

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HALLIBURTON ENERGY SERVICES, INC.,
Petitioner,

v.

U.S. WELL SERVICES, LLC,
Patent Owner.

IPR2021-01316
Patent 10,280,724 B2

Before MEREDITH C. PETRAVICK, LYNNE H. BROWNE, and
SEAN P. O'HANLON, *Administrative Patent Judges*.

O'HANLON, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. Background

Halliburton Energy Services, Inc. (“Petitioner”) filed a Petition for *inter partes* review of claims 1–17 (“the challenged claims”) of U.S. Patent No. 10,280,724 B2 (Ex. 1001, “the ’724 patent”). Paper 2 (“Pet.”), 2. U.S. Well Services, LLC (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). With our authorization (*see* Ex. 1013), Petitioner filed a Preliminary Reply (Paper 7, “Prelim. Reply”) and Patent Owner filed a Preliminary Sur-reply (Paper 8, “Prelim. Sur-reply”).

Institution of an *inter partes* review is authorized by statute only when “the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a) (2018). A decision to institute may not institute on fewer than all claims challenged in the petition. *SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1354, 1359–60 (2018). If the PTAB institutes a trial, the PTAB will institute on all challenges raised in the petition. *See* Patent Trial and Appeal Board Consolidated Trial Practice Guide (“CTPG”) 64 (Nov. 2019) (“The Board will not institute on fewer than all claims or all challenges in a petition.”);¹ *see also AC Techs. S.A. v. Amazon.com, Inc.*, 912 F.3d 1358, 1364 (Fed. Cir. 2019) (“[I]f the Board institutes an IPR, it must . . . address all grounds of unpatentability raised by the petitioner.”).

We have authority, acting on the designation of the Director, to determine whether to institute an *inter partes* review under 35 U.S.C. § 314

¹ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

and 37 C.F.R. § 42.4(a). For the reasons set forth below, upon considering the Petition, Preliminary Response, Preliminary Reply, Preliminary Sur-reply, and evidence of record, we conclude that the information presented shows that there is a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of at least one of the challenged claims. Thus, we institute *inter partes* review of all challenged claims based on all asserted grounds.

B. Real Parties in Interest

Petitioner identifies itself, Halliburton Co., and Halliburton Holdings LLC as the real parties in interest. Pet. 1.

Patent Owner identifies itself as the sole real party in interest. Paper 5, 1.

C. Related Matters

The parties indicate that the '724 patent has not been the subject of any district court proceeding. Pet. 1; Paper 5, 1. The parties note other petitions for *inter partes* review filed by Petitioner and challenging patents owned by Patent Owner. Pet. 1; Paper 5, 1.

D. The Challenged Patent

The '724 patent relates to hydraulic fracturing in oil and gas wells, which entails pumping fluid into underground formations at high pressure. Ex. 1001, 1:8–28. Typically, this pumping is performed by large diesel-powered pumps, and a system of hydraulics is typically used to drive smaller ancillary devices such as augers, chemical pumps, mixing paddles, water

pumps, and cooling fans. *Id.* at 1:29–40, 2:37–41. The '724 patent purports to improve upon known fracturing systems and methods by using a plurality of electric motors to operate the fracturing pumps and each ancillary unit in a hydraulic fracturing system. *Id.* at 2:45–47. Variable frequency drives (“VFDs”) can be used to control the motors. *Id.* at 3:10–14. The '724 patent purports that using electric motors with variable frequency drives, rather than hydraulics, to power the ancillary units provides many advantages, including increasing the range of operating motor speed, eliminating the use of hydraulic fluid, reduced system weight, decreased noise, and a reduced number of interconnecting cables. *Id.* at 4:23–6:17.

Figure 1 shows a schematic view of the system and is reproduced below.

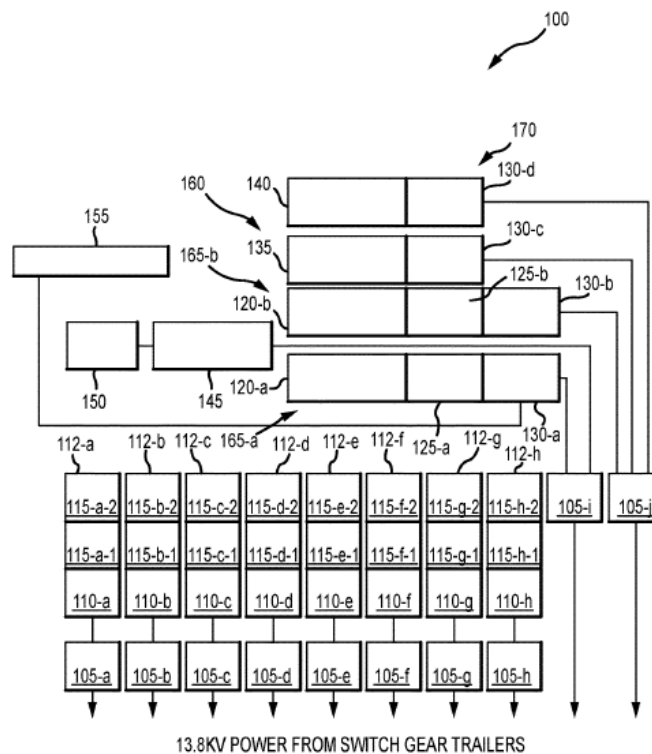


FIG.1

Figure 1 shows an overhead schematic view of hydraulic system 100. Ex. 1001, 7:15–17. Power supplied from switchgear (not shown) is provided to transformers 105-a–105-h. *Id.* at 7:17–21. The transformers supply stepped-down voltage to variable frequency drives 110-a–110-h, which control power provided to fracturing pumps 115-a-1–105-h-2. *Id.* at 7:21–30. Transformers 105-i, 105-j provide power received from switchgear (not shown) to sand equipment 145, hydration unit 160, blenders 165-a, 165-b, and chemical additive unit 170. *Id.* at 7:62–67. The blenders include slurry mixing units 102-a, 120-b, pumps 125-a, 125-b, and variable frequency drives 130-a, 130-b. *Id.* at 10:59–61.

E. The Challenged Claims

Petitioner challenges claims 1–17 of the '724 patent. Pet. 2, 9. Claims 1, 10, and 17 are independent. Claim 1 is illustrative of the challenged claims and is reproduced below.

1. A hydraulic fracturing system for fracturing a subterranean formation comprising:
 - an electric pump fluidly connected to a well associated with the subterranean formation, and configured to pump fluid into a wellbore associated with the well at a high pressure so that the fluid passes from the wellbore into the subterranean formation and fractures the subterranean formation;
 - one or more ancillary units associated with the fluid pumped into the wellbore, the one or more ancillary units comprising a blender, the blender being positioned on a trailer and fluidly connected to an auger, wherein one or more second motors are positioned any of proximate a top elevation of the auger or proximate a bottom elevation of the auger, or a combination thereof, such that the one or more second motors provide power to drive the auger;

a first motor electrically coupled to the electric pump to operate the electric pump;

the one or more second motors comprising one or more electric motors, each of the one or more second motors electrically coupled to at least one of the one or more ancillary units to operate the at least one of the one or more ancillary units; and

a plurality of variable-frequency drives (VFD), each VFD connected to at least one of the first motor or the one or more second motors to control the speed of the first motor or the one or more second motors.

Ex. 1001, 15:44–16:4.

F. Asserted Grounds of Unpatentability

The Petition relies on the following prior art references:

Name	Reference	Exhibit
Coli	US 9,140,110 B2, issued September 22, 2015	1004
Broussard	US 8,789,601 B2, issued July 29, 2014	1005
Payne	US 2016/0258267 A1, published September 8, 2016	1006

Petitioner asserts the following grounds of unpatentability:

Claim(s) Challenged	35 U.S.C. §	Reference(s)
1–4, 6–8, 10–12, 14–17	102	Coli
1–4, 6–8, 10–12, 14–17	103	Coli
4, 5, 12, 13	103	Coli, Broussard
9	103	Coli, Payne

Pet. 9. Petitioner submits a declaration of Robert A. Durham, Ph.D. (Ex. 1003, “the Durham Declaration”) in support of its contentions. Patent Owner submits a declaration of Mr. Robert Schaaf (Ex. 2008) in support of its preliminary responses.

II. ANALYSIS

A. Discretionary Denial Under 35 U.S.C. § 314(a)

Petitioner argues that “[t]he Board should not deny institution under 35 U.S.C. §314(a), because the ’724 Patent has not been asserted in litigation.” Pet. 9.

Patent Owner argues that “Petitioner is using the IPR process as a weapon to coordinate an attack against [Patent Owner’s] patent portfolio.” Prelim. Resp. 14. Patent Owner notes that Petitioner has filed 15 petitions for *inter partes* review of Patent Owner’s patents, including eight petitions that challenge patents (including the ’724 patent) that have not been asserted against Petitioner. *Id.* at 15–21. Patent Owner argues that we should exercise our “broad discretion” under § 314 to deny institution. *E.g., id.* at 20–21; *see also* Prelim. Sur-reply 1–2.

Petitioner replies that it has filed only a single petition against each of Patent Owner’s patents that it challenges. Prelim. Reply 1. Noting that Patent Owner issued a press release regarding the litigation it filed against Petitioner, Petitioner argues that it “should not need to sit idle against a looming cloud of other patents.” *Id.* at 2 (citing Ex. 1015).

Unlike the covered business method patent review provisions of the AIA,² neither the statute nor our rules require that Petitioner have been sued for infringement of the challenged patent in order to be able to file a petition for *inter partes* review. *See* 35 U.S.C. § 311; AIA § 18(a)(1)(B); 37 C.F.R. §§ 42.101, 42.302. Institution of an *inter partes* review, however, is discretionary, even if the statutory requirements are satisfied. *See SAS*, 138 S. Ct. at 1356 (“§ 314(a) invests the Director with discretion on the question *whether* to institute review”); *see also* CTPG 55–61 (discussing considerations in instituting a review). “The Board will also take into account whether various considerations . . . warrant the exercise of the Director’s discretion to decline to institute review,” and our exercise of “discretion is informed by 35 U.S.C. §[] 316(b) . . . , which require[s] the Director to ‘consider the effect of any such regulation [under this section] on the economy, the integrity of the patent system, the efficient administration of the Office, and the ability of the Office to timely complete proceedings instituted under this chapter.’” CTPG 55–56.

The Board has exercised its § 314(a) discretion to deny institution due to the advanced state of a district court proceeding in which the challenged patent is asserted. *See, e.g., Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 15 (PTAB May 13, 2020) (designated informative). We have exercised our discretion to deny institution of a later-filed petition after having considered a previously-filed petition challenging the same patent. *See, e.g., Valve Corp. v. Elec. Scripting Prods., Inc.*, IPR2019-00062, Paper 11 (PTAB Apr. 2, 2019) (designated precedential). And we have

² Leahy-Smith American Invents Act (“AIA”), Pub. L. No. 112–29, 125 Stat. 284 (2011).

exercised our discretion to deny institution when a petition demonstrates a reasonable likelihood of prevailing as to some, but not all, challenged claims (*see, e.g., Chevron Oronite Co. LLC v. Infineum USA L.P.*, IPR2018-00923, Paper 9 (PTAB Nov. 7, 2018) (designated informative)) and when a petition suffers from a lack of particularity that results in voluminous and excessive grounds (*see, e.g., Adaptics Limited v. Perfect Co.*, IPR2018-01596, Paper 20 at 17–18 (PTAB Mar. 6, 2019) (designated informative)).

This case is unlike other situations in which the Board has exercised its discretion to deny institution. Instead, Patent Owner asks us to deny institution because Petitioner has filed petitions challenging several of Patent Owner's patents that are not asserted in district court litigation, arguing that the filing of this many petitions by one petitioner against one patent owner is contrary to the purposes of the AIA. Prelim. Resp. 11–21. Patent Owner's arguments fail to persuade us to exercise our discretion to deny institution in this case. For each of Patent Owner's patents, Petitioner has filed only one petition. We do not see this action as being contrary to the purposes of the AIA. *See, e.g., Gen. Plastic Indus. Co., Ltd. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19 at 16 (PTAB Sept. 6, 2017) (designated precedential) (citing H.R. Rep. No. 112-98, pt. 1, at 48 (2011)) (noting that the AIA is “not to be used as [a] tool[] for harassment or a means to prevent market entry through repeated litigation and administrative attacks on the validity of a patent. Doing so would frustrate the purpose of the section as providing quick and cost effective alternatives to litigation.”). Moreover, it is undisputed that Patent Owner has asserted seven of its patents against Petitioner in district court litigation, and Petitioner expresses reasonable

concern that Patent Owner may initiate additional litigation regarding its as-yet unasserted patents. *See* Prelim. Reply 2.

Accordingly, for the foregoing reasons, we decline to exercise our discretion under 35 U.S.C. § 314(a) to deny institution.

B. Discretionary Denial Under 35 U.S.C. § 325(d)

Patent Owner argues that we should exercise our discretion under 35 U.S.C. § 325(d) to deny institution of *inter partes* review because substantially the same prior art and arguments advanced by Petitioner were presented during prosecution of the application resulting in the '724 patent. Prelim. Resp. 21–32; Prelim. Sur-reply 2–5. Petitioner argues that discretionary denial is not warranted. Pet. 10–11; Prelim. Reply 3–5. For the reasons discussed below, we decline to exercise our discretion to deny institution.

1. Legal Framework

Institution of *inter partes* review is discretionary. *See Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (“[T]he PTO is permitted, but never compelled, to institute an IPR proceeding.”); 35 U.S.C. § 314(a). Pursuant to 35 U.S.C. § 325(d), in determining whether to institute an *inter partes* review, “the Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office.”³ In evaluating whether to exercise our discretion to deny institution under § 325(d), we weigh the following non-exclusive factors:

³ The Board institutes trial on behalf of the Director. 37 C.F.R. § 42.4(a).

- (a) the similarities and material differences between the asserted art and the prior art involved during examination;
- (b) the cumulative nature of the asserted art and the prior art evaluated during examination;
- (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection;
- (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art;
- (e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and
- (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson & Co. v. B. Braun Melsungen AG, IPR2017-01586, Paper 8 at 17–18 (PTAB Dec. 15, 2017) (designated precedential in relevant part). Although *Becton, Dickinson* involved prior art or arguments that were presented during examination of the patent application, the enumerated factors “should be read broadly . . . to apply to any situation in which a petition relies on the same or substantially the same art or arguments previously presented to the Office during a proceeding pertaining to the challenged patent.” *Advanced Bionics, LLC v. Med-El Elektromedizinische Geräte GMBH*, IPR2019-01469, Paper 6 at 10 (PTAB Feb. 13, 2020) (designated precedential). Factors (a), (b), and (d) relate to whether the art and arguments presented in the petition are the same or substantially the same as those previously presented to the Office. *Id.* Factors (c), (e), and (f) “relate to whether the petitioner has demonstrated a material error by the Office” in its prior consideration of that art or arguments. *Id.*

Thus, under § 325(d), the Board uses the following two-part framework: (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and (2) if either condition of [the] first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of [the] challenged claims.

Id. at 8.

2. Background

The '724 patent was filed on July 7, 2017, as application no. 15/644,487 and contained 20 claims, of which claims 1, 13, and 20 were independent. Ex. 1002, 65–69, 94. The Applicant also filed an Information Disclosure Statement (“IDS”) disclosing Coli, Broussard, and Payne. *Id.* at 13–30.

On November 13, 2017, the Examiner issued a non-final Office action rejecting claims 1–4 as being anticipated by Lestz⁴ and claims 1, 4, 5, and 10 as being anticipated by Payne. Ex. 1002, 134–37. The Examiner found claims 13–20 to be allowable and claims 6–9, 11, and 12 to contain allowable subject matter. *Id.* at 137. The Examiner also indicated that Coli, Broussard, and Payne had been considered. *Id.* at 117, 121, 128, 132. The Applicant responded on February 13, 2018, by amending claim 1 to recite that the ancillary units included “one or more of a blender and a hydration unit” and specifying that the one or more second motors are electric motors. *Id.* at 147.

⁴ US 2016/0230525 A1, published August 11, 2016.

On March 12, 2018, the Examiner issued a final Office action rejecting claims 1, 5, and 10 as being anticipated by Payne and claims 1–3 as being obvious in view of Lestz and Payne. Ex. 1002, 161–64. The Examiner found claims 13–20 to be allowable and claims 6–9, 11, and 12 to contain allowable subject matter because “[t]he prior art of record does not disclose all the claimed subject matter including the combination of the blender unit and second motor for driving the auger nor the plurality [of] variable frequency drives.” *Id.* at 164–65. The Applicant responded on June 27, 2018, by canceling the language previously added to claim 1 and incorporating into claim 1 the recitations of claim 6 (regarding variable frequency drives), which was canceled. *Id.* at 254–55.

On July 25, 2018, the Examiner issued a non-final Office action withdrawing the indicated allowability of claims 6–9, 11, 12 and 13–20 and rejecting claims 1–3, 5, 7–10, and 12–20 as being anticipated by Payne. Ex. 1002, 268–71. The Examiner found claim 11 to contain allowable subject matter. *Id.* at 271. Notably, claim 11 recited,

The system of claim 1, wherein the one or more ancillary units comprise the blender, the blender being positioned on a trailer and fluidly connected to an auger, wherein the one or more second motors are positioned any of proximate a top elevation of the auger or proximate a bottom elevation of the auger, or a combination thereof, such that the one or more second motors provide power to drive the auger.

Id. at 255. The Applicant responded on November 16, 2018 by amending each of claims 1, 13, and 20 to include the recitations of claim 11, which was canceled. *Id.* at 294–306.

On December 31, 2018, the Examiner issued a Notice of Allowance. *Id.* at 323–29. Independent claim 1, 13, and 20 issued as claims 1, 10, and 17, respectively. *Id.* at 332.

3. Analysis

a. Whether the Same or Substantially the Same Art Was Presented to the Office

Applying the *Advanced Bionics* framework, we first determine whether the same or substantially the same art or arguments were presented previously to the Office. It is undisputed that each of the asserted references—Coli, Broussard, and Payne—was submitted to the Office via IDS. Ex. 1002, 13–30. The Examiner indicated that Coli, Broussard, and Payne had been considered. *Id.* at 117, 121, 128, 132. Our precedent establishes that “[p]reviously presented art includes . . . art provided to the Office by an applicant, such as on an Information Disclosure Statement (IDS), in the prosecution history of the challenged patent.” *Advanced Bionics*, Paper 6 at 7–8. Moreover, the Examiner rejected claims based on Payne. *See, e.g.*, Ex. 1002, 269–71.

Accordingly, we determine that each of Coli, Broussard, and Payne was presented previously to the Office.

b. Whether the Office Erred in a Manner Material to Patentability

Having determined that the first part of the *Advanced Bionics* framework is satisfied, we turn to the second part of the framework in which we consider whether Petitioner has demonstrated that the Office erred in a manner material to the patentability of the challenged claims. Petitioner

argues that the Examiner erred in a material manner because Coli discloses “the alleged point of novelty” the Examiner relied upon when allowing the claims during prosecution. Pet. 10; Prelim. Reply 4–5.

Patent Owner argues that “Petitioner offers no explanation or evidence of a material error.” Prelim. Resp. 31. Patent Owner also reiterates its arguments that the asserted references were presented previously to the Office. *Id.* at 30–31; Prelim. Sur-reply 4–5.

As discussed above, the subject matter found allowable by the Examiner related to the ancillary units comprising a blender fluidly connected to an auger, the second motors positioned proximate a top elevation of the auger, a bottom elevation of the auger, or a combination thereof, and the second motors providing power to the auger. Ex. 1002, 255, 271, 302, 304, 306, 323–29. As discussed below, Petitioner demonstrates sufficiently for purposes of institution that Coli, which Petitioner asserts in all grounds, discloses these recitations. Coli discloses that its system includes electrically-powered blender units to generate the treatment fluid. Ex. 1004, 2:38–41, 8:58–60. The system can include a dual configuration having two blender units. *Id.* at 9:20–22, Fig. 5B. The blender units can be positioned on the same trailer as the fracturing modules. *Id.* at 8:60–64. The blender units contain a plurality of electric motors, one of which powers auger 45a. *Id.* at 9:44–50. The electric motors can be positioned proximate a top elevation of the augers. *Id.* at Fig. 5B.

Accordingly, by not fully considering Coli’s disclosure, we determine that the Examiner erred in a manner material to patentability during prosecution of the application resulting in the ’724 patent.

4. Conclusion

After considering the framework set forth in *Advanced Bionics* and the underlying *Becton, Dickinson* factors, we determine that discretionary denial under § 325(d) is not appropriate under the facts before us.

C. Principles of Law

1. Inter Partes Review

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic*, 815 F.3d at 1363 (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). Petitioner bears the burden of persuasion to prove unpatentability of each challenged claim by a preponderance of the evidence. 35 U.S.C. § 316(e). This burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). The Board may authorize an *inter partes* review if we determine that the information presented in the Petition and Patent Owner’s Preliminary Response shows that there is a reasonable likelihood that Petitioner will prevail with respect to at least one of the claims challenged in the petition. 35 U.S.C. § 314(a).

2. Anticipation

“Under 35 U.S.C. § 102 a claim is anticipated ‘if each and every limitation is found either expressly or inherently in a single prior art reference.’” *King Pharm., Inc. v. Eon Labs, Inc.*, 616 F.3d 1267, 1274 (Fed. Cir. 2010) (quoting *Celeritas Techs. Ltd. v. Rockwell Int’l Corp.*, 150 F.3d

1354, 1360 (Fed. Cir. 1998)). “Anticipation requires the presence in a single prior art disclosure of all elements of a claimed invention arranged as in the claim.” *Therasense, Inc. v. Becton, Dickinson & Co.*, 593 F.3d 1325, 1332 (Fed. Cir. 2010) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983)).

A reference inherently discloses an element of a claim “if that missing characteristic is necessarily present, or inherent, in the single anticipating reference.” *Schering Corp. v. Geneva Pharm.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) (citing *Cont’l Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 1268 (Fed. Cir. 1991)). “Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient.” *Therasense*, 593 F.3d at 1332 (quoting *Cont’l Can*, 948 F.2d at 1269).

3. Obviousness

A patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) when in evidence, any objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

D. Level of Ordinary Skill in the Art

The level of ordinary skill in the art is “a prism or lens” through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). The person of ordinary skill in the art is a hypothetical person presumed to have known the relevant art at the time of the invention. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In determining the level of ordinary skill in the art, we may consider certain factors, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *Id.* (internal quotation marks and citation omitted).

Petitioner contends that a person having ordinary skill in the art at the time of the invention (“POSITA”) would have either “a Bachelor of Science in Mechanical Engineering, Electrical Engineering, Petroleum Engineering or an equivalent field as well as at least two years of academic or industry experience in the oil and gas industry, including well drilling, completion, or production,” or “at least four years of industry experience in the oil and gas industry, including well drilling, completion, or production.” Pet. 11.

Patent Owner asserts that it “has used Petitioner’s proposed definition of a person of ordinary skill in the art.” Prelim. Resp. 7.

Based on the arguments presented and the cited references, we find Petitioner’s definition of the level of ordinary skill reasonable and for purposes of this Decision adopt it as our own.

E. Claim Construction

In an *inter partes* review, claims are construed using the same claim construction standard that would be used to construe the claims in a civil action under 35 U.S.C. § 282(b), including construing the claims in accordance with the ordinary and customary meaning of such claims as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent. 37 C.F.R. § 42.100(b). Thus, we apply the claim construction standard as set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). In addition to the specification and prosecution history, we also consider use of the terms in other claims and extrinsic evidence including expert and inventor testimony, dictionaries, and learned treatises, although extrinsic evidence is less significant than the intrinsic record. *Id.* at 1312–17. Usually, the specification is dispositive, and it is the single best guide to the meaning of a disputed term. *Id.* at 1315.

Only those terms that are in controversy need be construed, and only to the extent necessary to resolve the controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

Neither Petitioner nor Patent Owner provides any explicit construction of any claim terms. Pet. 12; Prelim. Resp. 8. However, in its Preliminary Reply, Petitioner contends that Patent Owner argues the claim language an/the “electric pump . . . configured to pump fluid into a wellbore . . . at a high pressure so that the fluid passes from the wellbore into the subterranean formation and fractures the subterranean formation,” as recited in claims 1, 10, and 17, requires the fluid to be maintained at a high pressure through

portions of the wellbore, including “vertical and/or deviated portions of the wellbore.” Prelim. Reply 11 (citing Prelim. Resp. 32–38). Petitioner further contends that Patent Owner’s position is contrary to the plain language of the claims, as the claim language and the specification do not mention “vertical” or “deviated” portions, and does not require maintaining a high pressure of the fluid through the “vertical and/or deviated portions of the wellbore.” *Id.* at 11–12. According to Petitioner, the express language of the claims only requires that: (a) a pump be configured to pump fluid at high pressure; so that (b) the fluid passes from the wellbore into the formation; and (c) the fluid fractures the formation. *Id.* at 12.

Except to the extent that we explain how we interpret the claims in the analysis below, we decline to otherwise expressly construe any claim terms at this time. *Nidec*, 838 F.3d at 1017.

F. Overview of the Asserted Prior Art

1. Coli

Coli relates to hydraulic fracturing in hydrocarbon-bearing wells. Ex. 1004, 1:22–23. Coli recognizes drawbacks of the diesel motors typically used in such drilling. *Id.* at 1:44–2:2. Coli purports to improve upon known fracturing systems by using electric motors and generators powered by natural gas to drive the pumps. *Id.* at 5:16–26. Coli purports that this use of electric components beneficially reduces the amount of infrastructure, is safer and easier to control than known diesel systems, facilitates syncing the equipment within the system, and reduces costs. *Id.* at 6:1–42.

Figure 2 is a schematic view of the fracturing site and is reproduced below.

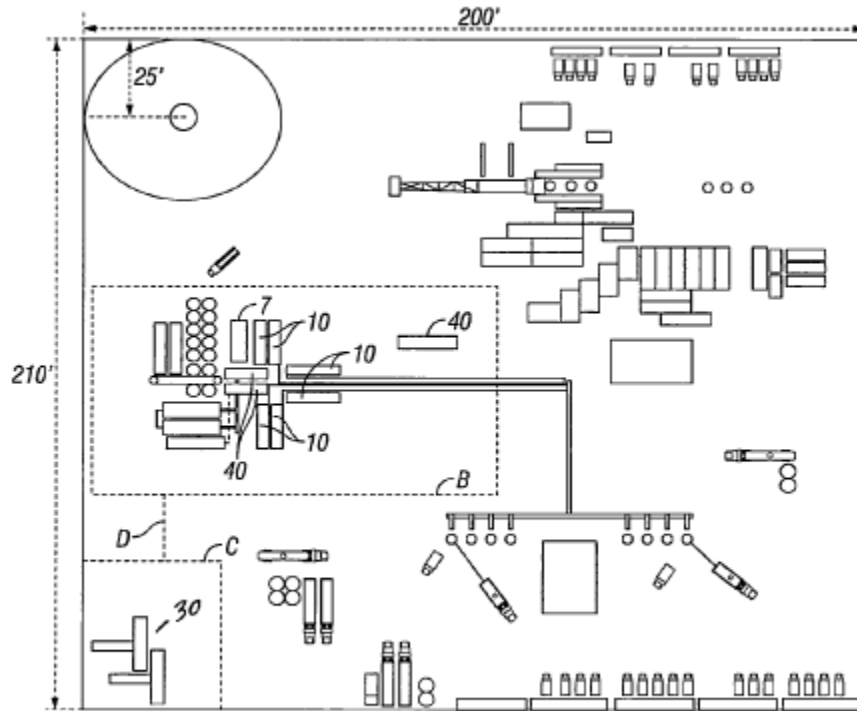


FIG. 2

Figure 2 illustrates a schematic diagram of a fracturing site, including dotted line boxes marking region B and region C, separated by distance D.

Ex. 1004, 4:33–35, 6:1–3. Trailers 10 housing one or more fracturing modules, each module including an electric motor coupled to one or more pumps, are located in region B. *Id.* at 6:3–6, 6:43–47. One or more natural gas-powered turbine generators 30 are located in region C, separated from the fracturing modules for safety. *Id.* at 6:6–9. The turbine generators provide a dedicated source of on-site electric power. *Id.* at 6:10–12. Electrically-powered blender units are located in region B. *Id.* at 8:58–64. Blender modules 40 are powered by the turbine generator and provide fracturing fluid to a pump for delivery to the wellbore. *Id.* at 9:4–8. Control center 40 includes suitable controls and computer monitoring for the entire fracturing operation. *Id.* at 12:19–28.

2. Broussard

Broussard relates to hydraulic fracturing in oil and gas wells, which entails pumping fluid into underground formations at high pressure. Ex. 1005, 1:17–30. Typically, this pumping is performed by large diesel-powered pumps. *Id.* at 1:31–34. Broussard purports to improve upon known fracturing systems and methods by using electric motors to drive the pumps. *Id.* at 1:51–64. Broussard purports that electric motors and generators can be loaded directly on a truck or trailer, increasing efficiency and lowering cost. *Id.* at 7:30–60. Figure 3 illustrates a portion of the system and is reproduced below.

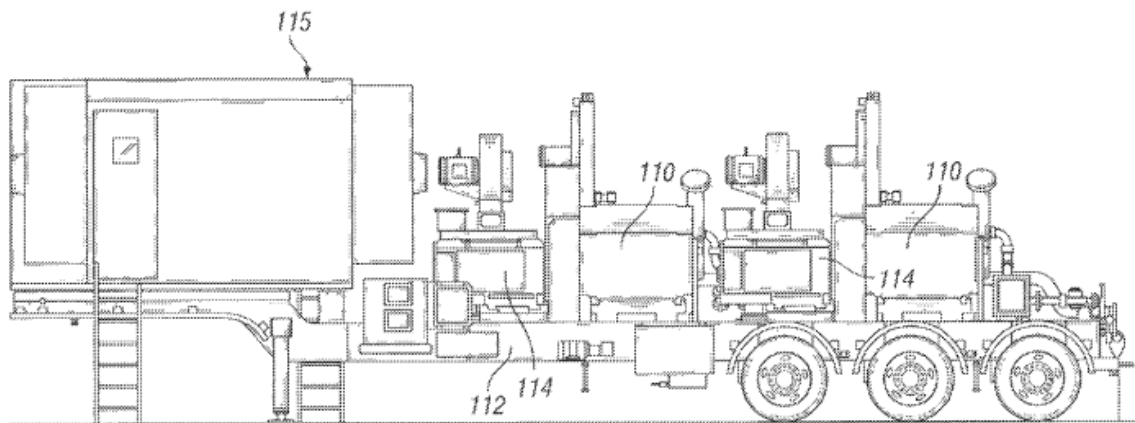


FIG. 3

Figure 3 is a left side view of the fracturing equipment mounted on a vehicle, showing trailer 112 carrying pumps 110, electric motors 114, and variable frequency drive 115. Ex. 1005, 3:18–20; 7:61–67. The variable frequency drive controls the speed of the electric motor and connected pumps. *Id.* at 4:4–11. Multiple vehicles, including trailers or trucks, may be combined as a fleet at one wellbore. *See id.* at 4:8–18, Fig. 1. However, the variable frequency drives can be discrete to each vehicle or pump, allowing

independent control, so that if one pump or motor becomes incapacitated the remaining pumps and motors on the vehicle or in the fleet can continue to function. *Id.* The variable frequency drives can also provide “monitoring and protection of drive internal operations while communicating with an operator via one or more user interfaces. For example, motor diagnostics can be performed frequently (e.g., on the application of power, or with each start), to prevent damage to a grounded or shorted electric motor.” *Id.* at 4:40–45.

3. *Payne*

Payne discloses a system for “remotely monitoring and controlling electrical motors in oil and gas well stimulation hydraulic fracturing applications.” Ex. 1006 ¶ 3. Payne purports to improve upon conventional fracturing systems by using electrical motors in place of diesel engines. *Id.* ¶ 9. Payne purports that electrical motors advantageously allow for more precise, continuous speed control. *Id.* Payne additionally purports that AC motors are better suited for fracturing operations and that “VFD drive technology used with AC motors has advanced significantly in recent times to become more compact, reliable and cost-effective.” *Id.* ¶ 11.

Payne’s fracturing system includes fracturing pump trailers, transformer trailers, switchgear trailers, a blender unit trailer, a hydration unit trailer, and a system control center. Ex. 1006 ¶¶ 43–44, Fig. 1. Both the blender unit and hydration unit include electric motors, motor-drives, and programmable automation controllers that communicate with variable frequency drives. *Id.* ¶¶ 39–40, 71–72, 88–90.

G. Asserted Anticipation by Coli

Petitioner argues that claims 1–4, 6–8, 10–12, and 14–17 are anticipated by Coli. Pet. 12–38. In support of its showing, Petitioner relies upon the Durham Declaration. *Id.* (citing Ex. 1003). We have reviewed Petitioner’s assertions and supporting evidence. For the reasons discussed below, and based on the record before us, we determine that Petitioner demonstrates a reasonable likelihood of prevailing in showing that at least one challenged claim is anticipated by Coli.

1. Independent Claims 1, 10, and 17

Independent claim 1 recites a system comprising an electric pump powered by a first motor to pump fracturing fluid into a well, ancillary units including a blender and an auger powered by second electric motors, and a plurality of variable frequency drives that control the speed of the pump or ancillary unit motors. Ex. 1001, 15:44–16:4. Independent claim 10 is identical to claim 1, except that it recites that the one or more second motors comprise “an electric motor” rather than “one or more electric motors.” *Id.* at 16:42–17:2. Independent claim 17 recites a method of powering one or more ancillary units including steps that are substantially the same as the recitations of claim 10. *Id.* at 18:1–27. The parties advance substantially the same arguments for claims 10 and 17 as they advance for claim 1. Pet. 30–32, 34–38; Prelim. Resp. 33–35. Our analysis focuses on claim 1 but applies equally to claims 10 and 17.

a. Preamble

Claim 1 recites “[a] hydraulic fracturing system for fracturing a subterranean formation.” Ex. 1001, 15:44–45. Petitioner argues that Coli

discloses such a system. Pet. 13 (citing Ex. 1004, 1:27–43, 2:6–21, 2:42–53, 6:43–59; Ex. 1003 ¶ 61).

Patent Owner does not contest this aspect of the Petition. *See generally* Prelim. Resp.

Coli discloses “a system and method for hydraulic stimulation of underground hydrocarbon-bearing formations.” Ex. 1004, 2:6–8.

Accordingly, for the foregoing reasons and on this preliminary record, to the extent the preamble is limiting, Coli supports Petitioner’s contentions.

b. The Pump Recitation

Claim 1 recites “an electric pump fluidly connected to a well associated with the subterranean formation, and configured to pump fluid into a wellbore associated with the well at a high pressure so that the fluid passes from the wellbore into the subterranean formation and fractures the subterranean formation.” Ex. 1001, 15:46–51. Petitioner maps this recitation to Coli’s fluid pump 22 of its fracturing modules 20. Pet. 14 (citing Ex. 1004, 6:43–59, Fig. 3;⁵ Ex. 1003 ¶ 63). Petitioner argues that Coli’s pumps deliver fracturing fluid to a wellbore under high pressure for fracturing the wellbore. *Id.* (citing Ex. 1004, 1:27–43, 5:3–15, 6:43–59, 7:37–43, 13:16–37, 14:64–15:6, claim 12; Ex. 1003 ¶ 65).

Patent Owner argues that Coli discloses that its pumps are configured to “transfer fluid ‘at medium pressure and high rate ... via multiple high pressure, plunger style pumps,’” but “is silent about an electric pump ...

⁵ We understand Petitioner’s citation to Exhibit 1009 to be an obvious typographical mistake, with the intended citation being to Exhibit 1004 (Coli). *See* Pet. 14.

configured to pump fluid into a wellbore associated with the well at high pressure.” Prelim. Resp. 33–34 (alterations in original) (emphasis omitted) (citing Ex. 1004, 5:5–10, claim 1; Ex. 2008 ¶¶ 56–57).

That Coli discloses operating the pump at “medium pressure” (*see, e.g.,* Ex. 1004, 5:5–10) does not negate the fact that Coli’s pumps are also configured for high pressure applications. Indeed, Coli discloses that the pump may be a “a quintiplex or triplex plunger style pump, for example, the SWGS-2500 Well Service Pump sold by Gardner Denver, Inc.” (Ex. 1004, 7:40–43) and that “[e]ach fracturing module 20 sits on trailer 10 which houses the necessary mounts and manifold systems for low pressure suction and *high pressure discharges*” (*id.* at 13:19–22 (emphasis added)). Patent Owner does not dispute that such pumps are capable of or configured to operate at high pressure. Furthermore, claim 1 is directed to a system that only requires that the pump be “configured to” pump fluid at a high pressure; that is, the recited operation is functional in nature. Because we find that the pump disclosed in Coli is a high-pressure pump designed to operate at “high pressure discharges” and rated at 2500 hp (*see id.* at 8:8–10), we determine that Petitioner has made a sufficient showing for purposes of institution that Coli discloses the pump “configured to pump fluid into a wellbore associated with the well at a high pressure so that the fluid passes from the wellbore into the subterranean formation and fractures the subterranean formation,” as recited in claim 1.

Accordingly, for the foregoing reasons and on this preliminary record, Coli supports Petitioner’s contentions.

c. The Ancillary Units Recitation

Claim 1 recites,

one or more ancillary units associated with the fluid pumped into the wellbore, the one or more ancillary units comprising a blender, the blender being positioned on a trailer and fluidly connected to an auger, wherein one or more second motors are positioned any of proximate a top elevation of the auger or proximate a bottom elevation of the auger, or a combination thereof, such that the one or more second motors provide power to drive the auger.

Ex. 1001, 15:52–60. Petitioner maps Coli’s blender units to the recited ancillary units, reproducing an annotated version of Coli’s Figure 5B to illustrate its mapping. Pet. 15–17 (citing Ex. 1004, 3:41–45, 3:65–4:20, 8:57–9:19, 9:31–10:3, 10:8–16, 10:28–59, 11:18–32, Figs. 5A, 5B; Ex. 1003 ¶¶ 67–70).

Patent Owner does not contest this aspect of the Petition. *See generally* Prelim. Resp.

Coli discloses that its system includes electrically-powered blender units to generate the treatment fluid. Ex. 1004, 2:38–41, 8:58–60. The system can include a dual configuration having two blender units. *Id.* at 9:20–22, Fig. 5B. The blender units can be positioned on the same trailer as the fracturing modules. *Id.* at 8:60–64. The blender units contain a plurality of electric motors, one of which powers auger 45a. *Id.* at 9:44–50. The electric motors can be positioned proximate a top elevation of the augers. *Id.* at Fig. 5B.

Accordingly, for the foregoing reasons and on this preliminary record, Coli supports Petitioner’s contentions.

d. The First Motor Recitation

Claim 1 recites “a first motor electrically coupled to the electric pump to operate the electric pump.” Ex. 1001, 15:61–62. Petitioner maps this recitation to Coli’s electric motor 21 of its fracturing modules 20. Pet. 17–18 (citing Ex. 1004, 2:6–21, 2:42–53, 6:43–59, Fig. 4A; Ex. 1003 ¶ 71).

Patent Owner does not contest this aspect of the Petition. *See generally* Prelim. Resp.

Coli discloses that its fracturing module 20 includes “an electric motor 21 coupled to one or more electric pumps 22.” Ex. 1004, 7:38–40.

Accordingly, for the foregoing reasons and on this preliminary record, Coli supports Petitioner’s contentions.

e. The Second Motors Recitation

Claim 1 recites “the one or more second motors comprising one or more electric motors, each of the one or more second motors electrically coupled to at least one of the one or more ancillary units to operate the at least one of the one or more ancillary units.” Ex. 1001, 15:63–67. Petitioner relies on its showing made regarding the Ancillary Units Recitation. Pet. 18–19 (citing Ex. 1004, 8:57–9:3, 9:31–10:3, 10:28–59; Ex. 1003 ¶¶ 72–73).

Patent Owner does not contest this aspect of the Petition. *See generally* Prelim. Resp.

As noted above, Coli discloses that its blender units contain a plurality of electric motors, one of which powers auger 45a. Ex. 1004, 9:44–50.

Accordingly, for the foregoing reasons and on this preliminary record, Coli supports Petitioner's contentions.

f. The Variable Frequency Drives Recitation

Claim 1 recites "a plurality of variable-frequency drives (VFD), each VFD connected to at least one of the first motor or the one or more second motors to control the speed of the first motor or the one or more second motors." Ex. 1001, 16:1–4. Petitioner argues that Coli discloses that both of its pump motor and auger motor are controlled via variable frequency drives. Pet. 20–22 (citing Ex. 1004, 2:29–31, 6:43–59, 7:44–66, 8:57–9:36, 10:4–7, 11:2–17, Figs. 5A, 5B; Ex. 1003 ¶¶ 74–76).

Patent Owner does not contest this aspect of the Petition. *See generally* Prelim. Resp.

Coli discloses that, "[b]ecause [its] electric motors are controlled by variable frequency drives, absolute control of *all equipment on location* can be maintained from one central point." Ex. 1004, 11:10–12 (emphasis added). Coli discloses that "[t]ypically, each fracturing module 20 will be associated with a drive housing for controlling electric motor 21 and pumps 22, as well as an electrical transformer and drive unit 50." Ex. 1004, 7:45–50. Petitioner's declarant testifies that "the drive unit is the variable frequency drive." Ex. 1003 ¶ 74. Coli discloses that "[b]lender module 40 can . . . include a control cabin 53 for housing equipment controls for first blender unit 47a and second blender unit 47b, and can further include appropriate *drives* and coolers as required." Ex. 1004, 10:4–7 (emphasis added). Petitioner's declarant interprets these "drives" to be variable frequency drives. Ex. 1003 ¶ 76.

Accordingly, for the foregoing reasons and on this preliminary record, Coli and Dr. Durham's testimony support Petitioner's contentions.

g. Conclusion

Accordingly, at this stage of the proceeding, we determine that Petitioner has established a reasonable likelihood of prevailing on its assertion that claims 1, 10, and 17 are anticipated by Coli.

2. Dependent Claims 2–4, 6–8, 11, 12, and 14–16

Each of claims 2–4 and 6–8 depends, directly or indirectly, from claim 1, and each of dependent claims 11, 12, and 14–16 depends directly from claim 10. The Petition maps these challenged dependent claims to Coli. Pet. 22–30, 32–34. Patent Owner does not challenge separately the arguments and evidence presented for the dependent claims. *See generally* Prelim. Resp.

Based on our review of the current record before us, we determine that the information presented in the Petition establishes that there is a reasonable likelihood that Petitioner would prevail in challenging these dependent claims.

H. Asserted Obviousness Based on Coli

Petitioner argues that claims 1–4, 6–8, 10–12, and 14–17 would have been obvious over Coli. Pet. 38–41. In support of its showing, Petitioner relies upon the Durham Declaration. *Id.* (citing Ex. 1003). We have reviewed Petitioner's assertions and supporting evidence. For the reasons discussed below, and based on the record before us, we determine that

Petitioner demonstrates a reasonable likelihood of prevailing in showing that at least one challenged claim would have been obvious over Coli.

1. Claims 1–3, 6–8, 10, 11, and 14–17

a. Analysis of Petitioner’s Showing and Patent Owner’s Responses

Petitioner relies on Coli as set forth in § II.G above and advances obviousness arguments regarding the Variable Frequency Drives Recitation. Pet. 39–40. Petitioner argues that, to the extent Patent Owner argues that Coli does not disclose the Variable Frequency Drives Recitation, “it also would have been obvious to a POSITA—from *Coli*’s discussion of ‘variable frequency drives’—to use variable frequency drives to control the speed of motors 42a and 42b that power augers 45a and 45b.” *Id.* at 39 (citing Ex. 1003 ¶ 114). Petitioner argues that an ordinarily skilled artisan would connect Coli’s augers to a variable frequency drive because “a VFD improves energy efficiency, lowers noise, and reduces mechanical stress on machines.” *Id.* (citing Ex. 1003 ¶ 114).

Patent Owner does not contest this challenge apart from repeating its arguments regarding Coli’s pumps that it advanced for Petitioner’s anticipation challenge based on Coli. Prelim. Resp. 35–37.

Coli discloses that its

control system can regulate fracturing module 20 in delivery of treatment fluid from blender module 30 to pumps 22 for delivery to the wellbore. Controls for the electric-powered operation described herein are a significant improvement over that of conventional diesel powered systems. Because electric motors are controlled by variable frequency drives, absolute control of all equipment on location can be maintained from one central point. When the system operator sets a maximum

pressure for the treatment, the control software and variable frequency drives calculate a maximum current available to the motors. Variable frequency drives essentially “tell” the motors what they are allowed to do.

Ex. 1004, 11:4–17.

According, for the foregoing reasons and on this preliminary record, Coli supports Petitioner’s contentions. We further determine that, based on this preliminary record, Petitioner has set forth reasoning with rational underpinning explaining why it would have been obvious to use variable frequency drives to control Coli’s auger motors. *See, e.g.*, Pet. 39–40; *see also* Ex. 1003 ¶ 114.

b. Alleged Objective Evidence of Nonobviousness

Notwithstanding what the teachings of the prior art would have suggested to one skilled in the art, objective evidence of nonobviousness (so called “secondary considerations”) may lead to a conclusion that the challenged claims would not have been obvious. *In re Piasecki*, 745 F.2d 1468, 1471–72 (Fed. Cir. 1984). Objective evidence of nonobviousness “may often be the most probative and cogent evidence in the record” and “may often establish that an invention appearing to have been obvious in light of the prior art was not.” *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1349 (Fed. Cir. 2012) (citing *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983)).

“In order to accord substantial weight to secondary considerations in an obviousness analysis, ‘the evidence of secondary considerations must have a “nexus” to the claims, i.e., there must be “a legally and factually

sufficient connection” between the evidence and the patented invention.” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (citing *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1332 (Fed. Cir. 2019)). “The patentee bears the burden of showing that a nexus exists” *WMS Gaming Inc. v. Int’l Game Tech.*, 184 F.3d 1339, 1359 (Fed. Cir. 1999). Nexus is a legally and factually sufficient connection between the objective evidence and the claimed invention, such that the objective evidence should be considered in determining nonobviousness. *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392 (Fed. Cir. 1988). A nexus is presumed when “the patentee shows that the asserted objective evidence is tied to a specific product and that product ‘embodies the claimed features, and is coextensive with them.’” *Fox Factory*, 944 F.3d at 1373 (quoting *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1072 (Fed. Cir. 2018)). “A finding that a presumption of nexus is inappropriate does not end the inquiry into secondary considerations,” as “the patent owner is still afforded an opportunity to prove nexus by showing that the evidence of secondary considerations is the ‘direct result of the unique characteristics of the claimed invention.’” *Id.* at 1373–74 (citing *In re Huang*, 100 F.3d 135, 140 (Fed. Cir. 1996)).

Patent Owner argues that objective evidence regarding its Clean Fleet product supports the nonobviousness of the challenged claims. Prelim. Resp. 40–50. Patent Owner puts forth evidence of copying and commercial success. *Id.* Patent Owner argues that a nexus should be presumed because its “Clean Fleet® technology embodies the Challenged Claimed features of the ’724 Patent including, but not limited to, ‘a first motor electrically coupled to the electric pump to operate the electric pump.’” *Id.* at 49.

Continuing, Patent Owner argues that there is a nexus between the asserted evidence of copying and the invention claimed in the '724 patent “because there is evidence that VoltaGrid copied [Patent Owner’s] claimed invention.” *Id.* at 46. Patent Owner also argues that “the claimed combination as a whole serves as a nexus for the objective evidence of commercial success.” *Id.* at 50. Patent Owner cites to the prosecution history of U.S. Patent No. 9,410, 410 (“the '410 patent”) in support of its contentions. *Id.* at 40–50 (citing Ex. 2005).

Patent Owner argues that “[d]uring prosecution of the '410 Patent, [Patent Owner] presented persuasive evidence that its claimed system was not obvious,” which included “evidence of copying, industry praise, long-felt need, and commercial success related to the claimed technology.” Prelim. Resp. 40–42.

Petitioner argues that a presumption of nexus is not warranted in this proceeding because Patent Owner submits the same Clean Fleet product to support its contentions of secondary considerations in other *inter partes* review proceedings that challenge different patents with non-overlapping inventors. Prelim. Reply 7 (citing *Fox Factory*, 944 F.3d at 1375). Petitioner argues that the Clean Fleet product cannot be coextensive with the '724 patent claims because Patent Owner’s other patents include features not recited in the '724 patent claims, including a boost pump, a heater, and switchgear. *Id.* at 7–8. Continuing, Petitioner argues that “[Patent Owner] asserts that the pumps and electric motors provide nexus, yet the copying allegations say nothing about the pumps and motors.” *Id.* at 10. Petitioner argues that “a showing of copying is only equivocal evidence of non-obviousness in the absence of more compelling objective indicia of other

secondary considerations.” *Id.* (quoting *Ecolchem, Inc. v. S. Cal. Edison Co.*, 227 F.3d 1361, 1380 (Fed. Cir. 2000)).

Petitioner also argues that, because the ’410 patent “published more than one year before ’724 Patent’s priority date and . . . qualifies as prior art to the ’724 Patent[,] . . . any secondary considerations are *not* attributable to the claimed invention of the ’724 Patent, but instead to the prior art.”

Prelim. Reply 8 (citing Pet. 5–6).

Patent Owner replies that “Petitioner attempts to improperly shift the burden” to Patent Owner to prove a nexus to support secondary considerations. Prelim. Sur-reply 6–10.

Patent Owner bears the burden of showing that a nexus exists. *WMS Gaming*, 184 F.3d at 1359. On this record, Patent Owner does not sufficiently demonstrate that it is entitled to a presumption of nexus. To establish nexus with respect to commercial success, Patent Owner argues that its “Clean Fleet® technology embodies the Challenged Claimed features of the ’724 Patent including, but not limited to, ‘a first motor electrically coupled to the electric pump to operate the electric pump.’” Prelim. Resp. 49. However, Patent Owner does not provide details regarding its Clean Fleet product, and, thus, fails to establish persuasively that the Clean Fleet product “embodies the claimed features, and is coextensive with them.” *Fox Factory*, 944 F.3d at 1373 (quoting *Polaris*, 882 F.3d at 1072). Thus, on this record, Patent Owner has not shown sufficiently that it is entitled to a presumption of nexus. For the same reasons, on this record, Patent Owner has not sufficiently shown that the alleged commercial success is a “direct result of the unique characteristics of the claimed invention.” *See id.* at 1373–74.

Further, in as much as Patent Owner relies upon the declaration of Mr. Oehring (Ex. 2008, 34–37) to show a nexus with respect to copying, we do not find this testimony sufficient to establish nexus as it is untested at this stage of the proceeding. A final determination as to the veracity of Patent Owner’s evidence and arguments is best reserved for trial.

At this stage of the proceeding, and on this record, Patent Owner has not sufficiently established a nexus between the asserted objective indicia of nonobviousness and the claimed invention of the ’724 patent.

c. Conclusion

As set forth above, we have considered the scope and content of the prior art (§ II.F above), the differences between the claimed subject matter and the prior art (§ II.H.1.a above), the level of skill in the art (§ II.D above), and the objective evidence of nonobviousness (§ II.H.1.b above). Based on our findings, at this stage of the proceeding, we determine that Petitioner has established a reasonable likelihood of prevailing on its assertion that claims 1–3, 6–8, 10, 11, and 14–17 would have been obvious over Coli.

2. *Claims 4 and 12*

Claim 4 depends directly from claim 1 and recites “wherein the electric motor is selected from the group consisting of any of a single-phase AC motor, a three-phase motor, and a DC motor.” Ex. 1001, 16:13–15. Claim 12 depends directly from claim 10 and contains substantially the same recitation. *Id.* at 17:7–9. Petitioner argues that, to the extent Patent Owner argues that Coli does not disclose this recitation, “it would have been obvious to a POSITA from *Coli*’s disclosure of ‘an AC permanent magnet motor and/or a variable speed motor’ to use a single-phase AC motor, a

three-phase motor, or a DC motor.” Pet. 40 (citing Ex. 1003 ¶ 115).
Petitioner argues that, “through its disclosure of an electric motor itself, a POSITA would have understood that *Coli* discloses an AC or a DC motor,” and “through its disclosure . . . of an AC permanent magnet motor, which are AC motors, a POSITA would have understood the use of a three-phase or single phase motor in the system of *Coli*.” *Id.* at 41 (citing Ex. 1003 ¶ 115).

Patent Owner does not challenge separately the arguments and evidence presented for the dependent claims. *See generally* Prelim. Resp.

Coli discloses that its “electric motor can be an AC permanent magnet motor and/or a variable speed motor.” Ex. 1004, 2:29–31. Petitioner’s declarant testifies that “it would have been obvious to a POSITA to use a DC or an AC motor, given that there are only those two types of motors” and “[f]urthermore, for AC motors, it would have been obvious for [a] POSITA to use a single or three phase motor, considering those are the only two types of AC motors used in industrial applications.” Ex. 1003 ¶ 115.

According, for the foregoing reasons and on this preliminary record, *Coli* and Dr. Durham’s testimony support Petitioner’s contentions. We further determine that, based on this preliminary record, Petitioner has set forth reasoning with rational underpinning explaining why it would have been obvious to use of a single-phase AC motor, a three-phase motor, or a DC motor in *Coli*’s system. *See, e.g.*, Pet. 40–41; *see also* Ex. 1003 ¶ 115.

As set forth above, we have considered the scope and content of the prior art (§ II.F above), the differences between the claimed subject matter and the prior art (immediately above), the level of skill in the art (§ II.D above), and the objective evidence of nonobviousness (§ II.H.1.b above).

Based on our findings, at this stage of the proceeding, we determine that Petitioner has established a reasonable likelihood of prevailing on its assertion that claims 4 and 12 would have been obvious over Coli.

I. Asserted Obviousness Base on Coli and Broussard

Petitioner argues that claims 4, 5, 12, and 13 would have been obvious over Coli and Broussard. Pet. 42–48. In support of its showing, Petitioner relies upon the Durham Declaration. *Id.* (citing Ex. 1003). We have reviewed Petitioner’s assertions and supporting evidence. For the reasons discussed below, and based on the record before us, we determine that Petitioner demonstrates a reasonable likelihood of prevailing in showing that at least one challenged claim would have been obvious over Coli and Broussard.

Petitioner relies on Coli as set forth in § II.G above and relies on Broussard to provide additional teaching regarding electric motors and diagnostics performed by variable frequency drives. Pet. 42–43. Petitioner argues that it would have been obvious to incorporate Broussard’s teaching of diagnostics into Coli’s variable frequency drives or to substitute Broussard’s variable frequency drives in place of Coli’s. *Id.* at 43–44. Petitioner also argues that it would have been obvious to use a three-phase induction motor, rather than a permanent magnet (“PM”) motor in Coli’s system. *Id.* at 44–45.

Patent Owner repeats its arguments regarding Coli’s pumps that it advanced for Petitioner’s anticipation challenge based on Coli. Prelim. Resp. 37–38. Patent Owner also argues that Petitioner has not explained persuasively why an ordinarily skilled artisan would have replaced Coli’s

AC permanent magnet motor with Broussard's induction motor because "Petitioner fails to provide any supporting evidence that the 'PM motors' taught in *Coli* [are] similar to the 'induction motor' taught in *Broussard*." *Id.* at 38

Patent Owner fails to consider Petitioner's full argument for the proposed modification. Notably, Petitioner argues that it would have been obvious to use a three-phase induction motor "because they are more readily available and less expensive to install." Pet. 44 (citing Ex. 1005, 3:55–65; Ex. 1003 ¶ 123). The cited portion of Broussard states,

Use of induction motors, and in particular three-phase induction motors, allows for increased power output compared to other types of electric motors, such as permanent magnet (PM) motors. This is because three-phase induction motors have nine poles (3 poles per phase) to boost the power factor of the motors. Conversely, PM motors are synchronous machines that are accordingly limited in speed and torque. This means that for a PM motor to match the power output of a three-phase induction motor, the PM motor must rotate very fast, which can lead to overheating and other problems.

Ex. 1005, 3:55–65. Thus, Broussard provides explicit rationale for using a three-phase induction motor rather than a permanent magnet motor.

Based on our review of the current record before us, we determine that the information presented in the Petition establishes that there is a reasonable likelihood that Petitioner would prevail in challenging dependent claims 4, 5, 12, and 13.

J. Asserted Obviousness Base on *Coli* and Payne

Petitioner argues that claim 9 would have been obvious over *Coli* and Payne. Pet. 48–57. In support of its showing, Petitioner relies upon the

Durham Declaration. *Id.* (citing Ex. 1003). We have reviewed Petitioner's assertions and supporting evidence. For the reasons discussed below, and based on the record before us, we determine that Petitioner demonstrates a reasonable likelihood of prevailing in showing that claim 9 would have been obvious over Coli and Payne.

Claim 9 depends directly from claim 1 and recites,
wherein the one or more ancillary units comprise the hydration unit, the hydration unit being positioned on a trailer, the trailer further comprising a VFD, wherein the one or more second motors are positioned any of between the hydration unit and the VFD, or below the VFD, or a combination thereof, and wherein the one or more second motors provide power to the hydration unit via the VFD.

Ex. 1001, 16:34–41. Petitioner relies on Coli as set forth in § II.G above and relies on Payne to teach use of a hydration unit. Pet. 48–57. Petitioner argues that Coli discloses that its blender module includes a hydration unit because it blends fluids received from a fluid additive source and chemicals to generate fracturing fluid. *Id.* at 54 (citing Ex. 1004, 3:11–17, 5:3–15, 8:57–9:3, 9:20–36, 10:17–27; Ex. 1003 ¶ 140). Petitioner argues that Payne discloses a hydration unit that contains electric motor drives, which Petitioner argues are variable frequency drives, with the motor, pumps, and control system for the hydration unit positioned on a single trailer. *Id.* at 54–55 (citing Ex. 1006 ¶¶ 44–45, 89, claim 2, Fig. 8; Ex. 1003 ¶ 141). Petitioner argues that it would have been obvious to incorporate the motor and variable frequency drive of Payne's hydration unit, or the entirety of Payne's hydration unit, into Coli's hydration unit. Pet. 51–52.

Patent Owner does not contest this challenge apart from repeating its arguments regarding Coli's pumps that it advanced for Petitioner's anticipation challenge based on Coli. Prelim. Resp. 37–38.

Coli discloses that its blender module uses electric power “to effect blending of a fluid from the fluid source with a fluid additive from the fluid additive source to generate the fracturing fluid,” and that its “electric blending operation permits greater accuracy and control of fracturing fluid additives.” Ex. 1004, 3:14–17, 8:64–66. Petitioner's declarant interprets this discussion to disclose a hydration unit. Ex. 1003 ¶ 140. Payne discloses a fracturing system with a hydration unit including an electric-motor drive and a programmable automation controller (PAC). Ex. 1006 ¶¶ 88–89. Payne discloses that its programmable automation controllers communicate with variable frequency drives. *Id.* ¶ 39. Petitioner's declarant interprets Payne's electric-motor drive to be a variable frequency drive. Ex. 1003 ¶ 141. Petitioner argues that it would have been obvious to include these features of Payne's hydration unit in Coli's system “because such an improvement represents the use of a known technique (i.e., the VFD-controlled and trailer-mounted hydration unit) to predictably improve a similar system (i.e., the system of *Coli*) in the same way.” Pet. 51 (citing Ex. 1003 ¶ 138; *KSR*, 550 U.S. at 416–18⁶).

According, for the foregoing reasons and on this preliminary record, Coli, Payne, and Dr. Durham's testimony support Petitioner's contentions. We further determine that, based on this preliminary record, Petitioner has set forth reasoning with rational underpinning explaining why it would have

⁶ Petitioner cites to West's Supreme Court Reporter (“127 S.Ct. 1727, 1740”) rather than the official United States Reports. Pet. 51.

been obvious to include a hydration unit in Coli's system and to control the hydration unit with a variable frequency device. *See, e.g.*, Pet. 51; *see also* Ex. 1003 ¶ 138.

Based on our review of the current record before us, we determine that the information presented in the Petition establishes that there is a reasonable likelihood that Petitioner would prevail in challenging dependent claim 9.

III. CONCLUSION

For the foregoing reasons, we determine that the information presented establishes a reasonable likelihood that Petitioner would prevail in showing that at least one of the challenged claims of the '724 patent is unpatentable. At this preliminary stage, we have not made a final determination with respect to the patentability of the challenged claims or any underlying factual and legal issues. *See TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016) (noting that “there is a significant difference between a petitioner’s burden to establish a ‘reasonable likelihood of success’ at institution, and actually proving invalidity by a preponderance of the evidence at trial”).

Accordingly, *inter partes* review is instituted as to all challenged claims and all proposed grounds of unpatentability. *See SAS*, 138 S. Ct. at 1359–60; *see also PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018) (interpreting the statute to require “a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”); CTPG 64 (“The Board will not institute on fewer than all claims or all challenges in a petition.”).

IV. ORDER

Accordingly, it is:

ORDERED that pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–17 of the '724 patent is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial, which commences on the entry date of this decision.

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