

Filed: December 8, 2021

Filed on Behalf of:

Patent Owner LiquidPower Specialty Products Inc.

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BAKER HUGHES HOLDINGS, LLC
(f/k/a BAKER HUGHES, A GE COMPANY, LLC)
Petitioner

v.

LIQUIDPOWER SPECIALTY PRODUCTS INC.
(f/k/a LUBRIZOL SPECIALTY PRODUCTS, INC.)
Patent Owner

Case IPR2016-00734
Patent No. 8,022,118

PATENT OWNER'S NOTICE OF APPEAL

INTRODUCTION

LiquidPower Specialty Products Inc.’s (“LSPI’s”) appeal stems from the Patent Trial and Appeal Board’s Decision on Remand entered on November 14, 2019 (Paper 93) (the “Decision on Remand”), the Board’s subsequent Decision to Deny Patent Owner’s Request for Rehearing (Paper 100) (the “Rehearing Decision”) on May 11, 2020, and the order of Andrew Hirshfeld, Commissioner for Patents, Performing the Functions and Duties of the Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office, denying LSPI’s request for Director review (Paper 103) (the “Director Review Order”) on October 29, 2021, in the above-captioned *inter partes* review of United States Patent No. 8,022,118 (the “118 Patent”). This notice is timely filed within 63 days of the Director Review Order. 37 C.F.R. § 90.3(b)(1). Please note that the Decision on Remand in this matter has been sealed to the public, and currently only the Parties and the Board and have access to it. The Director Review Order, the Rehearing Decision, and redacted version of the Decision on Remand are attached to this Notice.

LSPI previously filed a notice of appeal from the Decision on Remand and the Rehearing Decision, and that appeal is before the Federal Circuit in Case No. 20-2001. LSPI requests that the Court consolidate this new appeal with Case No. 20-2001. LSPI notes that it fully briefed its challenge to the Decision on Remand

and the Rehearing Decision in Case No. 20-2001. Through this appeal, LSPI intends to challenge the Director Review Order and submit supplemental briefing limited to the issue of Commissioner Hirshfeld's lack of authority to deny LSPI's Director review request. LSPI also intends to preserve its appellate rights as to the remaining issues but does not intend to submit further briefing on them, as they are already fully briefed.

LSPI'S APPEAL

Please take notice that under 35 U.S.C. §§ 141(c), 142, 319; 37 C.F.R. §§90.2(a), 90.3(a), and Federal Rules of Appellate Procedure/Federal Circuit Rule 4(3)(a), Patent Owner LSPI hereby appeals to the United States Court of Appeals for the Federal Circuit from the Director Review Order, the Rehearing Decision, and the Decision on Remand.

LSPI'S ISSUES ON APPEAL

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), LPSI's issues on appeal may include, but are not limited to: (i) whether it is unconstitutional for a panel of Administrative Patent Law Judges to issue a final order invalidating the 118 Patent without an opportunity for review by a validly appointed Director or Acting Director, as *United States v. Arthrex, Inc.*, 141 S. Ct. 1970 (June 21, 2021) requires; (ii) whether the Commissioner of Patents, Drew Hirshfeld, lacked authority under the Federal Vacancies Reform Act (FVRA), 5 U.S.C. § 3345 et

seq., to deny LSPI's requests for review by the Director or Acting Director of U.S. Patent and Trademark Office of the Board's decisions and order that the PTAB's Final Written Decisions are final decisions of the agency; (iii) the Board's findings that claims 8-10 of the 118 Patent are unpatentable under 35 U.S.C. § 103 over the combination of Eaton, Strausz, and Naiman; (iv) whether the objective evidence of non-obviousness precludes each of the findings of obviousness on claims 8-10 of the 118 Patent; (v) whether the objective evidence of non-obviousness must be considered before reaching a conclusion on obviousness on claims 8-10 of the 118 Patent; and (vi) any findings or determinations supporting or related to the aforementioned issues, as well as all other issues decided adversely to LSPI in any orders, decisions, rulings, and/or opinions.

Simultaneously with this submission, LSPI is filing a true and correct copy of this Notice of Appeal with the Director of the United States Patent and Trademark Office and a true and correct copy of the same, along with the required docketing fee, with the Clerk of the United States Court of Appeals for the Federal Circuit as set forth in the accompanying Certificate of Filing.

Dated: December 8, 2021

Respectfully Submitted,

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CERTIFICATE OF FILING

The undersigned hereby certifies that, in addition to being electronically filed through PTAB E2E, a true and correct copy of the above-captioned PATENT OWNER'S NOTICE OF APPEAL is being sent via priority mail on December 8, 2021, to the Director of the United States Patent and Trademark Office, at the following address:

Director of the United States Patent and Trademark Office
c/o Office of the General Counsel, 10B20
Madison Building East
600 Dulany Street
Alexandria, VA 22314

The undersigned also hereby certifies that a true and correct copy of the above-captioned PATENT OWNER'S NOTICE OF APPEAL and the filing fee is being filed via CM/ECF with the Clerk's Office of the United States Court of Appeals for the Federal Circuit on December 8, 2021.

Dated: December 8, 2021

Respectfully Submitted,

/Elizabeth S. Weiswasser/

Elizabeth S. Weiswasser

Reg. No. 55,721

CERTIFICATE OF SERVICE

I hereby certify that on December 8, 2021, a copy of **PATENT OWNER'S NOTICE OF APPEAL** was served by filing this document through the PTAB's E2E Processing System as well as delivering a copy via electronic mail upon the following:

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Paper No. 93
Entered: November 14, 2019

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BAKER HUGHES, a GE COMPANY, LLC
(f/k/a BAKER HUGHES INCORPORATED),
Petitioner,

v.

LIQUIDPOWER SPECIALTY PRODUCTS INC.
(f/k/a LUBRIZOL SPECIALTY PRODUCTS, INC.),
Patent Owner.

IPR2016-00734
Patent 8,022,118 B2

Before KRISTINA M. KALAN, CHRISTOPHER M. KAISER, and
MICHELLE N. ANKENBRAND, *Administrative Patent Judges*.

ANKENBRAND, *Acting Vice Chief Administrative Patent Judge*.

DECISION ON REMAND
35 U.S.C. § 144 and 37 C.F.R. § 42.5(a)

Determining Claims 8–10 Unpatentable
35 U.S.C. § 318(a); 37 C.F.R. § 42.73

I. INTRODUCTION

We issue this decision pursuant to a remand from the United States
Court of Appeals for the Federal Circuit in *LiquidPower Specialty Products*

Inc. v. Baker Hughes, A GE Company, LLC, No. 2018-1141, 749 F. App'x 965 (Fed. Cir. 2018). For the reasons set forth below, we determine that Baker Hughes, a GE Company, LLC (“Petitioner” or “Baker”) has demonstrated by a preponderance of the evidence that claims 8–10 are unpatentable.

A. Procedural History

Petitioner filed a Petition (Paper 2) requesting an *inter partes* review of claims 1–11 of U.S. Patent No. 8,022,118 B2 (“the ’118 patent,” Ex. 1001) pursuant to 35 U.S.C. § 311.¹ On October 4, 2016, we instituted an *inter partes* review of all challenged claims. Paper 9.

During trial, LiquidPower Specialty Products Inc. (“Patent Owner” or “LSPI”) filed a Response (Paper 48, “PO Resp.” (public version)), and Petitioner filed a Reply (Paper 59, “Pet. Reply” (public version)).² We also authorized Patent Owner to file a Sur-Reply to respond to arguments and evidence presented in Petitioner’s Reply regarding, among other things, objective indicia of non-obviousness. Paper 71, “PO Sur-Reply” (public version).³

On November 1, 2017, we issued a Final Written Decision determining that Petitioner had shown by a preponderance of the evidence

¹ In support of the Petition, Petitioner filed a declaration of Thomas H. Epps, III, Ph.D. (Ex. 1005).

² With the Response, Patent Owner filed a declaration of Brian Dunn, Ph.D. (Ex. 2021 (public version)). With the Reply, Petitioner filed a reply declaration of Dr. Epps (Ex. 1056 (public version)). All citations to the Response, Reply, Dr. Dunn’s declaration, and Dr. Epps’s reply declaration are to the public versions of those Papers and Exhibits, unless otherwise noted.

³ All citations to Patent Owner’s Sur-Reply are to the public version of the document unless otherwise noted.

that claims 1–11 were unpatentable. Paper 85 (“Final Decision” or “Final Dec.”). On November 2, 2017, Patent Owner appealed the portion of our decision holding claims 8–10 unpatentable as having been obvious over the combination of Eaton,⁴ Strausz,⁵ and Naiman⁶ to the United States Court of Appeals for the Federal Circuit.⁷ Paper 86.

On October 18, 2018, the Federal Circuit issued a decision vacating and remanding our Final Written Decision as to claims 8–10, with the following conclusion:

Substantial evidence supports the Board’s findings that the prior art discloses the drag reduction limitation and that a person of ordinary skill in the art would have been motivated to combine the prior art with a reasonable expectation of success. But because substantial evidence does not support the Board’s finding that LSPI failed to establish nexus, the Board erred in not weighing LSPI’s objective evidence of nonobviousness. Accordingly, we vacate its decision and remand. On remand, it is up to the Board to consider the amount of weight to give this evidence.

LiquidPower, 749 F. App’x at 968.

Following the remand, and with our authorization, Patent Owner filed a Brief on Remand (Paper 89, “PO Br.”) and Petitioner filed a Brief on Remand (Paper 90, “Pet. Br.”).

⁴ US Patent No. 6,015,779, issued Jan. 18, 2000 (Ex. 1002).

⁵ OTTO P. STRAUZ & ELIZABETH M. LOWN, THE CHEMISTRY OF ALBERTA OIL SANDS, BITUMENS AND HEAVY OILS 464–480 (2003) (Ex. 1003).

⁶ US Patent No. 4,983,186, issued Jan. 8, 1991 (Ex. 1004).

⁷ We also determined that Eaton anticipated claims 1, 3, 4, 6, 7, and 11 of the ’118 patent, and that the subject matter of claims 1–7 and 11 would have been obvious over the combination of Eaton and Strausz. *See* Final Dec. 77. Patent Owner did not appeal those determinations to the Federal Circuit. *See LiquidPower*, 749 F. App’x at 966 n.1.

*B. The '118 Patent*⁸

The '118 patent, titled “Drag Reduction of Asphaltenic Crude Oils,” issued on September 20, 2011. Ex. 1001, codes (45), (54). The '118 patent relates to “reducing pressure drop associated with the turbulent flow of asphaltenic crude oil through a conduit” by “treating the asphaltenic crude oil [i.e., crude oil having an asphaltene content of at least 3 weight percent and/or an API gravity of less than about 26°] with a high molecular weight drag reducing polymer that can have a solubility parameter within about 20 percent of the solubility parameter of the heavy crude oil.” *Id.* at Abstract.

According to the Specification, “[w]hen fluids are transported by a pipeline, there is typically a drop in fluid pressure due to the friction between the wall of the pipeline and the fluid.” *Id.* at 1:14–16. The pressure drop increases with increasing flow rate, resulting in energy losses and inefficiencies that increase equipment and operation costs. *Id.* at 1:16–26. The problems associated with pressure drop are most acute when fluids are transported over long distances. *Id.* at 1:24–25.

Before the '118 patent, it was known to use drag reducing polymers (also known as drag reducing agents or “DRAs”) in the fluid flowing through a pipeline to alleviate the problems resulting from pressure drop. *Id.* at 1:28–30. A drag reducing polymer “is a composition capable of substantially reducing friction loss associated with the turbulent flow of a fluid through a pipeline,” and such a composition works by “suppress[ing] the growth of turbulent eddies, which results in higher flow rate at a constant pumping pressure.” *Id.* at 1:32–37. Drag reduction generally “depends in

⁸ For context, we repeat this information from our Final Written Decision.

part upon the molecular weight of the polymer additive and its ability to dissolve in the hydrocarbon under turbulent flow.” *Id.* at 1:39–41.

According to the Specification, because conventional drag reducing polymers do not perform well in crude oils having a low API gravity⁹ and/or a high asphaltene content (i.e., heavy crude oils), there exists a need for improved drag reducing polymers capable of reducing the pressure drop associated with the turbulent flow of heavy crude oils through pipelines. *Id.* at 1:46–49. The subject matter of the disclosed invention, therefore, “relates generally to high molecular weight drag reducers for use in crude oils.” *Id.* at 1:7–8. More specifically, the ’118 patent discloses a method for reducing the pressure drop associated with flowing a liquid hydrocarbon through a conduit, such as a pipeline. *Id.* at 2:58–60. The method comprises introducing a drag reducing polymer into a liquid hydrocarbon having an asphaltene content of at least about 3 weight percent and an API gravity of less than about 26° (i.e., heavy crude oil) to produce a treated liquid hydrocarbon having a viscosity that is not less than the viscosity of the liquid hydrocarbon prior to treatment with the drag reducing polymer. *Id.* at 19:32–42. The ’118 patent provides several examples of suitable heavy crude oils, including Bow River crude oil. *Id.* at 4:37–42, Table 1.

The Specification further explains that, “[i]n order for the drag reducing polymer to function as a drag reducer, the polymer should dissolve or be substantially solvated in the liquid hydrocarbon.” *Id.* at 11:38–40. The liquid hydrocarbon and the drag reducing polymer, therefore, have

⁹ The Specification defines API gravity as “the specific gravity scale developed by the American Petroleum Institute for measuring the relative density of various petroleum liquids.” *Id.* at 3:61–64.

solubility parameters that can be determined according to known methods, and the claims set forth certain solubility parameters and ranges of solubility parameters. *Id.* at 4:19–32 (setting forth known methods for determining the solubility parameter of the liquid hydrocarbon), 11:46–12:23 (setting forth known methods for determining the solubility parameter of the drag reducing polymer); *see, e.g., id.* at 19:43–45 (“the drag reducing polymer has a solubility parameter within $4 \text{ MPa}^{1/2}$ of the solubility parameter of the liquid hydrocarbon”).

C. Illustrative Claim

Claim 10 is illustrative of the claimed subject matter we consider on remand, and recites:

10. A method comprising:

introducing a drag reducing polymer having a solubility parameter of at least about $17 \text{ MPa}^{1/2}$, into a pipeline, such that [sic] such that the friction loss associated with the turbulent flow through the pipeline is reduced by suppressing the growth of turbulent eddies, into a liquid hydrocarbon having an asphaltene content of at least 3 weight percent and an API gravity of less than about 26° to thereby produce a treated liquid hydrocarbon wherein the viscosity of the treated liquid hydrocarbon is not less than the viscosity of the liquid hydrocarbon prior to treatment with the drag reducing polymer;

wherein the drag reducing polymer has a solubility parameter within $4 \text{ MPa}^{1/2}$ of the solubility parameter of the liquid hydrocarbon and the drag reducing polymer comprises at least about 25,000 repeating units, and wherein a plurality of the repeating units comprise a heteroatom, wherein the heteroatom is selected from the group consisting of an oxygen atom, a nitrogen atom, a sulfur atom and/or a phosphorus atom and wherein the drag reducing polymer has a weight average molecular weight of at least $1 \times 10^6 \text{ g/mol}$ and

the drag reducing polymer is added to the liquid hydrocarbon in the range from about 0.1 to about 500 ppmw.

Ex. 1001, 20:13–36.

Claims 8 and 9 depend ultimately from claim 1 and, therefore, inherit the limitations of claim 1. Claim 1 recites a method similar to the method of claim 10, but claim 1 does not include the limitations requiring that “a plurality of the repeating units comprise a heteroatom, wherein the heteroatom is selected from the group consisting of an oxygen atom, a nitrogen atom, a sulfur atom and/or a phosphorus atom.” Claim 8, however, narrows the method of claim 1 by requiring that a plurality of the drag reducing polymer’s repeat units comprise a heteroatom, and claim 9 further limits the heteroatom to one “selected from the group consisting of an oxygen atom, a nitrogen atom, a sulfur atom and/or a phosphorus atom.” *Id.* at 20:8–12.

II. DISCUSSION

A. The Issues on Remand

The Federal Circuit directed us on remand to evaluate Patent Owner’s submitted objective evidence of non-obviousness and to “consider the amount of weight to give this evidence.” *LiquidPower*, 749 F. App’x at 968. The parties dispute the meaning of the Federal Circuit’s instructions and the issues we must consider on remand. *See* PO Br. 1–3; Pet. Br. 1.

Patent Owner asserts that we should reevaluate each aspect of the obviousness analysis with the benefit of the objective evidence. PO Br. 1. Patent Owner argues that this is necessary because a fact finder “must withhold judgment on an obviousness challenge until it considers all

relevant evidence, including that related to the objective considerations.” *Id.* (citing *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1076 (Fed. Cir. 2012); *Applied Materials, Inc. v. Adv. Semiconductor Materials Am., Inc.*, 98 F.3d 1563, 1570 (Fed. Cir. 1996)). Patent Owner further relies on *In re Rinehart*, 531 F.2d 1048, 1055 (CCPA 1976), asserting that the failure to reevaluate all aspects of the obviousness analysis risks providing that decision with “an undeservedly broadened umbrella effect.” PO Br. 2. Finally, Patent Owner directs us to the Federal Circuit’s decisions in *Nike, Inc. v. Adidas AG*, 812 F.3d 1326, 1340 (Fed. Cir. 2016), and *Apple Inc. v. International Trade Commission*, 725 F.3d 1356, 1365–66 (Fed. Cir. 2013), as support for its position that the Federal Circuit’s instructions “in no way foreclose[] the Board from reevaluating the obviousness issues with the benefit of the objective evidence that the Board did not previously consider.” PO Br. 2–3.

In response, Petitioner asserts that the Federal Circuit’s decision instructs the Board only to weigh Patent Owner’s objective evidence of non-obviousness against the evidence of obviousness. Pet. Br. 1. According to Petitioner, although the Federal Circuit may have specifically instructed the Board in other cases to reconsider its findings as to certain factual underpinnings in the obviousness analysis in light of objective evidence, it has not done so here. *Id.* Instead, Petitioner asserts that the Federal Circuit’s decision directs the Board that “on remand, it is up to the Board to consider the amount of weight to give [the secondary considerations] evidence.” *Id.* (quoting *LiquidPower*, 749 F. App’x at 968). Petitioner continues that the Federal Circuit specifically held that

[s]ubstantial evidence supports the Board’s findings that the prior art discloses the drag reduction limitation and that a person of ordinary skill in the art would have been motivated to combine the prior art with a reasonable expectation of success.

Id. (quoting *LiquidPower*, 749 F. App’x at 968). Accordingly, Petitioner asserts that these findings are now the law of the case and we are foreclosed from reconsidering these findings. *Id.* (citing *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1348 (Fed. Cir. 2012)).

Our instructions from the Federal Circuit are clear and narrow: “consider the amount of weight to give” Patent Owner’s “objective evidence of non-obviousness.” *LiquidPower*, 749 F. App’x at 968. Patent Owner appears to acknowledge as much in asserting that nothing in the Federal Circuit’s decision “forecloses” us from reconsidering our prior findings. PO Br. 2–3.

The Federal Circuit’s intention in this case is clear when compared to its instructions in *Nike*, which Patent Owner cites in support of its position that we should reevaluate the entire record. In *Nike*, the Federal Circuit explicitly instructed the Board “to examine Nike’s evidence and its impact, if any, on the Board’s analysis under the first three Graham factors.” *Nike*, 812 F.3d at 1340. We have no such direction here. Patent Owner further compares the remand in this case to the remand in *Apple*, characterizing *Apple* as a “similar remand to consider prior art.” PO Br. 3. We disagree. In *Apple*, the Federal Circuit stated

[W]e conclude that the ITC fact findings regarding the scope and content of the prior art (what the reference discloses) are supported by substantial evidence. We remand so the ITC can consider that evidence in conjunction with the evidence of secondary considerations and determine in the first instance

whether claim 10 would have been obvious to one of skill in the art at the time of the invention.

Apple, 725 F.3d at 1366. The Federal Circuit’s instructions in *Apple* are similar to those here. In neither case do we discern any suggestion that the Federal Circuit intended for us to reconsider the prior fact findings regarding the level of ordinary skill in the art, the scope and content of the prior art, and the differences between the claimed subject matter and the prior art, including whether a person of ordinary skill in the art would have had a reason to modify the prior art. We will balance all of the record evidence in making a final determination on remand as to whether Petitioner establishes by a preponderance of the evidence that claims 8–10 of the ’118 patent would have been obvious. *See Cyclobenzaprine*, 676 F.3d at 1075. In so doing, we will weigh Patent Owner’s objective evidence of non-obviousness and our prior findings that the prior art discloses the limitations of the claims and “that a person of ordinary skill in the art would have been motivated to combine the prior art with a reasonable expectation of success.”

LiquidPower, 749 F. App’x at 968. However, we will leave undisturbed the prior findings that the Federal Circuit affirmed on appeal.

B. Brief Summary of Our Prior Obviousness Findings

Before turning to the objective evidence of non-obviousness, we provide a brief summary of our findings in the Final Decision as to claims 8–10 and as is relevant to the issues on remand. First, we note that, on appeal to the Federal Circuit, Patent Owner raised two arguments: (1) that substantial evidence does not support our finding that the combined teachings of Eaton, Strausz, and Naiman disclose “introducing a drag reducing polymer . . . into a pipeline, such that the friction loss associated with the turbulent flow through the pipeline is reduced by suppressing the

growth of turbulent eddies' into HAC [heavy asphaltenic crude] ('the drag reduction limitation')"; and (2) that substantial evidence does not support our finding that one of ordinary skill in the art would have had a reason to replace Eaton's drag reducing polymers with Naiman's polymers to reduce drag in Bow River crude oil (a heavy crude oil) with a reasonable expectation of success. *LiquidPower*, 749 F. App'x at 967–968. Accordingly, we summarize those findings as to claims 8–10, as they are most relevant to our decision.

As to the drag reduction limitation, we found Naiman taught “that polymers made using its processes are drag reducing polymers, i.e., they would reduce drag and possess the additional properties associated with drag reduction, such as straight chain structure, high molecular weight, and shear resistance.” Final Dec. 67. We also credited Dr. Epps's testimony that one of ordinary skill in the art:

knowing the target solubility parameter of the hydrocarbon (i.e., 17.1–19.6 MPa^{1/2} for Bow River crude oil), would have consulted the literature or used calculations to determine which of Naiman's disclosed polymers (e.g., styrene, poly(hexyl acrylate), poly(octyl acrylate), poly(dodecyl acrylate)) would provide a solubility parameter within the target range, and then used Naiman's disclosed polymerization process to prepare that polymer or polymers.

Id. at 66. As a result, we determined Petitioner established, by a preponderance of the evidence, that the combined teachings of Eaton, Strausz, and Naiman disclose or suggest, *inter alia*, the drag reduction limitation. *Id.* at 67. On appeal, the Federal Circuit held substantial evidence supports that finding. *LiquidPower*, 745 F. App'x at 968.

As to the reason for replacing Eaton's polymers to reduce drag in a heavy asphaltenic crude oil with a reasonable expectation of success, we

found that an ordinarily skilled artisan would have replaced “Eaton’s drag reducing polymers and method of making those polymers (i.e., Ziegler-Natta polymerization) with Naiman’s more commercially viable drag reducing monomers and polymerization method.” Final Dec. 69. We also found “sufficient evidence in the record before us that one of ordinary skill in the art would have appreciated that introducing one of Naiman’s polymers (made by Naiman’s process) into[,]” for example, “the Bow River crude oil that Eaton discloses, would result in an operable method.” *Id.* at 70. Finally, we determined that “replacing Eaton’s polymers with the polymers described in Naiman would have been a substitution of one known drag reducing polymer for another with the predictable result of reducing the frictional loss associated with turbulent flow through a pipeline by suppressing the growth of turbulent eddies, i.e., reducing drag.” *Id.* at 70–71. On appeal, the Federal Circuit held that substantial evidence supports those findings. *LiquidPower*, 745 F. App’x at 968.

C. Objective Evidence of Non-obviousness

We now turn to the objective evidence of non-obviousness of record in this proceeding. Factual inquiries for an obviousness determination include secondary considerations based on objective evidence of non-obviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). Notwithstanding what the teachings of the prior art would have suggested to one of ordinary skill in the art at the time of the invention, the totality of the evidence submitted, including objective evidence of non-obviousness, may lead to a conclusion that the challenged claims would not have been obvious to one of ordinary skill in the art. *In re Piasecki*, 745 F.2d 1468, 1471–72 (Fed. Cir. 1984).

We note that it is not sufficient that a product or its use merely be within the scope of a claim in order for us to give substantial weight to any objective evidence of non-obviousness tied to that product. There must also be a causal relationship, termed a “nexus,” between the evidence and the claimed invention. *Merck & Co. v. Teva Pharm. USA, Inc.*, 395 F.3d 1364, 1376 (Fed. Cir. 2005). A nexus is required in order to establish that the evidence relied upon traces its basis to a novel element in the claim, not to something in the prior art. *Institut Pasteur v. Focarino*, 738 F.3d 1337, 1347 (Fed. Cir. 2013).

In this case, the Federal Circuit held that Patent Owner submitted evidence establishing a nexus between the claimed invention and the objective evidence of record related to its commercial product, as well as Petitioner’s and non-party Flowchem LLC’s (“Flowchem”) commercial products. *LiquidPower*, 749 F. App’x at 968. Accordingly, we presume a nexus exists and consider all of the evidence of non-obviousness in turn.

1. Long-Felt Need

“Evidence of a long felt but unsolved need that is met by the claimed invention is further evidence of non-obviousness.” *Millennium Pharms., Inc. v. Sandoz Inc.*, 862 F.3d 1356, 1369 (Fed. Cir. 2017). First, establishing long-felt need first requires objective evidence that a recognized problem existed in the art for a long period without solution. *See Orthopedic Equip. Co. v. All Orthopedic Appliances, Inc.*, 707 F.2d 1376 (Fed. Cir. 1983); *In re Gershon*, 372 F.2d 535, 539 (CCPA 1967). Second, another must not have satisfied the long-felt need before the invention of the challenged patent. *Newell Cos. v. Kenney Mfg. Co.*, 864 F.2d 757, 768 (Fed. Cir. 1988). Third, the invention of the challenged patent must satisfy the long-felt need. *In re*

Cavanagh, 436 F.2d 491, 496 (CCPA 1971); *see also Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1332–33 (Fed. Cir. 2009) (articulating all three factors).

Here, we consider only the first two factors, as we discern no dispute over whether the claimed invention satisfies the alleged long-felt need.

a. Whether There Was a Recognized Need for a Long Period of Time

First, we consider whether the record includes sufficient objective evidence that a recognized problem existed in the art for a long period of time without solution. *See In re Gershon*, 372 F.2d at 539.

Patent Owner argues that the invention of claims 8–10 satisfied a long-felt need for a drag reducing agent (“DRA”) that would work in heavy crude oil. PO Br. 3. Specifically, Patent Owner asserts, “[h]undreds of millions of barrels of heavy crude oil have been produced annually since at least the 1990s, and heavy crude oil has made up a significant portion of the crude oil imported into the U.S. since that time.” PO Resp. 28 (citing Ex. 2021 ¶ 145; Ex. 2039, 458; Ex. 2094; Ex. 2099); PO Br. 3. Patent Owner’s expert, Dr. Dunn, explained the problems associated with heavy crude, testifying, “heavy crude oils are more difficult to transport by pipeline, including because such oils are more viscous and require greater pressure to pump, so those in the field needed and demanded solutions to those problems.” Ex. 2021 ¶ 146.

Patent Owner asserts that Petitioner’s own customers and distributors expressed interest in a solution because of the difficulty in transporting heavy crude. PO Resp. 29–30 (citing Exs. 2050, 2054–2059). For example, [REDACTED], an energy distributor, stated that it was “certainly interested” in a DRA for heavy crude. Ex. 2050, BH019026. Patent Owner alleges that in

spite of the known problem in transporting heavy crude, both Petitioner and Flowchem were unable to develop their own DRAs for use in heavy crudes. PO Resp. 31–32 (citing Ex. 2021 ¶ 148; Ex. 2048, 5; Ex. 1031, 280; Exs. 2015, 2062). For example, Patent Owner’s submitted evidence describes Flowchem’s “FLO DRA product line” as having “been around for a while,” but notes “none of the existing technologies work in heavy crude.” Ex. 2062, BH011308. Patent Owner further asserts that Petitioner did “not offer an effective heavy crude DRA product” before the invention of the ’118 patent. PO Resp. 31 (quoting Ex. 2051; citing Exs. 2052, 2053).

In response, Petitioner contends that there was little need for a heavy crude DRA because, at the time of the ’118 patent, market demand for heavy crude oil was marginal. Pet. Reply 23 (citing Ex. 1031, 275). Instead, Petitioner asserts that heavy crude oil was a “future relevant hydrocarbon resource.” *Id.* (citing Ex. 2039, 456). Petitioner further asserts that Patent Owner’s evidence of customer interest is inadequate because it includes email correspondence describing discussions from 2006–2009, a period after the filing of the application that issued as the ’118 patent. *Id.* In Petitioner’s view, the “post-filing correspondence does not show a long-felt need, but instead demonstrates that drag reduction of heavy crude oils was at most considered ‘the way of the future.’” *Id.* (quoting Ex. 2055).

After having considered the evidence, we find that the record includes some evidence of a need for a DRA for heavy crude oils. We agree with Petitioner that the evidence of customer interest is not as probative as it might be because it fails to describe a need that existed for a long time. *See, e.g.,* Ex. 2055, BH036544 (“Heavier crudes are the way of the future.”); *see also* Ex. 1031, 275 (a 2010 article explaining, “[h]istorically demand for

heavy and extra-heavy oil has been marginal”). However, we credit the testimony of Dr. Dunn, who describes, with supporting evidence, the historic challenges faced in transporting and distributing heavy crude oil through pipelines. Ex. 2021 ¶ 146; *see also* Ex. 1031, 275 (pointing to heavy crude oil’s “high viscosity and composition complexity” as that historically having made them “difficult and expensive to produce, transport and refine”). Thus, we determine that at least some evidence points to a recognized need for methods of reducing drag in heavy crudes prior to the invention of the ’118 patent.

b. Whether the Need was Not Satisfied Earlier by Another

Second, we consider whether another satisfied the long-felt need before the invention of the ’118 patent. *Newell Cos.*, 864 F.2d at 768. By asserting that it was the first to satisfy the aforementioned long-felt need, Patent Owner implicitly asserts that nothing (and no other) satisfied the need earlier. *See generally* PO Resp. 28–31. Again, Patent Owner directs us to evidence that Petitioner’s customers and distributors expressed interest in a DRA for use in heavy crudes. *Id.* at 29–30 (citing Exs. 2050, 2054–2059). Patent Owner alleges that both Petitioner and Flowchem were unable to fulfill the requests of their customers and distributors because they were unable to develop their own DRAs for use in heavy crudes. *Id.* at 31–32 (citing Ex. 2021 ¶ 148; Ex. 2048, 5; Ex. 1031, 280; Exs. 2015, 2062).

In response, Petitioner asserts that Eaton¹⁰ satisfied any alleged long-felt need prior to the ’118 patent because it discloses a DRA for use in Bow

¹⁰ As is relevant to our discussion here, we found that Eaton discloses a DRA that reduced drag in heavy asphaltenic crude oil as recited in, for example, claim 1 of the ’118 patent. Final Dec. 21–40.

River crude, a heavy, asphaltenic crude oil. Pet. Br. 4. In addition to Eaton, Petitioner asserts that Patent Owner marketed its own prior DRA products, LP300 and LP400, as performing drag reduction in heavy crude. Pet. 22 (citing Ex. 1028, 1029). Specifically, Petitioner points to promotional brochures for LP300 and LP400 that describe the products as being “[d]esigned specifically to increase performance in heavier crudes.” Ex. 1029, 1; Ex. 1030, 1. Although the promotional brochures indicate that those products exhibit higher drag reduction performance in light crude oil, Patent Owner marketed the LP300 and LP400 products for use in heavy crude, and the brochures show that the products successfully reduced drag in heavy crude. Ex. 1029, 1; Ex. 1030, 1. Eaton, the LP300 brochure, and the LP400 brochure are particularly probative, because an assertion of long-felt need loses persuasive value if the prior art shows a solution to that long-felt need. The fact that Eaton’s solution or Patent Owner’s prior LP 300 and LP 400 products may have been less effective than Patent Owner’s later products is immaterial, as the claims do not require any specific level of drag reduction. *See, e.g.*, Ex. 1001, 20:13–36 (claim 10). Accordingly, we find that the record evidence demonstrates that Eaton, LP 300, and LP 400 already satisfied the need for a DRA for heavy crude.

c. Conclusion as to Long-Felt Need

In sum, although we credit Patent Owner’s evidence that both customers and distributors were seeking a solution to drag reduction in heavy crude, we consider Petitioner’s evidence with respect to Eaton and Patent Owner’s earlier LP300 and LP400 products to be more probative. We acknowledge that Patent Owner’s later products that embody the invention (discussed in greater detail below) may have provided an

improved DRA for heavy crude. However, we view Eaton, LP300, and LP400 as cutting against Patent Owner's position that the long-felt need for a DRA that would work in heavy crude oil was not satisfied prior to the invention of the '118 patent, especially because the claims do not require a particular level of drag reduction. On balance, and on this record, we accord minimal weight to Patent Owner's evidence of long-felt need.

2. *Failure of Others*

Patent Owner argues that prior to the invention of the '118 patent, industry competitors tried and failed to develop a DRA for heavy crude. PO Resp. 31–32; PO Br. 5–6. Specifically, Patent Owner directs us to a number of emails and documents in the record and asserts that neither Flowchem's FLO DRA product line nor Petitioner's products existing at the time of the '118 patent worked in heavy crude. PO Resp. 31 (citing Exs. 1031, 2015, 2021, 2048, 2050–2059, 2062–2064); *see* Paper 77, 7:14–24 (asserting the same).

Petitioner disputes Patent Owner's assertion that both Petitioner and Flowchem tried and failed to develop a DRA for use in heavy crudes. Pet. Reply 24. Petitioner asserts that the evidence demonstrates there was no active development at Baker Hughes prior to 2009 [REDACTED]. Pet. Reply 24 (citing Ex. 2054, BH0238342; Ex. 2058, BH039322; Ex. 2063; Ex. 2064; Ex. 2060, 355:18–21).

We agree with Patent Owner that the record evidence indicates neither Flowchem nor Petitioner had developed an effective DRA product for use in heavy crudes prior to the invention of the '118 patent. However, the lack of an effective product tells us little about whether Flowchem, Petitioner, or others tried and failed to develop a DRA for heavy crude during the relevant

time frame. For example, evidence from 2011 describes Petitioner’s “research” into a DRA for heavy crude, but notes that development efforts were suspended to focus on “internal profitability and manufacturing support projects.” Ex. 2058, BH039322. This evidence, therefore does not show an attempt, or a failure, prior to the ’118 patent. *Id.* To the contrary, Patent Owner’s evidence includes Petitioner’s emails and documents from 2009, 2011, 2013, and 2014—after the filing and publication dates of the application that issued as the ’118 patent. In a 2009 email, one of Petitioner’s employees states that Petitioner was “begin[ning] development efforts My opinion, for whatever its worth, is to begin now.” Ex. 2055, BH036544; *see also* Exs. 2051–2053 (2013 documents setting forth a Preliminary Business Case for development of a FLO heavy crude product); Exs. 2063, 2064 [REDACTED].

In short, Petitioner asserts, and we agree, that the record contains insufficient evidence demonstrating that Petitioner or Flowchem attempted to develop a heavy crude DRA and failed in the attempt prior to the ’118 patent. Pet. Br. 5. Accordingly, we give little weight to Patent Owner’s evidence that others attempted but failed to develop a DRA for heavy crude prior to the ’118 patent.

3. *Unexpected Results*

To be particularly probative, evidence of unexpected results must establish that there is a difference between the results obtained and those of the closest prior art, and that the difference would not have been expected by one of ordinary skill in the art at the time of the invention. *Kao Corp. v. Unilever U.S., Inc.*, 441 F.3d 963, 970 (Fed. Cir. 2006). Here, Patent Owner

argues that the industry was skeptical and surprised that a DRA could reduce drag in heavy crude oil. PO Resp. 32–33; PO Br. 7–8. Specifically, Patent Owner asserts:

Before seeing the 118 Patent, Baker’s scientists were in disbelief over industry reports that LSPI had invented a DRA that worked in HAC [high asphaltenic crude]. Viewing the performance of LSPI’s DRA [ExtremePower], one Baker scientist stated that if “analysis of [LSPI’s DRA] indicates *drag reduction* is possible,” Baker should request some samples of the “heavy crude” to do studies.

...

Baker’s later acknowledgment that “we have no predictive capability in this area” is direct proof that Naiman did not work. PO Br. 8 (citing Ex. 2068, BH036464; Ex. 2054, BH028342). Such evidence does suggest surprise that Patent Owner’s DRA product was viable in heavy crude oil. However, other record evidence indicates that Petitioner’s scientists were surprised not because Patent Owner’s ExtremePower (“EP”) product¹¹ was able to reduce drag, but rather, because it was more effective than Patent Owner’s LP300 and LP400 products. *See* Ex. 2069 (email from Petitioner’s scientists after seeing the published ’118 patent stating “[i]t’s pretty scary, and I mean it. . . . EP worked better in heavy crude than LP”). Such evidence, in our view, cuts against Patent Owner’s position on unexpected results, as it suggests, at most, that the effectiveness of Patent Owner’s EP product over the prior LP products surprised Petitioner’s scientists; it does not suggest, however, that others were surprised that a DRA could reduce drag in heavy crude oil at all.

¹¹ Patent Owner asserts that its EP product practices the method recited in claims 8–11 of the ’118 patent. PO Resp. 35 (“ExtremePower[] is the commercial embodiment used to perform the invention of the 118 Patent.”).

Petitioner argues, and we agree, that the evidence fails to demonstrate that Patent Owner's results were unexpected, or that there was "an industry-wide belief that no DRAs would work to reduce drag in heavy crude oils." Pet. Reply 24–25; Pet. Br. 5–7. In particular, Petitioner asserts that skepticism of the results would have been groundless considering Eaton's successful drag reduction in heavy crude and Patent Owner's own prior DRAs used in heavy crude. Pet. Br. 6. For example, and as we explain above in connection with long-felt need, Eaton's polymer successfully reduced drag in Bow River crude, a heavy crude oil, and Patent Owner itself designed and marketed its prior LP DRA products for use in heavy crude. Pet. Br. 6 (citing Pet. Reply 22; Exs. 1028, 1029, 1030). Patent Owner's marketing materials for its LP300 and LP400 DRA products include graphics and performance characteristics showing that they were effective at reducing drag in heavy crude oil. Ex. 1029, 1–2; Ex. 1030, 1–2.

On this record, we accord little weight to Patent Owner's evidence of unexpected results. Although Patent Owner does present some evidence of surprise that its EP product reduced drag in heavy crude, we find the greater weight of the evidence suggests that others were surprised at the relative effectiveness of the EP DRA as a product for reducing drag in heavy crude oil, but were not surprised that it reduced drag in heavy crude oil. Such a lack of surprise is clearer in view of the fact that Patent Owner designed and marketed its prior DRA products for reducing drag in heavy crude, and those products were effective in doing so, albeit to a lesser extent than the EP product. Ex. 1029, 1–2; Ex. 1030, 1–2; *see also* Ex. 2067, BH013524, Figs. 4, 5 (showing that Patent Owner's LP products reduced drag in heavy crude oil, e.g., Marlim Blend).

4. *Industry Praise*

Industry praise for an invention may provide evidence of non-obviousness where the industry praise is linked to the claimed invention. *See Geo. M. Martin Co. v. Alliance Mach. Sys. Int'l LLC*, 618 F.3d 1294, 1305 (Fed. Cir. 2010); *Asyst Techs. Inc., v. Emtrak, Inc.*, 544 F.3d 1310, 1316 (Fed. Cir. 2008). Here, Patent Owner directs us to evidence of praise, explaining that the industry recognized its EP product as a “significant improvement” over traditional DRAs and widely recognized EP as “pioneering.” PO Resp. 33–34 (citing Ex. 1031, 280; Ex. 2021 ¶¶ 153–154; Ex. 2052); *see* PO Br. 9–10. Patent Owner also directs us to statements that Patent Owner attributes to Petitioner, including that “Extreme Power was unique to the drag reduction of high asphaltene crudes versus the general offerings of DRAs for lighter crudes,” and “a significant technological breakthrough for heavy oil transport.” PO Resp. 34 (quoting Ex. 2067 (emphasis omitted)). However, upon careful review of the statements, we find that they are not Petitioner’s, but rather, statements that Dr. Yung N. Lee (a representative of Patent Owner) made in connection with a presentation on Patent Owner’s EO product. In other words, the statements represent Patent Owner’s praise of itself, not praise from the industry. *See* Ex. 2067, BH013524 (“After touting the benefits of Extreme Power in heavy crude applications, Dr. Lee finally moved on to actual, albeit vague[], case studies where EP was employed.”).

Finally, Patent Owner directs us to additional evidence that Patent Owner contends describes EP as the only DRA for heavy crude oil in the market, including evidence that Patent Owner “has aggressively pursued patent protection for its heavy oil DRA formulation.” PO Resp. 34 (quoting

Ex. 2074, FC-LSPI001025; citing Ex. 2052, BH013549; Ex. 2053, BH014511; Ex. 2061). With respect to this evidence of EP's market position, we agree with Petitioner that it does not demonstrate industry praise, but instead is "simply recognition that [Patent Owner] had exclusivity in the market, due in part to its patents." Pet. Reply 25–26.

On this record, Patent Owner's evidence of industry praise is entitled to minimal weight. Although there is some evidence describing the pioneering nature of Patent Owner's EP product and, presumably by extension, its method of use, we agree with Petitioner that much of Patent Owner's evidence is of little probative value.

5. *Commercial Success*

"When a patentee can demonstrate commercial success, usually shown by significant sales in a relevant market, and that the successful product is the invention disclosed and claimed in the patent, it is presumed that the commercial success is due to the patented invention." *J.T. Eaton & Co. v. Atl. Paste & Glue Co.*, 106 F.3d 1563, 1571 (Fed. Cir. 1997); *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1329 (Fed. Cir. 2016). "Demonstrating that an invention has commercial value, that it is commercially successful, weighs in favor of its non-obviousness." *WBIP*, 829 F.3d at 1337.

Patent Owner argues that the commercial success of the invention of claims 8–10 demonstrates that the invention was not obvious. PO Resp. 35–36; PO Br. 8–9. Patent Owner asserts as evidence of commercial success "very high margins," "recover[y] [of] their investment well beyond expectations," and the "ab[ility] to command a price premium for heavy crude DRA products." PO Br. 9 (citing Ex. 2051, BH013541; Ex. 2072; Ex. 2061). However, beyond a statement that it has sold "well over ■■■

██████████ of ExtremePower,” Patent Owner does not point to any data to demonstrate EP’s commercial success, and instead relies on Baker Hughes and Flowchem business documents. *See* PO Resp. 35–36 (citing Exs. 2051, 2052, 2061, 2072). Patent Owner asserts these business documents show that Baker Hughes attributed the commercial success of Patent Owner’s EP product “to its drag reduction performance included in claims 8–10.” PO Br. 9 (citing Exs. 2051, 2052).

Petitioner responds that Patent Owner’s evidence of sales volumes provides no context and, therefore, we should give it little weight. Pet. Br. 8 (citing *Ex parte Jellá*, 90 USPQ2d 1009, 1012 (BPAI 2008)). Instead, Petitioner asserts that Patent Owner’s sales “may be attributed to nothing more than its marketing position.” Pet. Reply 26; Pet. Br. 8.

Notably, a Baker Hughes business case states, “Extreme Power is the only DRA capable of providing drag reduction in heavy crudes at this time. As such, it commands very high margins.” Ex. 2051, BH013541. At best, this evidence suggests it has achieved higher margins with its EP product than with its other products. Ex. 2051, BH013541. But we find lacking in the record evidence as to what margins are considered “very high margins,” or that the sales of EP product amounted to a commercial success. For example, Patent Owner does not provide any sales figures or evidence as to how EP sales relate to the overall DRA market or the DRA market for heavy crude oil. Patent Owner states that it has sold “over ██████████ of ExtremePower,” PO Resp. 35, but offers no evidentiary support for its assertion. *See also* Ex. 2021 ¶ 178 (Mr. Dunn’s conclusory testimony as to the same number of EP product barrels sold). Without support, we cannot make any findings regarding this statement’s persuasiveness. Accordingly,

we accord minimal weight to Patent Owner’s evidence of commercial success.

6. *Copying of the Claimed Invention*

“[C]opying requires duplication of features of the patentee’s work based on access to that work.” *Institut Pasteur & Universite Pierre et Marie Curie v. Focarino*, 735 F.3d 1337, 1347–48 (Fed. Cir. 2010); *see Tokai Corp. v. Easton Enters., Inc.*, 632 F.3d 1358, 1370 (Fed. Cir. 2011).

“Evidence of copying may include internal documents, direct evidence such as photos of patented features or disassembly of products, or access and similarity to a patented product.” *Liqwd, Inc. v. L’Oreal USA, Inc.*, No. 2018-2152, 2019 WL 5587047, at * 2 (Fed. Cir. Oct. 30, 2019) (citing *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1325 (Fed. Cir. 2004)).

Patent Owner asserts that in response to requests from customers and distributors for a DRA for use in heavy crudes, Petitioner sought to develop a solution. PO Resp. 36–37. According to Patent Owner, Petitioner failed in its attempts to develop its own solution and studied the ’118 patent in order to copy the invention. PO Resp. 36–48; PO Br. 9–10. The result, in Patent Owner’s view, is a product that is “virtually identical” to [REDACTED]. PO Resp. 39–40 (citing Ex. 2091, BH-IPR0019, BH-IPR0021; Ex. 1001, 13:11–23; Ex. 2021 ¶¶ 180–181; Ex. 2080, BH012455; Ex. 2014, 80); PO Sur-Reply 4–5. Patent Owner acknowledges that Petitioner’s DRA product differs in composition from [REDACTED], but argues that

Baker’s copying is not negated because it added tiny amounts [REDACTED] of ingredients from [REDACTED] after it copied LSPI. It is undisputed that [REDACTED] of Baker’s DRA polymer is the same as

LSPI's [REDACTED] whereas only [REDACTED] comes from [REDACTED], which does not disclose [REDACTED]^[12].

PO Sur-Reply 4 (citing Ex. 2309, 12:20–23, 40:11–41:1, 87:9–89:12); Paper 77, 13:13–20 (asserting the same). Irrespective of the alleged copying of [REDACTED], Patent Owner asserts that Petitioner does not dispute that it copied the claimed methods of the '118 patent. PO Sur-Reply 3–4 (citing Pet. Reply 28, 32–33, 37–38, 46, 50–51).

Petitioner disagrees and asserts that, rather than copying Patent Owner's invention, it relied upon [REDACTED] to develop a unique heteroatom-containing DRA. Pet. Br. 8 (citing Ex. 1046 ¶¶ 62–67). In particular, Petitioner asserts:

Although Petitioner's product contains [REDACTED], the presence of that monomer, even in substantial amounts, does not render the product the same or virtually the same as [REDACTED]. Ex. 1046, ¶¶ 62-65. Specifically, Petitioner's product is a [REDACTED] containing [REDACTED] repeat [REDACTED], which is then reacted with [REDACTED] to form a [REDACTED] having an increased effective molecular weight. *Id.*; Ex. 1044. Notably, this is the very process described in the [REDACTED] patent. Ex. 1046, ¶¶ 66-67. Thus, contrary to LSPI's assertion, Petitioner's product is not a copy of [REDACTED]. Rather, Petitioner's own patented technology is reflected in its unique heteroatom-containing DRA. *Id.*

Pet. Reply 27–28 (citing Ex. 1046 ¶¶ 62–67); *see* Paper 77, 12:1–19 (asserting the same). Petitioner asserts that, contrary to Patent Owner's allegations, Petitioner examined the '118 patent not to copy, but in an effort to avoid infringement. Pet. Reply 28–29. For example, Petitioner considered “how much a patent analysis would cost (to determine where we have a right to practice based on our existing patent vs Conoco's patent).”

¹² [REDACTED] is shorthand for [REDACTED]. Ex. 1001, 13:16–17.

Ex. 2054, BH028342. Petitioner asserts that the evidence Patent Owner provides does not establish that any copying occurred. *See* Pet. Reply 28. Instead, Petitioner argues the evidence suggests at most that it attempted to “to monitor their competitor’s activities and to release a competitive product. This is not evidence of copying; it is evidence of prudent business practices.” *Id.* at 28–29 (citing Ex. 2054, BH028342; Ex. 2055, BH036544).¹³

On this record, we accord minimal weight to Patent Owner’s evidence of copying. Although we recognize that both Patent Owner’s EP product and Petitioner’s product include the [REDACTED] monomer, we credit Dr. Epps’s testimony as to the composition of Petitioner’s product. Dr. Epps explains that

the Baker Hughes product is a [REDACTED] containing [REDACTED] repeat units. Once synthesized, that [REDACTED] is reacted with [REDACTED] to form a [REDACTED] having an increased effective molecular weight, as compared to the [REDACTED] prior to [REDACTED] addition. *See* Ex. 2091; Ex. 1045. The inclusion of the [REDACTED] repeat units is important because without those units, the [REDACTED] would not react with the [REDACTED] to form a [REDACTED]. Accordingly, even though those [REDACTED] repeat units make up a relatively small percentage of the [REDACTED], they serve an important function, i.e., to increase the effective molecular weight of the DRA [REDACTED]. Moreover, the reaction between the [REDACTED] and the [REDACTED] produces a [REDACTED] structure that differs significantly from a [REDACTED]

¹³ [REDACTED]

[REDACTED] without the additional [REDACTED] units in its backbone.

Ex. 1046 ¶ 65.¹⁴ We find that although the additional elements beyond [REDACTED] in Petitioner’s product represent a small percentage of the [REDACTED], “they serve an important function,” such that we view Petitioner’s product as different from [REDACTED] *Id.* Such differences, in our view, are consistent with Petitioner’s attempts to “determine where we have a right to practice based on our existing patent vs Conoco’s patent,” and not merely to copy. Ex. 2054, BH028342. Moreover, the claims at issue here are not directed to a particular polymer and instead are directed to a method of introducing a drag reducing polymer into a pipeline, and we are not presented with significant evidence regarding copying of the method set forth in the claims. Ex. 1001, 20:13–36 (claim 10). Taking all of these facts into consideration, Patent Owner’s evidence of copying is entitled to minimal weight.

7. *Flowchem’s Stipulated Consent Judgment*

Finally, Patent Owner notes that Flowchem, an industry competitor, entered into a stipulated injunction in which Flowchem “acknowledges and admits that each of the Asserted Claims of the Patents-in-Suit [including claims 8-10 of the 118 Patent] is valid and enforceable in all respects.” PO Resp. 51 (citing Ex. 2085, 4); PO Br. 10. Patent Owner asserts that we

¹⁴ [REDACTED]

should give weight to Flowchem’s acquiescence to the validity of the patent as one of the objective indicia supporting non-obviousness. PO Resp. 51 (citing *Forest Labs., Inc. v. Ivax Pharm., Inc.*, 438 F. Supp. 2d 479, 496 (D. Del. 2006), *aff’d*, 501 F.3d 1263 (Fed. Cir. 2007)). In Patent Owner’s view, if Flowchem believed the ’118 patent was obvious, it would not have stipulated to an injunction and acknowledged the validity of those claims. PO Br. 10.

In response, Petitioner asserts that Patent Owner provides no evidence that Flowchem entered into a stipulated injunction for the reason that Flowchem believed the claims were valid. Pet. Reply 30; Pet. Br. 10 (citing *Bosch Auto. Serv. Sols., LLC v. Matal*, 878 F.3d 1027, 1037–38 (Fed. Cir. 2017)). Although *Bosch* differs from the present case in that the asserted evidence of acquiescence there was a license, as opposed to a stipulated injunction, we nevertheless find its reasoning persuasive here. The mere fact that Flowchem settled, without additional evidence regarding the circumstances surrounding the settlement, does not provide a strong indication of non-obviousness. That is, the evidence of record does not show that Flowchem acted “out of respect for the patent rather than to avoid litigation expense.” *Cf. Bosch*, 878 F.3d at 1038. Accordingly, we give little weight to Flowchem’s stipulated injunction.

D. Overall Weighing of Obviousness of Claims 8–10

Having considered the parties’ arguments and evidence, we evaluate all of the evidence together to make a final determination of obviousness. *Cyclobenzaprine*, 676 F.3d at 1075 (stating that a fact finder must consider all evidence relating to obviousness before finding patent claims invalid). As described above, we have analyzed Patent Owner’s objective evidence of

non-obviousness and found it to be entitled to little weight. We determine that the evidence of long-felt need, failure of others, unexpected results, industry praise, commercial success, copying, and acquiescence, when considered and weighed with the strong and substantial evidence as to the other three *Graham* factors supports a conclusion that claims 8–10 would have been obvious. *See supra* § II.B.; Final Dec. 61–71 (findings as to Petitioner’s assertion that Eaton, Strausz, and Naiman would have rendered obvious claims 8–10).

III. CONCLUSION

For the foregoing reasons, we determine that Petitioner establishes, by a preponderance of the evidence, that claims 8–10 of the ’118 patent are unpatentable under 35 U.S.C. § 103 as having been obvious over the combination of Eaton, Strausz, and Naiman.¹⁵

Claims	35 U.S.C. §	Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
8–10	103	Eaton, Strausz, Naiman	8–10	
Overall Outcome			8–10	

¹⁵ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding, 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. §§ 42.8(a)(3), (b)(2) (2017).

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner establishes, by a preponderance of the evidence, that claims 8–10 of the '118 patent are unpatentable;

FURTHER ORDERED that, pursuant to 35 U.S.C. § 318(b), upon expiration of the time for appeal of this decision, or the termination of any such appeal, a certificate shall issue canceling claims 8–10;

FURTHER ORDERED that the parties shall file, within ten (10) days of the entry of this decision, a joint motion to seal this decision, and also shall provide as an exhibit to the motion a proposed redacted public version of this decision; and

FURTHER ORDERED that this is a Final Written Decision; therefore, 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.

IPR2016-00734
Patent 8,022,118 B2

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BAKER HUGHES, a GE COMPANY, LLC
(f/k/a BAKER HUGHES INCORPORATED),
Petitioner,

v.

LIQUIDPOWER SPECIALTY PRODUCTS INC.
(f/k/a LUBRIZOL SPECIALTY PRODUCTS, INC.),
Patent Owner.

IPR2016-00734
Patent 8,022,118 B2

Before KRISTINA M. KALAN, CHRISTOPHER M. KAISER, and
MICHELLE N. ANKENBRAND, *Administrative Patent Judges*.

ANKENBRAND, *Administrative Patent Judge*.

DECISION

Denying Patent Owner's Request for Rehearing of Decision on Remand
37 C.F.R. § 42.71(d)

I. INTRODUCTION

On November 14, 2019, we entered a Decision on Remand (Paper 93, “Remand Decision” or “Dec.”) in the above-referenced case. On December 16, 2019, Patent Owner LiquidPower Specialty Products Inc. (“LSPI”) filed a request for rehearing. Paper 97 (“Rehearing Request” or “Req.”). LSPI requests that the Board dismiss the case or stay the case pending the United States Court of Appeals for the Federal Circuit’s resolution of the petitions for en banc review in *Arthrex, Inc. v. Smith & Nephew, Inc.*, 94 F.3d 1320 (Fed. Cir. 2019). Req. 1–2. Alternatively, LSPI requests that the Board transfer the case to a new panel to re-evaluate the parties’ briefing on remand. *Id.* at 2–3.

II. STANDARD OF REVIEW

The party requesting rehearing has the burden to show that the Board should modify its decision. 37 C.F.R. § 42.71(d). Additionally, the request for rehearing “must specifically identify all matters the party believes the Board misapprehended or overlooked, and the place where each matter was previously addressed in a motion, an opposition, or a reply.” *Id.*

III. DISCUSSION

LSPI argues that we should stay this case pending the Federal Circuit’s resolution of the petitions for en banc review in *Arthrex*. Req. 4, 7–8. This argument is moot, however, because the Federal Circuit denied en banc review in *Arthrex* on March 23, 2020. *Arthrex, Inc. v. Smith & Nephew, Inc.*, 953 F.3d 760 (Fed. Cir. 2020).

LSPI also argues that we should dismiss this case because the remedy the Federal Circuit applied in *Arthrex* violates the Administrative Procedure Act (“APA”) and is insufficient to remedy the Appointments Clause

violation. Req. 4–7. Alternatively, LSPI argues that “the Board should transfer this case to a new panel of constitutionally appointed APJs [Administrative Patent Judges] to ‘hear the *inter partes* review anew on remand.’” *Id.* at 8. Specifically, LSPI asserts that we were unconstitutionally appointed principal officers when we issued the Final Written Decision in this case on October 2, 2017, and, therefore, remained unconstitutionally appointed when we issued the Remand Decision on November 14, 2019. *Id.* at 9–10.

LSPI, however, forfeited any challenges to the panel’s constitutionality by failing to raise those challenges in its opening brief to the Federal Circuit in its appeal of our Final Written Decision.¹ *Customedia Techs., LLC v. Dish Network Corp.*, 941 F.3d 1173, 1174 (Fed. Cir. 2019) (“Our law is well established that arguments not raised in the opening brief are waived) (citations and internal quotation marks omitted); *Vivint, Inc. v. Alarm.com Inc.*, No. 19-2438 (Fed. Cir. Jan. 16, 2020), ECF No. 29 (nonprecedential); see *LiquidPower Specialty Prods. Inc. v. Baker Hughes, A GE Co., LLC*, No. 18-1141, ECF No. 29 (LSPI’s Opening Brief on appeal, which fails to raise any constitutionality or APA arguments on appeal).

¹ Indeed, LSPI failed to raise any constitutional challenge in its Patent Owner Response, Sur-reply, or during the oral hearing in the case before remand. Paper 47 (Response); Paper 70 (Sur-reply); Papers 76, 77 (hearing transcripts). LSPI also did not raise any constitutional challenge before the Federal Circuit on appeal of our Final Written Decision, either in its briefing or during oral argument. See *LiquidPower Specialty Prods., Inc. v. Baker Hughes, A GE Co., LLC*, No. 18-1141, ECF Nos. 29, 39; Oral Argument, available at <http://oralarguments.cafc.uscourts.gov/mp3/2018-1141.mp3>. And LSPI did not raise any constitutional challenge in the additional briefing we ordered on remand. Paper 87.

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LSPI cannot cure that forfeiture by raising constitutional challenges for the first time in its request for rehearing of our decision on remand.

IV. ORDER

It is

ORDERED that LSPI's Request for Rehearing is *denied*.

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE OFFICE OF THE UNDERSECRETARY AND DIRECTOR OF
THE UNITED STATES PATENT AND TRADEMARK OFFICE

BAKER HUGHES HOLDINGS, LLC
(f/k/a BAKER HUGHES, A GE COMPANY, LLC),
Petitioner,

v.

LIQUIDPOWER SPECIALTY PRODUCTS INC.
(f/k/a LUBRIZOL SPECIALTY PRODUCTS, INC.),
Patent Owner.

IPR2016-00734 (Patent 8,022,118 B2)
IPR2016-01901 (Patent 8,450,249 B2)
IPR2016-01903 (Patent 8,426,498 B2)
IPR2016-01905 (Patent 8,450,250 B2)

Before ANDREW HIRSHFELD, *Commissioner for Patents, Performing the
Functions and Duties of the Under Secretary of Commerce for Intellectual
Property and Director of the United States Patent and Trademark Office.*

ORDER

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IPR2016-01901 (Patent 8,450,249 B2)
IPR2016-01903 (Patent 8,426,498 B2)
IPR2016-01905 (Patent 8,450,250 B2)

The Office has received a request for Director review of the Final Written Decision in each of the above-captioned cases. Ex. 3100. The requests were referred to Mr. Hirshfeld, Commissioner for Patents, Performing the Functions and Duties of the Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office.

It is ORDERED that the requests for Director review are denied; and
FURTHER ORDERED that the Patent Trial and Appeal Board's Final Written Decisions are the final decisions of the agency.

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IPR2016-01901 (Patent 8,450,249 B2)
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