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Paper 41
Entered: January 24, 2023

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.

IPR2021-01066
Patent 10,020,711 B2

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

HOSKINS, *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. 10,020,711 B2 (Ex. 1001, "the '711 patent"), claims 1–20. We issued an Institution Decision (Paper 9) instituting the petitioned review.

U.S. Well Services, LLC ("Patent Owner") elected not to file a Patent Owner Response to defend the challenged '711 patent claims. *See, e.g.*, 37 C.F.R. § 42.120; Paper 10, 8, 10 (Scheduling Order permitting Patent Owner Response to be filed by May 11, 2022).

Patent Owner instead filed an initial *non-contingent* motion to amend the '711 patent (Paper 17), to which Petitioner filed an opposition (Paper 23). We issued Preliminary Guidance (Paper 24) concerning the initial motion to amend. Following the Preliminary Guidance, Patent Owner filed a revised *non-contingent* motion to amend the '711 patent (Paper 25, "Motion to Amend" or "Mot."), replacing the initial motion to amend. Petitioner filed an Opposition to the Motion to Amend (Paper 28, "Mot. Opp."). Patent Owner filed a Reply to Petitioner's Opposition (Paper 32, "Mot. Reply"). Petitioner filed a Sur-reply to Patent Owner's Reply (Paper 39, "Mot. Sur-reply").

An oral hearing was held on December 8, 2022, for which the transcript was entered into the record (Paper 40).

In summary, we *grant* the Motion to Amend as to cancelling original claims 1–20 of the '711 patent. 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 '711 patent, because all of these claims seek to add new matter to the application that issued as the '711 patent. As a result, we do not reach the grounds of unpatentability asserted in the Opposition against the proposed substitute claims.

II. BACKGROUND

A. Real Parties-in-Interest and Related Proceedings

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 real parties-in-interest. *See* Paper 4, 1; Paper 38.

The parties identify three judicial matters as related to this proceeding. *See* Pet. 1–2; 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 several patents, including patents related to the '711 patent, but not the '711 patent itself. *See* Pet. 1–2; 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. They are the following:

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
IPR2021-01036	9,611,728 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.
IPR2021-01066	10,020,711 B2
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

III. ORIGINAL CLAIMS 1–20

The Petition relies on five prior art references to challenge original claims 1–20 of the '711 patent. *See* Pet. 20. They are identified here, in alphabetical order:

Name	Reference	Exhibit No.
Blutke	US 7,279,655 B2	1006
Broussard	US 2014/0138079 A1	1005
Roby	US 7,770,396 B2	1007
Sanborn	US 2013/0306322 A1	1004
West	WO 2014/116761 A1	1008

The Petition relies on six grounds of unpatentability, all under 35 U.S.C. § 103, to challenge original claims 1–20 of the '711 patent. *See* Pet. 20. They are identified here:

Ground	Claims Challenged	References
1	1–10, 12	Sanborn, Blutke

Ground	Claims Challenged	References
2	11, 13–20	Sanborn, Blutke, West
3	1–20	Broussard, Blutke
4	1–10, 12	Sanborn, Blutke, Roby
5	11, 13–20	Sanborn, Blutke, West, Roby
6	1–20	Broussard, Blutke, Roby

The Motion to Amend includes a non-contingent request to cancel original claims 1–20 of the '711 patent, which are all of the claims challenged in the Petition. *See* Mot. Caption ("NON-CONTINGENT"), 1 (stating the motion is "Non-Contingent"), 2 ("The claim listing cancels original claims 1–20 . . . ."), App. A (pg. 1) (stating original claims 1–20 are "Cancelled"); Pet. 20. Petitioner's Opposition accordingly emphasizes the non-contingent nature of the Motion to Amend. *See* Mot. Opp. 1 (referring to the "Revised Non-Contingent Motion to Amend"). 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 1–20. As a result, we do not reach the grounds of unpatentability asserted in the Petition against these original claims.

IV. PROPOSED SUBSTITUTE CLAIMS 21–40

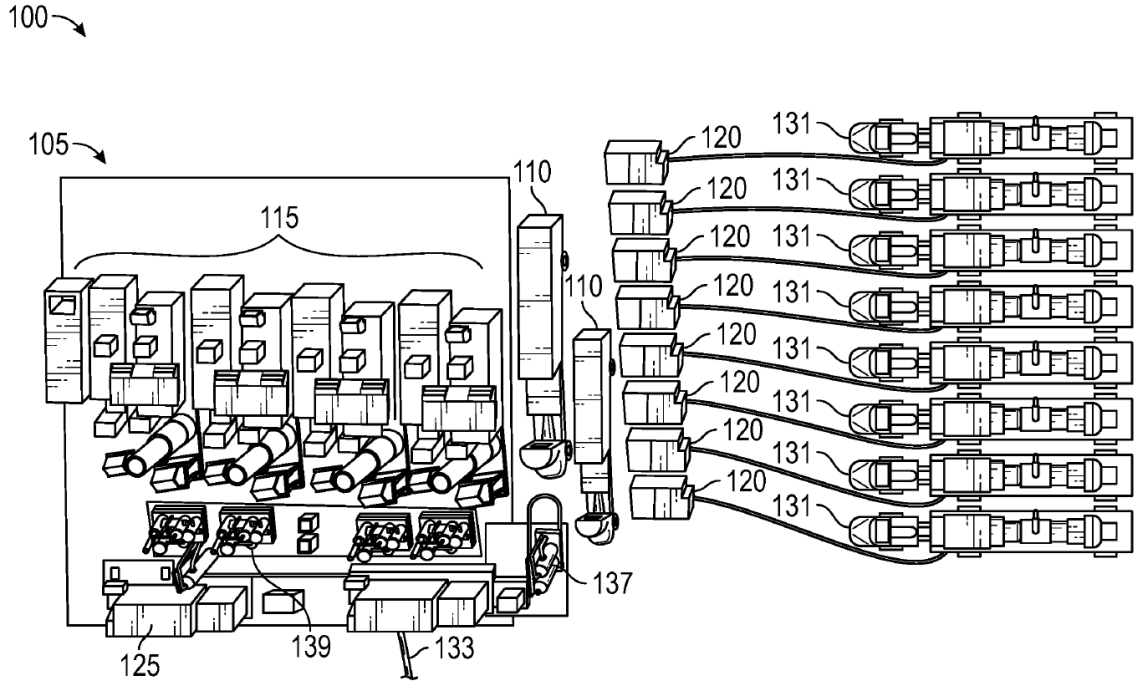
A. Introduction

The Motion to Amend proposes to add substitute claims 21–40 to the '711 patent. *See* Mot. 2, App. A. We determine these claims all seek to add new matter to the application that issued as the '711 patent. We therefore

deny the Motion to Amend as to these claims. As a result, we do not reach the grounds of unpatentability asserted in the Opposition against these claims.

B. The '711 Patent Disclosure

The '711 patent concerns a system for hydraulically fracturing a subterranean formation to extract oil or gas from the formation. *See* Ex. 1001, code (57), 1:28–37. Figure 1 is reproduced below.



The '711 Patent, Figure 1.

Figure 1 is an overhead perspective view of electrical power generation system 105 for a hydraulic fracturing system, including fracturing pump units 131. *See id.* at 3:49–52, 4:37–51. Pump units 131 "pump fluid into a wellbore associated with the well at a high pressure" in order to fracture a subterranean formation. *Id.* at code (57), 2:21–28.

Electrical power generation system 105 uses natural gas supplied via line 133 to generate electricity. *See id.* at 2:3–6, 4:40–41, 5:29–32. In

particular, the natural gas is fed to one or more gas compressors 125, which compress the gas and supply the compressed gas to turbines 115, which use the compressed gas to generate electricity to power pump units 131. *See id.* at 4:40–51. The '711 patent disclosure focuses on designing system 105 so that it may be "fueled by multiple fuel sources" (not just natural gas), including liquid fuels and solid fuels. *Id.* at 1:23–27, 2:1–17; *see also id.* at 2:37–53, 5:43–67 (identifying exemplary liquid fuels and solid fuels).

In some embodiments, this is accomplished by: (1) either *vaporizing* the liquid fuel or *gasifying* the solid fuel, so the alternative fuel is in a gaseous state similar to natural gas prior to its delivery to turbines 115; and (2) adding an inert gas to the vaporized or gasified fuel, to modify the fuel's energy state to be similar to the energy state of natural gas. *See id.* at 4:56–63, 6:1–16, 7:59–8:5 (describing Figure 3, which illustrates gas compression system 300, including liquid fuel vaporization system 316 to vaporize liquid fuel and oxygen separation system 322 to provide inert gas), 8:45–49, 11:45–53. The inert gas can be ambient air "that has some oxygen content removed and has a larger percentage of nitrogen." *Id.* at 6:8–21. These embodiments have the advantage that the turbines do not need to be modified to run on the alternative fuel source. *See id.* at 6:8–11, 6:54–60, 8:53–60.

C. The Proposed Substitute Claims

Patent Owner proposes to amend the '711 patent by adding new claims 21–40, as respective substitutes for original claims 1–20. *See* Mot. 2, App. A.

Illustrative claim 21, which is proposed as a substitute for original claim 1, is reproduced here. Underlined language reflects subject matter added to original claim 1, and struck-through language reflects subject matter omitted from original claim 1:

> 21. A hydraulic fracturing system for fracturing a subterranean formation comprising:
>
> a plurality of electric pumps fluidly connected to a well associated with the subterranean formation and powered by at least one electric motor, and configured to pump fluid into a wellbore associated with the well at a high pressure of between 5,000 psi and 15,000 psi so that the fluid passes from the wellbore into the subterranean formation and fractures the subterranean formation;
>
> at least one generator electrically coupled to the plurality of electric pumps so as to generate electricity for use by the plurality of electric pumps, the at least one generator configured to operate using fuel having a first energy;
>
> a gas compression system fluidly coupled to the at least one generator so as to provide the fuel for use by the at least one generator;
>
> an inert gas source providing an inert gas to regulate the fuel provided to the at least one generator; ~~and~~
>
> a combustible fuel vaporization system gaseously coupled to the gas compression system so as to provide at least one of vaporized fuel or gasified fuel, or a combination thereof, to the gas compression system; and
>
> an oxygen separation skid coupled to the combustible fuel vaporization system, the oxygen separation skid configured to process the inert gas to adjust an oxygen volumetric percentage or a nitrogen volumetric percentage of the inert gas, the inert gas provided to the combustible fuel vaporization system so as to modify a second energy of at least one of the vaporized fuel or the gasified fuel, or the combination thereof so that at least one of the vaporized fuel or the gasified fuel, or

> the combination thereof is operable with the at least one generator without modifying the at least one generator.

Mot. App. A (pgs. 1–2).

Proposed independent claim 33, which would substitute for original independent claim 13, would modify the original claim as follows: "a plurality of electric pumps . . . configured to pump fluid into a wellbore associated with the well at high pressure of between 8,000 psi and 12,000 psi so that the fluid passes from the wellbore into the subterranean formation and fractures the subterranean formation." Mot. App. A (pgs. 5–6). Proposed substitute claim 33 would also add an "oxygen separation skid" limitation to the original claim, similar to an analogous new limitation in proposed independent claim 21 reproduced above. *See id.*

In short, as pertinent here, each of the proposed substitute claims seeks to add that the "high pressure" recited in the original '711 patent claims corresponds to a specified numerical pressure range—between 5,000 psi and 15,000 psi in proposed substitute claim 21 and its dependent claims 22–32, or between 8,000 psi and 12,000 psi in proposed substitute claim 33 and its dependent claims 34–40.[1]

[1] Patent Owner does not rely on these numerical pressure ranges as a basis to distinguish the prior art cited in Petitioner's Opposition. *See* Mot. 11–25; Mot. Reply 4–11. We are aware, however, that the court in the Halliburton Litigation has determined the "high pressure" term in the claims of patents related to the '711 patent is indefinite. *See, e.g.*, Pet. 1–2; Paper 4, 1; IPR2021-01032, Ex. 1069, 8–18.

D. The Pressure Ranges in the Proposed Substitute Claims Would Improperly Add New Matter to the '711 Patent

For the following reasons, we determine proposed substitute claims 21–40 all seek to add new matter to the application that issued as the '711 patent, so we deny the Motion to Amend as to adding these claims to the '711 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 id.* 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 '711 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 2 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." Pet. 18.

Patent Owner utilizes the same formulation of ordinary skill. *See* Mot. 10–11.

[2] Available at https://www.uspto.gov/TrialPracticeGuideConsolidated.

The parties' agreed-upon formulation of ordinary skill is consistent with the level of skill reflected in the '711 patent and the prior art of record. We therefore apply it in the present Decision.

3. Testimonial Evidence

In relation to the written description issues that are pertinent to the present Decision, Petitioner relies on the proffered expert testimony of Mark Ehsani, Ph.D. (Ex. 1039). Patent Owner relies on the proffered expert testimony of William Marscher, P.E. (Ex. 1020) and Mr. Robert Schaaf (Ex. 2014).[3]

4. Proposed Substitute Independent Claims 21 and 33

Patent Owner asserts proposed substitute independent claims 21 and 33 do not introduce new matter into the '711 patent. *See* Mot. 3–10. Patent Owner cites disclosures of U.S. Patent Application No. 15/487,656 ("the '656 Application"), which issued as the '711 patent, that Patent Owner contends support the numerical pressure ranges recited in these claims. *See* Mot. 4, 7 (citing the '656 Application at ¶¶ 11, 23). The '656 Application can be found in the record as part of Exhibit 1002 (the prosecution history of the '711 patent), at pages 185–220.

Patent Owner additionally relies on the deposition testimony of Patent Owner's witnesses, Mr. Marscher and Mr. Schaaf, concerning their

[3] The pertinent testimony of Patent Owner's witnesses is found only in their depositions. Mr. Marscher did submit a Declaration (Ex. 2012), but it does not address whether the numerical pressure ranges recited in proposed substitute claims 21 and 33 have written description support in the application that issued as the '711 patent.

understanding of the meaning of "high pressure" fracturing operations in the context of related IPR proceedings disputed between Petitioner and Patent Owner,[4] which Patent Owner applies here to the "high pressure" term in the '656 Application. *See* Mot. 9–10. 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 [person of ordinary skill in the art ("POSITA")] in the fracking industry

[4] These proceedings are IPR2021-01032 challenging U.S. Patent No. 9,410,410 B2, and IPR2021-01034 challenging U.S. Patent No. 10,337,308 B2. The '711 patent asserts priority to both of those two patents. *See* Ex. 1001, code (63); Pet. 1–2; Paper 4, 1.

> would definitely think ***high pressure is 5,000 to 15,000 psi with an average value of 10 in my opinion***.

Ex. 1020, 2:1–3, 111:1–112:3 (emphases added). Patent Owner argues this testimony "support[s]" the high-pressure numerical range recited in proposed substitute claim 21 (i.e., between 5,000 psi and 15,000 psi). Mot. 9.

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

> 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. 2014, 1:12–14, 43:6–46:1 (emphases added). Patent Owner argues this testimony "support[s]" the high-pressure numerical range recited in proposed substitute claim 33 (i.e., between 8,000 psi and 12,000 psi). Mot. 9–10.

Petitioner argues the numerical pressure ranges specified in proposed substitute independent claims 21 and 33 improperly introduce new matter into the '711 patent. *See* Mot. Opp. 1–4. Petitioner asserts "no measured pressures (or ranges thereof) are disclosed in the specification" of the '656 Application, because the specification "does not provide any range of measured pressures (e.g., in pounds per square inch, or psi), let alone the specific pressure ranges recited in" the proposed substitute claims. *Id.* at 2–3 (citing Ex. 1002, 185–220; Ex. 1039 ¶¶ 13–14).

Concerning the '656 Application's disclosure of "high pressure" pumping, Petitioner asserts this "does not disclose any measured pressures (species) falling within the claimed pressure range (genus)," such as are recited in the proposed substitute claims. *Id.* at 3 (citing *Indivior UK Ltd. v. Dr. Reddy's Labs. S.A.*, 18 F.4th 1323, 1328–1329 (Fed. Cir. 2021)). Petitioner adds that "where a specification discloses a broad range of values and a value within that range is claimed, the disclosure must allow one skilled in the art to 'immediately discern the limitation at issue in the claims,'" which is not the case here. *Id.* (quoting *Gen. Hosp. Corp. v. Sienna Biopharms., Inc.*, 888 F.3d 1368, 1372 (Fed. Cir. 2018)).

Concerning the deposition testimony of Mr. Marscher and Mr. Schaaf quoted above, Petitioner asserts those "experts cannot even agree among each other as to the pressures possibly encompassed within the 'high pressure' term." *Id.* 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 "high pressure" means no less than 8,000 psi. *Id.* at 3–4 (citing Ex. 1020, 111:1–112:21; Ex. 2014, 44:7–13). In Petitioner's view: "The inconsistency between [Patent Owner's] experts confirms that the '711 Patent specification does not allow a POSITA to 'immediately discern the limitation at issue in the claims.'" *Id.* at 4 (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*, 18 F.4th at 1329).

Patent Owner replies that the deposition testimony of Mr. Marscher and Mr. Schaaf quoted above establishes that the numerical pressure ranges in proposed substitute claims 21 and 33 "are an inherent property" of the "high pressure" disclosures in the '656 Application, so they "are not prohibited new matter." Mot. Reply 2–3 (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)). In particular, according to Patent Owner, the "high pressure" disclosures of the '656 Application make clear that the numerical pressure ranges are necessarily present in the '656 Application, as would have been recognized by a person of ordinary skill in the art, according to Mr. Marscher and Mr. Schaaf. *See id.* at 3–4 (citing Ex. 1020, 111:3–5, 111:25–112:3; Ex. 2014, 43:17–18; *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999); *Cont'l Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 1268 (Fed. Cir. 1991)).

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*, 837 F.3d at 1344–45). Petitioner further asserts Patent Owner has not established that the '656 Application'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 21 and 33 both introduce new matter into the '656 Application. We have

reviewed the '656 Application disclosures cited by Patent Owner. *See* Ex. 1002, 188 (¶ 11), 190 (¶ 23). These disclosures pertinently demonstrate possession only of "a hydraulic fracturing system for fracturing a subterranean formation" that includes "a plurality of electric pumps . . . configured to *pump fluid into a wellbore associated with the well at a high pressure so that the fluid passes from the wellbore into the subterranean formation and fractures the subterranean formation*." *Id.* (emphases added). Thus, the '656 Application demonstrates possession of pumping fluid at a "high pressure" to fracture an underground formation, but it 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 21 and 33.

Patent Owner's attempt to leverage the "high pressure" fracturing disclosures of the '656 Application into demonstrating possession of the numerical pressure ranges recited in proposed substitute claims 21 and 33 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. 1020, 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. 2014, 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 '656 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 witnesses' testimony on this issue, especially because their opinions conflict with each other.

Third is the fact that the two proposed substitute independent claims specify materially different numerical pressure ranges, each of which Patent Owner asserts is supported by the simple disclosure of "high pressure" in the '656 Application. Patent Owner's position appears to be that the "high pressure" disclosure in the '656 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* Mot. 9–10; *see also* IPR2021-01032, Paper 77, 45:13–46:8 (Patent Owner's counsel's oral argument relating to the same issue disputed in the context of related U.S. Patent No. 9,410,410 B2). 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 both of the two numerical pressure ranges at issue here, based on the bare disclosure in the '656 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.

We acknowledge the *Indivior* decision was a 2–1 panel decision, over a vigorous dissent. However, the principal disagreement between the majority and dissenting opinions was whether the disclosure of *specific numerical percentages* in the specification might demonstrate possession of *a range of percentages*. In this respect, the facts of the case before us present an easier issue to decide, because the '656 Application demonstrates

possession of only the vaguely stated "high pressure" rather than specific numerical pressures. *See* Ex. 1002, 188 (¶ 11), 190 (¶ 23).

Fourth, when one looks at each claim separately, there are inconsistencies between the claim and Mr. Marscher's or Mr. Schaaf's testimony. For example, proposed substitute claim 21 recites a pressure of between 5,000 psi and 15,000 psi. This is supported by Mr. Marscher's testimony. *See* Ex. 1020, 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. 2014, 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 21 has written description support in the '656 Application.

Proposed substitute claim 33 recites a pressure between 8,000 psi and 12,000 psi. This is supported by Mr. Schaaf's testimony. *See* Ex. 2014, 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. 1020, 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 33 has written description support in the '656 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 '656 Application on the basis that "high pressure" *necessarily* demonstrates possession of the numerical pressure ranges recited in proposed substitute claims 21 and 33. 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. However, we are not persuaded by Patent Owner's position that the '656 Application necessarily demonstrates possession of proposed substitute claims 21 and 33, 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; *Cont'l 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 independent claims 21 and 33 would introduce new matter to the application that issued as the '711 patent, and we accordingly deny the Motion to Amend the '711 patent as to these claims.

5. Proposed Substitute Dependent Claims 22–32 and 34–40

The remaining proposed substitute claims 22–32 and 34–40 each depend from one of proposed substitute independent claims 21 or 33, and therefore incorporate the numerical pressure ranges recited in those independent claims. *See* Mot. App. A. Therefore, for the reasons provided in Section IV.D.4 above, we conclude that adding the proposed substitute dependent claims would introduce new matter to the application that issued as the '711 patent, and we accordingly deny the Motion to Amend the '711 patent as to these claims.

E. Petitioner's Unpatentability Grounds

In light of our determination above that proposed substitute claims 21–40 lack written description support in the application that issued as the '711 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).

V. SUMMARY OF CONCLUSIONS

We *grant* Patent Owner's non-contingent request to cancel original claims 1–20 of the '711 patent, and we *deny* Patent Owner's request to add proposed substitute claims 21–40 to the '711 patent.[5] Thus, the result of this Decision is summarized by the following two tables.

[5] 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).

Claim(s)	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–10, 12	103	Sanborn, Blutke[6]		
11, 13–20	103	Sanborn, Blutke, West[6]		
1–20	103	Broussard, Blutke[6]		
1–10, 12	103	Sanborn, Blutke, Roby[6]		
11, 13–20	103	Sanborn, Blutke, West, Roby[6]		
1–20	103	Broussard, Blutke, Roby[6]		
Overall Outcome				

Motion to Amend Outcome	Claim(s)
Original Claims Cancelled by Amendment	1–20
Substitute Claims Proposed in the Amendment	21–40
Substitute Claims: Motion to Amend Granted	
Substitute Claims: Motion to Amend Denied	21–40
Substitute Claims: Not Reached	

[6] We do not reach these asserted grounds because Patent Owner filed a non-contingent motion to amend in which these claims were cancelled. *See supra* Section III.

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 1–20 of the '711 patent;

FURTHER ORDERED that Patent Owner's Motion to Amend is *denied* as to the request to add proposed substitute claims 21–40 to the '711 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.

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