

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NESTE OIL OYJ,
Petitioner,

v.

REG SYNTHETIC FUELS, LLC,
Patent Owner.

Case IPR2013-00578
Patent No. 8,231,804

Before RAMA G. ELLURU, SHERIDAN K. SNEDDEN, and
CHRISTOPHER L. CRUMBLEY, *Administrative Patent Judges*.

CRUMBLEY, *Administrative Patent Judge*.

SUPPLEMENTAL FINAL WRITTEN DECISION
Proceedings on Remand
35 U.S.C. §§ 144 and 318(a)

This *inter partes* review returns to us on remand following the decision of the United States Court of Appeals for the Federal Circuit in *REG Synthetic Fuels, LLC v. Neste Oil Oyj*, 841 F.3d 954 (Fed. Cir. 2016).

I. BACKGROUND

The Board previously addressed the merits of the parties' arguments in a Final Written Decision issued March 12, 2015. Paper 54, "Decision" or "Dec."¹ In that Decision, we found that claims 1, 3, 4, and 8 of U.S. Patent No. 8,231,804 (Exhibit 1033, "the '804 patent") were unpatentable as anticipated by Craig² (*id.* at 33) and that claims 1–3, 5, and 8 were anticipated by Dindi³ (*id.* at 26–27). Relevant to this remand, we determined that Dindi was prior art to the '804 patent, because the record did not establish that the inventor, Ramin Abhari, conceived of the invention of the challenged claims prior to the June 13, 2008 filing date of Dindi. *Id.* at 24.

Following entry of the Decision, Patent Owner REG Synthetic Fuels LLC filed a Notice of Appeal (Paper 55), and the Federal Circuit issued a decision affirming-in-part, reversing-in-part, vacating-in-part, and remanding the case to the Board. Paper 56.

In its decision, the Federal Circuit affirmed our determination that claims 1, 3, 4, and 8 of the '804 patent were unpatentable as anticipated by

¹ The procedural history of the case prior to the Final Written Decision is summarized in that Decision (Paper 54, 1–4).

² U.S. Patent No. 4,992,605 to Craig et al. (Feb. 12, 1991) (Ex. 1035).

³ U.S. Published Patent Application No. 2008/0312480 to Dindi et al. (filed June 13, 2008) (Ex. 1036).

Craig, but vacated our determination that claims 2 and 5 were anticipated by Dindi. *REG Synthetic Fuels*, 841 F.3d at 965. Relevant to claims 2 and 5, the Federal Circuit determined that we erred in excluding the content of Exhibit 2061 as hearsay. As a result, the Federal Circuit determined that, based on the record including Exhibit 2061, REG had established sufficiently the conception of the claimed compositions as of April 2008, prior to Dindi’s filing date of June 13, 2008. *Id.* at 964–65. The Federal Circuit also vacated our exclusion of Exhibits 2012, 2013, 2057, and 2062 “because [they] may be relevant for diligence and reduction to practice” and remanded for further consideration. *Id.* at 965. Finally, because we did not reach the issues of diligence and reduction to practice in our prior decision, the court remanded for factual findings on these issues, which remain unresolved. *Id.*

Following issuance of the Federal Circuit’s mandate, the Board conferred with REG and Petitioner Neste Oil Oyj and set a schedule for briefing on remand. Paper 57. On May 12, 2017, the parties filed briefs addressing the prior art status of Dindi and the admissibility of Exhibits 2012, 2013, 2057, and 2062. Paper 58, “Neste Br.”; Paper 59, “REG Br.” The parties were permitted to file reply briefs and did so on May 26, 2017. Paper 60, “Neste Reply”; Paper 61, “REG Reply.”

We have reconsidered anew the record developed during trial and reviewed the parties’ positions in light of the Federal Circuit’s decision.⁴

⁴ We noted in our Order setting procedures on remand that we would revisit whether to order a second oral hearing following review of the parties’ remand briefing. Paper 57, 4. Given the briefing submitted by the parties, we determine that a second oral hearing is unnecessary.

For the reasons set forth below, we conclude that Dindi is not prior art to the '804 patent, and thus, Neste has not proven by a preponderance of the evidence that claims 2 and 5 of the '804 patent are unpatentable.

II. DISCUSSION

The '804 patent is directed to paraffin compositions containing mainly even carbon number paraffins, and methods of making such compositions. Ex. 1033, Abstract. Further description of the subject matter of the '804 patent may be found in our prior Decision. Dec. 5–6.

A. The Challenged Claims on Remand

Claims 2 and 5 depend from claim 1, which reads as follows:

1. A phase change material composition comprising at least 75 wt % even carbon number paraffins, wherein the paraffins are produced by hydrogenation/hydrogenolysis of naturally occurring fatty acids and esters.

Ex. 1033, 12:29–32. Claim 2 further requires that the composition comprise at least 80 wt % even carbon number paraffins, and claim 5 further requires that the even carbon number paraffins comprise n-dodecane ($C_{12}H_{26}$) and n-tetradecane ($C_{14}H_{30}$). *Id.* at 12:33–34, 12:39–40.

The Board previously construed two aspects of the challenged claims, neither of which the parties challenged on appeal. First, we concluded that the preamble of claim 1, “[a] phase change material composition,” merely expressed an intended use and, therefore, is not limiting on the scope of the claims. Dec. 8–9. Second, we noted that claim 1 is a product-by-process claim, and as such, the “produced by” wherein clause of the claim is not given patentable weight when attempting to distinguish over prior art products. Dec. 9–12. Given these uncontested constructions, the invention

of claim 2 is a composition comprising at least 80 wt % even carbon number paraffins, while the invention of claim 5 is a composition comprising at least 75 wt % even carbon number paraffins that includes n-dodecane and n-tetradecane.

B. The Issue on Remand

In our prior Decision, we determined that, if Dindi is prior art to the '804 patent, it anticipates claims 2 and 5. Dec. 24–27. REG did not challenge this determination on appeal, addressing only our conclusion that Dindi is prior art. The determinative issue before us, therefore, is whether Dindi has been successfully antedated and removed as prior art to claims 2 and 5 of the '804 patent.

To remove Dindi as a prior art reference, the record must establish either: (1) a conception and reduction to practice before the filing date of Dindi; or (2) a conception before the filing date of the Dindi patent combined with diligence and reduction to practice after that date. *See Taurus IP, LLC v. DaimlerChrysler Corp.*, 726 F.3d 1306, 1323 (Fed. Cir. 2013). The Federal Circuit held that the record before us establishes, with sufficient corroboration, that Mr. Abhari conceived of the invention of claims 2 and 5 of the '804 patent on April 29, 2008. *REG Synthetic Fuels*, 841 F.3d at 963. It is undisputed that Dindi was filed on June 13, 2008, and that Mr. Abhari filed on December 4, 2008 the application that issued as the '804 patent. Dindi is not prior art—and, therefore, Neste's ground of unpatentability fails—if either: (1) Mr. Abhari actually reduced to practice the invention of claims 2 and 5 between April 29 and June 13, 2008, or (2) Mr. Abhari exercised reasonably continuous diligence between June 13 and December 4, 2008, when the invention was constructively reduced to

practice by filing of a patent application. Because, as set forth below, we find sufficient evidence of actual reduction to practice, we do not address Mr. Abhari's alleged diligence.

REG argues on remand that the Federal Circuit's decision—specifically, its finding of conception—forecloses any further inquiry into actual reduction to practice. REG Br. 2 (“[T]he evidence that the Federal Circuit held established conception likewise proves actual [reduction to practice] . . .”). In REG's view, actual reduction to practice requires only that the inventor construct an embodiment that meets all limitations of the claims, and that the embodiment work for its intended purpose. *Id.* Neste disagrees, arguing that not only must the embodiment work for its intended purpose, but the inventor must *recognize* that it does so. Neste Br. 5 (citing *Cooper v. Goldfarb*, 154 F.3d 1321, 1327 (Fed. Cir. 1998)).

REG asserts that the law “does not impose a separate appreciation test beyond that required by conception,” and contends that Mr. Abhari's appreciation that he had made the compositions of claims 2 and 5 is sufficient to show actual reduction to practice. REG Reply 1. We disagree. Actual reduction to practice not only requires that Mr. Abhari make the composition of claims 2 and 5, but also that he “determine[] that the invention would work for its intended purpose.” *See Cooper*, 154 F.3d at 1327. In other words, the inventor must have recognized the utility of the composition that he created. *Estee Lauder Inc. v L'Oreal, S.A.*, 129 F.3d 588, 593 (Fed. Cir. 1997) (in analyzing reduction to practice, “the utility requirement is satisfied when an inventor has learned enough about the product to justify the conclusion that it is useful for a specific purpose”

(quoting *Standard Oil Co. (Indiana) v. Montedison, S.p.A.*, 494 F. Supp. 370, 381 (D. Del. 1980))).

For this reason, we cannot assume, as REG asks us to do, that the Federal Circuit’s decision regarding conception forecloses the question of whether Mr. Abhari actually reduced to practice the invention of claims 2 and 5. Conception asks whether the inventor formed in his mind “a definite and permanent idea of the complete and operative *invention*.” *Coleman v. Dines*, 754 F.2d 353, 359 (Fed. Cir. 1985) (quoting *Gunter v. Stream*, 573 F.2d 77, 80 (CCPA 1978)) (emphasis altered). Contrast this with the test for reduction to practice which, as outlined above, asks whether the inventor recognized the *utility* of what he had conceived. *See Cooper*, 154 F.3d at 1327; *see also Burroughs Wellcome Co. v. Barr Labs., Inc.*, 40 F.3d 1223, 1228 (Fed. Cir. 1994) (“[A]n inventor need not know that his invention will work for conception to be complete. He need only show that he had the idea; the discovery that an invention actually works is part of its reduction to practice.” (citations omitted)). While the Federal Circuit held that Mr. Abhari created the compositions of claims 2 and 5 (*REG Synthetic Fuels*, 841 F.3d at 962–3), we must still decide whether the record supports the conclusion that Mr. Abhari recognized that the compositions would work for their intended purpose.

The question, then, is what utility must be shown; in other words, what is the “intended purpose” that the compositions must be shown to satisfy? *See Harding v. Steingiser*, 318 F.2d 748, 751 (CCPA 1963) (“The first question is, therefore, what was the practical use to which appellant intended to put his invention.”). REG posits two potential uses: the compositions may be used as a phase change material (PCM), or they may

be used as a diesel fuel or fuel additive. REG Reply 2. For the following reasons, we agree that Mr. Abhari's intended purpose of the claimed invention was as a PCM, but disagree with REG regarding its use as a diesel fuel or fuel additive. Only Mr. Abhari's recognition of utility as a PCM, therefore, is relevant to our inquiry.

As noted above, although the preamble of the claims recite a PCM, we have previously held that the scope of the claims are not so limited. Dec. 8–9. The reason for this conclusion, however, was that the preamble expressed an *intended use* for the claimed compositions. Although this is not limiting on the legal *scope* of the claims, it certainly is indicative of the use the inventor intended for the compositions. Although, in cases where the claims recite no intended purpose, it is appropriate to look at any possible utility, we see no reason to ignore the express language of the claims when the preamble sets forth an intended use. *Cf. Nelson v. Bowler*, 626 F.2d 853, 856 (CCPA 1980) (“[E]vidence of any utility is sufficient since the [claims] do not recite any particular utility.”); *see also Blicke v. Treves*, 241 F.2d 718, 721 (CCPA 1957) (recited use for the claimed compounds, or lack thereof, “does have a bearing on the kind of utility which must be shown”). Nor do we find that the passing mention of diesel fuel additives in the specification of the '804 patent (Ex. 1033, 12:10–15) is sufficient to alter this understanding; the disclosure is directed to only a distilled C16 n-paraffin product, and there is no mention of greater than 80 wt% even carbon number paraffins (as required by claim 2) or C₁₂ or C₁₄ (as required by claim 5). By contrast, the specification discusses PCMs extensively, including embodiments that fall within claims 2 and 5. *See, e.g., id.* at 1:29–2:3 (background of the invention), Examples 3–5 (discussing products' uses as

PCMs). By the plain language of the claims and the weight of the specification of the '804 patent, it is clear that the intended use of the compositions was as a PCM. Recognition of this utility, therefore, shall be the focus of our reduction to practice inquiry herein.

C. Findings of Fact

Based on the record before us, including the testimony of Mr. Abhari and various supporting documents,⁵ the following timeline of events has been established by a preponderance of the evidence. We note at the outset that, while Neste challenges whether REG has provided sufficient corroboration for Mr. Abhari's testimony, it did not directly challenge the events set forth by Mr. Abhari or submit any contradictory evidence of its own. The question of whether such facts have been sufficiently corroborated to support a conclusion of antedation is addressed separately below.

Mr. Abhari testifies that, in May of 2007, he ran a sample of canola oil through a slurry reactor containing a nickel molybdenum (NiMo) oxide catalyst. Ex. 2001 ¶ 14. On May 31, 2007, a sample obtained from that reactor was subjected to gas chromatography analysis. Ex. 2004. According to Mr. Abhari, the large peak on Exhibit 2004 corresponds to n-octadecane, or n-C₁₈, an even carbon number paraffin. Ex. 2001 ¶ 21. Mr. Abhari testifies that he found this result "particularly surprising," because it showed very high concentrations of even carbon number paraffins resulting from

⁵ We recognize that the Federal Circuit vacated our prior exclusion of Exhibits 2012, 2013, 2057, and 2062 for further consideration on remand. The facts as set forth in this section were established without reference to these contested exhibits.

hydrogenation/hydrogenolysis without subsequent distillation. *Id.* ¶ 22. The record establishes that further test runs and GC analyses were run from June to August of 2007. Ex. 2007.

On July 19, 2007, Mr. Abhari informed his colleagues that he intended to contact Intertek PARC, regarding testing using its P-63 reactor unit. Ex. 2009. As of August 15, 2007, Mr. Abhari's project was in the testing queue at PARC and remained in the queue until at least December 6, 2007. Ex. 2010. Though Mr. Abhari testifies that the testing was for the purpose of reducing to practice the invention of the '804 patent, none of the emails contained in Exhibits 2009 or 2010 discuss the purpose of the proposed PARC testing. Ex. 2001 ¶ 35.

Given the delays at the PARC facility, Mr. Abhari contacted SwRI, another testing facility, regarding use of its reactor as a pilot plant on October 19, 2007. Ex. 2011. Mr. Abhari proposed an objective of "[c]onvert[ing] 1,200 gallons of bio-feedstock to synthetic diesel product using SwRI's large (2 gal/h) fixed-bed hydrogenation unit." *Id.* No mention was made of phase change materials or the significance of even carbon number paraffins. *See id.*

Mr. Abhari testified that, by "late 2007 or early 2008," he was searching the literature for potential uses for the paraffin compositions first produced in May of 2007, and "came across phase change material." Ex. 1074, 22:3–6; Ex. 2055 ¶ 28. In his deposition, Mr. Abhari referenced locating "reports that were published by Oak Ridge National Laboratory" (Ex. 1074, 23:12–15), but these reports do not appear to have been submitted into the record before us. Mr. Abhari also noted that, on the face of the '804

patent, a review by Sharma (Ex. 1077) is cited, and that this review in turn cites the Oak Ridge reports.

After reading these reports, Mr. Abhari testified that he drafted and submitted a February 19, 2008 internal memo at Syntroleum (REG's predecessor company) reflecting his belief that his compositions could have use as PCMs. Ex. 2055 ¶ 28. In our prior Decision, however, we determined that the memorandum itself (Ex. 2053) was improperly submitted as reply evidence, rather than as part of REG's prima facie case, and excluded the document from consideration.⁶ Dec. 19–20. Mr. Abhari also testified to a laboratory notebook page (Ex. 2002) that he claims is dated February 20, 2008, that reflects undated Intertek PARC test results from 2007 and references potential use as PCMs. Ex. 2055 ¶ 28. The notebook pages itself were excluded from evidence on Neste's Motion to Exclude, alleging insufficient authentication.⁷ Paper 52, 4–5.

Testing at the SwRI facility continued into 2008. Mr. Abhari testified that by March 7, 2008, SwRI had begun collecting samples of hydrocarbon product from its pilot plant run (Ex. 2001 ¶ 53), and on March 12, 2008, SwRI reported to Mr. Abhari that the product of the reaction runs was between 91% and 98% C₁₄–C₁₈. Ex. 2058, 1. Further correspondence between SwRI and Mr. Abhari on April 2, 2008, reports a Sample 084 collected on March 29, the gas chromatogram of which reports above 80 wt % even carbon number paraffins, as the Federal Circuit concluded, as well as the presence of tetradecane (C₁₄). *Id.* at 24, 44; *see also REG Synthetic*

⁶ REG did not contest this exclusion on appeal or ask that we revisit it on remand.

⁷ Again, REG did not appeal this exclusion.

Fuels, 841 F.3d at 962–63. Data continued to be received from SwRI through July 2008. Ex. 2058.

In the same time period, Mr. Abhari testifies that by March 6, 2008, he was in contact with Microtek Labs, asserted to be a “third party PCM producer.” Ex. 2055 ¶ 30; Ex. 2061, 1. On April 29, 2008, Mr. Abhari emailed Dawn Mantz of Microtek and stated that he had recovered an 80% purity C₁₈ using Syntroleum’s lab distillation glassware. Ex. 2061, 2. The Federal Circuit cited this email, in combination with the test results from SwRI, as evidence of Mr. Abhari’s recognition that he had obtained a composition within the scope of challenged claims 2 and 5. *REG Synthetic Fuels*, 841 F.3d at 964–65.

In his deposition, Mr. Abhari testified that he sent a sample of his paraffin compositions to Microtek “to run their own PCM test which included a DSC [(differential scanning calorimetry)] analysis.” Ex. 1074, 24:18–21. The results of the DSC analysis are not in record, as Mr. Abhari testified that he only received the results by phone from Microtek, to limit disclosure and preserve his ability to seek patent protection. *Id.* at 25:4–10. Mr. Abhari stated that the results confirmed his “guess” that the heat of fusion of the compositions would be “essentially the average” of the heats of fusion of the component paraffins. *Id.* at 25:14–27:7. According to Mr. Abhari, the DSC analysis was needed to confirm his guess regarding the heat of fusion—and, therefore, the “performance quality” of a PCM—but was not needed to determine whether the composition is a PCM in the first place. Ex. 2055 ¶ 29. After the DSC testing at Microtek in March of 2008, no further DSC tests were conducted on the paraffin compositions until after Mr. Abhari filed his patent application. Ex. 1074, 29:9–19.

D. Appreciation of Utility as a PCM

As Neste recognizes, Mr. Abhari testifies that he would not have contacted Microtek—undisputedly, a PCM producer—unless he recognized the utility of his compositions as PCMs. Neste Br. 9 (citing Ex. 2055 ¶ 30). We agree with Mr. Abhari and REG that this conclusion is logical and is corroborated by the emails of Exhibit 2061.⁸ Even accepting that fact, however, Neste argues that the correspondence between Mr. Abhari and Microtek merely shows that he contemplated the *possibility* that his compounds could have utility as a PCM; further testing was needed to confirm this guess. Neste Br. 10 (“[A]ppreciating a potential use does not establish that Mr. Abhari knew that the composition would work.”). Neste contends that, by Mr. Abhari’s own admission, DSC analysis was needed to confirm utility as a PCM. *Id.*

While Mr. Abhari testified that Microtek successfully tested his compositions using DSC analysis prior to the filing date of Dindi, there is no corroboration for this testimony in the record, and REG does not rely on it for evidence of reduction to practice. Rather, REG argues that testing was not required to establish reduction to practice of Mr. Abhari’s compositions, because their utility was immediately obvious. REG Br. 4. Citing *Sylvestri v. Norman*, 496 F.2d 593, 601 (CCPA 1974), REG contends that “where . . . an inventor merely discovers a new or similar form of an invention already known to be useful,” testing is not required. *Id.*

⁸ Though we previously excluded the contents of Exhibit 2061 for hearsay, we noted that using the emails to prove that Mr. Abhari contacted Microtek was a non-hearsay purpose and, therefore, may be considered for that fact. Paper 52, 8.

At the outset, we note that the Federal Circuit has described “[t]he threshold of utility” as “not high: An invention is ‘useful’ . . . if it is capable of providing some identifiable benefit.” *Juicy Whip, Inc. v. Orange Bang, Inc.*, 185 F.3d 1364, 1366 (Fed. Cir. 1999). The required utility has been characterized as both “substantial” (i.e., providing immediate benefit or real-world value) and “specific” (i.e., “not so vague as to be meaningless”). See *In re Fisher*, 421 F.3d 1365, 1371 (Fed. Cir. 2005). In the context of actual reduction to practice, the required utility may either be “obvious or . . . established by proper tests.” *Blicke v. Treves*, 241 F.2d at 720. The degree of testing required, if any at all, is determined by the technology at issue and the nature of the problem solved:

The nature and complexity of the problem necessarily influence the nature and sufficiency of the testing necessary to show a reduction to practice. . . . [W]hen the problem to be solved does not present myriad variables, common sense similarly permits little or no testing to show the soundness of the principles of operation of the invention.

Scott v. Finney, 34 F.3d 1058, 1062–1063 (Fed. Cir. 1994).

On the record before us, we agree with REG that the utility of the paraffin compositions as PCMs would have been obvious once Mr. Abhari received gas chromatography results from SwRI showing the component paraffins and their boiling point distributions. See Ex. 2058, 42, 44. The Sharma reference—entitled “Latent Heat Storage Materials and Systems,” and published in 2005, several years before Mr. Abhari’s work—discusses PCMs in depth and states that compositions “can be identified as PCMs from the point of view [of] melting temperature and latent heat of fusion.” Ex. 1077, 5. Sharma specifically identifies paraffin wax as “the most-used commercial organic heat storage PCM” and goes on to provide a table with

the melting points and latent heats of fusion of various n-paraffins, including even carbon number paraffins such as n-hexadecane (C₁₆) and n-octadecane (C₁₈). *Id.* at 5–7. Mr. Abhari testified that the heat of fusion of a composition containing a mixture of paraffins, such as the compositions he produced, could be estimated by averaging the heats of fusions of the various components as shown, for example, in Sharma. Ex. 1074, 26:5–27:4. On this record, we cannot conclude that it was necessary to determine the exact heat of fusion of a composition before appreciating its utility as a PCM. The GC results and the literature led Mr. Abhari to a reasonable estimate that a composition’s melting point and heat of fusion were within the range normally useful as a PCM. We determine that a preponderance of the evidence supports the conclusion that he appreciated its utility.

Neste does not provide any direct evidence in response to Mr. Abhari’s testimony; rather, it cites Mr. Abhari’s statement during cross examination that he “needed a DSC test” to confirm his guess regarding the suitability of his compounds as PCMs. Neste Br. 8–9 (citing Ex. 1074, 24:3–9, 27:5–14). We do not share Neste’s interpretation of this testimony or consider it an admission that DSC testing is necessary before a material can be appreciated as a PCM. Mr. Abhari analogizes DSC testing for a paraffin to octane testing for a gasoline; octane testing may be necessary to determine the performance quality of a gasoline sample, but not its utility as a gasoline itself. Ex. 2055 ¶ 29.

Indeed, Mr. Abhari’s testimony regarding the obvious utility of paraffins as PCMs in early 2008 is supported by the testimony of both parties’ experts, as well as Neste’s briefing and evidence. Citing Sharma, Neste’s expert, Dr. Klein, testified that “even carbon number paraffins were

already identified [in 2007] as more promising than odd carbon number paraffins for phase change material applications.” Ex. 1072 ¶ 12. Dr. Lamb, REG’s expert, testified that “the area of phase change materials using paraffins was pretty well established,” (Ex. 1140, 10:20–22), and Neste cited this testimony in its Observations as evidence that “Dr. Lamb does not disagree with Dr. Klein that it was known to use paraffins in phase change materials.” Paper 36, 1. Finally, Neste’s Reply asserted that “[t]he prior art also shows that paraffins were known as [PCMs] because of their high latent heats,” and cites two additional prior art references from 1994 and 2007 in support. Paper 24, 1 (citing Ex. 1078, 118–19 and Ex. 1079, 324). Given this testimony and evidence, we do not find credible Neste’s contention that the utility of Mr. Abhari’s compositions as a PCM was not immediately apparent.

Neste also attempts to distinguish the case at hand from the other obvious-utility cases cited by REG, arguing that REG’s position contradicts its earlier contention that Mr. Abhari’s paraffin compositions were “complex mixture[s] of even and odd number carbon paraffins of various chain lengths, as well as other cyclical and oligomeric molecules.” Neste Reply 2 (quoting Paper 16, 9–10). While we recognize that REG made this argument, it is not one that we accepted at the time; indeed, we ruled in Neste’s favor on the product-by-process issue, holding that “REG has not presented credible evidence that an undistilled product would contain a complex mix of components, or exhibit the alleged functionally distinct behavior.” Dec. 10. For the same reason, we do not find Dr. Lamb’s testimony that “it’s an extremely difficult task to predict the melting point of a complex hydrocarbon mixture” (Ex. 1140, 127:16–18) to contradict REG’s

obvious utility argument, as there is no evidence before us that Mr. Abhari's compositions were "complex hydrocarbon mixtures." In fact, the products discussed in the emails of Exhibit 2061, which the Federal Circuit relied upon as establishing conception, refer to a distilled composition.

E. Corroboration

Having found that Mr. Abhari's testimony sufficiently supports the conclusion that he appreciated the utility of his composition as a PCM prior to the filing date of Dindi, we must ask whether there is sufficient corroboration for that testimony. "[T]he purpose of corroborative evidence is to confirm and to strengthen the testimony of the inventor. Obviously the amount and quality of corroborative evidence that is necessary in any given case will vary with the facts of that case." *Hasselstrom v. McKusick*, 324 F.2d 1013, 1018 (CCPA 1963). The requirement of corroboration is grounded in credibility concerns, and the sufficiency of the corroboration is determined under a "rule of reason," whereby all pertinent evidence is examined to determine the credibility of the inventor's testimony. *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1170 (Fed. Cir. 2006). Corroboration is, therefore, sufficient if it indicates that the inventor's testimony is credible overall; every fact asserted by the inventor, including utility, need not be corroborated explicitly:

Under a rule of reason analysis, an inventor's uncorroborated testimony that he conceived a utility for his invention may be accepted if there exists other corroborated evidence to indicate that the inventor's testimony is credible. . . . While there must generally be corroboration of an inventor's testimony of conception of his or her invention, the utility of the invention need not always be explicitly corroborated. Circumstances may make a utility implicit [where] . . . a person of ordinary skill in

the art would have accepted [the inventor's] testimony of intended use of his invention at the time of his conception.
Kridl v. McCormick, 105 F.3d 1446, 1451 (Fed. Cir. 1997) (internal citations omitted).

Neste argues that REG has failed to corroborate several elements of Mr. Abhari's testimony, including whether he actually sent a sample of his composition to Microtek (Neste Br. 9), whether he received any DSC test results in response (*id.* at 10), and whether he knew from the literature that even carbon number paraffins were useful as PCMs (*id.* at 11). On the second point, we agree that there are no corroborated test results, but as noted above, we disagree with Neste that test results are a necessary prerequisite to appreciating the utility of Mr. Abhari's compositions. As for Neste's other corroboration arguments, we agree with REG that they ignore the "rule of reason" under which corroboration is considered.

Upon review of the record as a whole, two items of independent evidence provide corroboration of Mr. Abhari's testimony sufficient to conclude that his testimony regarding appreciation of utility is credible. First, as set forth in detail above, the Sharma reference, as well as other art cited by Neste and the testimony of both experts, leads us to conclude that a person of ordinary skill in the art would have expected Mr. Abhari to know of the utility of his compositions once he knew the component paraffins. *See Kridl*, 105 F.3d at 1451 ("Circumstances may make a utility implicit [where] a person of ordinary skill in the art would have accepted [the inventor's] testimony of intended use of his invention at the time of his conception."). Second, the emails to Microtek are independent evidence that Mr. Abhari did indeed appreciate his compositions' utility; even without reference to the content of the email, the fact that Mr. Abhari contacted a

PCM manufacturer is evidence that he knew his compositions had utility as PCMs. This corroborative evidence is independent of Mr. Abhari's testimony and is sufficient to assure us of its credibility on this point.

F. Motion to Exclude

As noted above, the Federal Circuit vacated our decision on Neste's Motion to Exclude as to Exhibits 2012, 2013, 2057, and 2062, for further consideration of the hearsay objections in light of the decision on appeal, "because [they] may be relevant for diligence and reduction to practice." *REG Synthetic Fuels*, 841 F.3d at 965. Upon review, however, we have determined that we need not rely on any of the exhibits in question to reach our decision in REG's favor. For this reason, Neste's objections to the exhibits are moot, as we would have found against Neste on the merits regardless of the outcome of the Motion.

III. CONCLUSION

For the foregoing reasons, we conclude that REG has shown sufficiently, by corroborated testimony, that as of the date Mr. Abhari conceived of his invention, he had constructed an embodiment that meets all limitations of challenged claims 2 and 5, and recognized that the embodiment would work for its intended purpose. We, therefore, find that Mr. Abhari actually reduced to practice the invention of claims 2 and 5 as of April 29, 2008, before the filing date of Dindi. As such, the evidence of record establishes antedation of the Dindi reference, which as a result cannot be considered prior art to claims 2 and 5 of the '804 patent. Neste has not shown, by a preponderance of the evidence, that claims 2 and 5 of the '804 patent are anticipated by Dindi.

IV. ORDER

Accordingly, the Order of the Board's March 12, 2015 Final Written Decision is hereby amended as follows:

ORDERED that claims 1, 3, 4, and 8 of U.S. Patent No. 8,231,804 are *unpatentable*;

FURTHER ORDERED that claims 2 and 5 of U.S. Patent No. 8,231,804 have *not been proven unpatentable*;

FURTHER ORDERED that Patent Owner's Motion to Amend Claims is *denied*; and

FURTHER ORDERED that, because this is a final decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

Case IPR2013-00578

Patent No. 8,231,804

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