

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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U.S. WELL SERVICES, LLC,  
Petitioner,

v.

HALLIBURTON ENERGY SERVICES, INC.,  
Patent Owner.

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IPR2022-01162  
Patent 9,435,333 B2

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Before HUBERT C. LORIN, KRISTINA M. KALAN, and  
JAMES J. MAYBERRY, *Administrative Patent Judges*.

LORIN, *Administrative Patent Judge*.

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

## I. INTRODUCTION

### A. Background

U.S. Well Services, LLC (“Petitioner”) filed a Petition to institute an *inter partes* review of claims 1–12 of U.S. Patent No. 9,435,333 B2 (Ex. 1001, “the ’333 patent”) pursuant to 35 U.S.C. § 311 *et seq.* Paper 2 (“Petition” or “Pet.”). Halliburton Energy Services Inc. (“Patent Owner”) filed a Preliminary Response. Paper 8 (“Preliminary Response” or “Prelim. Resp.”).

We have authority under 35 U.S.C. § 314, which provides that an *inter partes* review may not be instituted unless the information presented in the Petition and the Preliminary 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) (2021).

After considering the Petition, the Preliminary Response, and the evidence of record, we deny Petitioner’s request to institute an *inter partes* review as to the challenged claims of the ’333 patent on the grounds of unpatentability presented.

### B. Related Proceedings

The parties identify the following related district court proceeding:

- *U.S. Well Services, Inc. v. Halliburton Company*, No. 6:21-cv-00367-ADA (W.D. Tex.).

Pet. 1; Prelim. Resp. 3, 6.

Petitioner also identifies *inter partes* proceedings IPR2022-01163, IPR2022-01164, and IPR2022-01165 challenging U.S. Patent No. 7,574,325 B2, U.S. Patent Reissue No. RE47695 E1, and U.S. Patent No. 7,836,949 B2, respectively. Pet. 1.

*C. Real Parties in Interest*

Petitioner identifies itself as the real party-in-interest. Pet. 1. Patent Owner identifies itself as the real party-in-interest. Paper 6.

*D. The '333 patent (Ex. 1001)*

*1. Disclosure*

The '333 patent, titled “Corrosion Resistant Fluid End For Well Service Pumps,” relates to methods for introducing treatment fluids in a wellbore to facilitate hydraulic fracturing. Ex. 1001, code (54), 1:9–11.

According to the '333 patent, “[w]ell service pumps can be used to pump fluids that are used to create and/or extend existing fractures” (*id.* at 1:13–15) to “allow oil or gas to travel more easily from the rock pores” (*id.* at 1:17). “Well service pumps are usually provided with fluid ends within which reciprocating plungers place fluids under pressure.” *Id.* at 1:24–26. The '333 patent explains that the body of a fluid end is an aggregate of fastened metal blocks for easy servicing of internal compartments. *Id.* at 1:26–28.

“However, the joints between the blocks and the supporting features for the valves tend to weaken the body of a fluid end, limiting its pressure rating, and making it susceptible to corrosion, leaks and cracks.” *Id.* at 1:30–34. The '333 patent explains that corrosion of a fluid end can be caused by exposure to salt solutions used in hydraulic fracturing” (*id.* at 1:34–36) and, as a result, “it is not unusual for the bodies of fluid ends to fail under load, significantly cutting short their useful lives” (*id.* at 1:42–44). Replacement of failed fluid ends is said to be burdensome in the oilfield because a fluid end “can cost tens of thousands of dollars if not more” (*id.* at

1:47–48) and requires “a hoist . . . to lift and position the various portions of a fluid end body” (*id.* at 1:49–50).

To that end, the ’333 patent discloses “the use of corrosion resistant alloys as fluid ends to prolong the life of a well service pump.” *Id.* at 1:58–59. This is depicted in Figure 1 of the ’333 patent, reproduced below.

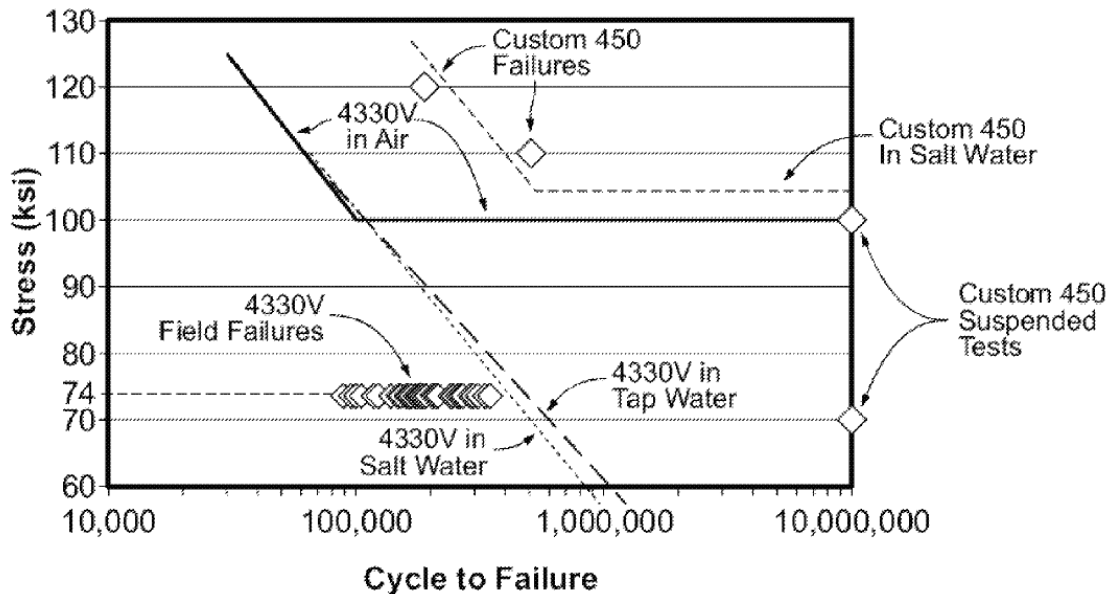


Fig. 1 of the ’333 patent (Ex. 1001) is a plot showing the result of fatigue tests as described in Example 1.

In Example 1, “two steel alloys were tested for their resistance effects against corrosion and wear.” *Id.* at 6:42–43. The plot in Figure 1 shows the result of “several experiments including laboratory fatigue testing in air and water, including salt water environments simulating frac fluids.” *Id.* at 6:43–45. “The two steel alloys tested were a martensitic age-hardenable stainless steel, commercially-available as ‘CUSTOM 450®’ . . . and a NiCrMoV hardened and tempered high strength alloy steel, commercially available as ‘4330V.’” *Id.* at 6:49–53.

The plot lines in Fig. 1 “represent fatigue data on axial tensile test coupons tested at a stress ratio of 0.1 with both of the steel alloys heat treated to 135 ksi yield strength.” *Id.* at 6:55–57.

“The 4330V steel coupon was first tested in air and displayed a fatigue limit around 100 ksi” (*id.* at 6:57–58), which the plot in Figure 1 illustrates as a “horizontal stress line, below which the material has an infinite fatigue life” (*id.* at 6:59–60). For a 4330V steel coupon tested in tap and salt water within the stress and cycle ranges tested, the plot in Figure 1 shows that “there is no stress level below which there is infinite fatigue life.” *Id.* at 6:64–65. The tests also indicated that 4330V fluid ends operated at the maximum stress level encountered during field operation would have a maximum expected life of approximately 400,000 cycles, as shown in Figure 1 as the point where the horizontal line drawn at 74 ksi intersects the 4330V lines. *Id.* at 7:6–12.

The plot in Figure 1 shows “that the fatigue limit of CUSTOM 450® is somewhere above 100 ksi” (*id.* at 7:18–19) and that “CUSTOM 450® has a fatigue limit in salt water somewhere between 100 ksi and 120 ksi” (*id.* at 7:21–22).

According to the ’333 patent, Example 1 demonstrates “the effectiveness of corrosion resistant alloy as a material which can be used in fluid ends of water service pumps.” *Id.* at 7:23–25.

## 2. Claims 1–12

The ’333 patent has 12 claims and Petitioner challenges all of them. Pet. 3. Claims 1, 5, and 9 are the independent claims from which claims 2–4, 6–8, and 10–12 depend, respectively. Claims 1, 5, and 9 are reproduced

below. Reference labels in brackets matching those used in the Petition have been added.

1. 1[a] A method comprising: providing a well service pump;
  - 1[b] providing a fluid end body that comprises a corrosion resistant alloy (a) having a fatigue limit of at least 75 ksi and (b) comprising chromium as an alloying element at 5% or greater by weight of the corrosion resistant alloy;
  - 1[c] installing the fluid end body in the well service pump; and;
  - 1[d] pumping an aqueous-based fluid through the fluid end body, wherein the fatigue limit is greater than or equal to a tensile stress assumed by the fluid end body when the well service pump operates at maximum working pressure while pumping the aqueous-based fluid, wherein the aqueous-based fluid has a salt concentration of about 4% by weight or greater.

Ex. 1001, 7:61–8:8.

5. 5[a] A method comprising: providing a well service pump;
  - 5[b] providing a fluid end body comprising a corrosion resistant alloy (a) having a fatigue limit of at least 75 ksi and (b) comprising chromium at 5% or greater by weight of the corrosion resistant alloy coupling the fluid end body to the well service pump; and
  - 5[c] pumping an aqueous-based fluid through the fluid end body, wherein the aqueous-based fluid includes a corrosion inhibitor and the fatigue limit is greater than or equal to a tensile stress assumed by the fluid end body when the well service pump operates at maximum working pressure while pumping the aqueous-based fluid with corrosion inhibitor, wherein the aqueous based fluid has a salt concentration of about 4% by weight or greater.

*Id.* at 8:22–37.

9. 9[a] A method comprising: providing a well service pump that comprises a fluid end body made from a corrosion resistant alloy having a fatigue limit of at least 75 ksi,

9[b] the corrosion resistant alloy comprising: iron; chromium in an amount of from about 5% to about 20%; and an alloying element selected from the group consisting of: molybdenum, copper, niobium, and any combination of these

9[c] pumping a fracturing fluid through the fluid end body, wherein the fatigue limit is greater than or equal to a tensile stress assumed by the fluid end body when the well service pump operates at maximum working pressure while pumping the fracturing fluid; and;

9[d] performing a fracturing treatment using the well service pump wherein the fracturing fluid has a salt concentration of about 4% by weight or greater.

*Id.* at 8:51–9:3.

*E. The Asserted Grounds*

Petitioner contends that claims 1–12 of the '333 patent are unpatentable under the following grounds:

| Ground | Claim(s)<br>Challenged | 35 U.S.C. §        | Reference(s)/Basis                       |
|--------|------------------------|--------------------|------------------------------------------|
| I      | 1, 3–7, 9, 11, 12      | § 103 <sup>1</sup> | Harvey, <sup>2</sup> Norman <sup>3</sup> |
| II     | 2, 8, and 10           | § 103              | Harvey, Norman, Ganguly <sup>4</sup>     |
| III    | 1–12                   | § 103              | Gardner, <sup>5</sup> Norman             |

Pet. 10.

Petitioner also relies on the Declaration of John Ely (Ex. 1003, “Ely Decl.”) and the prosecution file for the ’333 patent (Ex. 1002) as support for the various contentions. Patent Owner relies on the Declaration of Dr. Lawrence E. Eiselstein (Ex. 2001, “Eiselstein Decl.”) as support for the various contentions.

## II. ANALYSIS

### A. Claim Construction

For petitions filed on or after November 13, 2018, “[claims] of a patent . . . shall be construed using the same claim construction standard that

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<sup>1</sup> The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. §§ 102 and 103. Because the challenged claims of the ’333 patent have an effective filing date before the effective date of the applicable AIA amendments, we refer to the pre-AIA version of 35 U.S.C. § 103 throughout this Decision.

<sup>2</sup> Harvey, U.S. 5,102,312, issued April 7, 1992 (Ex. 1004) (“Harvey”).

<sup>3</sup> Norman et al., U.S. Patent No. 5,551,516, issued Sept. 3, 1996 (Ex. 1005) (“Norman”).

<sup>4</sup> Ganguly et al., U.S. Patent Application Publication No. 2008/0000065 A1, published Jan. 3, 2008 (Ex. 1012) (“Ganguly”).

<sup>5</sup> Gardner Denver, Inc., *Drilling, Production, Well Service and Industrial Pumps*, Brochure (March 2003) (Ex. 1006) (“Gardner”).

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 (2021); *see also Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005).

Petitioner does not submit constructions for any claim terms. There is a heading in the Petition: “A. “tensile stress assumed by the fluid end body when the well service pump operates at maximum working pressure” (Claims 1, 5, 9).” Pet. 13. But nothing more is said about it. Patent Owner makes a similar point: “[i]n the ‘Claim Construction’ portion of the Petition, Petitioner includes a heading corresponding to a portion of claim element 1[d] (relating to the claimed tensile stress limitation), suggesting that this term requires construction, yet Petitioner fails to offer one.” Prelim. Resp. 18.

Only those terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

### *B. Legal Standards*

A patent claim is unpatentable as obvious 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 said 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 ordinary skill in the art; and (4) objective evidence of obviousness or non-obviousness.<sup>6</sup> *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

“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 Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (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 cannot satisfy its burden of proving obviousness by employing “mere conclusory statements.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

*C. Level of Ordinary Skill in the Art*

Petitioner contends:

A person of ordinary skill in the art (“PHOSITA”) in the relevant field relating to the ’333 Patent, in December 2011, would have a Bachelor of Science in Mechanical Engineering, Materials Science, or Metallurgical Engineering or an equivalent field and at least two years of academic or industry experience in the oil and gas industry, including experience with corrosion science.

Pet. 12–13. Patent Owner applies Petitioner’s definition only for the purposes of the Preliminary Response. Prelim. Resp. 18.

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<sup>6</sup> The parties have not directed us to any such objective evidence. Petitioner indicates that “Patent Owner has advanced certain ‘secondary indicia’ arguments tied to the claimed invention of the ’333 Patent in an interrogatory response in the USWS litigation.” Pet. 40. But, according to Petitioner, “the record in the USWS litigation has not been fully developed showing objective indicia of nonobviousness.” *Id.* Patent Owner has not advanced any secondary considerations in the Preliminary Response. *See generally* Prelim. Resp.

Petitioner’s proposed definition of a person of ordinary skill in the art appears reasonable, and we adopt that definition for our analysis in this decision. Accordingly, for the purposes of this Decision, we adopt Petitioner’s proposal regarding the level of one of ordinary skill in the art with the exception of the open-ended phrase “at least,” which expands the range of experience indefinitely without an upper bound. We determine that the level reflected in the prior art is consistent with Petitioner’s definition.

#### D. Overview of the Prior Art References

*1. Harvey (Ex. 1004)*

Harvey discloses a pump head for high-pressure pumps used in water blasting systems. Ex. 1004, 1:5–12. A cross-sectional side view of a fluid pump head is depicted in Figure 1 of Harvey, reproduced below.

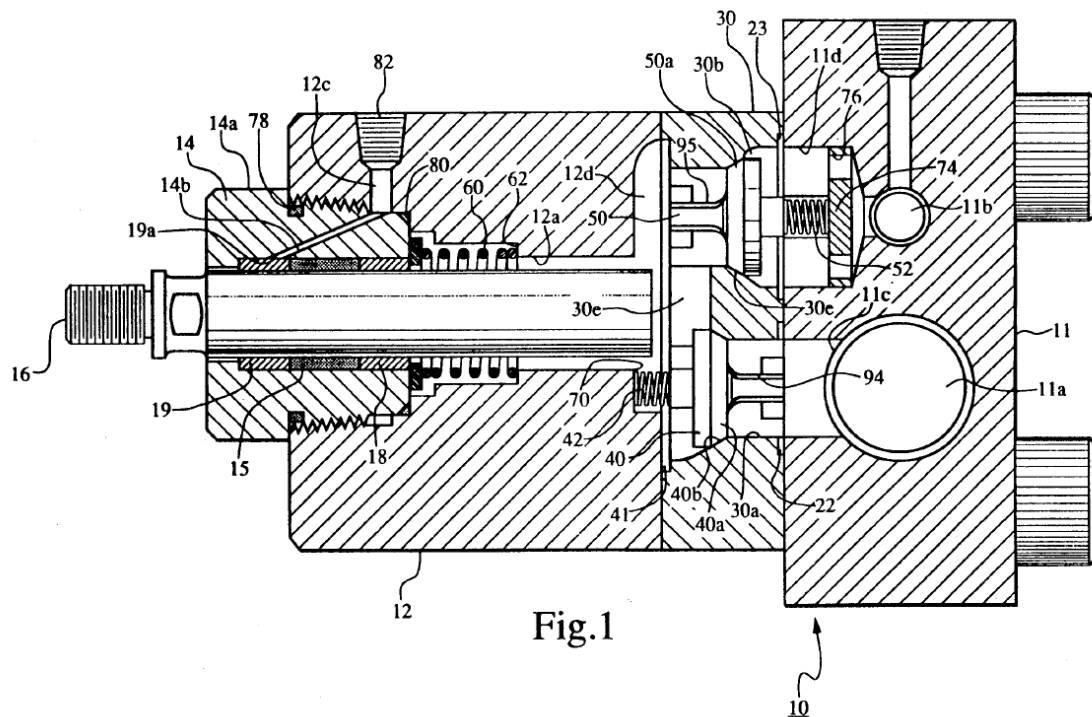


Fig. 1 of Harvey (Ex. 1004) shows an embodiment of a fluid pump head.

Fluid end (10) depicted in Fig. 1 is disposed adjacent to manifold block (11), which is disposed adjacent to valve cartridge (30). *Id.* at 4:51–54. Fluid cylinder (12) is disposed adjacent to valve cartridge (30). *Id.* at 4:54–55. Harvey discloses that “fluid cylinder 12 has a packing cartridge 14 . . . through which a plunger or piston 16 moves in response to power supplied through a typical cross head (not shown).” *Id.* at 4:51–59.

Harvey also discloses that the pumps may have a quintuplex configuration. *Id.* at 2:45–50, 7:30–35. Harvey teaches that these pumps have been used in oil field operations, including for water systems, and water-and-sand-injection systems. *Id.* at 1:12–17. Harvey discloses a preference that the valve cartridge, manifold, fluid cylinder and valves of a pump head (fluid end) are made from “a very high strength easily-machined material,” such as “Carpenter Custom 450 Stainless Steel.” *Id.* at 7:55–60, 3:57–59. Harvey discloses that high pressure pumps producing pressures up to 50,000 psi have been used with both water systems and water-and-sand-injection systems in oil field operations. *Id.* at 1:10–17.

## *2. Norman (Ex. 1005)*

Norman discloses the use of “aqueous viscoelastic surfactant based fluids as hydraulic fracturing fluids” that may be used in high-temperature and high-permeability formations. Ex. 1005, 1:4–9. Norman teaches that a fracturing fluid is injected through a wellbore and against the face of the formation at a pressure and flow rate at least sufficient to overcome the overburden pressure and to initiate and/or extend fractures into the formation. *Id.* at 1:14–19. Norman discloses an aqueous viscoelastic surfactant based fracturing fluid of water, an inorganic salt stabilizer, a

surfactant/thickener, and an organic salt or alcohol. *Id.* at 1:35–38. Norman teaches that the surfactant or thickening agent may be an amine acid salt or a quaternary ammonium salt. *Id.* at 8:46–47. According to Norman, the purpose of the thickening agent additive is to “increase the viscosity of the aqueous fluid enough to maintain proppant in suspension during fluid placement.” *Id.* at 9:1–4. Norman discloses that the surfactant thickener’s concentration can range from about 0.05 to about 6 percent by weight of the aqueous fluid. *Id.* at 9:1–15, 12:52–56.

### 3. *Ganguly (Ex. 1012)*

Ganguly is related to an “autofrettage process for mechanically pre-treating the fluid end of a multi-cylinder reciprocating pump in order to induce residual compressive stresses in the cylinders of the fluid end.” Ex. 1012 ¶ 2. Ganguly explains that fluid ends of reciprocating pumps, such as triplex pumps, that are used in hydraulic fracturing are susceptible to fatigue failure due to “repeatedly exposing the fluid end of the pump to high pressures.” *Id.* ¶ 3. “[A] need exists to increase fatigue resistance in the fluid end cylinders of a multi-cylinder reciprocating pump.” *Id.* To that end, Ganguly provides “[a]n autofrettage process . . . to create compressive residual stresses in the inside walls of the fluid end of a multi-cylinder reciprocating pump, such that the tensile stress that the fluid end experiences during the pumping cycle is minimal.” *Id.* ¶ 4.

### 4. *Gardner (Ex. 1006)*

Gardner is a brochure for Gardner Denver’s “Drilling Pumps,” “Continuous Drilling Pumps,” “Continuous & Intermittent Duty Pumps,” and “Intermittent Duty Well Stimulation/Service Pumps.” Ex. 1006, 2–5. The brochure recites a 2003 copyright date. *Id.* at 6. Gardner further

discloses pressure pumps to meet extended and continuous duty applications including oilfield operations. *Id.* at 3, 4. Gardner discloses triplex and quintuplex continuous duty pumps with fluid ends that can be used for saltwater disposal, water blast, and other hydrocarbon services. *Id.* at 3. Gardner discloses that these pumps may be made with “stainless steel inline fluid ends.” *Id.*

### *E. Ground I*

Petitioner challenges claims 1, 3–7, 9, 11, and 12 as unpatentable under 35 U.S.C. § 103 over the combination of Harvey and Norman. Pet. 10, 20–48.

#### *1. Independent Claim 1*

Claim 1 calls for a “well service pump” with a “fluid end body” comprising a corrosion resistant alloy “comprising chromium as an alloying element at 5% or greater by weight of the corrosion resistant alloy” (limitation [1b]) and having a “fatigue limit” that is

- “at least 75 ksi” (limitation [1b]); and,
- “greater than or equal to a tensile stress assumed by the fluid end body when the well service pump operates at maximum working pressure while pumping [an] aqueous-based fluid, wherein the aqueous-based fluid has a salt concentration of about 4% by weight or greater” [(limitation [1d]).

Ex. 1001, 7:61–67, 8:3–8.

#### *a) Petitioner’s Contentions*

##### *i. Limitation [1b]*

Petitioner contends that Harvey discloses high pressure pumps comprising “fluid ends” providing a wide range of operating pressures.

Pet. 16 (citing Ex. 1004, 3:57–59). Petitioner contends that Harvey discloses a pump head (that comprises a fluid end) that “includes a manifold block 11 []disposed adjacent to a valve cartridge 30 and a fluid cylinder 12 []disposed adjacent to the cartridge 30.” *Id.* (citing Ex. 1004, 4:51–57, referring to Figure 1<sup>7</sup>). Petitioner further contends that Harvey discloses that said fluid ends are “made with stainless steel parts which afford corrosion resistance and relatively long service life.” *Id.* (quoting [sic] Ex. 1004, 3:57–59 (*cf.* 1:29–31, referring to U.S. Patent No. 3,870,439)).

According to Petitioner, given that “‘stainless steel’ is defined as a corrosion-resistant iron alloy that contain a minimum of 10.5% chromium” (Pet. 16 (citing Ex. 1008, page 1<sup>8</sup>)) and stainless steel “has a fatigue strength, i.e., fatigue limit, between 12300 and 155000 psi, i.e., between 12.3 ksi and 155 ksi” (*id.* (citing Ex. 1009, at “Fatigue Strength”<sup>9</sup>)), a person of ordinary skill in the art would have understood that Harvey’s fluid end contains chromium (i.e., “at 5% or greater by weight”) and has fatigue limit of “at least 75 ksi” as claimed.

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<sup>7</sup> Figure 1 of Harvey “is a cross-sectional side view of a fluid pump head according to the present invention.” Ex. 1004, 4:45–46. “[T]he numeral 10 refers generally to one embodiment of a fluid end according to the invention.” *Id.* at 4:51–53.

<sup>8</sup> “The Use of Stainless Steel in Structures” by L Gardner, Imperial College London, UK, Prog. Struct. Engng Mater. 2005; 7:45–55, Applications, published on Feb. 21, 2005. Ex. 1008; *see* Pet. v. Page 1 states, *inter alia*, that “[s]tainless steel is now used as a general expression to describe corrosion-resistant iron alloys that contain a minimum of 10.5% chromium.”

<sup>9</sup> MatWeb Material Property Data, “Overview of Materials for Stainless Steel,” accessed on June 1, 2022. Ex. 1009; *see* Pet. v. Ex. 1009 indicates a “Fatigue Strength” range for “Stainless Steel” of “12300–155000 psi.”

Petitioner also contends that Harvey discloses that its fluid end can preferably be “made from ‘a very high strength easily-machined material,’ such as ‘Carpenter Custom 450 Stainless Steel.’” Pet. 16–17 (citing Ex. 1004, 7:55–60).

According to Petitioner, given that “Carpenter Custom 450 Stainless Steel” “contains [] between 14% and 16% chromium” (Pet. 17 (citing Ex. 1010, at “Chromium, Cr.”<sup>10</sup>)) and “has a fatigue strength, i.e., fatigue limit, of 750,000<sup>11</sup> psi, i.e., 75 ksi” (*id.* (citing Ex. 1010, at “Fatigue Strength”)), if the parts of Harvey’s fluid end are made of Carpenter Custom 450 Stainless Steel, a person of ordinary skill in the art would have understood that Harvey’s fluid end contains chromium and has a fatigue limit of “at least 75 ksi” as claimed.

For these reasons, Petitioner contends that Harvey discloses a “fluid end body” comprising a corrosion resistant alloy “comprising chromium as an alloying element at 5% or greater by weight of the corrosion resistant alloy” and having a “fatigue limit” that is “at least 75 ksi,” thereby satisfying limitation [1b]. Pet. 16–17.

*ii. Limitation [1d]*

Petitioner contends that Harvey discloses high pressure pumps producing pressures up to 50,000 psi that are useful in oil field operations. Pet. 17, 15 (citing Ex. 1004, 1:5–8, 10–17). Petitioner states:

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<sup>10</sup> MatWeb Material Property Data, “Carpenter Custom 450® Stainless Steel,” accessed on June 1, 2022. Ex. 1010; *see* Pet. v. Ex. 1010 indicates “Chromium, Cr” in the range of “14–16%” for “Carpenter Custom 450® Stainless Steel, Annealed.”

<sup>11</sup> Page 2 of Ex. 1010 records the “fatigue strength” as “75,000.”

*Harvey* discloses that the pumps have quintuplex configurations. Ex. 1004, 2:45–50 and 7:30–35. Quintuplex pumps are known to a PHOSITA to be utilized in hydraulic fracturing to pump fluid including salts. Ex. 1007 pg. 34 ¶ 1, pg. 43 ¶ 3 and 4, and pg. 211 ¶ 5–7<sup>12</sup>.

*Id.* at 14; *see also id.* at 15.

Petitioner contends that Norman discloses hydraulic fracturing whereby an aqueous viscoelastic surfactant based fluid that includes a thickening agent of quaternary ammonium salts in the range from about 0.05 to about 6 percent by weight of the aqueous viscoelastic surfactant based fluid is injected “through a wellbore and into a subterranean formation at a pressure sufficient to fracture the formation.” Pet. 18 (citing Ex. 1005, Abstract, 9:1–15, claims 1 and 3). According to Petitioner, “a PHOSITA would know pressures up to 50,000 psi are sufficient to fracture the formation.” *Id.* (citing Ex. 1003 (no specific paragraph is referenced<sup>13</sup>)).

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<sup>12</sup> BJ Energy Solutions, “Hydraulic Fracturing Manual” Version 1.0 published in June 2005. Ex. 1007; *see* Pet. v. Page 34 ¶ 1 and page 43 ¶¶ 3 and 4 of Ex. 1007 concern fracturing fluids. Page 211 ¶ ¶ 5–7 discloses, *inter alia*, that “[m]ost high pressure pumps used in hydraulic fracturing are of the triplex variety, although quintuplex pumps are becoming more popular.”

<sup>13</sup> This is an instance, among others, where Petitioner fails to provide a pin cite to the portions of Mr. Ely’s testimony on which it relies. Petitioner merely cites to “Ex. 1003” without citing to a particular paragraph, section, or page. This approach improperly fails to identify with particularity what Petitioner considers to be its argument, and shifts the burden of deciphering Petitioner’s arguments onto Patent Owner and the Board, which is contrary to the statutory and regulatory provisions governing *inter partes* review proceedings discussed above. To hold otherwise would require us to “play archaeologist with the record,” which we decline to do. *DeSilva v. DiLeonardi*, 181 F.3d 865, 866–67 (7th Cir. 1999).

Petitioner then argues that the combination of Harvey and Norman would have led one of ordinary skill in the art to use Harvey's quintuplex pumps to perform Norman's hydraulic fracturing. Pet. 15. "[A] PHOSITA at the time the '333 Patent was filed would have recognized that quintuplex pumps disclosed in Harvey are utilized in the hydraulic fracturing of Norman to 'provid[e] a well service pump.'" *Id.* (citing Ex. 1004, 2:45–50, 7:30–35; Ex. 1007 page 34 ¶ 1, page 43 ¶¶ 3, 4, page 211 ¶¶ 5–7).

According to Petitioner, when such a pump is used under those conditions it necessarily has a fatigue limit satisfying limitation [1d].

[Said] *well service pump* inherently has a maximum working pressure (i.e., above which, it will fail/break-down), and as such, the fatigue limit must be greater than or equal to the tensile stress. Otherwise, the well service pump will fail. It is clear that the prior art teaches the identical structure and methodology.

Pet. 19 (citing *Titanium Metals Corp. v. Banner*, 778 F.2d 775 (Fed. Cir. 1985), *In re Spada*, 911 F.2d 705 (Fed. Cir. 1990)) (emphasis added), *see also* Pet. 18 ("a PHOSITA would understand that in operation the fatigue limit is greater than or equal tensile stress assumed by the 'Carpenter Custom 450 Stainless Steel' fluid end body when the pump operates at maximum working pressure in order for the pump to function. Ex. 1004, 1:10–17, and Ex. 1003")

#### *b) Patent Owner's Contentions*

Patent Owner argues, *inter alia*, that "Petitioner makes conclusory statements in its combination of the disclosures of Harvey and Norman" that are "devoid of reasoning or supporting evidence." Prelim. Resp. 22, 24.

As an example, Patent Owner points to an assertion in the Petition that Harvey discloses high pressure pumps that "may produce pressures up to 50,000 psi." Prelim. Resp. 24 (citing Pet. 17–18). According to Patent

Owner, “[w]ith no further explanation in the Petition or the expert declaration, Petitioner concludes: ‘Accordingly, a PHOSITA would know pressures up to 50,000 psi are sufficient to fracture the formation.’” *Id.* (citing Pet. 17–18; Ex. 1003 ¶¶ 83–85). Patent Owner explains that Harvey discloses using its pumps for water-blasting in, for instance, oil field operations, but “Harvey does not disclose its pumps being used for fracking or in a corrosive environment, like high-salinity water.” *Id.* (citing, *inter alia*, Eiselstein Decl. ¶ 11); *see also id.* at 24 (“A POSITA<sup>14</sup> would not understand that Harvey’s pump head specifications would be relevant to the corrosive environment as described in the ’333 patent” (citing Eiselstein Decl. ¶ 11)).

Patent Owner also contends, *inter alia*, that “Harvey is silent as to any disclosure of ‘tensile stress assumed by the fluid end body.’” Prelim. Resp. 25. According to Patent Owner, “[t]he Petition concludes that the fluid end body disclosed by Harvey has a fatigue limit greater than or equal to a *tensile stress* assumed by the fluid end body but provides no explanation for why a POSITA ‘would understand’ Harvey to make such a disclosure.” Prelim. Resp. 25 (citing Pet. 18; Ex. 1003 ¶ 86).

*c) Analysis*

We agree with Patent Owner’s identified deficiencies in the combination of Harvey and Norman.

The principal question is whether the combination of Harvey and Norman would have led one of ordinary skill in the art to a method comprising limitation [1d].

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<sup>14</sup> “POSITA” is the same as “PHOSITA” and both are acronyms for a “person (having) ordinary skill in the art.”

Petitioner relies on Harvey for the recited “fluid end body of a well service pump” and Norman for the recited aqueous-based fluid which Norman uses to hydraulically fracture a formation. Pet. 17–19. Petitioner contends that “a PHOSITA would know pressures up to 50,000 psi are sufficient to fracture the formation.” Pet. 18 (citing generally Ex. 1003). Petitioner’s apparent position is that this knowledge would have led one of ordinary skill in the art to incorporate Harvey’s pump, including its fluid end, in Norman’s hydraulic fracturing, thereby reaching limitation [1d].

However, as Patent Owner contends, there is no explanation in the Petition or the Ely Declaration why one of ordinary skill in the art would “know” to use Harvey’s fluid end at pressures up to 50,000 psi in order to fracture a formation with an aqueous-based fluid as Norman teaches. Prelim. Resp. 24. As Patent Owner points out, there is no mention of hydraulic fracturing in Harvey, only “water blasting,” albeit the water-blasting could be conducted in “oil field operations.” *Id.*; Ex. 1004, 1:14.

Harvey does disclose high pressure quintuplex pumps and Petitioner does provide evidence that such pumps “are known to a PHOSITA to be utilized in hydraulic fracturing to pump fluid including salts.” Pet. 14 (citing, *inter alia*, Ex. 1004, 2:45–50, 7:30–35; Ex. 1007, p. 211 ¶¶ 5–7). But the evidence provides only a general description of using quintuplex pumps “in hydraulic fracturing,” without any mention of pressures. Ex. 1007, p. 211 ¶¶ 5–7. And Harvey discloses pumps in a quintuplex configuration that have a wide “range of pressures from relatively low to relatively high pressures, e.g. from 4000 to 15000 p.s.i.,” without any mention of hydraulic fracturing. Ex. 1004, 2:45–47. Based on these broad disclosures alone, Petitioner does not demonstrate that one of ordinary skill

in the art would “know” to use quintuplex pumps at pressures up to 50,000 psi to fracture a formation with an aqueous-based fluid as Norman teaches.

Because there is insufficient explanation and evidence showing why one of ordinary skill in the art would “know” to use Harvey’s fluid end at pressures up to 50,000 psi in order to fracture a formation with an aqueous-based fluid as Norman teaches, there is insufficient support for Petitioner’s apparent position that one of ordinary skill in the art would have been led to incorporate Harvey into Norman and thereby reach limitation [1d].

There is also insufficient support for Petitioner’s argument that Harvey’s high-pressure pumps/fluid ends necessarily have a “fatigue limit greater than or equal to a tensile stress . . .” (limitation [1d]) when operating at maximum working pressure.

Petitioner argues that “a well service pump inherently has a maximum working pressure (i.e., above which, it will fail/break-down), and as such, the fatigue limit *must* be greater than or equal to the tensile stress.”

Pet. 19 (emphasis added). We note in that regard that the ’333 patent discusses applying the “Miner’s Rule” where a material has a “tensile stress at maximum working pressure [that] is *above* the fatigue limit” to provide a cumulative damage model in predicting the failure of the material. Ex. 1001, 5:29–3 (emphasis added). This suggests that not all well service pumps operating at maximum working pressure will necessarily have a “fatigue limit greater than or equal to a tensile stress . . .” as Petitioner argues. Pet. 19.

Be that as it may, the question is whether *Harvey*’s high-pressure pumps/fluid ends have a “fatigue limit greater than or equal to a tensile stress . . .” as limitation [1d] requires. Answering that particular question is made difficult because, as Patent Owner points out, “Harvey is silent as to

any disclosure of ‘tensile stress assumed by the fluid end body’.” Prelim. Resp. 25.

Petitioner ignores the fact that Harvey does not disclose a tensile stress. Instead, Petitioner explains that Harvey discloses “Carpenter Custom 450 Stainless Steel” and argues that “a PHOSITA would understand that in operation the fatigue limit is greater than or equal tensile stress assumed by the ‘Carpenter Custom 450 Stainless Steel’ fluid end body when the pump operates at maximum working pressure in order for the pump to function.” Pet. 18 (citing Ex. 1004. 1:10–17; Ex. 1003 (no paragraph is referenced)).

There is insufficient support for Petitioner’s argument that Harvey’s “Carpenter Custom 450 Stainless Steel” fluid end body necessarily has a fatigue limit that is greater than or equal to the tensile stress. Petitioner cites 1:10–17 of Harvey (Pet. 18) but that passage talks about prior art pumps, not pumps made of “Carpenter Custom 450 Stainless Steel.” Petitioner also cites the Ely Declaration. Pet. 18. We believe Petitioner is referring to ¶ 86 but it merely repeats what the Petition generally says. *Compare* Pet. 18, *with* Ex. 1003 ¶ 86.

There being no other evidence provided in support of its argument, Petitioner has insufficiently shown that Harvey’s high-pressure pumps/fluid ends necessarily have a “fatigue limit greater than or equal to a tensile stress . . .” (limitation [1d]) when operating at maximum working pressure as Petitioner has argued.

We recognize that the ’333 patent describes the use of corrosion resistant alloys such a “Carpenter Custom 450 Stainless Steel” for fluid ends to prolong the life of a well service pump. Ex. 1001, 1:58–59, 3:35–38; *see* section I.D.1 and earlier discussion of limitation [1b]. Even if we assume *arguendo* that Harvey’s “Carpenter Custom 450 Stainless Steel” fluid end

body is the same as the “Carpenter Custom 450 Stainless Steel” fluid end body of the ’333 patent and thus would necessarily have the same fatigue limit, it still remains that Petitioner has insufficiently shown that one of ordinary skill in the art would have been led to incorporate Harvey’s fluid end body in Norman and thereby reach limitation [1d].

*d) Conclusion as to Claim 1*

After considering Petitioner’s and Patent Owner’s contentions in light of the supporting evidence on this record, we agree with Patent Owner that the Petition insufficiently identifies the evidence in support of its contentions that “a PHOSITA would know pressures up to 50,000 psi are sufficient to fracture the formation” (Pet. 18) and that Harvey’s high-pressure pumps/fluid ends necessarily have a “fatigue limit greater than or equal to a tensile stress . . .” (limitation [1d]) when operating at maximum working pressure (*id.* at 19).

Given the Petition insufficiently identifies the evidence in support of the contentions discussed, Petitioner insufficiently shows that the combination of Harvey and Norman would have led one of ordinary skill in the art to a method comprising limitation [1d]. Accordingly, we determine Petitioner has not shown a reasonable likelihood of establishing the obviousness of claim 1 under Ground I.

*2. Claims 3–7, 9, 11 and 12*

Claims 5 and 9 are independent claims that include limitations [5b], [5c] and [9a], [9b], [9c], respectively, that are similar in substance to limitations [1b] and [1d] discussed in relation to claim 1. Petitioner’s position is generally the same as that advanced for claim 1. *See* Pet. 22–23 (claim 5) and 24–26 (claim 9).

Based on our consideration of claim 1, we determine that for purposes of institution, Petitioner has not sufficiently shown that the cited prior art combination discloses or renders obvious the subject matter of claims 5 and 9.

Dependent claims 3–4, 6–7, and 11–12 depend from independent claims 1, 5, and 9, respectively, and therefore require all the limitations of said respective independent claims. Thus, the analysis presented above for claims 1, 5, and 9 applies equally to claims 3, 4, 6, 7, 11, and 12. For the reasons discussed with respect to claims 1, 5, and 9, Petitioner has not provided a sufficient showing that all the limitations of claims 3, 4, 6, 7, 11, and 12 of the '333 patent are disclosed or rendered obvious by the combination of Harvey and Norman.

Accordingly, we determine Petitioner has not shown a reasonable likelihood of establishing the obviousness of claims 3–7, 9, 11 and 12 under Ground I.

#### *F. Ground II*

Petitioner sets forth an additional ground (Ground II) challenging dependent claims 2, 8, and 10 based on a combination of Harvey, Norman, and Ganguly. Pet. 10, 26–27.

Dependent claims 2, 8, and 10 depend from independent claims 1, 5, and 9, respectively, and therefore require all the limitations of said respective independent claims. Thus, the analysis presented above for claims 1, 5, and 9 applies equally to claims 2, 8, and 10. Petitioner's reliance on Ganguly in this ground does not remedy the deficiency we identify with respect to independent claims 1, 5, and 9. For the reasons discussed with respect to claims 1, 5, and 9, Petitioner has not provided a sufficient showing

that all the limitations of claims 2, 8, and 10 of the '333 patent are disclosed or rendered obvious by the combination of Harvey, Norman, and Ganguly.

Accordingly, we determine Petitioner has not shown a reasonable likelihood of establishing the obviousness of claims 2, 8, and 10 under Ground II.

*G. Ground III*

Petitioner sets forth an additional ground (Ground III) challenging claims 1–12 based on a combination of Gardner and Norman. Pet. 10, 28–40.

*1. Independent claim 1*

*a) Petitioner's Contentions*

*i. Limitation [1b]*

Petitioner contends that Gardner meets limitation [1b] because it discloses triplex and quintuplex pumps that include stainless steel fluid ends. Pet. 30 (citing Ex. 1006, page 3). According to Petitioner, a “PHOSITA would have understood that ‘stainless steel’ is defined as a corrosion-resistant iron alloy that contain a minimum of 10.5% chromium” (*id.* (citing Ex. 1008, page 1)) and that “a stainless steel fluid end has a fatigue strength, i.e., fatigue limit, between 12300 and 155000 psi, i.e., between 12.3 ksi and 155 ksi” (*id.* (citing Ex. 1009, at “Fatigue Stress”)).

*Limitation [1d]*

Petitioner contends that the combination of Gardner and Norman meets limitation [1d].

Petitioner relies on Gardner to show high-pressure pumps (e.g., triplex and quintuplex pumps) which “may produce pressures of 20,000 psi” and that such pumps are useful in oil field operations. Pet. 31 (citing Ex. 1006,

p. 3 ¶ 2, table 2, p. 4 ¶¶ 1, 3, p. 5 ¶ 5). According to Petitioner, Gardner discloses a high-pressure pump “known to be used in hydraulic fracturing.” *Id.* at 33.

Petitioner relies on Norman to show hydraulic fracturing while using an aqueous-based fluid as recited in the limitation [1d]. Petitioner repeats the various contentions about what Norman discloses that were presented under Ground I. Pet. 32, 33; *see* Section II.E.1.a. Similar to Ground I, Petitioner states that “a PHOSITA would know pressures up to 20,000 psi are sufficient to fracture the formation.” *Id.* at 31 (citing Ex. 1003 (no specific paragraph is referenced)); *cf.* section II.E.1.a).

In a similar vein to Ground I, Petitioner then contends that the combination of Gardner and Norman would have led one of ordinary skill in the art to use Gardner’s quintuplex pumps to perform Norman’s hydraulic fracturing. Pet. 29. “[A] PHOSITA at the time the ’333 Patent was filed would have recognized that triplex and quintuplex pumps disclosed in Gardner are utilized in the hydraulic fracturing of Norman to ‘provid[e] a well service pump.’” *Id.* (citing Ex. 1006, p. 3 ¶ 2, p. 4 ¶¶ 1, 3, p. 5 ¶ 5; Ex. 1007 p. 34 ¶ 1, p. 43 ¶¶ 3, 4, p. 211 ¶¶ 5–7).

Finally, Petitioner contends, as it did under Ground I, that when such a pump is used under those conditions it necessarily has a fatigue limit satisfying limitation [1d].

[A] well service pump inherently has a maximum working pressure (i.e., above which, it will fail/break-down), and as such, the fatigue limit must be greater than or equal to the tensile stress. Ex. 1003. Otherwise, the well service pump will fail. It is clear that the prior art teaches the identical structure and methodology.

Pet. 33 (citing *Titanium Metals; In re Spada*); *cf.* section II.E.1.a).

*b) Patent Owner's Contentions*

As with Ground I, Patent Owner argues that “the Petition fails to provide a basis for the Board to conclude that Gardner and Norman would be combined.” Prelim. Resp. 30 (“As with Ground I . . .; see section II.E.1.b). According to Patent Owner, Petitioner summarizes the references’ disclosures and then

concludes—without explanation—that a POSITA “would have understood that triplex and quintuplex pumps are utilized in hydraulic fracturing.” Pet. 29. This conclusory statement, however, does not even give a reason why a POSITA would combine Gardner and Norman. The expert declaration simply repeats the Petition and provides no further explanation. Ex. 1003, ¶¶ 123–129.

*Id.*

Patent Owner contends that “Gardner’s single reference to ‘stainless steel’ is . . . insufficient for Petitioner to prove that Gardner discloses element 1[b].” Prelim. Resp. 32. Patent Owner disagrees with Petitioner’s reliance on Exhibits 1008 and 1009 to fill the gap. According to Patent Owner, Exhibit 1008 gives no suggestion that the disclosed stainless steel “is relevant to the oil and gas industry and, more specifically, hydraulic fracturing” and Exhibit 1009 “gives a wide range of values for fatigue limit and chromium content—and some of these values fall outside the requirements of 1[d].” *Id.* at 31.

Patent Owner further contends that “[l]ike Harvey, Gardner is silent as to any disclosure of ‘tensile stress assumed by the fluid end body.’” Prelim. Resp. 33 (concerning limitation [1d]).

Although the Petition concludes that the fluid end body disclosed by Gardner has a fatigue limit greater than or equal to a tensile stress assumed by the fluid end body, neither the Petition nor the

expert declaration provides an explanation for why a POSITA “would understand” Gardner to make such a disclosure. Pet. 32; Ex. 1003, ¶ 147 (same as Pet. 32).

*Id.*

Patent Owner also argues that the “Petition fails because it relies on Gardner without showing that Gardner qualifies as a printed publication.” Prelim. Resp. 29. Because we determine Petitioner has not shown a reasonable likelihood of establishing the obviousness of claims 1–12 under Ground III, we do not consider this argument.

*c) Analysis*

We agree with Patent Owner’s identified deficiencies in the combination of Gardner and Norman.

The principal question is whether the combination of Gardner and Norman would have led one of ordinary skill in the art to a method comprising limitation [1d].

Petitioner relies on Gardner for the recited “fluid end body of a well service pump” and Norman for the recited aqueous-based fluid which Norman uses to hydraulically fracture a formation. Pet. 31–34. Petitioner contends that “a PHOSITA would know pressures up to 20,000 psi are sufficient to fracture the formation.” Pet. 31 (citing generally Ex. 1003). Petitioner’s apparent position is that this knowledge would have led one of ordinary skill in the art to incorporate Gardner’s pump, including its fluid end, in Norman’s hydraulic fracturing, thereby reaching limitation [1d].

However, there is no explanation in the Petition or the Ely Declaration why one of ordinary skill in the art would “know” to use Gardner’s fluid end at pressures up to 20,000 psi in order to fracture a formation with an aqueous-based fluid as Norman teaches. As Patent Owner suggest, there is

no mention of hydraulic fracturing in Gardner, only that its pumps may be used in “oil field operations,” such as “oil line pumping” and “oil field drilling rigs.” Ex. 1006, p. 5; Prelim. Resp. 30.

Gardner does disclose high pressure triplex and quintuplex pumps and Petitioner does provide evidence that such pumps “are known to a PHOSITA to be utilized in hydraulic fracturing to pump fluid including salts.” Pet. 28 (citing, *inter alia*, Ex. 1007, Page 211 ¶¶ 5–7). But the evidence provides only a general description of using triplex and quintuplex pumps “in hydraulic fracturing,” without any mention of pressures. Ex. 1007, p. 211 ¶¶ 5–7. And Gardner discloses triplex and quintuplex pumps that have a wide range of pressures, without any mention of hydraulic fracturing. Ex. 1006, 3–6. Based on these broad disclosures alone, Petitioner does not demonstrate that one of ordinary skill in the art would “know” to use quintuplex pumps at pressures up to 20,000 psi to fracture a formation with an aqueous-based fluid as Gardner teaches.

Because there is insufficient explanation and evidence showing why one of ordinary skill in the art would “know” to use Gardner’s fluid end at pressures up to 20,000 psi in order to fracture a formation with an aqueous-based fluid as Norman teaches, there is insufficient support for Petitioner’s apparent position that one of ordinary skill in the art would have been led to incorporate Gardner in Norman and thereby reach limitation [1d].

There is also insufficient support for Petitioner’s argument that Gardner’s high-pressure pumps/fluid ends necessarily have a “fatigue limit greater than or equal to a tensile stress . . .” (limitation [1d]) when operating at maximum working pressure.

Petitioner argues that “a well service pump inherently has a maximum working pressure (i.e., above which, it will fail/break-down), and as such, the fatigue limit *must* be greater than or equal to the tensile stress.”

Pet. 33 (emphasis added). We again note that the ’333 patent discusses applying the “Miner’s Rule,” where a material has a “tensile stress at maximum working pressure [that] is *above* the fatigue limit,” to provide a cumulative damage model in predicting the failure of the material. Ex. 1001, 5:29–3 (emphasis added). This suggests that not all well service pumps operating at maximum working pressure will necessarily have a “fatigue limit greater than or equal to a tensile stress . . . .” as Petitioner argues.

Be that as it may, the question is whether Gardner’s high-pressure pumps/fluid ends have a “fatigue limit greater than or equal to a tensile stress . . . .” as limitation [1d] requires. Answering that particular question is made difficult because, as Patent Owner points out, “[l]ike Harvey, Gardner is silent as to any disclosure of ‘tensile stress assumed by the fluid end body.’” Prelim. Resp. 33.

Petitioner ignores the fact that Gardner does not disclose a tensile stress. Instead, Petitioner explains that

Gardner [ ] discloses that the fluid end body is made from stainless steel, and at pressures up to 20,000 psi a PHOSITA would [?] that in operation the fatigue limit is greater than or equal tensile stress assumed by the stainless steel fluid end body when the pump operates at maximum working pressure in order for the pump to function.

Pet. 32 (citing Ex. 1006, 3, table 2; Ex. 1003 (no paragraph is referenced)).

There is insufficient support for Petitioner’s argument that Gardner’s stainless steel fluid end body necessarily has a fatigue limit that is greater

than or equal to the tensile stress. Petitioner cites page 3, table 2 of Gardner (Pet. 32), which simply depicts a graph of stress-strain behavior of annealed and cold-worked stainless steel. Petitioner also cites the Ely Declaration.

*Id.* We believe Petitioner is referring to ¶ 147 but it merely repeats what the Petition generally says. *Compare* Pet. 32, *with* Ex. 1003 ¶ 147.

There being no other evidence provided in support of its argument, Petitioner has insufficiently shown that Gardner’s pumps/fluid ends necessarily have a “fatigue limit greater than or equal to a tensile stress . . .” (limitation [1d]) when operating at maximum working pressure as Petitioner has argued.

*d) Conclusion as to Claim 1*

After considering Petitioner’s and Patent Owner’s contentions in light of the supporting evidence on this record, we agree with Patent Owner that the Petition insufficiently identifies the evidence in support of its contentions that “a PHOSITA would know pressures up to 20,000 psi are sufficient to fracture the formation” (Pet. 31) and that Gardner’s high-pressure pumps/fluid ends necessarily have a “fatigue limit greater than or equal to a tensile stress . . .” (limitation [1d]) when operating at maximum working pressure (*id.* at 32).

Given the Petition insufficiently identifies the evidence in support of the contentions discussed, Petitioner insufficiently shows that the combination of Gardner and Norman would have led one of ordinary skill in the art to a method comprising limitation [1d]. Accordingly, we determine Petitioner has not shown a reasonable likelihood of establishing the obviousness of claim 1 under Ground III.

*2. Claims 2–12*

Claims 5 and 9 are independent claims that include limitations [5b], [5c] and [9a], [9b], [9c], respectively, that are similar in substance to limitations [1b] and [1d] discussed in relation to claim 1. Petitioner's position is the same as that advanced for claim 1. *See* Pet. 36–37 (claim 5) and 38 (claim 9).

Based on our consideration of claim 1, we determine that, for purposes of institution, Petitioner has not sufficiently shown that the cited prior art combination discloses or renders obvious the subject matter of claims 5 and 9.

Dependent claims 2–4, 6–8, and 10–12 depend from independent claims 1, 5, and 9, respectively, and therefore require all the limitations of said respective independent claims. Thus, the analysis presented above for claims 1, 5, and 9 applies equally to claims 2–4, 6–8, and, 10–12. For the reasons discussed with respect to claims 1, 5, and 9, Petitioner has not provided a sufficient showing that all the limitations of claims 2–4, 6–8, and 10–12 of the '333 patent are disclosed or rendered obvious by the combination of Gardner and Norman.

Accordingly, we determine Petitioner has not shown a reasonable likelihood of establishing the obviousness of claims 2–12 under Ground III.  
*H. Discretion under 35 U.S.C. § 325 (d) and 314(a)*

Petitioner argues that the Board should not exercise its discretion to deny institution under 35 U.S.C. § 314(a) in view of the district court litigation. Pet. 11–12 (citing, *inter alia*, *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential)). Petitioner also

argues that the Board should not exercise its discretion to deny institution under 35 U.S.C. § 325(d). *Id.* at 12.

Patent Owner presents arguments directed to whether we should exercise our discretion to deny institution under 35 U.S.C. § 314(a) and *Fintiv*. Prelim. Resp. 2–12. Patent Owner also presents arguments directed to whether we should exercise our discretion to deny institution under 35 U.S.C. § 325(d). *Id.* at 12–14.

For the reasons stated above, we decline to institute *inter partes* review. Because we base our denial of institution on the merits of this case, it is unnecessary for us to analyze whether we should also discretionarily deny institution under 35 U.S.C. § 314(a) or 35 U.S.C. § 325(d).

### III. CONCLUSION

For the foregoing reasons, we determine that Petitioner has not demonstrated a reasonable likelihood that it would prevail with respect to at least one of the claims challenged in the Petition. We decline to institute an *inter partes* review.

### IV. ORDER

It is

ORDERED that the Petition is denied; and

FURTHER ORDERED that that no *inter partes* review is instituted.

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Patent 9,435,333 B2

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