

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.

IPR2021-01036
Patent 9,611,728 B2

Before LYNNE H. BROWNE, GEORGE R. HOSKINS, and
SEAN P. O'HANLON, *Administrative Patent Judges*.

BROWNE, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Granting-in-Part and Denying-in-Part
Patent Owner's Revised Non-Contingent Motion to Amend
35 U.S.C. § 318(a)

I. INTRODUCTION

Halliburton Energy Services, Inc. (“Petitioner”) filed a Petition (Paper 2, “Pet.”) pursuant to 35 U.S.C. §§ 311–319 to institute an *inter partes* review of U.S. Patent No. 9,611,728 B2 (Ex. 1001, “the ’728 patent”), claims 1–13. We issued an Institution Decision (Paper 12) instituting the petitioned review.

U.S. Well Services, LLC (“Patent Owner”) then filed a Patent Owner Response (Paper 21) to the Petition, defending the challenged ’728 patent claims. Petitioner filed a Reply (Paper 33) to the Patent Owner Response. Patent Owner did not file a Sur-reply. *See, e.g.*, Paper 13, at 8, 10 (Scheduling Order permitting Sur-reply to be filed by Aug. 9, 2022).

Patent Owner also filed a non-contingent motion to amend the ’728 patent (Paper 22), to which Petitioner filed an opposition (Paper 29). We issued Preliminary Guidance (Paper 35) concerning the initial motion to amend. Following the Preliminary Guidance, Patent Owner filed a revised non-contingent motion to amend the ’728 patent (Paper 36, “Motion to Amend” or “Mot.”), replacing the initial motion to amend. Petitioner filed an Opposition to the Motion to Amend (Paper 39, “Mot. Opp.”). Patent Owner filed a Reply to Petitioner’s Opposition (Paper 43, “Mot. Reply”). Petitioner filed a Sur-reply to Patent Owner’s Reply (Paper 46, “Mot. Sur-reply”).

An oral hearing was held on December 7, 2022, for which the transcript was entered into the record (Paper 54, “Tr.”).

We *grant* the Motion to Amend as to cancelling original claims 1–13. As a result, we do not reach the grounds of unpatentability asserted in the Petition against these original claims.

We also *deny* the Motion to Amend as to adding proposed substitute claims to the '728 patent, because claims 14–19 and 21 seek to add new matter to the application that issued as the '728 patent and because, for the reasons discussed below, Petitioner has demonstrated that claims 20 and 22–26 are unpatentable.

II. BACKGROUND

Petitioner identifies three companies as real parties-in-interest: itself; Halliburton Co.; and Halliburton Holdings LLC. *See* Pet. 1. Patent Owner identifies itself and ProFrac Holding Corporation as the real parties-in-interest. Paper 4, 1; Paper 53, 1.

The parties identify three judicial matters as related to this proceeding. *See* Pet. 1; Paper 4, 1. They include *U.S. Well Services, Inc. v. Halliburton Co.*, Case No. 6:21-cv-00367-ADA (W.D. Tex.) (“the Halliburton Litigation”), in which Patent Owner has accused Petitioner of infringing the '728 patent and several other patents. *See* Pet. 1; Paper 4, 1. The Halliburton Litigation is still pending at this time.

Petitioner has also filed several other IPR proceedings to challenge patents owned by Patent Owner.¹ They are:

Proceeding No.	U.S. Patent No.
IPR2021-01032	9,410,410 B2
IPR2021-01033	8,789,601 B2
IPR2021-01034	10,337,308 B2
IPR2021-01035	9,970,278 B2
IPR2021-01037	9,745,840 B2
IPR2021-01038	10,408,030 B2
IPR2021-01065	9,840,901 B2

Proceeding No.	U.S. Patent No.
IPR2021-01238	10,526,882 B2
IPR2021-01315	9,893,500 B2
IPR2021-01316	10,280,724 B2
IPR2021-01538	10,408,031 B2
IPR2021-01539	10,648,311 B2
IPR2022-00074	10,254,732 B2
IPR2022-00610	10,934,824 B2

¹ The '728 patent is a continuation-in-part of the '410 patent.

III. ORIGINAL CLAIMS 1–13

The Petition relies on eight prior art references to challenge original claims 1–13 of the '728 patent. *See* Pet. 14. They are identified here, in alphabetical order:

Name	Reference	Exhibit No.
Aalvik	WO 2007/055587 A1	1011
Broussard	US 2014/0138079 A1	1007
Coli	US 2012/0255734 A1	1008
Henry	US 2011/0042387 A1	1010
Hodgson	WO 2014/105642 A1	1012
Jang	US 2014/0158345 A1	1013
Robinson	US 2007/0125544 A1	1006
West	WO 2014/116761 A1	1009

The Petition relies on eight grounds of unpatentability, all under 35 U.S.C. § 103, to challenge original claims 1–13 of the '728 patent. *See* Pet. 14. They are identified here:

Ground	Claim(s) Challenged	References
1A	1–3, 6–8, 10, 11, 13	Robinson, Broussard, Henry

Ground	Claim(s) Challenged	References
1B	1–3, 6–8, 10, 11	Robinson, Coli, West, Henry
2A	4, 5, 12	Robinson, Broussard, Henry, Aalvik
2B	4, 5, 12	Robinson, Coli, West, Henry, Aalvik
3A	9	Robinson, Broussard, Henry, Hodgson
3B	9	Robinson, Coli, West, Henry, Hodgson
4A	13	Robinson, Broussard, Henry, Jang
4B	13	Robinson, Coli, West, Henry, Jang

As discussed above, the Motion to Amend includes a non-contingent request to cancel original claims 1–13 of the '728 patent, which are all of the claims challenged in the Petition. *See* Mot. 2, App. A (pg. 1); Pet. 14. Petitioner does not oppose this portion of the Motion to Amend. *See generally* Mot. Opp. Therefore, we grant Patent Owner's request to cancel original claims 1–13. As a result, we do not reach the grounds of unpatentability asserted in the Petition against these original claims.

IV. PROPOSED SUBSTITUTE CLAIMS 14–26

A. Introduction

The Motion to Amend proposes to add substitute claims 14–26 to the '728 patent. *See* Mot. 2, App. A. We determine these claims either seek to add new matter to the application that issued as the '728 patent, or are unpatentable based on grounds asserted by Petitioner. We therefore deny the Motion to Amend as to these claims.

B. The '728 Patent Disclosure

The '728 patent, titled “Cold Weather Package for Oil Field Hydraulics,” issued April 4, 2017. Ex. 1001, codes (45), (54). It “relates to an electrical hydraulic fracturing system having heaters for heating hydraulic fluid.” *Id.* at 1:19–21. Figure 1 of the '728 patent is reproduced below.

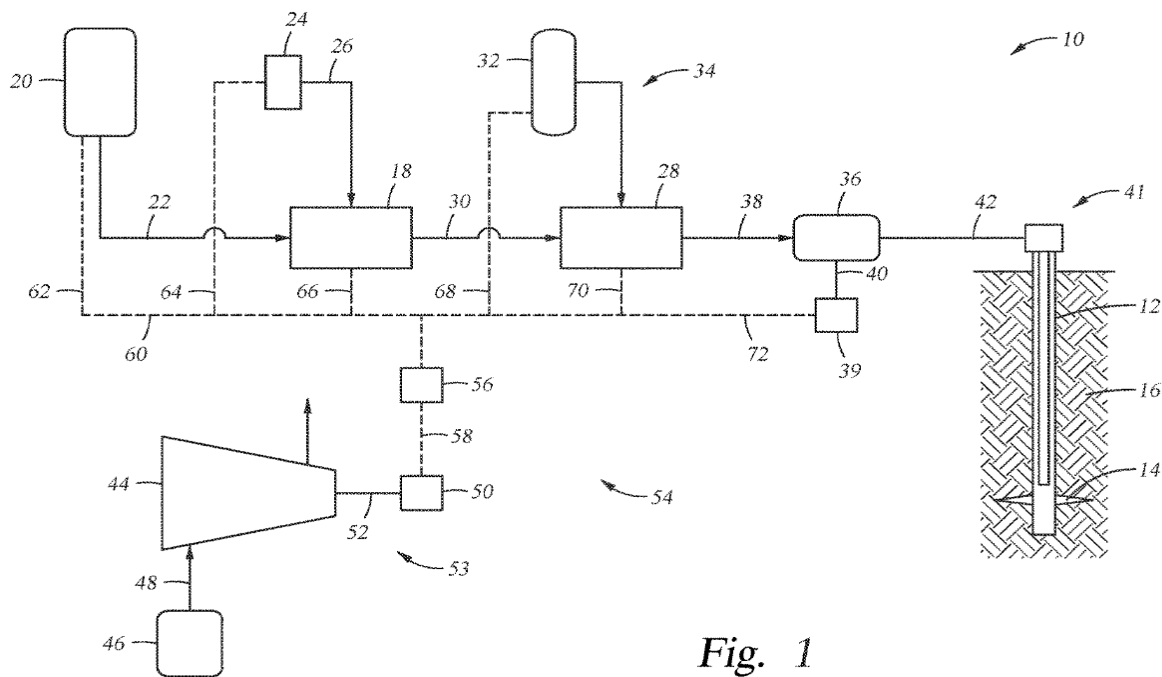


Fig. 1

Figure 1 shows a schematic of hydraulic fracturing system 10. *Id.* at 3:38–39. As shown in Figure 1, hydraulic fracturing system 10 includes fluid source 20 (represented by a large chamfered rectangle) in the upper left corner of the figure. *Id.* at Fig. 1, 4:15. To the right of fluid source 20 is additive source 24 (represented by a small rectangle). *Id.* at Fig. 1, 4:19. Below and to the right of additive source 24 is hydration unit 18 (represented by a large rectangle). *Id.* at Fig. 1, 4:16. Above and to the right of hydration unit 18 is proppant source 32 (represented by a cylinder). *Id.* at Fig. 1, 4:18–29. Below and to the right of proppant source 32 is blender unit 28 (represented

by a large rectangle). *Id.* at Fig. 1, 4:27. To the right of blender unit 28 is fracturing pump system 36 (represented by small chamfered rectangle). *Id.* at Fig. 1, 4:32–33. To the right of fracturing pump system 36 is wellhead assembly 41 (represented by a small rectangle) and below it is motor 39 (represented by a small rectangle). *Id.* at Fig. 1, 4:44. Below wellhead assembly 41 are wellbore 12 (shown as a vertical tunnel shaft) in subterranean formation 16 (represented by a large rectangle filled with cross-hatching). Fig. 1, 4:14–15. Fractures 14 are shown as triangles extending from wellbore 12 into subterranean formation 16 at the bottom of wellbore 12. *Id.*

Shown in Figure 1 below and between hydration unit 18 and blender unit 28 is transformer 56 (represented by a small rectangle) and below it is generator 50 (also represented by a small rectangle). Ex. 1001, Fig. 1, 5:2, 9. To the left of generator 50 is turbine 44 (represented by a truncated cone) and below it is fuel source 46 (represented by a chamfered square). *Id.* at Fig. 1, 4:63, 65. “Electricity generated in generator 50 is conveyed to transformer 56 via line 58” (represented by a dashed line extending between generator 50 and transformer 56). *Id.* at Fig. 1, 5:18–19. Transformer 56 is also connected to power bus 60 (represented by a horizontal dashed line extending from a point below the left half of fluid source 20 to motor 39) having lines 62, 64, 66, 68, and 70 (each of these lines is represented by a dashed vertical line extending from bus 60 as described below) connected thereto. *Id.* at Fig. 1, 5:23–24. “[L]ine 62 connects fluid source 20 to bus 60, line 64 connects additive source 24 to bus 60, line 66 connects hydration unit 18 to bus 60, line 68 connects proppant source 32 to bus 60, [and] line

70 connects blender unit 28 to bus 60.” *Id.* at Fig. 1, 5:26–30. The portion of bus 60 extending past line 70 is labeled 72. *Id.* at Fig. 1.

In operation, hydration unit 18 receives fluid from fluid source 20 via line 22 (represented by a solid arrow extending from the bottom of fluid source 20 to the left side of hydration unit 18). Ex. 1001, Fig. 1, 4:17–18. Hydration unit 18 also selectively receives additives from additive source 24 via line 26 (represented by a solid arrow extending from the right side of additive source 24 to the top of hydration unit 18). *Id.* at Fig. 1, 4:18–19. The fluid and additives are transferred from hydration unit to blender unit 28 via line 30 (represented by a solid arrow extending from the right side of hydraulic unit 18 to the left side of blender unit 28) where they are mixed. *Id.* at Fig. 1, 4:24–27. Proppant source 32 delivers proppant to blender unit 28 via line 34 (represented by a solid arrow extending from the right side of proppant source 32 to the top of blender unit 28) where the proppant is mixed with the fluid and additives to form a fracturing slurry. *Id.* at Fig. 1, 4:28–32. The fracturing slurry is delivered to fracturing pumping system 36 via line 38 (represented by a solid arrow extending from the right side of blender unit 28 to the left side of fracturing pumping system 36). *Id.* at Fig. 1, 4:32–33.

The ’728 patent describes an example wherein the pressure of the slurry in line 38 ranges from around 80 psi to around 100 psi. Ex. 1001, 4:40–42. Motor 39 “drives pump system 36 so that it can pressurize the slurry” to a pressure of about 15,000 psi. *Id.* at 4:43–46. The pressurized slurry is injected into wellhead assembly 41 via discharge piping 42 (represented by a solid line extending from the right side of fracturing pump system 36 to the left side of wellhead assembly 41). *Id.* at Fig. 1, 4:46–49.

The '728 patent describes turbine 44 as receiving a combustible fuel from a fuel source 46 via a feed line 48 (represented by a solid arrow extending from the top of fuel source 46 to the bottom of turbine 44). Ex. 1001, Fig. 1, 4:63–65. Combustion of the fuel in turbine 44 in turn powers a generator 50 that produces electricity. *Id.* at 5:1–2. As shown in Figure 1, shaft 52 (represented by a solid line extending between the turbine 44 and generator 50) connects generator 50 to turbine 44. *Id.* at Fig. 1, 5:2–3.

C. The Proposed Substitute Claims

Patent Owner proposes to amend the '728 patent by adding new claims 14–26, as respective substitutes for original claims 1–13. *See* Mot. 2, App. A.

The proposed substitute independent claims are reproduced below. Underlined language reflects subject matter added to the original claims, and bracketed language reflects subject matter omitted from the original claims:

14. A hydraulic fracturing system for fracturing a subterranean formation comprising:

a plurality of electric pumps fluidly connected to the well and powered by at least one electric motor, and configured to pump fluid into the wellbore at high pressure of between 5,000 psi and 15,000 psi so that the fluid passes from the wellbore into the formation, and fractures the formation;

a variable frequency drive connected to the electric motor to control the speed of the motor, wherein the variable

frequency drive frequently performs electric motor diagnostics to prevent damage to the at least one electric motor; and

a working fluid system comprising working fluid[[,]] and a heater that is in thermal contact with the working fluid;

wherein the heater comprises a tank having the working fluid and a heating element in thermal contact with the working fluid, and prior to generation of power for the plurality of electric pumps, the heater receives energizing power from a secondary power source to heat the working fluid prior to circulation of the working fluid through the plurality of electric pumps.

Mot. App. A, 1–2.

20. A hydraulic fracturing system for fracturing a subterranean formation comprising:

a pump having a discharge in communication with a wellbore that intersects the formation;

an electric motor coupled to and that drives the pump;

a variable frequency drive connected to the electric motor that controls a speed of the motor and performs electric motor diagnostics; and

a working fluid system comprising a piping circuit having working fluid, and a heater that is in thermal contact with the working fluid, the heater coupled to a load box that directs energy to the heater and to at least one additional component at a stepped down voltage;

wherein the working fluid comprises one of lube oil and hydraulic fluid.

Mot. App. A, 3.

Proposed substitute claims 14–19 seek to add that the “high pressure” recited in original claims 1–6 of the ’728 patent corresponds to a specified numerical pressure range—between 5,000 psi and 15,000 psi in proposed substitute claim 14 and its dependent claims 15–18; or between 8,000 psi

and 12,000 psi in proposed substitute claim 19. Proposed substitute claims 20–26 seek to add a load box coupled to the heater.

D. Proposed Substitute Claims 14–19 and 21 Would Improperly Add New Matter to the '728 Patent

For the following reasons, we determine proposed substitute claims 14–19 and 21 seek to add new matter to the application that issued as the '728 patent, so we deny the Motion to Amend as to adding these claims to the '728 patent.

1. Statement of Law

A motion to amend “may not . . . introduce new matter.” 35 U.S.C. § 316(d)(3). “*Before considering the patentability of any substitute claims . . . the Board first must determine whether the motion to amend meets the statutory and regulatory requirements set forth in § 316(d) and 37 C.F.R. § 42.121.*” *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 15 at 4 (PTAB Feb. 25, 2019) (precedential, “*Lectrosonics*”) (emphases added). This includes the prohibition against new matter in § 316(d)(3). *See Lectrosonics*, at 7–8.

“*[T]he patent owner must satisfy the Board that the statutory criteria in [35 U.S.C.] § 316(d)(3) are met and that any reasonable procedural obligations imposed by the Director are satisfied.*” *Aqua Prods., Inc. v. Matal*, 872 F.3d 1290, 1305–06 (Fed. Cir. 2017) (emphasis added) (lead plurality opinion by J. O’Malley); *see also id.* at 1341 (“There is no disagreement that the patent owner bears a burden of production in accordance [with] 35 U.S.C. § 316(d).”) (majority opinion by J. Reyna).

Accordingly: “A motion to amend may be denied where . . . [t]he amendment seeks to . . . introduce new subject matter.” 37 C.F.R. § 42.121(a)(2)(ii); *see also* PTAB Consolidated Trial Practice Guide (Nov. 2019), 69, 71.² Further: “A motion to amend claims must . . . set forth . . . [t]he support in the original disclosure of the patent for each claim that is added or amended.” 37 C.F.R. § 42.121(b)(1).

The test for new matter is whether the original application’s disclosure “reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter.” *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc); *see also Senju Pharm. Co. v. Apotex Inc.*, 746 F.3d 1344, 1352 (Fed. Cir. 2014) (citing *Ariad* as providing the test for determining new matter under 35 U.S.C. § 132(a)). We perform “an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art,” to determine whether it demonstrates possession of the claimed subject matter. *Ariad*, 598 F.3d at 1351.

2. *Level of Ordinary Skill in the Art*

Petitioner contends a person having ordinary skill in the art pertaining to the ’728 patent would have either:

- (1) 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 (2) at least four years of industry experience in the oil and gas industry, including well drilling, completion, or production.

² Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

Pet. 14–15.

Patent Owner utilizes Petitioner’s formulation of ordinary skill. *See* Mot. 12–13. Petitioner’s formulation of ordinary skill is consistent with the level of skill reflected in the ’728 patent and the prior art of record. We therefore apply it in the present Decision.

3. *Proposed Substitute Independent Claim 14 and Dependent Claim 19*

Patent Owner asserts proposed substitute independent claim 14, and its dependent claim 19, do not introduce new matter into the ’728 patent. Mot. 4–6, 8, 12. Patent Owner cites various disclosures of U.S. Patent Application 15/145,440 (“the ’440 Application”), which issued as the ’728 patent, that Patent Owner contends support the numerical pressure ranges recited in these claims. *See* Mot. 5 (citing the ’440 Application at Abstract, Fig. 1, ¶¶ 6, 7, 16, 17). We add the published version of the ’440 Application to the record. Ex. 3002. Patent Owner also cites various disclosures of U.S. Patent Application No. 13/679,689 (“the ’689 Application”), which issued as U.S. Patent No. 9,410,410 (“the ’410 patent”). *Id.* (citing the ’689 Application at Abstract, Figs. 1 and 2, ¶¶ 5, 7, 10, 11, 16–18, 22, 25, 28, 31). The ’410 patent (i.e., the patent that issued from the ’689 Application) can be found in the record as Exhibit 1005. We add the published version of the ’689 Application to the record. Ex. 3003.

Patent Owner additionally relies on the deposition testimony of Patent Owner’s witnesses, Mr. Marscher and Mr. Schaaf, concerning their understanding of the meaning of “high pressure” as recited in the original

claims of the '728 patent. *See* Mot. 12. Specifically, Mr. Marscher testified as follows on June 21, 2022:

Q. In the context of hydraulic fracturing pumps, what does high pressure mean?

A. Well, *typically a person in the art would say it's between 5,000 and 15,000 psi. Maybe 10,000 psi would be a typical number these days.*

I've also done work from time to time in the waterjet industry where you cut wood and fiberglass and even metal with a very high-pressure waterjet. And they use reciprocating pumps in that industry, too. My old company made some of them. In that case you've got to be up to at least 20,000 psi, and 40,000 is better. So it's very application dependent.

And, you know, in the waterjet industry high pressure would be 20,000 to 40,000. Very high would be over 40,000. *In the fracking industry, high pressure would be 5,000 to 15,000 in my opinion. Very high would be over 15,000.* I think even today that's unusual. Might be needed from time to time in certain formations.

In other industries, like in many chemical industries, we're using centrifugal pumps, single stage or, you know, two or three stages. High pressure would be considered anything over several hundred psi. So it depends on the application.

But somebody who's a POSITA³ in the fracking industry would definitely think *high pressure is 5,000 to 15,000 psi with an average value of 10 in my opinion.*

Ex. 1033, 2:1–3, 111:1–112:3 (emphases added).

One week later, on June 29, 2022, Mr. Schaaf testified as follows:

³ Person of ordinary skill in the art.

- Q. What rates of pressure would you consider high pressure?
- A. Well, it's well-known to a person in -- in the industry what "high pressure" would mean.
- Q. What does "high pressure" mean?
- A. Well, to a POSITA the pressure is what -- they would understand what the "high pressure" is.
- Q. I'm asking you was that understanding is.
- A. Well, I think, generally, *a POSITA would agree that 8,000 to 12,000 psi would be considered high pressure.*
- Q. Would pressure above 12,000 psi be considered high pressure?
- A. It could be considered, yes.
- Q. Would pressure below 8,000 psi be considered high pressure?
- A. To some people, you know, somewhat below it would be, you know, maybe the 7,500 psi, that would -- that would be considered high pressure. But, in general, it's -- *it's agreed upon that 8,000 to 12,000 psi is high pressure.*
- Q. Is it generally agreed upon that 5,000 to 15,000 psi is high pressure?
- A. No.
- Q. *You would not consider 5,000 psi to be high pressure?*
- A. *Not when -- not when we're considering frac jobs, yeah. That is correct.*

...

- Q. . . . [L]et me know if this is correct. You would consider high pressure to be about 8,000 to 12,000 psi, but that certain fracturing jobs can take place at pressures that are not high pressure.
- A. Yes. And it's dependent on the formation itself, when the formation cracks or fractures. So the -- the hydraulic pressure or the pressure on the formations is what determines what it takes to fracture a well.

Ex. 1035, 43:6–46:1 (emphases added).

Patent Owner argues the foregoing testimony of its witnesses establishes the pressure range recited in proposed substitute claim 14 of “between 5,000 psi and 15,000 psi,” and the narrower range of “between 8,000 psi and 12,000 psi” in proposed substitute claim 19, are supported by the “high pressure” disclosures in the '440 and '689 Applications. Mot. 12.

Petitioner argues the numerical pressure ranges specified in proposed substitute independent claim 14 and proposed substitute dependent claim 19 improperly introduce new matter into the '728 patent. Mot. Opp. 1–3.

Petitioner asserts that “[n]either pressure range is disclosed in the specification” of the '728 patent. *Id.* at 1–2 (citing Ex. 1005, 20–40; Ex. 1079 ¶¶ 19–24; Ex. 1069, 13).

Petitioner identifies “a passage [in the '728 patent] that states ‘up to around 15,000 psi.’” Mot. Opp. 2. Petitioner asserts that “[a] disclosure of ‘over 10,000 psi’ and ‘up to around 15,000 psi’ does not provide written-description support for 5,000-15,000 psi (Claim 14) or 8,000-1[2],000 psi (Claim 19), which encompass pressures nonoverlapping with those in the specification.” *Id.*

Concerning the deposition testimony of Mr. Marscher and Mr. Schaaf quoted above, Petitioner asserts that Patent Owner’s “two experts cannot

even agree among each other as to the pressures possibly encompassed within the ‘high pressure’ term.” *Id.* at 2–3. Petitioner particularly cites, as being contradictory, Mr. Marscher’s testimony that “high pressure” means between 5,000 psi and 15,000 psi, and Mr. Schaaf’s testimony that “he ‘would not consider 5,000 psi to be high pressure.’” *Id.* at 3 (citing Ex. 1033,⁴ 111:1–112:21; Ex. 1035,⁵ 44:7–13). In Petitioner’s view: “The inconsistency between [Patent Owner’s] own experts confirms that the ’728 Patent specification does not allow a POSITA to ‘immediately discern the limitation at issue in the claims.’” *Id.* (citing *Gen. Hosp.*, 888 F.3d at 1372–73). Petitioner moreover asserts that expert testimony “cannot manufacture written-description support, because the support must be ‘in the original disclosure (i.e., the application as originally filed).” *Id.* (quoting *Lectrosonics*, at 7; citing *Indivior UK Ltd. v. Dr. Reddy’s Labs. S.A.*, 18 F.4th 1323, 1329 (Fed. Cir. 2021)).

Patent Owner replies that “the pressure ranges of Substitute Claims 14 and 19 are an inherent property such that the inclusion of the pressure ranges in the Substitute Claims are not prohibited new matter and satisfy the written description requirement.” Mot. Reply 1–2 (citing *Yeda Research & Dev. Co. v. Abbott GmbH & Co. KG*, 837 F.3d 1341, 1345 (Fed. Cir. 2016); *Kennecott Corp. v. Kyocera Int’l, Inc.*, 835 F.2d 1419, 1423 (Fed. Cir. 1987)). Specifically, Patent Owner asserts that the “[e]xpert testimony has established the inherency of the pressure ranges by making clear that the

⁴ Petitioner cites Ex. 1059, but there is no such exhibit in this proceeding. In this proceeding the quoted testimony appears in Ex. 1033.

⁵ Petitioner cites Ex. 1061, but there is no such exhibit in this proceeding. In this proceeding the quoted testimony appears in Ex. 1035.

subject matter at issue is necessarily present in the patent and would be recognized by a person of ordinary skill in the art (‘POSITA’) as provided by *In re Robertson*.⁶ *Id.* at 2. In support, Patent Owner asserts that Mr. Marscher “testified that the ranges provided in Substitute Claims 14 and 19 were necessary for high pressure fracturing operations. When discussing ‘high pressure’ in the context of hydraulic fracturing pumps, Mr. Marscher indicated that ‘it’s between 5,000 and 15,000 psi. Maybe 10,000 psi would be a typical number these days’” and that “Mr. Marscher continued that ‘a POSITA in the fracking industry would definitely think high pressure is 5,000 to 15,000 psi with an average value of 10 in my opinion.’” *Id.* at 2–3 (citing Ex. 1033, 111:3–5, 111:25–112:3). Thus, according to Patent Owner, “the disclosure of the ’728 Patent of ‘high pressure’ inherently provides disclosure of the necessary pressure ranges.” *Id.*

Patent Owner asserts further that “Mr. Robert Schaff provided a range that is confined within the range provided by Mr. Marscher. For example Mr. Schaff stated that ‘a POSITA would agree that 8,000 to 12,000 psi would be considered high pressure.’” Mot. Reply 3 (citing Ex. 1035, 43:17–18). As a result, according to Patent Owner, “the pressures in the Substitute Claims are necessarily present in the patent and a POSITA would recognize the pressures as being inherent to the technology.” *Id.*

In response, Petitioner reiterates arguments previously made in the Opposition. *See* Mot. Sur-reply 1–2. Petitioner further contends the *Yeda* decision cited by Patent Owner is distinguished from the facts presented here, because in *Yeda* “inherency was undisputed.” *Id.* at 2 (citing *Yeda*,

⁶ *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (quoting *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268 (Fed. Cir. 1991)).

837 F.3d at 1344–45). Petitioner further asserts Patent Owner has not established that the '728 patent's disclosure of "high pressure" *necessarily* discloses the numerical pressure ranges, as is required for inherency. *Id.* at 2–3 (citations omitted).

Upon review of the foregoing, we agree with Petitioner's position that the numerical pressure ranges recited in proposed substitute claims 14 and 19 each introduce new matter into the '728 patent. We have reviewed '440 Application (now the '728 patent) disclosures cited by Patent Owner. Ex. 3002 ¶¶ 6, 7, 16, Abstract, Fig. 1. These disclosures pertinently demonstrate possession only of a fracturing pump "to draw in low pressure fluid slurry (approximately 100 psi) and discharge the same fluid slurry at high pressures (over 10,000 psi)." *Id.* ¶ 6. The Abstract, Figure 1, and paragraphs 7, 16, and 17 of the '440 Application do not mention "high pressure," let alone the ranges set forth in claims 14 and 19.

We have reviewed the '689 Application disclosures cited by Patent Owner. *See* Ex. 3003 ¶¶ 5, 7, 10, 11, 16–18, 20, 25–28, 31, 33, 35, Abstract, Figs. 1–2. The disclosures in these paragraphs pertinently demonstrate possession only of "a system for hydraulically fracturing an underground formation" that is "configured to *pump fluid into the wellbore at high pressure so that the fluid passes from the wellbore into the formation, and fractures the formation.*" Ex. 3003 ¶ 5 (emphases added); *see also id.* ¶ 7 ("pumping the hydraulic fracturing fluid at *high pressure* to crack the formation" (emphasis added)); *id.* ¶ 11 ("pumping fracturing fluid into the well with an electrically powered pump *at a high pressure so that the fracturing fluid enters and cracks the formation*" (emphasis added)); *id.* ¶ 33 ("The fracturing fluid can be pumped into the wellbore *at a high enough*

pressure that the fracturing fluid cracks the formation, and enters into the cracks.” (emphasis added)). Thus, the ’689 Application demonstrates possession of pumping fluid at a “high pressure” to fracture an underground formation, but does not specify any particular numerical ranges of pressures that might correspond to the “high pressure,” including the two ranges specified in proposed substitute claims 14 and 19.

Patent Owner’s attempt to leverage the “high pressure” disclosures of the ’440 Application and the ’689 Application into demonstrating possession of the numerical pressure ranges recited in proposed substitute claims 14 and 19 is unavailing, for several reasons. First, as seen from the deposition testimony quoted above, Patent Owner’s own witnesses cannot agree on a numerical definition of “high pressure.” Mr. Marscher says high pressure is between 5,000 psi and 15,000 psi (*see* Ex. 1033, 111:1–112:3), whereas Mr. Schaaf says high pressure is between 8,000 psi and 12,000 psi and specifically disagrees with Mr. Marscher’s testimony that high pressure can be below 8,000 psi (*see* Ex. 1035, 43:6–44:13). Thus, the testimony of Patent Owner’s own witnesses is contrary to Patent Owner’s position that a person of ordinary skill in the art would have understood that the ’440 Application’s and ’689 Application’s disclosure of “high pressure” pumping demonstrates possession of a specific numerical range of pumping pressures.

Second, neither Mr. Marscher nor Mr. Schaaf cites any objective evidence to support their respective notions of what “high pressure” might be, in the context of hydraulic fracturing. For example, neither cites to any published industry standards to support their respective opinions. This lack of objective evidentiary support weakens the persuasiveness of both

witness's testimony on this issue, especially because their opinions conflict with each other.

Third, Patent Owner's position appears to be that the "high pressure" disclosure in the '440 Application and '689 Application permits Patent Owner to claim *any* numerical range of pressures, so long as the range does not fall below 5,000 psi (Mr. Marscher's lower bound for high pressure). *See, e.g.*, Tr. 45:13–46:8. This is inconsistent with controlling authority cited by Petitioner and not discussed by Patent Owner. In particular, the Federal Circuit in the *Indivior* decision determined that a claim directed to a film comprising "about 40 wt % to about 60 wt % of a water-soluble polymetric matrix" did not have written description support in a specification that did not expressly claim that range, did not state either of the two end values (40% and 60%), and did not disclose the range (40–60%). *Indivior*, 18 F.4th at 1325 (claim 1), 1327–30 (discussing claim 1). In particular: "In the case of a claimed range, a skilled artisan must be able to reasonably discern a disclosure of that range" in the specification at issue. *Id.* at 1328. We conclude Patent Owner's reliance on the testimony of Mr. Marscher and Mr. Schaaf that a skilled artisan could reasonably discern the two numerical pressure ranges at issue here, based on the bare disclosure in the '440 Application and the '689 Application of "high pressure" pumping, is not persuasive for the reasons provided above.

The *Indivior* decision also considered a narrower claim directed to a film comprising "about 48.2 wt % to about 58.6 wt % of the water-soluble polymetric matrix," and concluded that it also did not have written description support in the specification at issue, even though the specification provided examples of films having the two end point values of

the range (48.2% and 58.6%). *See id.* at 1325 (claim 7), 1329–30 (discussing claim 7). The Court concluded that finding written description support on those facts would “amount[] to cobbling together numbers after the fact” whereas “[a] written description sufficient to satisfy the requirement of the law requires a statement of an invention, not an invitation to go on a hunting expedition to patch together after the fact a synthetic definition of an invention.” *Id.* at 1329. We conclude in the present case that Patent Owner’s witnesses went on a hunting expedition which conflicts with the *Indivior* decision.

Fourth, when one looks at each claim separately, there are inconsistencies between the claim and Mr. Marscher’s or Mr. Schaaf’s testimony. Proposed substitute claim 14 recites a pressure of between 5,000 psi and 15,000 psi. This is supported by Mr. Marscher’s testimony. *See Ex. 1033*, 111:1–112:3. However, it is inconsistent with Mr. Schaaf’s testimony that high pressure is between 8,000 psi and 12,000 psi, and that high pressure cannot be below 8,000 psi. *See Ex. 1035*, 43:6–44:13. Patent Owner does not explain persuasively how or why we should credit Mr. Marscher’s testimony over Mr. Schaaf’s testimony to conclude proposed substitute claim 14 has written description support in the ’440 Application and the ’689 Application.

Proposed substitute claim 19 recites a pressure between 8,000 psi and 12,000 psi. This is supported by Mr. Schaaf’s testimony. *See Ex. 1035*, 43:6–44:13. However, it is inconsistent with Mr. Marscher’s testimony that high pressure is between 5,000 psi and 15,000 psi. *See Ex. 1059*, 111:1–112:3. Patent Owner does not explain persuasively how or why we should credit Mr. Schaaf’s testimony over Mr. Marscher’s testimony to conclude

proposed substitute claim 19 has written description support in the '689 Application.

Fifth, we have considered Patent Owner's belated argument in reply to Petitioner's opposition, relying on an alleged *inherent* disclosure of pressure ranges in the '440 Application on the basis that "high pressure" *necessarily* demonstrates possession of the numerical pressure ranges recited in proposed substitute claims 14 and 19. The *Yeda* and *Kennecott* decisions cited by Patent Owner stand for the proposition that written description support may be established by an inherent disclosure, as opposed to an express disclosure. *See Yeda*, 837 F.3d at 1344–45; *Kennecott*, 835 F.2d at 1422–23. We are not persuaded by Patent Owner's position that the '440 Application and the '689 Application necessarily demonstrate possession of proposed substitute claims 14 and 19, for all the reasons provided above. The *Robertson* and *Continental Can* decisions cited by Patent Owner stand for the proposition that inherency is determined from the viewpoint of a person of ordinary skill in the art, which may be established via witness testimony. *See Robertson*, 169 F.3d at 745; *Continental Can*, 948 F.2d at 1268–69. We conclude Patent Owner's witness testimony as to written description support is not persuasive, for all the reasons provided above.

For the foregoing reasons, we conclude that adding proposed substitute claims 14 and 19 would introduce new matter to the application that issued as the '728 patent, and we accordingly deny the Motion to Amend the '728 patent as to these claims.

4. *Proposed Substitute Dependent Claims 15–18*

The proposed substitute claims 15–18 each depend from proposed substitute independent claim 14, and therefore incorporate the numerical pressure ranges recited in that independent claim. *See* Mot. App. A. Therefore, for the reasons provided in Section IV.D.3 above, we conclude that adding the proposed substitute dependent claims 15–18 would introduce new matter to the application that issued as the '728 patent, and we accordingly deny the Motion to Amend the '728 patent as to these claims.

5. *Proposed Substitute Independent Claim 20*

Patent Owner asserts proposed substitute independent claim 20 does not introduce new matter into the '728 patent. Mot. 8–9, 13–14. Specifically, Patent Owner asserts that the added limitation “the heater coupled to a load box that directs energy to the heater and to at least one additional component at a stepped down voltage” “is supported in at least the originally-filed specification through its disclosure that the load box ‘can provide a source point for use by components (not shown) in or associated with the hydration unit 18 that operate on electricity at the stepped down voltage.’” Mot. 13–14 (citing Ex. 3002 ¶ 19).

Petitioner does not contest Patent Owner’s assertion. *See generally* Mot. Opp. We have reviewed the specification of the '440 Application and agree that it provides support for the added limitation.

6. *Proposed Substitute Dependent Claim 21*

Proposed substitute claim 21 is original claim 8 rewritten to depend from proposed substitute claim 20 with the added limitation that “prior to generation of power for the pump, the heater to receive energizing power

from a secondary power source to heat the working fluid prior to circulation.”⁷ Mot. App. 4. Patent Owner asserts that the specification of the ’440 Application provides support for this limitation in its recitation that

[A] secondary power source (not shown) such as an external generator, grid power, battery bank, or other power source at substantially the same voltage as load box 118 and load box 114 can be connected directly into the as load box 118 and load box 114 to power the heating element without the entire microgrid being energized. This allows heating of the hydraulic fluid prior to starting the entire hydraulic fracturing fleet system.

Mot. 13 (citing Ex. 1002, 68 (corresponding to ¶ 19 of the ’440 Application)). We note that this paragraph does not appear in the specification of the ’728 patent, or in paragraph 19 of the ’440 Application. *See* Ex. 1001; Ex. 1002, 68; Ex. 3002 ¶ 19. Rather, a similar paragraph appears therein, as follows:

a secondary power source (not shown) such as an external generator, grid power, battery bank, or other power source at the same voltage as load box 84 can be connected directly into the . . . load box 84 to power the heating element without the entire microgrid being energized. This allows heating of the hydraulic fluid prior to starting the entire hydraulic fracturing fleet system.

Ex. 1001, 6:43–49; Ex. 1002, 68; Ex. 3002 ¶ 19. For purposes of this Decision, we understand Patent Owner to refer to this paragraph for support for proposed substitute claim 21.

Petitioner contends that “[t]he only portions of the specification referring to a timing . . . discuss powering the heating element from a secondary power source [that] ‘allows heating of the hydraulic fluid prior to

⁷ We note that proposed substitute claim 14 adds a similar limitation. Having already determined that claim 14 adds new matter to the ’728 patent, we focus our discussion on claim 21.

starting the entire hydraulic fracturing fleet system.” Mot. Opp. 4 (citing Ex. 1001, 6:48–49, 7:13–14, 7:47–48). Thus, according to Petitioner, “[t]here is no written-description support.” *Id.* (citing Ex. 1041 ¶ 12).

Specifically, Petitioner contends that “the specification does not disclose the timing of ‘circulation’ of the working fluid. While the specification refers to ‘heating of the hydraulic fluid prior to starting the entire hydraulic fracturing fleet system’ . . . it does not disclose when that heated hydraulic fluid is circulated.” Mot. Opp. 5 (citing Ex. 1041 ¶ 14). Petitioner contends further that “[w]hile it would have been obvious to circulate warm (pre-heated) hydraulic fluid before starting the pumps, a description “‘that merely renders the invention obvious does not satisfy” the written description requirement.” *Id.* (citing *Idenix Pharms. LLC v. Gilead Scis. Inc.*, 941 F.3d 1149, 1165 (Fed. Cir. 2019)).

In addition, Petitioner contends that claim 21 lacks written description support because it recites “when power is *generated* (‘generation of power’),” whereas, “the specification refers to heating hydraulic fluid ‘prior to starting the entire fracturing fleet system.” Mot. Opp. 5. Petitioner contends that the specification “says nothing about when the ‘generation of power’ for those pumps occurs.” *Id.* Petitioner notes that in the ’728 patent “[p]roviding power (e.g., to pumps) is not always coincident with generating that power, such as for batteries, which store power that had been previously generated.” *Id.* (citing Ex. 1001, 6:43–49; Ex. 1041 ¶ 15).⁸

Patent Owner replies that “the ’728 Patent supports the timing of the heating with respect to circulation (specifically, heating the working fluid or

⁸ We do not address Petitioner’s genus/species argument as the claim at issue does not employ this type of claiming. Mot. Opp. 4.

lube oil prior to circulation), as well as timing of the heating with respect to power generation (specifically, heating the working fluid or lube oil prior to power generation).” Mot. Reply 5. As an example, Patent Owner contends that “the ’728 Patent expressly provides for ‘[powering] the heating element without the entire microgrid being energized. This allows heating of the hydraulic fluid prior to starting the entire hydraulic fracturing fleet system.’” *Id.* (citing Ex. 1001, 6:46–49). According to Patent Owner, “the working fluid is ‘circulated using an electric lube pump through the hydraulic fluid closed circuit for each piece of equipment.’” *Id.* (quoting Ex. 1001, 2:66–3:2) (alteration by Patent Owner). Thus, Patent Owner contends that “[i]f no power is provided to ‘the entire hydraulic fracturing fleet system’ before the fluid is heated, then the working fluid would be heated prior to circulation, as recited in the claims. Similarly, if the microgrid is not energized, power generation has not started.” *Id.*

Petitioner responds that Patent Owner “has not identified any disclosure that compares the timing of circulation of the working fluid to the timing of generation of power for the pumps.” Mot. Sur-reply 5.

Patent Owner has the burden to establish written description support in the original specification of the ’728 patent for the limitation “prior to generation of power for the pump, the heater to receive energizing power from a secondary power source to heat the working fluid prior to circulation.” Mot. App. 4. We agree with Petitioner that Patent Owner has not established a timing-based relationship between *generation* of power for the pump and *energizing* power from a secondary power source to heat the working fluid. The original specification of the ’728 patent simply discloses connection of a power source (*e.g.* external generator, grid power, battery

bank) to a load box to allow heating of the hydraulic fluid prior to starting the entire hydraulic fracturing fleet system. Ex. 1001, 6:43–49. This disclosure does not address when power for the pump is *generated*.

For the foregoing reasons, we conclude that adding proposed substitute claim 21 would introduce new matter to the application that issued as the '728 patent, and we accordingly deny the Motion to Amend the '728 patent as to claim 21.

7. *Proposed Dependent Claims 22–26*

Proposed dependent substitute claims 22–26 are original claims 9–13 rewritten to depend from proposed substitute claim 20. As such they do not add new limitations beyond the limitation added in proposed substitute claim 20. Having determined that proposed substitute claim 20 does not add new matter to the '728 patent, we also determine that proposed substitute claims 22–26 do not add new matter.

E. *Other Statutory and Regulatory Requirements*

In addition to demonstrating that the proposed substitute claims do not introduce new matter, Patent Owner must demonstrate that the amendment proposes a reasonable number of substitute claims, that the amended claims respond to a ground of unpatentability involved in the trial, and that the Motion to Amend includes a claim listing. 35 U.S.C. § 316(d)(1)(B); *Lectrosonics*, Paper 15 at 5; 37 C.F.R. § 42.121(b).

Patent Owner has proposed the same number of substitute claims as challenged claims. We determine that Patent Owner has demonstrated that the number of proposed claims is reasonable. 37 C.F.R. § 42.121(a)(3). Patent Owner asserts that “[t]he proposed substitute claims are responsive to

the Grounds at issue in this proceeding because they further distinguish the claims from the art of record at least because the substitute claims recite features not disclosed in the prior art of record.” Mot. 3. Petitioner does not contest Patent Owner’s assertion. *See generally* Mot. Opp. We agree with Patent Owner that the Motion to Amend responds to the grounds of unpatentability by reciting additional features. The Motion to Amend also includes a claim listing. Mot. App. A.

For these reasons and those discussed above, we determine that the Motion to Amend meets the statutory and regulatory requirements for proposed substitute claims 20 and 22–26.

F. Petitioner’s Unpatentability Grounds

In light of our determination above that proposed substitute claims 14–19 and 21 lack written description support in the application that issued as the ’728 patent, we do not reach the grounds of unpatentability set forth in Petitioner’s Opposition for these claims. *See* Mot. Opp. 7 (listing the grounds).

1. Summary of Grounds

For proposed substitute claims 20 and 22–26, Petitioner asserts the following grounds of unpatentability:

Claims(s) Challenged	35 U.S.C. §	Reference(s)/Basis
20, 23–26	103(a)	Robinson, ⁹ Broussard, ¹⁰ Henry, ¹¹ Morris ¹²
20, 23–25	103(a)	Robinson, Broussard, Henry, Payne ¹³
22	103(a)	Robinson, Broussard, Henry, Hodgson, ¹⁴ Morris
26	103(a)	Robinson, Broussard, Henry, Jang, ¹⁵ Payne

Mot. Opp. 7.

2. *Legal Standard For 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

⁹ US 2007/0125544 A1, pub. June 7, 2007 (Ex. 1006) (“Robinson”).

¹⁰ US 2014/0138079 A1, pub. May 22, 2014 (Ex. 1007) (“Broussard”).

¹¹ US 2011/0042387 A1, pub. February 24, 2011 (Ex. 1010) (“Henry”).

¹² US 2016/0177678 A1, pub. June 23, 2016 (Ex. 1037) (“Morris”).

¹³ US 2016/0258267 A1, pub. September 8, 2016 (Ex. 1038) (“Payne”).

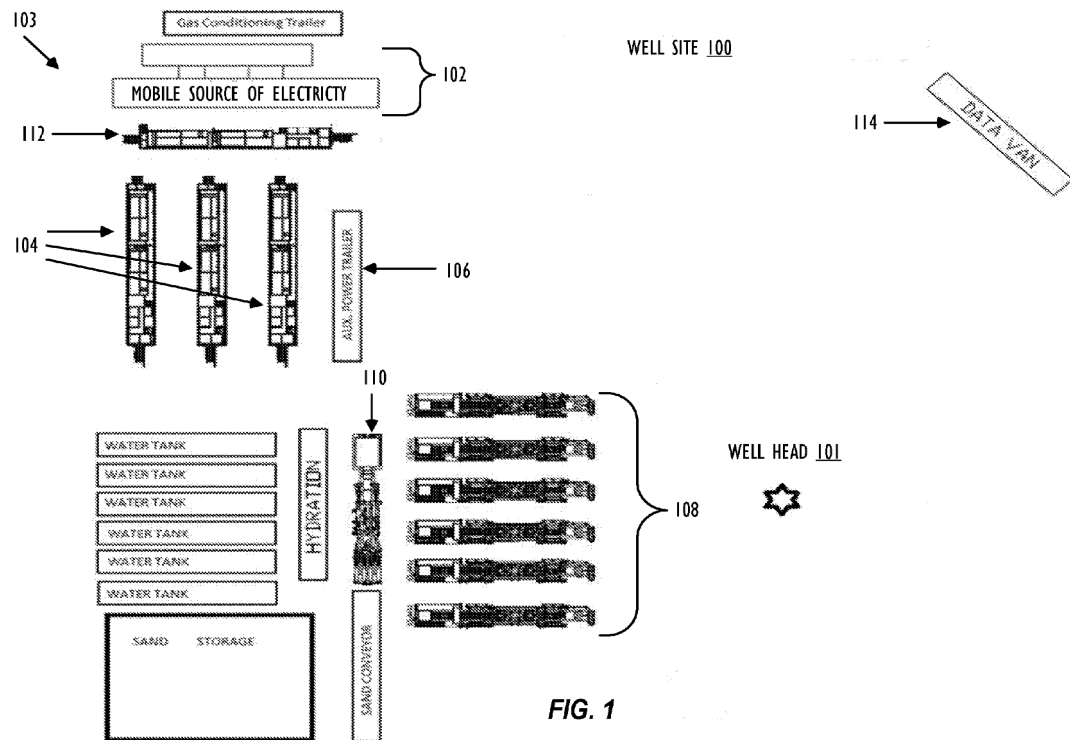
¹⁴ WO 2014/015642 A1, pub. July 3, 2014 (Ex. 1012) (“Hodgson”).

¹⁵ US 2014/0158345 A1, pub. June 12, 2014 (Ex. 1013) (“Jang”).

evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). “While the sequence of these questions might be reordered in any particular case” (*KSR*, 550 U.S. at 407), the Federal Circuit has explained that an obviousness determination can be made only after consideration of all of the *Graham* factors. *See, e.g., Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1360 (Fed. Cir. 2012).

3. Overview of Morris

Morris, titled “Mobile Electric Power Generation for Hydraulic Fracturing of Subsurface Geological Formations,” published June 23, 2016. Figure 1, reproduced below, shows a schematic diagram of an embodiment of a well site.



Ex. 1037, Fig. 1. “FIG. 1 is a schematic diagram [of] an embodiment of a well site 100 that comprises a wellhead 101 [represented by a six-pointed star on the right side of the diagram] and a mobile fracturing system 103,”

represented by three horizontally extending rectangles in the top left corner of the diagram, with the top rectangle labeled “Gas Conditioning Trailer,” the middle rectangle unlabeled, and the bottom rectangle labeled “MOBILE SOURCE OF ELECTRICITY.” *Id.* ¶ 41, Fig. 1. Four essentially equally spaced lines extend between the middle and bottom rectangles. *Id.*, Fig. 1. Bracket 102 to the right of the middle and bottom rectangles indicates that these two rectangles represent mobile source of electricity 102. *Id.* Switch gear transport 112 is represented by a diagram of a horizontally extending trailer below mobile source of electricity 102. *Id.* Three drive power transports 104 are represented by diagrams of three vertically extending trailers below switch gear transport 112. *Id.* To the right of drive power transports 104 another rectangle labeled “AUX. POWER TRAILIER” represents auxiliary power trailer 106. *Id.*

Below drive power transports 104 and auxiliary power trailer 106 are six horizontally extending rectangles, each labeled “Water Tank” and below them is a large rectangle with the label “SAND STORAGE.” Ex. 1037, Fig. 1. To the right of the water tanks is a vertically extending rectangle labeled “HYDRATION” and to the right of the sand storage is a vertically extending rectangle labeled “SAND CONVEYOR.” *Id.* Above the Sand Conveyor is a diagram of another trailer with a rectangle at its top representing blender transport 110. *Id.* ¶ 43, Fig. 1. To the right of blender transport 110 are six diagrams of trailers representing fracturing pump transports 108. *Id.* A rectangle in the top right corner of the diagram and extending at an angle and labeled “DATA VAN” represents data van 114. *Id.*

4. *Alleged Obviousness of Proposed Substitute Claims 20 and 23–26
in View of the Combined Teachings of Robinson, Broussard,
Henry, and Morris*

Petitioner asserts that proposed substitute claims 20 and 23–26 are unpatentable over the combined teachings of Robinson, Broussard, Henry, and Morris. Mot. Opp. 7.

a. *Alleged Obviousness of Proposed Independent Substitute Claim 20*

Proposed substitute claim 20 is original claim 7 with the added limitation that “the heater coupled to a load box that directs energy to the heater and to at least one additional component at a stepped down voltage.” Mot. App. 3–4. In canceling claim 7, Patent Owner does not dispute that original claim 7 is unpatentable over the combined teachings of Robinson, Broussard, and Henry as asserted in the Petition, which we determined to be sufficiently supported for institution. *See* Paper 12, 29–36. We have reviewed Petitioner’s contentions and Dr. Ehsani’s supporting testimony regarding claim 7, and are persuaded, for the reasons stated by Petitioner, that Robinson, Broussard, and Henry collectively teach all limitations of claim 7 and a person of ordinary skill in the art would have had reason to combine the references’ teachings with a reasonable expectation of success.” *See* Pet. 32–34; Ex. 1003 ¶¶ 91–100. Accordingly, we focus our discussion on the limitation added to original claim 7.

Petitioner asserts that “[t]he combination of *Robinson/Broussard/Henry/Morris* teaches the heater coupled to a load box that directs energy to the heater and to at least one additional component at a stepped down voltage.” Mot. Opp. 21–22. Noting that “*Morris* explains that ‘switchgear transport 112 . . . may comprise a plurality of electrical disconnect switches, fuses, transformers and/or circuit protectors to protect the fracturing

equipment,” Petitioner asserts that “[t]he switchgear transport 12 may also ‘transfer the electricity received from the mobile source of electricity to the drive power transports 104 and auxiliary power transports 106.’” *Id.* at 22 (citing Ex. 1037 ¶ 43). Petitioner asserts further that “[a]uxiliary transport 106 includes another step-down transformer and supplies power to ‘fracturing pump transport 108, . . . data van 114, lighting equipment, and any additional auxiliary equipment used for the fracturing operations” and that “[t]he switchgear (with switches, fuses and circuit protectors) described in Morris is one example of a ‘load box.’” *Id.* (citing Ex. 1037 ¶ 44; Ex. 1001, 5:50–52). Petitioner reasons that “[a] POSITA would have recognized that lube oil heaters would be part of the fracturing pump transport or the additional auxiliary equipment to which power would be directed from switchgear.” *Id.* (citing Ex. 1041 ¶¶ 59–60).

Patent Owner replies that Petitioner’s reasoning is “supported by nothing more than a conclusory statement from Petitioner’s expert.” Mot. Reply 8. Thus, Patent Owner contends that “[t]he proposed combination falls victim to . . . impermissible hindsight and is supported only by conclusory statements with no supporting rationale gleaned from the references or knowledge of the POSITA.” *Id.*

Petitioner responds that Patent Owner “does not address any of the disclosure of Morris [discussed in its Opposition], and instead asserts that ‘Petitioner contends that a heater would necessarily be considered auxiliary equipment for fracturing operations in view of *Morris*.’” Mot. Sur-reply 10 (citing Mot. Reply. 8). Petitioner asserts that Patent Owner “is arguing the references in isolation, rather than the combination of references. It is the combination of *Robinson/Broussard/Henry* that discloses the heater for

fracturing operations.” *Id.* at 10–11 (citing Pet. 32–34 (analysis for original claim 7)). Petitioner asserts further that “*Morris* merely adds the load box with step-down transformer to provide power to equipment, which would include the heater of *Robinson/Broussard/Henry*.” *Id.*

We see no evidence of improper hindsight. The Robinson/Broussard/Henry combination does not disclose the claimed load box. Morris discloses mobile source of electricity 103 to supply electric power to fracturing equipment within mobile fracturing system 103 that includes at least one switchgear transport 112, a plurality of drive transports 104, at least one auxiliary power transport 106, at least one blender transport 110, at least one data van 114 and a plurality of fracturing pump transports 108 that deliver fracturing fluid through wellhead 101 to subsurface geological formations. Ex. 1037 ¶ 43. Morris discloses that “switch gear transport 112 may comprise a plurality of electrical disconnect switches, fuses, transformers, and/or circuit protectors to protect the fracturing equipment.” *Id.* Dr. Ehsani, Petitioner’s expert, testifies that “the switchgear (with switches, fuses, and circuit protectors) described in Morris is one example of a ‘load box’” comparing it to the ’728 patent’s disclosure that “tie ins for devices that operate at the stepped down voltage” are exemplary load boxes. Ex. 1041 ¶ 60 (citing Ex. 1001, 5:50–52). Dr. Ehsani further testifies that a person of ordinary skill in the art “would have recognized that lube oil heaters would be part of the fracturing pump transport or the additional auxiliary equipment to which power would be directed from switchgear.” *Id.* We credit Dr. Ehsani’s un rebutted testimony, which is supported by Morris’ disclosures discussed above.

For these reasons, we determine that Petitioner has shown, by a preponderance of the evidence, that proposed substitute claim 20 is unpatentable over the combined teachings of Robinson, Broussard, Henry, and Morris.

b. Proposed Substitute Claims 23–26

Proposed substitute dependent claims 23–26 are original claims 10–14 rewritten to depend from proposed substitute independent claim 20. By cancelling original claims 10, 11, and 13, Patent Owner does not dispute that these claims are unpatentable over the combined teachings of Robinson, Broussard, and Henry as asserted in the Petition. We have reviewed Petitioner’s contentions and Dr. Ehsani’s supporting testimony regarding claims 10, 11, and 13 and are persuaded, for the reasons stated by Petitioner, that Robinson, Broussard, and Henry collectively teach all limitations of these claims and a person of ordinary skill in the art would have had reason to combine the references’ teachings with a reasonable expectation of success.” *See* Pet. 35–38; Ex. 1003 ¶¶ 102–107. Having determined that proposed substitute independent claim 20 is unpatentable over the combined teachings of Robinson, Broussard, Henry, and Morris, we also determine that proposed substitute dependent claims 23, 24, and 26 are unpatentable over this combination of references.

Proposed substitute claim 25 is original claim 12 rewritten to depend from proposed substitute claim 20. By canceling claim 12, Patent Owner does not dispute that this claim is unpatentable over the combined teachings of Robinson, Broussard, Henry, and Aalvik, as asserted in the Petition. We have reviewed Petitioner’s contentions and Dr. Ehsani’s supporting testimony regarding claim 12 and are persuaded, for the reasons stated by

Petitioner, that Robinson, Broussard, Henry, and Aalvik collectively teach all limitations of claim 12 and a person of ordinary skill in the art would have had reason to combine the references' teachings with a reasonable expectation of success." *See* Pet. 55; Ex. 1003 ¶¶ 149–150. Specifically, Petitioner's challenge to claim 12 relies on Aalvik to teach a first transformer for stepping down a voltage of electricity from an electrical source to a voltage that is useable by the pump. *See* Pet. 55 (citing *id.* at 53–55). In its challenge to proposed substitute claim 25, Petitioner asserts that Morris teaches this limitation. *See* Mot. Opp. 23 (citing *id.* at 17–19). Patent Owner does not argue claim 25 separately. Mot. Reply 11. Having reviewed the full record, we determine that Petitioner has shown, by a preponderance of the evidence, that proposed substitute claim 25 is unpatentable over the combined teachings of Robinson, Broussard, Henry, and Morris.

*5. Alleged Obviousness of Proposed Substitute Claims 20 and 23–25
in View of the Combined Teachings of Robinson, Broussard,
Henry, and Payne*

In light of the fact that we have determined that proposed substitute claims 20 and 23–25 are unpatentable over the combined teachings of Robinson, Broussard, Henry, and Morris, we do not reach this ground of unpatentability set forth in Petitioner's Opposition. *Boston Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App'x 984, 990 (Fed. Cir. Apr. 30, 2020) (non-precedential) (recognizing that the "Board need not address issues that are not necessary to the resolution of the proceeding" and, thus, agreeing that the Board has "discretion to decline to decide additional instituted grounds once the petitioner has prevailed on all its challenged claims").

6. Alleged Obviousness of Proposed Substitute Claim 22 in View of the Combined Teachings of Robinson, Broussard, Henry, Hodgson, and Morris

Proposed substitute dependent claim 22 is original claim 9 rewritten to depend from proposed substitute independent claim 20. Mot. App. 4. By canceling claim 9, Patent Owner does not dispute that this original claim is unpatentable over the combined teachings of Robinson, Broussard, Henry, and Hodgson. as set forth in the Petition. We have reviewed Petitioner's contentions and Dr. Ehsani's supporting testimony regarding claim 9, and are persuaded, for the reasons stated by Petitioner, that Robinson, Broussard, and Henry collectively teach all limitations of claim 9 and a person of ordinary skill in the art would have had reason to combine the references' teachings with a reasonable expectation of success. *See* Pet. 62–64; Ex. 1003 ¶¶ 166–169. Having determined that proposed substitute independent claim 20 is unpatentable over the combined teachings of Robinson, Broussard, Henry, and Morris, we also determine that proposed substitute dependent claim 22 is unpatentable over Robinson, Broussard, Henry, Hodgson, and Morris.

7. Alleged Obviousness of Claim 26 in View of the Combined Teachings of Robinson, Broussard, Henry, Jang, and Payne

In light of the fact that we have determined that proposed substitute claim 26 is unpatentable over the combined teachings of Robinson, Broussard, Henry, and Morris, we do not reach this ground of unpatentability set forth in Petitioner's Opposition. *Boston Sci.*, 809 F. App'x at 990.

V. SUMMARY OF CONCLUSIONS

We *grant* Patent Owner's non-contingent request to cancel original claims 1–13 of the '728 patent, and we *deny* Patent Owner's request to add proposed substitute claims 14–26 to the '728 patent.¹⁶ Thus, the result of this Decision is summarized by the following table.

Motion to Amend Outcome	Claim(s)
Original Claims Canceled by Amendment	1–13
Substitute Claims Proposed in the Amendment	14–26
Substitute Claims: Motion to Amend Granted	
Substitute Claims: Motion to Amend Denied	14–26
Substitute Claims: Not Reached	

VI. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Patent Owner's Motion to Amend is *granted* as to the non-contingent request to cancel original claims 1–13 of the '728 patent;

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

FURTHER ORDERED that Patent Owner's Motion to Amend is *denied* as to the request to add proposed substitute claims 14–26 to the '728 patent; and

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

IPR2021-01036
Patent 9,611,728 B2

FOR PETITIONER:

Chad Walters
Brandon Chen
Clarke Stavinoha
BAKER BOTTS L.L.P.
Chad.walters@bakerbotts.com
Brandon.chen@bakerbotts.com
Clarke.stavinoha@bakerbotts.com

David J. Tobin
MCDERMOTT WILL & EMERY LLP
dtobin@mwe.com

FOR PATENT OWNER:

Taylor Evans
Scott Hughes
Corey Leggett
Melissa Schwaller
HOGAN LOVELLS US LLP
taylor.evans@hoganlovells.com
schott.hughes@hoganlovells.com
corey.leggett@hoganlovells.com
mesliss.schaller@hoganlovells.com

