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## United States Court of Appeals for the Federal Circuit

02-1391

EMERGENCY FUEL, LLC, SPARE TANK, LLC, LEONARD BLOOM,  
WILLIAM J. HUBBARD, and THE ESTATE OF REGINALD SPENCER,  
through Ellen Spencer and Chad Spencer, Personal Representatives,

Plaintiffs-Appellants,

v.

PENZOIL-QUAKER STATE COMPANY,

Defendant -Appellee.

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DECIDED: July 25, 2003

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Before NEWMAN, MICHEL, and PROST, Circuit Judges.

PROST, Circuit Judge.

Emergency Fuel, LLC, Spare Tank, LLC, Leonard Bloom, William Hubbard, and The Estate of Reginald Spencer (collectively "Emergency Fuel") appeal from a decision of the United States District Court for the District of Maryland granting Penzoil-Quaker State Company's ("Penzoil's") motion for summary judgment of invalidity of the asserted claims of United States Patent Nos. 5,681,358 ("the '358 patent") and 5,938,799 ("the '799 patent") for lack of enablement, and United States Patent Nos. 6,110,237 ("the '237 patent") and 6,113,660 ("the '660 patent") for on-sale and public use statutory bars. We affirm the portion of the district court's judgment granting summary judgment of invalidity of the '358 and '799 patents for lack of enablement, and reverse and remand the portion of the judgment invalidating the '237 and '660 patents.

### BACKGROUND

Emergency Fuel is the owner of the four patents at issue in this appeal. Each of the subject patents claims an emergency fuel that provides for the clean and smooth operation of an internal combustion engine. The fuel can be stored safely in an automobile for a long period of time and later poured into its fuel tank when the automobile runs out of gas. Mr. William Hubbard and Mr. Reginald Spencer invented the emergency fuel and, with the assistance of counsel, applied for the various patents at issue in this case. They subsequently joined with Spare Tank, LLC, and Emergency Fuel, LLC to produce the emergency fuel for sale to the public under the trademark Spare Tank®.

Emergency Fuel filed its first patent application in September 1995. It abandoned this application soon thereafter in favor of a Continuation-In-Part (“CIP”) application, filed on February 20, 1996, and resulting in the ’358 patent. On July 10, 1997, Emergency Fuel sent letters to QVC and Home Shopping Network, shop-at-home television programs. These letters attached a product information sheet for “SPARE TANK Emergency Fuel.” The letters described the product as “the first and only patented product in the world that is safe to carry in the trunk of a car (gasoline is not) and is ready to use in an out-of-gas situation.”<sup>[1]</sup> The letters also stated, “[w]e are offering to you the one-gallon size because this is of interest to auto owners which represent the largest market.” Emergency Fuel filed a second CIP application on October 22, 1997, which resulted in the ’433 patent (not accused of being infringed). Penzoil alleges that around November 1997, the inventors gave a sample of Spare Tank® to a third party, Milton Fick, who allegedly used the fuel in an internal combustion engine of a lawnmower at his home.<sup>[2]</sup> On May 20, 1998, Emergency Fuel filed a third CIP application, which resulted in the ’799 patent.<sup>[3]</sup> Emergency Fuel filed additional CIP applications on April 21, 1999, and July 29, 1999, which resulted in the ’237 and ’660 patents, respectively.

On January 18, 2000, Emergency Fuel filed an infringement suit alleging that Penzoil’s accused product infringes claim 1 of the ’358 patent and claim 4 of the ’799 patent. The ’237 and ’660 patents issued after the commencement of the infringement action and were added to the complaint by amendment, which alleged that Penzoil infringed all the claims in these two patents.

Emergency Fuel filed a motion for summary judgment of literal infringement of the four patents in suit, which the district court denied. Penzoil subsequently sought summary judgment on several grounds, including that: (1) the asserted claims of the ’358 and ’799 patents are invalid for lack of enablement under 35 U.S.C. § 112; and (2) the ’237 and ’660 patents are invalid under 35 U.S.C. § 102(b) because Emergency Fuel offered to sell its fuel in July 1997 and the fuel was in public use around November 1997, both occurring more than one year prior to the

actual filing dates of these patents. The district court granted summary judgment of invalidity on these two grounds and found it unnecessary to reach Penzoil's remaining arguments for summary judgment and both parties' other outstanding motions. Emergency Fuel, LLC v. Penzoil-Quaker State Co., 187 F. Supp. 2d 575, 578, 583 (D. Md. 2002).

Emergency Fuel filed a timely appeal to this court and we have jurisdiction pursuant to 28 U.S.C. § 1295(a) (1).

## DISCUSSION

We review the district court's grant of summary judgment de novo, with all justifiable factual inferences being drawn in favor of the party opposing the motion. See Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 255 (1986). Summary judgment is appropriate where there is no genuine issue of material fact and the moving party is entitled to judgment as a matter of law. See Fed. R. Civ. P. 56(c). Furthermore, we review the district court's claim construction de novo. Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1456 (Fed. Cir. 1998) (en banc).

### I. INVALIDITY OF THE '358 AND '799 PATENTS

Emergency Fuel alleges that Penzoil infringes claim 1 of the '358 patent, which reads:

1. A method of using a stable emergency fuel in an internal combustion engine of a vehicle comprising the steps of:
  - providing a container having mineral spirits therein, the mineral spirits having a flash point of at least 100°F. or higher,

safely storing the container with the emergency fuel in the vehicle for a period of at least twelve months unless needed for use prior thereto, and

pouring the mineral spirits into a fuel tank of the vehicle in the event the vehicle runs out of fuel, the emergency fuel providing clean and smooth operation of the internal combustion engine.

'358 patent, col. 10, ll. 53-65 (emphasis added).

The '358 specification states that “[i]n order to run smoothly, the fuel must have an octane number in the same range as or higher than regular gasoline. This is typically from 86 to 88.” Id. at col. 5, ll. 56-58. In light of the foregoing statement, the district court concluded that claim 1 covers an emergency fuel with an octane number of at least 86. The '358 specification also teaches that “[t]he presence of naphthenes, aromatics and isoparaffins all

help to improve the octane number.” *Id.* at col. 5, ll. 62-64. With regard to the use of aromatics, the district court found that the ’358 patent taught against using large amounts of aromatic hydrocarbons, while the more recent patents acknowledge that to fulfill the smooth and clean engine operation requirement one must increase aromatic content. Thus, the district court concluded that the ’358 patent does not teach the full scope of the claimed invention, specifically, how to obtain an octane number of 86 using aromatics.

Emergency Fuel also alleges that Penzoil infringes claim 4 of the ’799 patent, which reads:

4. An emergency fuel for an internal combustion engine to be stored in a vehicle and to be used when the vehicle is out of fuel, the emergency fuel comprising:

mineral spirits,

the emergency fuel having an octane number of at least

70, and

the emergency fuel having a flash point of at least 100 °F.

’799 patent, col. 13, ll. 1 -7.

The district court found that the ’799 patent also teaches not to increase aromatic content, but incorporates by reference the entire ’358 patent, including the limitation that the fuel have an octane number of 86 to 88. The court further noted that the ’799 patent makes it appear that the blends described in the specification examples would achieve the claimed octane number of 70, but that the octane numbers for those blends are actually lower than 70. Accordingly, the district court concluded that the claims of the ’358 and ’799 patents were not enabled because if one skilled in the art does what the patents teach, he or she would not be able to obtain compositions that fall within the asserted claims without undue experimentation.

On appeal, Emergency Fuel argues that cautionary instructions in the specifications regarding the method of increasing octane by adding aromatics does not justify summary judgment for lack of enablement where those skilled in the art were aware of alternative modes of increasing octane and the specification itself discloses those alternative modes. These alternative methods are the addition of isoparaffins and naphthenes. Further, Emergency Fuel contends that the district court erroneously required the ’358 and ’799 patent specifications to include a working example of an emergency fuel with the requisite octane rating to satisfy the enablement requirement.

Penzoil counters that the asserted claims of the '358 and '799 patents are invalid for lack of full scope enablement in light of the deficient disclosure of how to achieve an 86 octane rating in the emergency fuel by adding aromatics. Penzoil also contends that the isoparaffin embodiment cannot save the asserted claims because the claims were not restricted to that embodiment and the embodiment is not adequately enabled by the '358 specification. With regard to the '799 patent, Penzoil does not dispute that claim 4 covers an emergency fuel with an octane rating of at least 70. However, Penzoil notes that the sole support for this requirement is a table purporting to teach how various octane numbers can be achieved by varying aromatic content, which the parties do not dispute was incorrect.

#### A. CONSTRUCTION OF THE '358 AND '799 PATENT CLAIMS

We agree with the district court that claim 1 of the '358 patent is limited to an emergency fuel having an octane rating of at least 86. The claim recites an emergency fuel that “provid[es] clean and smooth operation of the internal combustion engine.” '358 patent at col. 10, ll. 64-65. To understand the meaning of the ambiguous claim language, “smooth operation,” we must look to the specification for the meaning ascribed to that term by the inventor. See Teleflex, Inc. v. Ficoso N. Am. Corp., 299 F.3d 1313, 1325 (Fed. Cir. 2002); Markman v. Westview Instruments, Inc., 52 F.3d 967, 979 (Fed. Cir. 1995) (stating “[c]laims must be read in view of the specification, of which they are a part”) (citations omitted); Scimed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc., 242 F.3d 1337, 1339-41 (Fed. Cir. 2001) (affirming summary judgment below and reading claim in light of specification). The '358 patent specification explains that “[i]n order to run smoothly, the fuel must have an octane number in the same range as or higher than regular gasoline. This is typically from 86 to 88.” '358 patent at col. 5, ll. 56-58. Further, Mr. Hubbard and Emergency Fuel’s designated expert, Richard Bechtold, confirmed that the “smooth operation” limitation of claim 1 of the '358 patent cannot be satisfied unless the emergency fuel has at least an octane rating of 86 to 88. Accordingly, the district court correctly construed claim 1 of the '358 patent as limited to an emergency fuel having an octane rating of at least 86. As to claim 4 of the '799 patent, the claim language dictates an emergency fuel having an octane rating of at least 70. We next address the district court’s enablement analysis.

#### B. ENABLEMENT OF THE '358 AND '799 PATENT CLAIMS

A patent specification must “contain a written description of the invention and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same . . .” 35 U.S.C. § 112 (2000); Genentech, Inc. v. Novo Nordisk A/S, 108 F.3d 1361, 1365 (Fed. Cir. 1997). The enablement requirement is satisfied if the patent specification teaches those skilled in the art how to make and use the full scope of the claimed invention without undue experimentation. Id. That some experimentation is required to practice the claimed invention is permissible, so long as it is not undue. Atlas Powder Co. v. E.I. Dupont De Nemours & Co., 750 F.2d 1569, 1576 (Fed. Cir. 1984). Moreover, enablement is determined as of the filing date of the patent application. Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1384 (Fed. Cir. 1986). The burden of proof is on the accused infringer to present clear and convincing evidence that the asserted patent claims are invalid under § 112. United States v. Telectronics, Inc., 857 F.2d 778, 785 (Fed. Cir. 1988). Whether a claim is enabled is a question of law based on underlying facts, and we review those facts for clear error. See Enzo Biochem Inc. v. Calgene, Inc., 188 F.3d 1362, 1369 (Fed. Cir. 1999).

In support of its argument that the ’358 and ’799 patents are enabled, Emergency Fuel relies on: (1) the teaching in the ’358 specification that “[t]he presence of naphthenes, aromatics, and isoparaffins all help to improve the octane number” and an example in the ’799 patent indicating that octane number can be increased by increasing the aromatic content of the hydrocarbon mixture; (2) the definition of octane number, i.e., the percentage of isooctane (an isoparaffin) in normal heptane [4]; and (3) knowledge in the art that any of these three groups of chemicals, especially isoparaffins, could be used to increase octane number.

We reject these arguments, however, and agree with the district court that the ’358 and ’799 patents do not enable one skilled in the art to obtain an octane rating of at least 86 without undue experimentation. It is true, as Emergency Fuel asserts, that “a specification need not disclose what is well known in the art.” Genentech, Inc., 108 F.3d at 1366 (citation omitted). However, knowledge in the art can merely supplement, but not be a substitute for, a basic enabling disclosure. Id. (stating that “[i]t is the specification, not the knowledge of one skilled in the art, that must supply the novel aspects of an invention in order to constitute adequate enablement”). In this case, knowledge in the art that increasing naphthenes, aromatics, or isoparaffins can increase an octane number does not add to the explicit teaching in the specification that octane can be increased by the addition of any of these three chemicals. Rather, this knowledge in the art merely reiterates that which is already unequivocally taught in the specification. Generally increasing the octane of the emergency fuel, however, is not commensurate with the scope of the claim limitation, which requires raising the octane number above 86. Nat’l Recovery Techs., Inc. v. Magnetic Separation

Sys., 166 F.3d 1190, 1196 (Fed. Cir. 1999) (stating “[t]he scope of the claims must be less than or equal to the scope of the enablement”).

Although the specification teaches one skilled in the art generally how to increase octane, it does not teach how to specifically attain an octane rating of at least 86 using any of the disclosed methods. See John Hopkins Univ. v. Cellpro Inc., 152 F.3d 1342, 1361 (Fed. Cir. 1998) (stating that enablement requirement is satisfied if the description enables any mode of making and using the invention). The ’358 specification, for example, instructs that one can increase octane (by an unspecified amount), by adding naphthenes, aromatics, or isoparaffins, but it does not specify the amount to add, i.e. at what ratio or at what strength, to achieve the necessary octane number. Moreover, the mere presence of isoparaffins<sup>[5]</sup> does not necessarily increase the octane rating above 86. See Genentech, Inc., 108 F.3d at 1366 (stating that “[p]atent protection is granted in return for an enabling disclosure of an invention, not for vague intimations of general ideas that may or may not be workable”). For example, as Penzoil’s patent application for an emergency fuel demonstrates, the addition of certain isoparaffins to the point of purity, i.e. 99.9%, does not yield an octane number above 86. Thus, if one skilled in the art followed the steps set forth in the ’358 and ’799 specifications, he or she would not be able to replicate the claimed invention by obtaining an emergency fuel with an octane of at least 86, without undue experimentation.

The aromatic method of increasing octane is even more problematic to Emergency Fuel’s position because both the ’358 and ’799 specifications discourage the use of large amounts of aromatic hydrocarbons in order to achieve clean and smooth operation. The ’358 specification states that “[t]he emergency alternative fuel must also have a low content of aromatic components to prevent or reduce the production of soot and smoky combustion products. . . . It is preferred that aromatic content of the alternative fuel be less than 15% by volume.” ’358 patent at col. 6, ll. 24-31. The ’799 patent similarly states that “[a]s the aromatic content increases, the exhaust from the engine tends to be more black and to have a disagreeable odor. Thus, aromatic content preferably, is limited.” ’799 patent at col. 12, ll. 29-31. In addition, the ’799 patent incorporates by reference the entire ’358 patent and, thus, the cautionary statements with regard to the use of aromatics, as well as the reference to an octane number of 86 to 88.

Notably, however, Emergency Fuel’s subsequent patents teach that to fulfill the smooth and clean engine operation requirement, one must increase aromatic content significantly above 15%. Indeed, the ’237 and ’660 patents reveal that the aromatic content must be closer to 60% to yield an octane rating above 86. ’237 patent, col. 12, ll. 25-44; ’660 patent, col. 13, ll. 25-40. Thus, if a person of ordinary skill in the art attempted to increase the octane number of the emergency fuel by adding aromatic hydrocarbons, that person would have to experiment

enough to learn that he has to completely disregard the teachings in the '358 specification that the aromatic content should be less than 15% and instead quadruple the amount of aromatics.

Lastly, Emergency Fuel alleges that the district court erroneously concluded that a working example of an emergency fuel with the required octane rating was necessary in the specification to satisfy the enablement requirement. See In re Borkowski, 422 F.2d 904, 908 (C.C.P.A. 1970) (stating that “a specification need not contain a working example if the invention is otherwise disclosed in such a manner that one skilled in the art will be able to practice it without an undue amount of experimentation”); Manual of Patent Examining Procedure § 2164.02 (2001). Emergency Fuel does not reference, however, any portion of the district court’s opinion as explicitly requiring a “working example” to satisfy the enablement requirement. Furthermore, we do not interpret the district court’s opinion as a whole as requiring a working example to satisfy the enablement requirement. Rather, the district court viewed the lack of working examples in either of the '358 and '799 specifications as further evidence that the asserted claims were not enabled. See Application of Collianni, 561 F.2d 220, 222 (C.C.P.A. 1977) (upholding claim rejection and considering the lack of a working example as evidence that claims were not enabled). Therefore, we conclude that the asserted claims of the '358 and '799 patents are invalid under § 112 because they are not sufficiently enabled. Accordingly, we affirm the portion of district court’s decision granting summary judgment to Penzoil on the claims asserted under the '358 and '799 patents.

## II. INVALIDITY OF THE '237 AND '660 PATENTS

Emergency Fuel also contends that Penzoil infringes all of the claims of the '237 and '660 patents. Penzoil counters that both of these patents are statutorily barred because the invention was offered for sale in July 1997 and in public use in approximately November 1997. See 35 U.S.C. § 102(b) (2000) (stating that a patent is invalid due to anticipation if “the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States”).

Because the later patents are CIPs, the district court first determined if they could claim the benefit of the earlier filing dates of the '358 and '799 patents.<sup>[6]</sup> After interpreting all the claims in the '237 and '660 patents as requiring a fuel with an octane rating in the 86 to 88 range, the district court concluded that the insufficient disclosures in the '358 and '799 specifications as to achieving an 86 octane rating foreclosed the later patents from relying on the earlier patents’ filing dates. See 35 U.S.C. § 120 (2000) (stating that a patent application can benefit from the filing date of an earlier filed application only if the disclosure of the earlier application provides enabling

support for the claims of the later application as required by 35 U.S.C. § 112).

Having found that the '237 and '660 patents are not entitled to an earlier filing date, the district court next determined whether they are invalid under § 102(b). The district court concluded that the emergency fuel alleged to have been on sale and in public use in 1997 ("the subject emergency fuel") was covered by the patent claims at issue because it had an octane rating of at least 86. The court based this conclusion on two documents: (1) an undated advertisement for Spare Tank®, which refers to the '358 patent, and (2) a letter from Maryland Q.C. Laboratories, Inc. dated July 9, 1996. This letter stated that independent testing on a one gallon sample of Spare Tank® showed that it had an octane level of 90. The district court next concluded that Emergency Fuel's letters to QVC and the Home Shopping Network in July 1997 constituted an offer to sell Spare Tank® under the Uniform Commercial Code and that Spare Tank® was in public use by a third party in approximately November 1997.<sup>[7]</sup> Thus, the district court held that the '237 and '660 patents are invalid by reason of the public use and on sale bar.

With regard to the statutory bar allegations, Emergency Fuel challenges both documents relied upon by the district court in finding that the subject emergency fuel had an octane rating of at least 86. According to Emergency Fuel, the undated advertisement for Spare Tank® was not for the same emergency fuel that was the subject of the sale and use activities in 1997. It also notes that the test results in the July 9 letter from Maryland Q.C. Laboratories, Inc. were inaccurate. Emergency Fuel next contends that: (1) the offer it made to QVC and Home Shopping Network would not constitute a sale, if accepted, and therefore is not an offer for sale under § 102(b); and (2) the uncorroborated testimony of a third party, several years after the event, cannot support summary judgment of a public use in November 1997.

Penzoil responds that the subject emergency fuel did have an octane rating of at least 86. In support, Penzoil relies on the undated advertisement for Spare Tank® and Emergency Fuel's letters offering Spare Tank® for sale in July 1997. Penzoil does not dispute, however, that the results in the July 9 letter are inaccurate. Penzoil also maintains that Emergency Fuel's July 1997 letters to QVC and the Home Shopping Network constituted an offer for sale and the use of a Spare Tank® sample by a third party in approximately November 1997 constituted a public use for purposes of § 102.

Accepting the district court's construction of the '237 and '660 patents and therefore its holding that these patents are not entitled to a filing date earlier than the dates on which their applications were actually filed,<sup>[8]</sup> we disagree with the district court that they are statutorily barred by § 102(b). The statutory bar of § 102(b) applies to both "on-sale" and public use conduct. The general purpose behind the § 102(b) bar is to require inventors to assert

with due diligence their right to patent through the prompt filing of a patent application. LaBounty Mfg., Inc. v. U.S. Int'l Trade Comm'n, 958 F.2d 1066, 1071 (Fed. Cir. 1992).

The on sale bar applies to a claim when two conditions have been met before its critical date: (1) the invention is the subject of a commercial offer for sale; and (2) the invention is ready for patenting. Pfaff v. Wells Elecs., Inc., 525 U.S. 55, 57 (1998). Penzoil must overcome the presumption of patent validity with facts supporting a conclusion of invalidity by clear and convincing evidence. Dana Corp. v. Am. Axle & Mfg., Inc., 279 F.3d 1372, 1375 (Fed. Cir. 2002). If Penzoil cannot carry its burden of proof with respect to either of the “commercial offer for sale” or “ready for patenting” requirements, the on sale bar does not apply. The “ready for patenting” requirement may be satisfied in at least two ways: (1) by proof of reduction to practice before the critical date; or (2) proof that prior to the critical date the inventor had prepared drawings or other descriptions of the invention that were sufficiently specific to enable a person skilled in the art to practice the invention. Pfaff, 525 U.S. at 59. Penzoil relies on the first alternative, which requires us to determine “whether the subject of the barring activity met each of the limitations of the claim, and thus was an embodiment of the claimed invention.” Scaltech Inc. v. Refec/Tetra, LLC., 178 F.3d 1378, 1383 (Fed. Cir. 1999); Space Sys./Loral, Inc. v. Lockheed Martin Corp., 271 F.3d 1076, 1080 (2001) (stating that when development and verification are needed in order to prepare a patent application that complies with § 112, the invention is not yet ready for patenting). For a public use statutory bar to apply, Penzoil must similarly establish that the emergency fuel allegedly used by a third person in approximately November 1997 met each of the limitations of the claims of the '237 and '660 patents. See Dana Corp., 279 F.3d at 1375-76.

We conclude that Penzoil has not satisfied the “reduction to practice” requirement because it has not established by clear and convincing evidence that the subject emergency fuel met the “octane rating of at least 86” limitation of the asserted claims. See Intel Corp. v. Int'l Trade Comm'n, 946 F.2d 821, 829 (Fed. Cir. 1991) (stating that whether a patent is invalid for a public use or sale is a question of law based on underlying facts). The undated advertisement for Spare Tank®, relied upon by Penzoil, which represents that the product has an 86 octane rating does not support Penzoil's position. Even accepting that the advertisement was for the same emergency fuel that was involved in the 1997 sale and use activities, a mere representation in an advertisement that Spare Tank® has an octane rating of 86 does not establish that the product actually met this claim limitation. Penzoil's reliance on Emergency Fuel's July 1997 letters offering Spare Tank® for sale is equally deficient. Although the subject of the offer letters was an emergency fuel with an octane rating of at least 86, Penzoil has not shown that the fuel actually had an 86 octane rating. Thus, Penzoil has not shown by clear and convincing evidence that the emergency fuel offered for sale by the advertisement and July 1997 letters was an embodiment of the claimed invention. See

Scaltech Inc., 178 F.3d at 1383; Space Sys./Loral, Inc., 271 F.3d at 1080.

Indeed, as discussed above, Emergency Fuel's '358 and '799 patents did not teach those skilled in the art how to make an emergency fuel with an octane rating of at least 86. Penzoil maintained that the '358 and '799 patents were not enabled because "the inventors had not even adequately taught themselves, let alone others, how to achieve the required 86 to 88 octane rating as of the date of the '358 patent." Penzoil further stated that "the inventors had not even yet conceived the higher aromatic levels required to produce the high octane fuel blends at the time the earlier patents were applied for." Here, the 1997 sale and use activities took place before the date on which the patentees applied for the '799 patent.

Lastly, as Penzoil notes, § 102 also applies in conjunction with § 103, if the claimed invention would have been obvious from the on-sale device in conjunction with the prior art. LaBounty Mfg., Inc., 958 F.2d at 1071. In effect, what was offered for sale or in public use becomes a prior art reference under 35 U.S.C. § 103 against the claimed invention. Baker Oil Tools, Inc. v. Geo Vann, Inc., 828 F.2d 1558, 1562-63 (Fed. Cir. 1987); Lough v. Brunswick Corp., 86 F.3d 1113, 1122-23 n.5 (Fed. Cir. 1996) (stating that § 102(b) may create a bar to patentability in conjunction with § 103 if the differences between the claimed invention and a prior art reference would have been obvious to one skilled in the art). Because both on-sale and obviousness determinations are questions of law that we review de novo, see Manville Sales Corp. v. Paramount Sys., 917 F.2d 544, 549 (Fed. Cir. 1990); B.F. Goodrich Co. v. Aircraft Braking Sys. Corp., 72 F.3d 1577, 1582 (Fed. Cir. 1996), the ultimate determination of obviousness under the § 102(b)/103 bar is necessarily also a question of law subject to de novo review.

Penzoil argues that if the emergency fuel involved in the sale and use activities is added to the prior art, the '237 and '660 patents are invalid as obvious. In support, Penzoil notes that Emergency Fuel argued that its earlier patents were enabled because achieving higher octane by the addition of isoparaffins was known in the art. According to Penzoil, therefore, even if the subject emergency fuel had an octane rating lower than 86, those skilled in the art knew how to achieve an 86 octane rating and could have substituted the lower octane value of the fuel with an 86 octane rating. As we discussed with regard to the enablement analysis of the '358 and '799 patents, however, the evidence demonstrates that those skilled in the art knew only how to generally increase octane. Such persons did not know how to obtain a specific octane rating depending on the starting materials and additives used. Thus, the subject emergency fuel did not render obvious the asserted claims of the '237 and '660 patents.

Accordingly, we conclude that the claims of the '237 and '660 patents are not statutorily barred under § 102(b), either alone or in conjunction with § 103, because Penzoil has not established by clear and convincing

evidence that the emergency fuel that was offered for sale or publicly used had an octane rating of at least 86.

In light of our disposition, we remand to the district court for entry of judgment consistent with this opinion and for consideration of Penzoil's other allegations not previously ruled upon by the district court.

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[1] The United States Patent and Trademark Office ("PTO") had allowed only the claims of the '358 patent before July 1997.

[2] The precise time of the alleged public use is unclear. However, Mr. Fick testified that he used it "within a month or two" of November 15, 1997.

[3] The '799 patent incorporates the '358 patents in its entirety.

[4] Emergency Fuel reasons that, by definition, increasing the isoparaffin content increases the octane number. We note that Penzoil argues that Emergency Fuel did not present this argument to the district court in connection with the summary judgment proceedings.

[5] Cycloparaffins are referred to as naphthenes.

[6] If a claim in the '237 or '660 patent were entitled to a filing date of one of the earlier patents, the sale and use activities in July and November 1997 would not bar such a claim because the activity would not have occurred more than one year before that claim's effective filing date. See id.

[7] It is not disputed that both of these alleged activities occurred before the critical dates of the '237 and '660 patents, i.e., one year before the actual filing dates of the patent applications.

[8] We note that if claims in the '237 and '660 patents reciting the "clean and smooth operation" limitation were interpreted as covering an emergency fuel with an octane rating of 65-75, as Emergency Fuel urges, such claims may be entitled to a filing date of one of the earlier patents. See 35 U.S.C. § 120.