming the

benefit of the 1974 filing date of the '379 application under 35 U.S.C. § 120. On December 2, 1986, the application matured into the '549 patent. Claim 7 of the '549 patent, which depends on claim 4, relates to blocking the uptake of the monoamine serotonin in an animal's brain neurons through administration of the compound N-methyl-3-(p-trifluoromethylphenoxy)-3-phenylpropylamine hydrochloride—commonly referred to as fluoxetine hydrochloride. Claim 4 provides as follows:

A method of blocking the uptake of monoamines by brain neurons in animals comprising administering to said animal a monoamine blocking amount of a compound of the formula



wherein each R' is independently hydrogen or methyl; wherein R is naphthyl or



wherein R'' and R''' are halo, trifluoromethyl, C₁-C₄ alkyl, C₁-C₃ alkyloxy or C₃-C₄ alkenyl; and wherein n and m are 0, 1 or 2; and acid addition salts thereof formed with pharmaceutically-acceptable acids.

C. Best Mode: p-trifluoromethylphenol

Both the '081 and '549 patents identify p-trifluoromethylphenol as a starting material for making fluoxetine hydrochloride. During the early stages of experimentation, Molloy used commercial p-trifluoromethylphenol purchased from Marshallton Research Laboratories. However, when large quantities of p-trifluoromethylphenol were necessary for clinical testing, Lilly's division director refused to purchase p-trifluoromethylphenol due to the high costs. Instead, he required that Molloy and his colleagues synthesize their own p-trifluoromethylphenol.

To that end, Molloy worked with Lilly scientist Edward Lavagnino ("Lavagnino") to devise a

cost-efficient method of synthesizing p-trifluoromethylphenol. After experimenting with various prior art methods, Molloy concluded that those methods were inadequate for generating a sufficient amount of p-trifluoromethylphenol for use in clinical testing. Then, following further research, Molloy and Lavagnino developed their own method for preparing p-trifluoromethylphenol that, as Lavagnino described in his deposition, was "superior" because it used "real cheap" starting material "available [in] tank car quantities." Also, in an article written after the filing of the '379 application, Molloy described his new synthesizing method as an improvement over prior art, because the "literature methods for [p-trifluoromethylphenol's] preparation are cumbersome and not easily adapted to large scale operations."

The '081 and '549 patents do not claim the material p-trifluoromethylphenol or a method for synthesizing it, nor do they disclose Molloy's method for synthesizing it.

D. Best Mode: Recrystallization

While experimenting with compounds claimed in the '081 and '549 patents, Molloy recrystallized the compounds in order to remove impurities and enhance their suitability for pharmaceutical use. The recrystallization process involved using a solvent to dissolve a sample of the compound and then separating the desired product in crystalline form from the impurities that remained dissolved. Between February 1973 and January 1974, Molloy and other Lilly scientists experimented with various solvents for recrystallizing fluoxetine hydrochloride and eventually found a particular solvent that produced a higher yield and higher purity than other solvents.

The record evidence illustrates that while Lilly scientists knew that some solvents for recrystallizing fluoxetine hydrochloride were more effective than others, choosing a suitable recrystallization solvent was well known to one of ordinary skill in the art. In particular, Dr. Elias J. Corey ("Corey"), a Nobel laureate, testified that fluoxetine hydrochloride is "generally quite easy to purify by recrystallization." Corey also explained that, although it requires some experimentation, selecting a recrystallization solvent is "very straightforward." Further, Barr's expert testified that "in 1974, sometimes the recrystallization of amine hydrochlorides was indeed routine."

The '081 and '549 patents do not claim a process for recrystallizing fluoxetine hydrochloride nor do they disclose any solvents for use in the recrystallizing fluoxetine hydrochloride.

E. Double Patenting: The '213 patent

On May 20, 1986, the '213 patent issued from an application filed on April 8, 1983. Claim 1 of the '213 patent provides:

A method for treating anxiety in a human subject in need of such treatment which comprises the administration to such human an effective amount of fluoxetine or norfluoxetine or pharmaceutically acceptable salts thereof.

II. STANDARD OF REVIEW

We review a district court's grant of summary judgment de novo. Conroy v. Reebok Int'l, Ltd., 14 F.3d 1570, 1575, 29 USPQ2d 1373, 1377 (Fed. Cir. 1994). Summary judgment is appropriate when, based on the record, no genuine issue exists as to any material fact, and the moving party is entitled to judgment as a matter of law. See Fed. R. Civ. P. 56(c). A genuine issue exists if the evidence is such that a reasonable jury could find for the nonmoving party. Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 248 (1986); General Mills, Inc. v. Hunt-Wesson, Inc., 103 F.2d 978, 980, 41 USPQ2d 1440, 1442 (Fed. Cir. 1997). A disputed fact is material if it might affect the outcome of the suit such that a finding of that fact is necessary and relevant to the proceeding. Anderson, 477 U.S. at 248; General Mills, 103 F.2d at 980, 41 USPQ2d at 1442.

When evaluating a motion for summary judgment, the court views the record evidence through the prism of the evidentiary standard of proof that would pertain at a trial on the merits. Anderson, 477 U.S. at 252-53. Under the patent statutes, a patent enjoys a presumption of validity, see 35 U.S.C. § 282, which can be overcome only through clear and convincing evidence, see United States Surgical Corp. v. Ethicon, Inc., 103 F.3d 1554, 1563, 41 USPQ2d 1225, 1232 (Fed. Cir. 1997). Thus, a moving party seeking to invalidate a patent at summary judgment must submit such clear and convincing evidence of invalidity so that no reasonable jury could find otherwise. Alternatively, a moving party seeking to have a patent held not invalid at summary judgment must show that the nonmoving party, who bears the burden of proof at trial, failed to produce clear and convincing evidence on an essential element of a defense upon which a reasonable jury could invalidate the patent. In determining whether a genuine issue of material fact exists, the court views the evidence in the light most favorable to the nonmoving party and resolves all doubts in its favor. Anderson, 477 U.S. at 255; Transmatic, Inc. v. Gulton Indus., Inc., 53 F.3d 1270, 1274, 35 USPQ2d 1035, 1038 (Fed. Cir. 1995).

III. BEST MODE

Pursuant to § 112, ¶ 1, a patent specification must set forth the "best mode contemplated by the inventor of carrying out his invention." 35 U.S.C. § 112, ¶ 1 (1994). The best mode requirement creates a statutory bargained-for-exchange by which a patentee obtains the right to exclude others from practicing the claimed invention for a certain time period, and the public receives knowledge of the preferred embodiments for practicing the claimed invention. Spectra-Physics, Inc. v. Coherent, Inc., 827 F.2d 1524, 1532, 3 USPQ2d 1737, 1742 (Fed. Cir. 1987) (quoting In re Gay, 309 F.2d 769, 772, 135 USPQ 311, 315 (CCPA 1962)).

Our case law explicating the best mode requirement focuses on a two-prong inquiry. Chemcast Corp. v. Arco Indus. Corp., 913 F.2d 923, 927-28, 16 USPQ2d 1033, 1036-37 (Fed. Cir. 1990). First, the factfinder must determine whether, at the time of filing the application, the inventor possessed a best mode for practicing the invention. Fonar Corp. v. General Elec. Co., 107 F.3d 1543, 1548, 41 USPQ2d 1801, 1804 (Fed. Cir. 1997); United States Gypsum Co. v. National Gypsum Co., 74 F.3d 1209, 1212, 37 USPQ2d 1388, 1390 (Fed. Cir. 1996). Second, if the inventor possessed a best mode, the factfinder must determine whether the written description disclosed the best mode such that one reasonably skilled in the art could practice it. Fonar, 107 F.3d at 1548, 41 USPQ2d at 1804; U.S. Gypsum, 74 F.3d at 1212, 37 USPQ2d at 1390. The first prong involves a subjective inquiry, focusing on the inventor's state of mind at the time of filing. U.S. Gypsum, 74 F.3d at 1212, 37 USPQ2d at 1390; Chemcast, 913 F.2d at 928, 16 USPQ2d at 1036. The second prong involves an objective inquiry, focusing on the

scope of the claimed invention and the level of skill in the art. U.S. Gypsum, 74 F.3d at 1212, 37 USPQ2d at 1390; Chemcast, 913 F.2d at 928, 16 USPQ2d at 1036-37.

With respect to the second prong of the best mode requirement, the extent of information that an inventor must disclose depends on the scope of the claimed invention. Engel Indus. v. Lockformer Co., 946 F.2d 1528, 1531, 20 USPQ2d 1300, 1302 (Fed. Cir. 1991). Accordingly, an inventor need not disclose a mode for obtaining unclaimed subject matter unless the subject matter is novel and essential for carrying out the best mode of the invention. Applied Med. Resources Corp. v. United States Surgical Corp., 147 F.3d 1374, 1377, 47 USPQ2d 1289, 1291 (Fed. Cir. 1998). Furthermore, the best mode requirement does not extend to production details or routine details. Young Dental Mfg. Co., Inc. v. Q3 Special Prods., Inc., 112 F.3d 1137, 1143, 42 USPQ2d 1589, 1594-95 (Fed. Cir. 1997). Production details, which do not concern the "quality or nature of the [claimed] invention," see id. at 1143, 42 USPQ2d at 1595, relate to commercial and manufacturing considerations such as equipment on hand, certain available materials, prior relationships with suppliers, expected volume of production, and costs, see Wahl Instruments, Inc. v. Acvious, Inc., 950 F.2d 1575, 1581, 21 USPQ2d 1123, 1128 (Fed. Cir. 1991) (explaining that a "step or source or technique considered 'best' in a manufacturing circumstance may have been selected for a non-'best mode' reason"). Routine details, on the other hand, implicate the quality and nature of invention, but their disclosure is unnecessary because they are readily apparent to one of ordinary skill in the art. Young Dental, 112 F.3d at 1143, 42 USPQ2d at 1595.

At the district court, Barr advanced two independent reasons for invalidating the '081 and '549 patents for failure to disclose the best mode: (1) Lilly failed to disclose Molloy's preferred method for synthesizing p-trifluoromethylphenol, and (2) it failed to disclose Molloy's preferred solvent for recrystallizing the fluoxetine hydrochloride compound. On cross-motions for summary judgment, the district court held in favor of Lilly. Barr appeals, and we address each argument in turn.

A. Synthesizing p-trifluoromethylphenol

Barr contends that claim 5 of the '081 patent and claim 7 of the '549 patent do not meet the best mode requirement because the patents fail to disclose Molloy's method for synthesizing p-trifluoromethylphenol. In the present case, even assuming that Molloy preferred his method for synthesizing p-trifluoromethylphenol to alternative means of obtaining the material, we hold that failure to disclose the synthesizing method does not contravene the best mode requirement.

We begin our analysis by examining the scope of the claimed inventions. See Engel Indus., 946 F.2d at 1531, 20 USPQ2d at 1302 ("The best mode inquiry is directed to what the applicant regards as his invention, which in turn is measured by the claims."). Claim 5 of the '081 patent covers a formula for the compound fluoxetine hydrochloride, and claim 7 of the '549 patent covers a method for blocking the uptake of serotonin by brain neurons through administering a dosage of fluoxetine hydrochloride. Example 1 in both the '081 and '549 patents identifies the chemical p-trifluoromethylphenol as a starting material for making fluoxetine hydrochloride. Neither patent, however, claims p-trifluoromethylphenol itself or a method for synthesizing it. Thus, while the best mode for developing fluoxetine hydrochloride involves use of p-trifluoromethylphenol, the claimed inventions do not cover p-

trifluoromethylphenol and the patents do not accord Lilly the right to exclude others from practicing Molloy's method for synthesizing p-trifluoromethylphenol. As a result, the best mode requirement does not compel disclosure of Molloy's unclaimed method for synthesizing p-trifluoromethylphenol.

Furthermore, the circumstances here are different from those in Dana Corp. v. IPC Ltd., 860 F.2d 415, 418, 8 USPQ2d 1692 (Fed. Cir. 1988), and Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 940-41, 15 USPQ2d 1321, 1328 (Fed. Cir. 1990), in which an inventor failed to disclose unclaimed subject matter that was necessary for carrying out the best mode of the invention. In the present case, Molloy disclosed his preference for using p-trifluoromethylphenol when making fluoxetine hydrochloride. What he did not disclose, nor was he required to do so, was the unclaimed method for synthesizing p-trifluoromethylphenol. Cf. Randomex, Inc. v. Scopis Corp., 849 F.2d 585, 590, 7 USPQ2d 1050, 1054 (Fed. Cir. 1988) (finding no violation of best mode requirement by concealment of a preferred cleaning fluid formula when the claimed invention "neither added nor claimed to add anything to the prior art respecting cleaning fluid").

To be sure, if the best mode for carrying out a claimed invention involves novel subject matter, then an inventor must disclose a method for obtaining that subject matter even if it is unclaimed. Applied Med. Resources Corp. v. United States Surgical Corp., 147 F.3d 1374, 1377, 47 USPQ2d 1289, 1291 (Fed. Cir. 1998); Wahl Instruments, 950 F.2d at 1583-84, 21 USPQ2d at 1130. That, however, is not the case here. In the present case, the record insistently demonstrates that p-trifluoromethylphenol was commercially available at the time Lilly filed its original application. The record includes a product catalog from Marshallton Research Laboratories, dated January 1973, offering to sell p-trifluoromethylphenol. The record also contains an expert witness report explaining that p-trifluoromethylphenol was commercially available before 1974 from Aldrich Chemical Company. Additionally, the record includes prior art references that describe methods for preparing p-trifluoromethylphenol.

Barr contends that Clayton v. Akiba, 214 USPQ 374 (Bd. Pat. App. 1982), supports its position that Lilly was obligated to disclose the method for synthesizing p-trifluoromethylphenol. We do not find that argument persuasive. Clayton, aside from being non-binding on this court, involves facts that are inapposite to the present case. In Clayton, the claimed invention was a chemical compound, and the Board found that the inventor violated the best mode requirement by failing to disclose his method for preparing a necessary intermediate compound. See id. at 380-81. The Board's reasoning, however, hinged on the fact that the intermediate compound was "itself admittedly a novel compound . . . and, thus, its preparation [was] part and parcel of 'carrying out' the invention." Id. at 381 (emphasis added). Here, by contrast, the chemical p-trifluoromethylphenol, as explained above, was commercially available and described in the prior art.

Barr also seizes upon portions of the record evidence in an effort to establish a best mode violation. For example, Barr relies on Lavagnino's deposition testimony that Molloy's method for synthesizing p-trifluoromethylphenol used material "available in tank car quantities, real cheap chemical, and simple transformations." Barr also cites Lavagnino's statement explaining that Molloy's synthesizing method could be "scaled up" to produce large amounts of p-trifluoromethylphenol. Barr points to Molloy's own statement that "the relatively high cost" of p-trifluoromethylphenol "is a limiting factor in its use as a chemical intermediate," and that he preferred his synthesizing method because other methods were "cumbersome and not easily adapted to large scale operations." Finally, Barr relies on evidence that Lilly stopped

purchasing p-trifluoromethylphenol after Molloy developed his synthesizing method.

Rather than establishing a best mode violation, this amalgam of evidence provides paradigmatic examples of production details that the law excepts from best mode disclosure. Indeed, this evidence relates to considerations of costs, volume, and available resources for manufacturing fluoxetine hydrochloride, all details that are superfluous to the best mode requirement. See Wahl Instruments, 950 F.2d at 1581-82, 21 USPQ2d 1128-29 (holding no best mode violation for failure to disclose a method chosen for reasons of cost and volume). In short, the reasons for using Molloy's synthesizing method were not linked to the intrinsic quality of fluoxetine hydrochloride, which is the thrust of the best mode requirement.

B. Recrystallization Solvent

Barr also argues that claim 5 of the '081 patent and claim 7 of the '549 patent violate the best mode requirement because Molloy failed to disclose the particular recrystallization solvent that he used to purify fluoxetine hydrochloride. Even assuming that Molloy preferred a particular and specific recrystallization solvent to others, we hold that failure to disclose that solvent does not violate the best mode requirement.

Once again, we begin our analysis with the scope of the claimed invention. See Engel Indus., 946 F.2d at 1531, 20 USPQ2d at 1302. Claim 5 of the '081 patent covers the compound fluoxetine hydrochloride, and claim 7 of the '549 patent covers a method for administering it. Both patents teach that the preferred embodiment of fluoxetine hydrochloride is achieved by purifying the compound through recrystallization. Based on the record, there is no genuine issue that one of ordinary skill in the art possessed the requisite knowledge to select a solvent for recrystallizing fluoxetine hydrochloride. Even Barr's expert testified that "in 1974, sometimes the recrystallization of amine hydrochlorides was indeed routine." Choosing a solvent for performing recrystallization, therefore, constitutes a routine detail that falls outside the ambit of the best mode disclosure. See Young Dental, 112 F.3d at 1144, 42 USPQ2d at 1595; Fonar, 107 F.3d at 1549, 41 USPQ2d at 1805 ("It is well established that what is within the skill of the art need not be disclosed to satisfy the best mode requirement as long as that mode is described.").

Barr contends that, even if choosing a solvent for recrystallization is a routine detail, the best mode requirement compels Molloy to disclose the particular and specific solvent he used in the recrystallization process. In effect, Barr argues that Molloy was obligated to disclose not only the preferred embodiment of the claimed invention, but also the preferred solvent for the unclaimed recrystallization process. Stated at a higher level of generality, Barr asserts that a patentee must disclose a preferred mode for carrying out an unclaimed routine detail. That position, however, is in conflict with the scope of the claims at issue, our prior decisions, and the purpose undergirding the best mode requirement.

As we have often said, "[i]t is concealment of the best mode of practicing the claimed invention that § 112, ¶ 1 is designed to prohibit." Chemcast, 913 F.2d at 927, 16 USPQ2d at 1036 (emphasis added). Here, the patents disclose that the best mode of the claimed invention is fluoxetine hydrochloride that is purified through recrystallization. The patents, however, do not claim a process for purifying fluoxetine hydrochloride through recrystallization or a solvent for performing the recrystallization. Thus, failure to disclose a preferred solvent does not equate to a best mode violation because the patents simply do not claim a recrystallization process or a recrystallization solvent. See Engel Indus., 946 F.2d at 1531, 20 USPQ2d at 1302 ("Unclaimed

subject matter is not subject to the disclosure requirements of § 112; the reasons are pragmatic: the disclosure would be boundless and the pitfalls endless."); cf. Northern Telecom Ltd. v. Samsung Elecs. Co., 215 F.3d 1281, 1288, 55 USPQ2d 1065, 1070 (Fed. Cir. 2000) (holding no best mode violation when inventor did not disclose an unclaimed, preferred method for use of the claimed invention—thin-line etching—because the claim covered a general process of plasma etching and the patent described the best mode for carrying out that process).

Further, § 112 requires only "an adequate disclosure of the best mode." Amgen, Inc. v. Chugai Pharm. Co., Ltd., 927 F.2d 1200, 1212, 18 USPQ2d 1016, 1025-26 (Fed. Cir. 1991). It logically follows that a patentee's failure to disclose an unclaimed, preferred mode for accomplishing a routine detail does not violate the best mode requirement because one skilled in the art is aware of alternative means for accomplishing the routine detail that would still produce the best mode of the claimed invention. Indeed, Barr and other companies are able to recrystallize fluoxetine hydrochloride by using solvents different from the one Molloy used. In addition, our cases hold that a patentee complies with § 112 even though some experimentation is necessary to practice the best mode. See id. (holding that best mode does not require a "guarantee that every aspect of the specification be precisely and universally reproducible"); Scripps Clinic & Research Found. v. Genentech, Inc., 927 F.2d 1565, 1579-80 (Fed. Cir. 1991); Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1384-85, 231 USPQ 81, 94 (Fed. Cir. 1986). In Hybritech, for example, this court held that the patentee did not violate § 112, even though carrying out the best mode of the invention involved screening experiments that were laborious and time consuming, because screening methods were known in the art. 802 F.2d at 1384-85, 231 USPQ at 94. Similarly, in the present case, solvents for recrystallizing fluoxetine hydrochloride were known in the art, and simply because selecting a desired solvent may have required some experimentation, nondisclosure of Molloy's particular solvent does not rise to a best mode violation.

Moreover, the purpose behind the best mode requirement supports our conclusion. As we explained in Amgen, the best mode requirement establishes a quid pro quo whereby the patentee "must not receive the right to exclude others unless at the time of filing he has provided an adequate disclosure of the best mode." 927 F.2d at 1210, 18 USPQ2d at 1024. The best mode requirement, however, is a two-way street, and in the present case, the '081 and '549 patents do not grant Lilly the right to exclude others from practicing Molloy's method of recrystallization or from using his preferred solvent. Thus, it would be incongruous to require that Molloy disclose that information nonetheless. See Randomex, 849 F.2d at 588, 7 USPQ2d at 1053 ("It is concealment of the best mode of practicing the claimed invention that section 112, ¶ 1 is designed to prohibit." (emphasis in original)).

In sum, because no genuine issue of material fact exists upon which a reasonable jury could find that claim 5 and claim 7 did not comply with the best mode requirement, we affirm the district court's grant of summary judgment in favor of Lilly. Thus, we have no occasion to determine if Barr has a right to a jury trial on that issue.

III. DOUBLE PATENTING

Through a statutorily prescribed term, Congress limits the duration of a patentee's right to exclude others from practicing a claimed invention. 35 U.S.C. § 154(a)(2) (1994). The

judicially-created doctrine of obviousness-type double patenting cements that legislative limitation by prohibiting a party from obtaining an extension of the right to exclude through claims in a later patent that are not patentably distinct from claims in a commonly owned earlier patent. In re Longi, 759 F.2d 887, 892, 225 USPQ 645, 648 (Fed. Cir. 1985) (explaining that, even though no explicit statutory basis exists for obviousness-type double patenting, the doctrine is necessary to prevent a patent term extension through claims in a second patent that are not patentably distinct from those in the first patent). As one of our predecessor courts explained, "[t]he fundamental reason for the rule [of obviousness-type double patenting]

is to prevent unjustified timewise extension of the right to exclude granted by a patent no matter how the extension is brought about." In re Van Ornum, 686 F.2d 937, 943-44, 214 USPQ 761, 766 (CCPA 1982) (quoting In re Schneller, 397 F.2d 350, 158 USPQ 210, 214 (CCPA 1968)).

Generally, an obviousness-type double patenting analysis entails two steps. First, as a matter of law, a court construes the claim in the earlier patent and the claim in the later patent and determines the differences. Georgia-Pacific Corp. v. United States Gypsum Co., 195 F.3d 1322, 1326, 52 USPQ2d 1590, 1593 (Fed. Cir. 1999). Second, the court determines whether the differences in subject matter between the two claims render the claims patentably distinct. Id. at 1327, 52 USPQ2d at 1595. A later claim that is not patentably distinct from an earlier claim in a commonly owned patent is invalid for obvious-type double patenting. In re Berg, 140 F.3d 1428, 1431, 46 USPQ2d 1226, 1229 (Fed. Cir. 1998). A later patent claim is not patentably distinct from an earlier patent claim if the later claim is obvious over, or anticipated by, the earlier claim. In re Longi, 759 F.2d at 896, 225 USPQ at 651 (affirming a holding of obviousness-type double patenting because the claims at issue were obvious over claims in four prior art patents); In re Berg, 140 F.3d at 1437, 46 USPQ2d at 1233 (Fed. Cir. 1998) (affirming a holding of obviousness-type double patenting where a patent application claim to a genus is anticipated by a patent claim to a species within that genus).

On appeal, we limit our inquiry to an analysis of whether claim 7 of the '549 patent is invalid for obvious-type double patenting over claim 1 of the '213 patent. In accordance with the two-prong obviousness-type double patenting test demarcated in Georgia-Pacific, we first construe the claims at issue and determine the differences in subject matter between these two claims. The relevant portion of claim 1 of the '213 patent is directed to a method for treating anxiety in a human by administering an effective amount of fluoxetine or a pharmaceutically-acceptable salt thereof. '213 patent, col. 2, ll. 34-39. Claim 7 of the '549 patent covers a method of blocking the uptake of serotonin by brain neurons in animals by administering the compound fluoxetine hydrochloride. '549 patent, col. 20, ll. 7-9.

A person of ordinary skill in the art would have recognized that fluoxetine hydrochloride is a pharmaceutically-acceptable salt of fluoxetine. In fact, hydrochloride salts are the most common pharmaceutically acceptable salts of basic drugs, and hence are obvious compounds. See, e.g., The Merck Index of Chemicals and Drugs (Paul G. Stecher et al. eds., 7th ed. 1960) (listing multiple hydrochloride salts of drugs).

Therefore, the only difference between claim 1 of the '213 patent and claim 7 of the '549 patent

is that the former addresses a method of treating anxiety in humans with fluoxetine hydrochloride while the latter claims a method of using fluoxetine hydrochloride to block serotonin uptake in animals. Having recognized the difference between the claims at issue, we must decide whether this difference renders the claims patentably distinct.

Serotonin uptake inhibition is a natural biological activity that occurs when fluoxetine hydrochloride is administered to an animal, such as a human, for any purpose, including the treatment of anxiety. That is, serotonin uptake inhibition is an inherent property of fluoxetine hydrochloride upon its administration. Barr has offered a panoply of evidence to support the recognition of this inherent biological function of fluoxetine hydrochloride.

In Lilly's March 24, 1998 10-K filing with the Securities and Exchange Commission, Lilly pointed out that serotonin uptake inhibition is the "process by which Prozac works." The title of a 1995 article published by Lilly also indicates that Prozac is a serotonin uptake inhibitor: Minireview Prozac (Fluoxetine, Lilly 110140), The First Selective Serotonin Uptake Inhibitor and Antidepressant Drug: Twenty Years Since Its First Publication. David T. Wong, Frank P. Bymaster, & Eric A. Engleman, at 1 (1995). The summary of this article "describe[s] the evolutionary process involved in the discovery of the selective 5-HT [serotonin] uptake inhibitor, fluoxetine. . . ." Id. at 1. The first full sentence of the article states: "Fluoxetine (Prozac) first appeared in scientific literature as Lilly 110140 (the hydrochloride form), a selective serotonin uptake inhibitor, in the August 15, 1974 issue of Life Sciences." Id. The article continues: "After twenty-plus years of extensive investigations, inhibition of serotonin uptake remains the major mechanism of action for fluoxetine. . . ." Id. Several tables in the article specifically demarcate amounts of serotonin uptake inhibition resulting from fluoxetine administration. Id. at 7, 10-12, 14, 18. The article even illustrates chemical structures of several serotonin uptake inhibitors, one of which is fluoxetine. Id. at 9. The article concludes by stating that despite "intensive investigation," including over 5500 research papers on the subject, fluoxetine "is still regarded as a selective [serotonin] uptake inhibitor."

During a deposition, Lilly's expert, Alan Frazer, divulged that "[t]here is no doubt in my mind" that fluoxetine hydrochloride inhibits serotonin reuptake in "the vast majority" of people that ingest fluoxetine hydrochloride. Frazer also stated that he had "no doubt" that inhibition reuptake in brain neurons is the expected consequence of administering fluoxetine hydrochloride. Frazer further acknowledged in a sworn statement that: "Clearly, there are [sic] a wealth of data demonstrating that the uptake of serotonin is inhibited in most humans when fluoxetine is administered." Another one of Lilly's experts, Louis Lemberger, stated in the course of a deposition: "If you give fluoxetine hydrochloride to a human being you are going to inhibit serotonin uptake. . . ." Yet another Lilly expert, Irwin Slater, also agreed that ingesting fluoxetine hydrochloride will result in the inhibition of serotonin uptake in brain neurons.

Likewise, Barr's expert, Fridolin Sulser, stated in an affidavit that "[t]he pharmacological effect of administering fluoxetine hydrochloride is to inhibit serotonin reuptake in brain neurons." He also recognized that "it is literally impossible to treat someone for anxiety . . . with fluoxetine hydrochloride without at the same time inhibiting serotonin reuptake." In an expert report, Dr. Sulser again reiterated that "the primary pharmacological effect of fluoxetine is the inhibition of serotonin reuptake in brain neurons." He further reiterated that administering fluoxetine hydrochloride "will inherently and inevitably block the reuptake of serotonin. . . ." He provided a wealth of support for these opinions. Another Barr expert, Robert Roth, also stated that "[t]he biological activity of claim 7 of the '549 patent[] inherently and inevitably occurs whenever someone practices . . . the '213 . . . patent[]." He continued, stating that "there is no doubt" that

"administration of fluoxetine hydrochloride inherently and inevitably blocks the reuptake of serotonin. . . ." Dr. Roth provided a plethora of support for his opinion.

Lilly has not proffered any significant evidence rebutting Barr's ample foundation for the proposition that administration of fluoxetine hydrochloride naturally and inherently inhibits the uptake of serotonin.

A reference is anticipatory if it discloses every limitation of the claimed invention either explicitly or inherently. Atlas Powder Co. v. Ireco Inc., 190 F.3d 1342, 1346, 51 USPQ2d 1943, 1945 (Fed. Cir. 1999). A reference includes an inherent characteristic if that characteristic is the "natural result" flowing from the reference's explicitly explicated limitations. Continental Can Co. USA, Inc. v. Monsanto Co., 948 F.2d 1264, 1269, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991) (citations omitted). In this case, it is clear from all of the evidence proffered by Barr that the natural result flowing from administration of fluoxetine hydrochloride is inhibition of serotonin uptake. Therefore, the limitation of claim 7 of the '549 patent directed to blocking serotonin uptake by use of fluoxetine hydrochloride is an inherent characteristic of the administration of fluoxetine hydrochloride for any purpose, including the treatment of anxiety.

A patentable distinction does not lie where a later claim is anticipated by an earlier one. That is, a later patent claim that fails to provide novel invention over an earlier claim is not patentably distinct from the earlier claim. Salient aspects of the case at issue are factually similar to Burroughs Wellcome Co. v. Barr Labs., Inc., 40 F.3d 1223, 32 USPQ2d 1915 (Fed. Cir. 1994). That case involved several patents directed to the use of 3'-azidothymidine ("AZT") to treat individuals infected with the human immunodeficiency virus ("HIV") or individuals who had acquired immunodeficiency syndrome ("AIDS"), and involved United States Patent No. 4,818,750 ("the '750 patent"), which covered a method of using AZT to increase the T-lymphocyte count of persons infected with HIV. Burroughs Wellcome, 40 F.3d at 1225, 32 USPQ2d at 1916-17. While never directly addressed by the majority, in his partial dissent, Judge Lourie articulated that the '750 patent should have been invalidated for double patenting because the method claimed in the '750 patent "is an inherent, inevitable result of the practice of the other method patents claiming treatment of HIV or AIDS." Id. at 1233, 32 USPQ2d at 1924 (Lourie, J., dissenting-in-part). He stated that because the method claimed in the '750 patent was inherent in the use of AZT to treat HIV and AIDS patients, it lacked novelty. Id. He continued, suggesting that allowing a common owner to receive both a patent claiming the physical act of treating individuals that have HIV or AIDS and a patent covering the result that such treatment accomplishes makes "no sense." Id. at 1234, 32 USPQ2d at 1924. "It amounts to deciding that treating a person in pain with aspirin is one invention and invoking the pain relieving mechanism by means of that treatment is another." Id.

Similarly, in the case at bar, claim 7 of the '549 patent simply describes the process by which fluoxetine hydrochloride physically acts on individuals who receive the drug. That is, fluoxetine hydrochloride inherently blocks serotonin uptake upon administration. Therefore, no patentable distinction rests between administering fluoxetine hydrochloride for treatment of anxiety and inhibition of serotonin uptake by administration of fluoxetine hydrochloride.

The only other difference between claim 1 of the '213 patent and claim 7 of the '549 patent is that the former is directed to humans while the latter is directed to animals. Humans are a species of the animal genus. Our case law firmly establishes that a later genus claim limitation

is anticipated by, and therefore not patentably distinct from, an earlier species claim. In re Berg, 140 F.3d at 1437, 46 USPQ2d at 1233 (Fed. Cir. 1998); In re Goodman, 11 F.3d 1046, 1053, 29 USPQ2d 2010, 2016 (Fed. Cir. 1993); In re Gosteli, 872 F.2d 1008, 1010, 10 USPQ2d 1614, 1616 (Fed. Cir. 1989); Titanium Metals Corp. v. Banner, 778 F.2d 775, 782, 227 USPQ 773, 779 (Fed. Cir. 1985); In re Van Ornum, 686 F.2d at 944, 214 USPQ at 767 (C.C.P.A. 1982).

A motion for summary judgment shall be granted "if the pleadings, depositions, answers to interrogatories, and admissions on file, together with affidavits, if any, show that there is no genuine issue as to any material fact, and that the moving party is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(c). A genuine issue of material fact exists if there is sufficient evidence for a jury to return a verdict in favor of the nonmoving party on the particular issue. Anderson, 477 U.S. at 248. While the burden rests on the party moving for summary judgment to show "that there is an absence of evidence to support the non-moving party's case," the nonmoving party must affirmatively demonstrate by specific factual allegations that a genuine issue of material fact exists for trial. Celotex Corp. v. Catrett, 477 U.S. 317, 322-23, 325. In this case, Barr moved for summary judgment that claim 7 of the '549 patent was invalid for double patenting over, inter alia, claim 1 of the '213 patent. Barr has presented an abundance of evidence indicating that the natural result of fluoxetine hydrochloride is the inhibition of serotonin uptake. Lilly has not proffered sufficient evidence in response to this evidence. Therefore, there remains no genuine issue of fact as to this issue. That is, there is not sufficient evidence on which a jury could base a finding that fluoxetine hydrochloride does not inhibit the uptake of serotonin. Accordingly, the district court erred by indicating that Barr failed to establish that inhibition of serotonin uptake merely describes a biological result of fluoxetine hydrochloride administration for the treatment of anxiety. Further, there is no issue of fact as to whether a human is a species of the animal genus or whether fluoxetine hydrochloride is a pharmaceutically-acceptable salt of fluoxetine. Consequently, the double patenting issue in this case is solely a matter of law.

We have compared the differences between the claims at issue as a whole and conclude that they are not patentably distinct. Therefore, we reverse the district court's denial of the portion of Barr's motion for summary judgment contending that claim 7 of the '549 patent is invalid for obviousness-type double patenting over claim 1 of the '213 patent. Consequently, the portion of Barr's motion for summary judgment pertaining to double patenting is granted. The district court's grant of Lilly's motion for summary judgment pertaining to double patenting is reversed.

CONCLUSION

Because we hold that claim 5 of the '081 patent and claim 7 of the '549 patent comply with the best mode requirement and that claim 7 is invalid for obviousness-type double patenting in view of claim 1 of the '213 patent, we affirm-in-part and reverse-in-part. Further, because we do not reach the issue, we vacate the district court's grant of a jury trial to Barr.

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

COSTS

Each party shall bear its own costs.

FOOTNOTES:

[1] All other issues relating to validity were resolved by consent of the parties. As a result, the district court's judgment disposed of all claims at issue.

[2] This section provides, in pertinent part, as follows:

An abbreviated application for a new drug shall contain . . . a certification, in the opinion of the applicant and to the best of his knowledge, with respect to each patent which claims the listed drug . . . for which the applicant is seeking approval under this subsection . . . that such patent is invalid or will not be infringed by the manufacture, use, or sale of the new drug for which the application is submitted.

35 U.S.C. § 355(j)(2)(A)(vii)(IV) (1994).

[3] This section provides, in pertinent part, that "[i]t shall be an act of infringement to submit . . . an application under . . . [the Hatch-Waxman Act] . . . for a drug claimed in a patent or the use of which is claimed in a patent." 35 U.S.C. § 271(e)(2)(A).

[4] Application Serial No. 846,448 was a continuation-in-part of Serial No. 544,654 (October 24, 1983), which was a continuation of Serial No. 872,147 (January 25, 1978), which in turn was a divisional of Serial No. 432,379 (January 10, 1974).

[5] A patent owner cannot avoid double patenting by disclaiming the earlier patent. Further, because Lilly disclaimed the '213 patent, it cannot now terminally disclaim the '549 patent to expire at the time the '213 patent would have expired had it not been disclaimed. That is, the fact that the '213 patent has been disclaimed is of no help to Lilly, as double patenting precludes claim 7 of the '549 patent from extending beyond the termination date of the '213 patent, whether that termination date is at the end of its normal term or, as in this case, is the date it is terminated via disclaimer.

[6] An absence of overlap between the later claim and the earlier claim does not preclude a conclusion that the later claim is patentably indistinct from the earlier claim.

[7] A two-way double patenting test does not apply in this case. The two-way test is only appropriate in the unusual circumstance where, inter alia, the United States Patent and Trademark Office ("PTO") is "solely responsible for the delay in causing the second-filed application to issue prior to the first." (emphasis added). In re Berg, 140 F.3d at 1437, 46 USPQ2d at 1233 (Fed. Cir. 1998); see also In re Goodman, 11 F.3d 1046, 1053, 29 USPQ2d 2010, 2016 (Fed. Cir. 1993) (holding that PTO actions did not dictate the rate of prosecution when Goodman accepted early issuance of species claims and filed a continuation application to prosecute genus claims). Such circumstances are not present in this case, because the PTO was not solely responsible for the delay. Indeed, the '549 patent issued in December 1986, approximately eight months after a continuation-in-part was filed, which stemmed from a continuation application, which in turn stemmed from a divisional of the original '379 application that was filed in January 1974. Further, an expert hired on behalf of Lilly in the matters of PTO and corporate intellectual property practice, in discussing claim 7 of the '549

patent, stated: “[I]t is true that the claim could have been presented earlier. . . .” This statement indicates that the delay was not solely caused by the PTO.

[8] The reference to “selective” means that fluoxetine hydrochloride inhibits the uptake of serotonin to a greater degree than it inhibits the uptake of other monoamines (such as dopamine or norepinephrine).

[9] The Wong article defines 5-HT as serotonin. Wong at 2.