

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.

IPR2022-00074
Patent 10,254,732 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. 10,254,732 B2 (Ex. 1001, “the ’732 patent”), claims 1–13. The Board 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 ’732 patent claims. *See, e.g.*, 37 C.F.R. § 42.120; Paper 10, 8, 11 (Scheduling Order permitting Patent Owner Response to be filed by August 5, 2022).

Patent Owner instead filed an initial non-contingent motion to amend the ’732 patent (Paper 19), to which Petitioner filed an opposition (Paper 21). We issued Preliminary Guidance (Paper 25) concerning the initial motion to amend. Following the Preliminary Guidance, Patent Owner filed a revised non-contingent motion to amend the ’732 patent (Paper 31, “Motion to Amend” or “Mot.”), replacing the initial motion to amend. Petitioner filed an Opposition to the Motion to Amend (Paper 35, “Mot. Opp.”). Patent Owner filed a Reply to Petitioner’s Opposition (Paper 42, “Mot. Reply”). Petitioner filed a Sur-reply to Patent Owner’s Reply (Paper 50, “Mot. Sur-reply”).

An oral hearing was held on March 9, 2023, for which the transcript was entered into the record (Paper 53, “Tr.”).

In summary, we *grant* the Motion to Amend as to cancelling original claims 1–13 of the ’732 patent. As a result, we do not reach the unpatentability grounds asserted in the Petition against these original claims.

We also *deny* the Motion to Amend as to adding proposed substitute claims 14–26 to the ’732 patent, because these claims are indefinite under 35 U.S.C. § 112. As a result, we do not reach the obviousness grounds asserted in the Opposition against the proposed substitute claims under 35 U.S.C. § 103.

II. BACKGROUND

A. *Real Parties-in-Interest*

Petitioner identifies three companies as real parties-in-interest: itself (i.e., Halliburton Energy Services, Inc.); Halliburton Company; and Halliburton Holdings LLC. *See* Pet. 8. Patent Owner identifies itself (i.e., U.S. Well Services, LLC) and ProFrac Holding Corporation as real parties-in-interest. *See* Paper 5, 1; Paper 29.

B. *Related Proceedings*

The parties indicate the ’732 patent has not been asserted in district court litigation. *See* Pet. 8; Paper 5, 1.

Petitioner has filed several IPR proceedings to challenge patents owned by Patent Owner. These proceedings include:

IPR2021-01032 (U.S. Patent No. 9,410,410);
IPR2021-01033 (U.S. Patent No. 8,789,601);
IPR2021-01034 (U.S. Patent No. 10,337,308);
IPR2021-01035 (U.S. Patent No. 9,970,278);
IPR2021-01036 (U.S. Patent No. 9,611,728);
IPR2021-01037 (U.S. Patent No. 9,745,840);
IPR2021-01038 (U.S. Patent No. 10,408,030);
IPR2021-01065 (U.S. Patent No. 9,840,901);
IPR2021-01066 (U.S. Patent No. 10,020,711);
IPR2021-01238 (U.S. Patent No. 10,526,882);
IPR2021-01315 (U.S. Patent No. 9,893,500);

IPR2021-01316 (U.S. Patent No. 10,280,724);
IPR2021-01538 (U.S. Patent No. 10,408,031);
IPR2021-01539 (U.S. Patent No. 10,648,311);
IPR2022-00610 (U.S. Patent No. 10,934,824);
IPR2023-00557 (U.S. Patent No. 9,650,871); and
IPR2023-00558 (U.S. Patent No. 11,136,870).

III. ORIGINAL CLAIMS 1–13

The Petition relies on five prior art references to challenge original claims 1–13 of the ’732 patent. *See* Pet. 17. They are identified here, in alphabetical order:

Name	Reference	Exhibit No.
Broussard	US 2014/0138079 A1	1004
Case	US 2011/0061855 A1	1007
Dykstra ¹	US 2008/0236818 A1	1005
Krenek	US 2009/0078410 A1	1006
StarTech	Amazon.com listing for StarTech.com 1 Port RS232 Serial to IP Ethernet Converter (NETRS2321P) by StarTech (Oct. 9, 2014)	1018

The Petition relies on six grounds of unpatentability to challenge original claims 1–13 of the ’732 patent. *See* Pet. 17. They are:

¹ Petitioner refers to this reference as “Dykstra-818.” We refer simply to “Dykstra” because this is the only Dykstra reference at issue in this Decision.

Claim(s)	35 U.S.C. §	Reference(s) / Basis
1–13	103	Broussard, Dykstra
1–8, 11–13	103	Broussard, Dykstra, Case
1–13	103	Broussard, Krenek
2	103	Broussard, Dykstra, StarTech
2	103	Broussard, Dykstra, Case, StarTech
2	103	Broussard, Krenek, StarTech

The Motion to Amend includes a non-contingent request to cancel original claims 1–13 of the ’732 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 1–13 . . .”); Mot. App. A, 1 (stating original claims 1–13 are “Cancelled”); Pet. 17. 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 unpatentability grounds 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 ’732 patent. *See* Mot. 2, App. A. We determine these claims are indefinite under 35 U.S.C. § 112. We therefore deny the Motion to Amend as to these claims. As a result, we do not reach the obviousness grounds asserted in the Opposition against the proposed substitute claims under 35 U.S.C. § 103.

B. The '732 Patent Disclosure

The '732 patent generally concerns a system for hydraulically fracturing an underground formation to extract hydrocarbons from the formation. *See* Ex. 1001, 1:21–27. Such systems typically mix water with a “proppant” to form a fracturing fluid mixture. *See id.* at 1:21–31. The proppant is a solid particulate such as sand or ceramic beads, and it props open and remains in the fractures to enhance the flow of hydrocarbons through the fractures for recovery. *See id.* at 1:38–46. These systems employ fluid pumps to pump the fracturing fluid mixture into the underground formation “at a high pressure to hydraulically fracture the reservoir rock in the well in order to form fractures” in the formation. *Id.* at 1:27–40.

The '732 patent focuses on “systems and methods for wirelessly monitoring and controlling proppant usage in real time in a hydraulic fracturing operation.” *Id.* at 1:17–20. Accordingly, the proposed substitute claims recite various details concerning data communications between a proppant container monitoring system, a proppant dispensing system, and a remote information handling system. *See* Mot. App. A, 1–2 (independent claim 14), 4–5 (independent claim 21). However, in this Decision, we need delve into only one aspect of these data communication details, which is discussed further below.

C. The Proposed Substitute Claims

Patent Owner proposes to amend the '732 patent by adding new claims 14–26, as respective substitutes for original claims 1–13. *See* Mot. 2, App. A. Claims 14 and 21 are the independent claims.

Claim 14, which is proposed as a substitute for original claim 1, recites a system for use with a fracturing operation, comprising “a plurality of . . . pumps fluidly connected to a well . . . and configured to pump fluid into the well at high pressure so that the fluid passes from the well into the formation, and fractures the formation.” Mot. App. A, 1–2. Claim 14 further requires: a control box comprising “a first serial transceiver in communication with [a proppant container] weight monitoring system”; and “a camera associated with [a] proppant dispensing system positioned to monitor a position of a gate of the proppant dispensing system, wherein data from the camera bypasses the first serial transceiver.” *Id.*

Claim 21, which is proposed as a substitute for original claim 8, recites a method for conducting a fracturing operation, comprising “pumping fluid with a plurality of . . . pumps into a wellbore at high pressure so that the fluid passes from the wellbore into the formation, and fractures the formation.” Mot. App. A, 4–5.

D. Testimonial Evidence

Petitioner relies on the proffered expert testimony of Robert A. Durham, Ph.D. (Exs. 1002, 1033, and 1036). Patent Owner relies on the proffered expert testimony of William D. Marscher, P.E. (Exs. 1030 and 2014) and Mr. Robert Schaaf (Exs. 1031 and 2012).

E. Threshold Criteria of 35 U.S.C. § 316 and 37 C.F.R. § 42.121

“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 [35 U.S.C.] § 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*”).

“[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) (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).

We accordingly address these threshold criteria here, one of which is disputed between the parties.

1. *Must Propose a Reasonable Number of Substitute Claims*

A motion to amend must propose a reasonable number of substitute claims. *See* 35 U.S.C. § 316(d)(1)(B); 37 C.F.R. § 42.121(a)(3). “The presumption is that only one substitute claim would be needed to replace each challenged claim.” 37 C.F.R. § 42.121(a)(3); *Lectrosonics*, Paper 15 at 4. Here, the Motion to Amend is entitled to that presumption, because it proposes thirteen substitute claims to replace the thirteen original claims of the ’732 patent. *See* Mot. 2, App. A. Further, Petitioner does not argue that the Motion to Amend proposes an unreasonable number of substitute claims. *See, e.g.*, Mot. Opp. 1–3 (addressing the threshold criteria for motions to amend). Based on this record, we conclude the Motion to Amend proposes a reasonable number of substitute claims.

2. *Must Respond to Ground of Unpatentability*

“A motion to amend may be denied where . . . [t]he amendment does not respond to a ground of unpatentability involved in the trial.” 37 C.F.R. § 42.121(a)(2)(i). Patent Owner asserts the Motion to Amend responds to a ground of unpatentability presented in the Petition. *See* Mot. 3. Petitioner does not oppose this aspect of the Motion to Amend. *See, e.g.*, Mot. Opp. 1–3 (addressing the threshold criteria for motions to amend). Based on this record, we conclude the Motion to Amend responds to a ground of unpatentability involved in the trial, for the reasons provided in the Motion.

3. *Must Not Enlarge Scope of Claims*

A motion to amend “may not enlarge the scope of the claims of the patent.” 35 U.S.C. § 316(d)(3); *see* 37 C.F.R. § 42.121(a)(2)(ii). Patent Owner asserts the Motion to Amend does not enlarge the scope of the ’732 patent’s original claims. *See* Mot. 3–4. Petitioner does not oppose this aspect of the Motion to Amend. *See, e.g.*, Mot. Opp. 1–3 (addressing the threshold criteria for motions to amend). Based on this record, we conclude the Motion to Amend does not enlarge the scope of the ’732 patent’s original claims, for the reasons provided in the Motion.

4. *Must Not Introduce New Matter*

a) *Statement of Law*

A Motion to Amend “may not . . . introduce new matter.” 35 U.S.C. § 316(d)(3); *see* 37 C.F.R. § 42.121(a)(2)(ii). 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); see PTAB Consolidated Trial Practice Guide (Nov. 2019),² 69, 71.

The test for new matter is whether an 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.

b) Person of Ordinary Skill in the Art

Petitioner contends a person having ordinary skill in the art pertaining to the ’732 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.” Pet. 13.

Patent Owner utilizes the same formulation of ordinary skill. See Mot. 13.

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 '732 patent and the prior art of record. We therefore apply it in the present Decision.

c) Proposed Substitute Claims 14–20

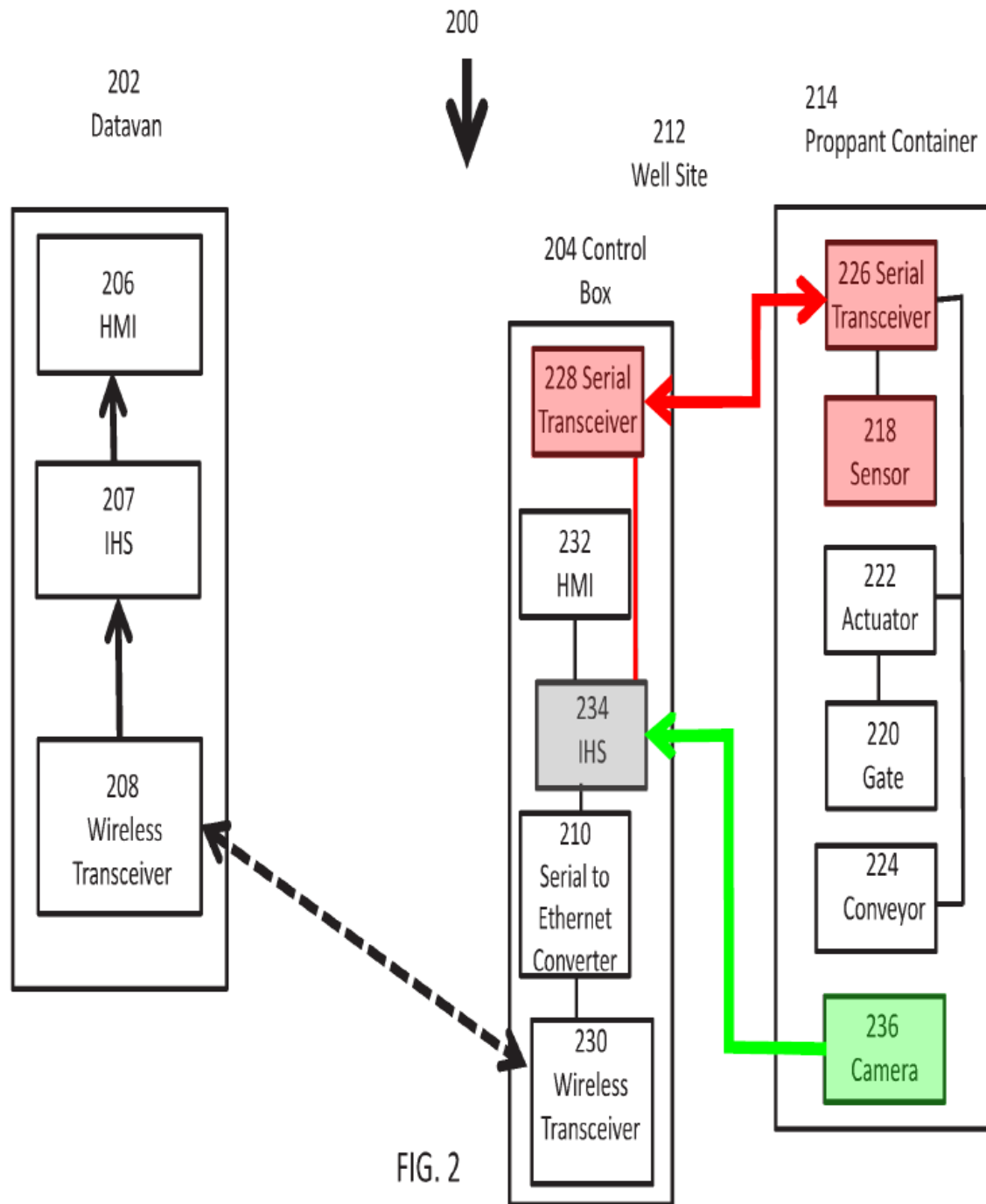
Patent Owner asserts proposed substitute independent claim 14, and its dependent claims 15–20, do not introduce new matter into the '732 patent. *See* Mot. 4. Patent Owner cites various disclosures of U.S. Patent Application No. 15/235,716 (“the '716 Application”), which issued as the '732 patent, that Patent Owner contends support these claims.³ *See* Mot. 4–9. The '716 Application can be found in the record as Exhibit 1003 (the prosecution history of the '732 patent), at pages 514–38.

Petitioner objects that the '716 Application does not demonstrate possession of data from a camera that “bypasses” a first serial transceiver, as recited in claim 14. *See* Mot. Opp. 1–3. We summarize the '716 Application disclosures on this issue, then we address the parties' arguments.

(i) The '716 Application

Figure 2 of the '716 Application (Ex. 1003, 538) is reproduced below, with our annotations in red, green, and gray.

³ Patent Owner also cites various disclosures of U.S. Provisional Application No. 62/204,331 in this regard. *See* Mot. 4–9. However, nothing in the present Decision turns on whether the '732 patent is entitled to the benefit of this application's filing date. Therefore, we do not address this aspect of the Motion to Amend.



The '716 Application, Figure 2 (Annotated).

Figure 2 is a schematic block diagram of system 200 for monitoring and controlling proppant flow from proppant container 214, by a user located in remote datavan 202, via control box 204 at well site 212. *See id.* at 518 (¶ 9), 520 (¶ 23), 522–523 (¶¶ 27–28), 526 (¶ 34).

As annotated in red and gray, sensor 218 monitors the weight of proppant within container 214, and sends corresponding data signals to information handling system (IHS) 234 via serial transceivers 226 and 228. *See id.* at 523 (¶ 29), 524 (¶ 31), 526–527 (¶¶ 34–35). IHS 234 uses the same serial transceiver 226, 228 communication pathway to send control signals to actuator 222 of gate 220, and thereby vary the amount of proppant dispensed from container 214. *See id.* at 525–26 (¶ 33), 527 (¶ 35).

As annotated in green and gray, “a live video feed can be directed from the container 214 . . . through a camera 236 that sends a Radio-Frequency (RF) signal back to the IHS 234 at the control box 204.”⁴ *Id.* at 529 (¶ 40). This “mak[es] it possible to know instantly if a gate 220 was left open . . . or conversely, if a gate commanded to open was stuck shut due to a mechanism failure.” *Id.*

(ii) *Analysis*

Patent Owner argues the ’716 Application demonstrates possession of a camera (i.e., camera 236) associated with a proppant dispensing system (i.e., control box 204 and proppant container 214) and positioned to monitor a position of a gate (i.e., gate 220) of the proppant dispensing system. *See* Mot. 5–6 (addressing limitation [14e], citing the ’716 Application at Figs. 1–2, ¶¶ 2, 29, 35, and 37), 6–7 (addressing limitation [14k], citing the ’716 Application at Figs. 1–2, ¶ 40). Patent Owner also argues that data from camera 236 bypasses both of the serial transceivers 226 and 228. *See*

⁴ As discussed below, Petitioner argues the ’716 Application does not explain what the green arrow represents, but we find it represents the described communication of data from camera 236 to IHS 234.

id. at 6 (addressing limitation [14g], citing the '716 Application at Figs. 1–2, ¶¶ 28 and 34–35), 6–7 (addressing limitation [14k]); Mot. Reply 2–5.

Patent Owner particularly relies on paragraph 40, which states that camera 236 “sends a Radio-Frequency (RF) signal back to the IHS 234 at the control box 204,” and on Figure 2 which Patent Owner asserts includes a “bold arrow between the camera 236 and the IHS 234 to show how data from the camera 236 . . . is *transferred directly* to the IHS 234.” Mot. Reply 3 (emphasis added). Patent Owner also relies on Figure 2’s illustration of other “lines from the sensor 218, the actuator 222, the gate 220, and the conveyor 224 that all connect to the serial transceiver 226,” and “a second bold arrow between the serial transceiver 226 of the proppant container 214 and the serial transceiver 228 of the control box 204” which “then connects with the IHS 234.” *Id.* Patent Owner concludes “data from the camera is *bypassing* the serial transceiver, whereas other data is not.” *Id.* at 3–4.

Petitioner argues the '716 Application fails to demonstrate possession of the camera data bypass requirement of claim 14. *See* Mot. Opp. 1–3 (citing Ex. 1036 ¶¶ 14–16). Petitioner asserts “[Patent Owner’s] alleged support for the ‘bypass’ claim limitation appears to be a wireless transmission from the camera,” yet the '716 Application makes “no mention of any data ‘bypass[ing]’ any components (and the word ‘bypass’ does not appear in the specification) or what it means for data to ‘bypass’ the transceiver, nor is there any explanation for how such data is transmitted while ‘bypass[ing] a serial transceiver.’” *Id.* at 2 (citing Ex. 1036 ¶ 15). Petitioner also asserts “[t]here is not even a communication link shown or described between the camera and a serial transceiver that would be

‘bypassed’ via RF transmission from the camera to IHS 234.” *Id.* Petitioner moreover argues Patent Owner’s witness “Mr. Marscher admits that ‘[t]he ’732 Patent is not disclosing the detailed electronic design of the IHS components, wireless transmission components, or ethernet network components or the programming of its disclosed software concepts.’” *Id.* (quoting Ex. 2014 ¶ 52).

Concerning Figure 2, Petitioner argues that although it “shows an arrow from camera 236 to IHS 234,” the ’716 Application “does not explain what this arrow represents.” *Id.* at 2–3. Petitioner asserts “Figure 2 does not show any connection or communication link between the camera and the ‘first serial transceiver’ such that the transceiver can be ‘bypassed’ when data is transmitted from the camera to the IHS.” *Id.* (citing Ex. 1036 ¶ 16); Mot. Sur-reply 7–8 (citing Ex. 1036 ¶¶ 15–16). Petitioner asserts Patent Owner’s contrary position is mere attorney argument that is not supported by expert testimony, whereas Petitioner’s position is supported by testimony from Dr. Durham. See Mot. Sur-reply 7 (citing Ex. 1036 ¶¶ 14–16).

Patent Owner replies that “[i]t is not necessary that the exact terms of a claim be used *in haec verba* [in these words] in the specification” for written description to be established, so the fact that the ’716 Application does not mention the term “bypass” is not dispositive. Mot. Reply 4 (citations omitted). Patent Owner reiterates that a person of ordinary skill in the art would recognize from paragraph 40 and Figure 2 that “the camera is not sending data to the IHS through the serial transceivers (like the other components are), and the camera is instead sending data directly to the IHS, meaning it is *bypassing* the serial transceiver.” *Id.* at 4–5. Patent Owner

also argues Petitioner's reliance on Mr. Marscher's declaration testimony is misplaced. *See id.* at 5.

Petitioner replies that Patent Owner's position "describes the 'bypass' claim term as a negative limitation, i.e., information from the camera 236 does not go through the serial transceiver 226." Mot. Sur-reply 8 (citing Mot. Reply 3–4). In this circumstance, according to Petitioner, "there generally must be something in the specification that conveys to a skilled artisan that the inventor intended the exclusion, such as a discussion of disadvantages or alternatives," which is not the case with the '716 Application. *Id.* (citation omitted).

Upon review of the foregoing and the evidence of record, we agree with Patent Owner. As a threshold issue, neither party's briefing takes a firm position as to which serial transceiver 226 or 228 in Figure 2 of the '716 Application might correspond to the "first" transceiver of proposed substitute claim 14. We conclude serial transceiver 228 corresponds to the claimed "first" transceiver because, as claimed: control box 204 is "comprising" transceiver 228; transceiver 228 is "in communication with the weight monitoring system" of proppant container 214; IHS 234 of control box 204 is "in communication with" transceiver 228; and data converter 210 of control box 204 is "coupled to [transceiver 228] via" IHS 234. Mot. App. A, 1–2; *see also* Tr. 13:6–7 (Petitioner's counsel stating "the serial transceiver we're talking about here is serial transceiver 228), 22:5–6 (Patent Owner's counsel stating "the first serial transceiver is marked as number 228"). Next, for the following reasons, we conclude the '716 Application demonstrates possession of data from camera 236 that

“bypasses” first serial transceiver 228, as recited in proposed substitute claim 14.

We reject the implicit claim construction that underpins Petitioner’s opposing argument and Dr. Durham’s opposing testimony, that the plain and ordinary meaning of the claim term “bypasses” requires the camera to have a communication link to the transceiver being bypassed. *See, e.g.*, Mot. Opp. 2 (“There is not even a communication link shown or described between the camera and a serial transceiver that would be ‘bypassed’ via RF transmission[.]”), 3 (“Figure 2 does not show any connection or communication link between the camera and the ‘first serial transceiver’ such that the transceiver can be ‘bypassed’[.]”); Mot. Sur-reply 7–8; Ex. 1036 ¶¶ 14–16; Tr. 12:19–13:13. This implicit claim construction is not supported by any citation to intrinsic evidence, or extrinsic evidence apart from the testimony of Dr. Durham. *See* Mot. Opp. 2–3; Mot. Sur-reply 7–8. And, Dr. Durham’s testimony similarly is unsupported by citation to persuasive evidence that might establish the plain and ordinary meaning of “bypass” is as limited as his testimony suggests. *See* Ex. 1036 ¶¶ 14–16.

We also reject Petitioner’s assertion and Dr. Durham’s testimony that the ’716 Application “does not explain” what the arrow in Figure 2 connecting camera 236 to IHS 234 represents. *See* Mot. Opp. 2–3; Mot. Sur-reply 7–8. In our view, a person of ordinary skill in the art would understand that this arrow corresponds to the written description that “a live video feed can be directed from the container 214 . . . through a camera 236 that sends a Radio-Frequency (RF) signal back to the IHS 234 at the control box 204.” Ex. 1003, 529 (¶ 40), 538 (Fig. 2). This is clear from simply

reading paragraph 40 in combination with viewing the illustration in Figure 2, which is being described by paragraph 40.

To the extent corroboration for this finding is required, Figure 2 illustrates five similar arrows, the first of which is the single-direction solid-line arrow from camera 236 to IHS 234 principally at issue here. *See id.* at 538 (Fig. 2). The second arrow is a double-direction solid-line arrow between serial transceivers 226 and 228, which the '716 Application describes as illustrating a data communication pathway. *See id.* at 522–23 (¶¶ 28–29), 526–28 (¶¶ 34–38). The third arrow is a double-direction dotted-line arrow between wireless transceivers 208 and 230, which the '716 Application describes as illustrating a data communication pathway. *See id.* at 522–523 (¶¶ 27–28, 30), 526–528 (¶¶ 34–38), 531 (¶ 43). The fourth arrow is a single-direction solid-line arrow from wireless transceiver 208 to IHS 207 in datavan 202, and the fifth arrow is a single-direction solid-line arrow from IHS 207 to human machine interface 206 in datavan 202, which the '716 Application describes as illustrating data communication pathways. *See id.* at 522 (¶ 27), 523 (¶ 30), 526–528 (¶¶ 34–38), 531 (¶ 43). Thus, the '716 Application taken as a whole and in context, reflects that these five arrows illustrate data communication pathways between various components of system 200. The separate illustrations of the two arrows between control box 204 and proppant container 214 demonstrate possession of data from camera 236 bypassing first serial transceiver 228, because camera 236 transmits its data via radio frequency directly to IHS 234 rather than through first serial transceiver 228.

In light of the foregoing evidence, Dr. Durham’s testimony dismissing the significance of the arrows in Figure 2 in the context of the claim term “bypassing” is not persuasive. See Ex. 1036 ¶¶ 14–16. In particular, Dr. Durham’s supposition that the radio frequency communication between camera 236 and IHS 234 may pass through first serial transceiver 228 (*id.* ¶ 15) is inconsistent with the five arrows shown in Figure 2, and their corresponding written descriptions as illustrating data communication paths between various components.

Dr. Durham further vaguely suggests that the arrow in Figure 2 representing direct RF communication from camera 236 to IHS 234 may involve using its own serial transceiver, because “[t]he use of wireless communication (RF) does not, in and of itself, teach a [person of ordinary skill in the art] that serial communications or a serial transceiver are being ‘bypassed.’” Ex. 1036 ¶¶ 15–16. Dr. Durham testifies in support that “[w]ireless communication merely means that the signal is converted to an RF wave and sent/received with communications antennas, rather than with a connected set of conductors” and “[s]erial communications can be wireless or wired.” *Id.* ¶ 15. However, even if the direct RF communication from camera 236 to IHS 234 represented by the arrow in Figure 2 is a serial communication, this pathway still bypasses first serial transceiver 228 as illustrated by the arrows in Figure 2, which is all that proposed substitute claim 14 requires.

We further conclude the declaration testimony of Mr. Marscher cited by Petitioner as an alleged admission has very little if any relevance to the issue presented here. Mr. Marscher pertinently states that the ’732 patent, and by Petitioner’s inference the ’716 Application from which the

'732 patent issued, “*is not disclosing the detailed electronic design of the IHS components, wireless transmission components, or ethernet network components, or the programming of its disclosed software concepts.*”

Ex. 2014 ¶ 52 (emphasis added). We agree with Mr. Marscher that Figure 2, which the '716 Application describes as a “schematic” “block diagram” of system 200 (Ex. 1003, 520 (¶ 23), 526 (¶ 34)), is not meant to depict the detailed electronic design of the system. This is far afield from Petitioner’s contention that Mr. Marscher admits that the '716 Application fails to demonstrate possession of data from camera 236 bypassing first serial transceiver 228.

Finally, we are not persuaded by Petitioner’s contention that the “bypasses” claim term at issue here is a negative limitation such that the '716 Application must convey “that the inventor intended the exclusion, such as a discussion of disadvantages or alternatives.” Mot. Sur-reply 8. On the facts presented here, the '716 Application demonstrates possession of data from camera 236 bypassing first serial transceiver 228, because camera 236 transmits its data directly to IHS 234 rather than through first serial transceiver 228. The claim limitation at issue here is dissimilar to the claim limitation at issue in the decision cited by Petitioner, which “require[d] administering fingolimod ‘at a daily dosage of 0.5 mg, *absent an immediately preceding loading dose regimen.*’” *Novartis Pharms. Corp. v. Accord Healthcare, Inc.*, 38 F.4th 1013, 1015 (Fed. Cir. June 21, 2022) (emphasis added), *petition for cert. filed*, No. 22-671 (U.S. Jan. 18, 2023). The claim limitation at issue here affirmatively requires a data communication path and specifies that the path bypasses the first serial

transceiver, which is not a negative limitation akin to the claim limitation at issue in *Novartis*.

For the foregoing reasons, we conclude the camera data bypass limitation of proposed substitute claim 14 is not new matter to the '716 Application. Further, based on the record presented, we do not independently discern any other limitations in claims 14–20 that might lack written description support in the '716 Application. Therefore, we conclude these claims do not add new matter to the '716 Application.

d) Proposed Substitute Claims 21–26

Patent Owner asserts proposed substitute independent claim 21, and its dependent claims 22–26, do not introduce new matter into the '732 patent. *See* Mot. 4. Patent Owner cites various disclosures of the '716 Application that Patent Owner contends support these claims. *See id.* at 9–12. Petitioner does not oppose this aspect of the Motion to Amend. *See, e.g.,* Mot. Opp. 1–3 (addressing the threshold criteria for motions to amend). Based on this record, we conclude these claims do not add new matter to the '716 Application, for the reasons provided in the Motion.

5. Conclusion Regarding Threshold Criteria

Patent Owner has met its burden to establish that the statutory and regulatory requirements set forth in 35 U.S.C. § 316(d) and 37 C.F.R. § 42.121 have been satisfied.

F. Petitioner's Unpatentability Grounds

We now turn to the unpatentability grounds asserted in Petitioner's Opposition to the Motion to Amend. The Opposition relies on three of the

five prior art references cited in the Petition against the original claims of the '732 patent (i.e., Broussard, Dykstra, and StarTech), as well as the following three additional prior art references, listed in alphabetical order. *See* Mot. Opp. 6–7.

Name	Reference	Exhibit No.
Hardin	US 2015/0144336 A1	1032
Omont	US 2017/0226842 A1	1037
S&S Proposal	Stewart & Stevenson, Commercial Proposal (Nov. 2014) ⁵	1076

Petitioner's Opposition relies on seven grounds of unpatentability to challenge proposed substitute claims 14–26 of the '732 patent. *See* Mot. Opp. 3–4 (indefiniteness ground), 6–7 (obviousness grounds). They are:

Claim(s)	35 U.S.C. § ⁶	Reference(s) / Basis
14–26	112(b)	Indefiniteness
14–20	103	Broussard, Dykstra, Hardin
21–26	103	Broussard, Dykstra, Hardin, Omont
14–20	103	S&S Proposal, Dykstra

⁵ *See, e.g.*, Paper 36, ix, 18.

⁶ The Leahy-Smith America Invents Act (Pub. L. No. 112-29, 125 Stat. 284 (2011), “AIA”) revised 35 U.S.C. § 112, applying to patent applications filed on or after September 16, 2012. *See* AIA § 4(c) (amending § 112), § 4(e) (effective date). The '732 patent was filed on August 12, 2016, so we cite the AIA version of § 112 in this Decision. *See* Ex. 1001, code (22). We do not reach Petitioner's obviousness grounds under 35 U.S.C. § 103, so we do not decide whether the AIA's revisions to § 103 apply here.

Claim(s)	35 U.S.C. § ⁶	Reference(s) / Basis
17, 18, 21–26	103	S&S Proposal, Dykstra, Omont
14–20	103	Broussard, Dykstra, Hardin, StarTech
14–20	103	S&S Proposal, Dykstra, StarTech

For the following reasons, we conclude proposed substitute claims 14–26 are unpatentable as indefinite under 35 U.S.C. § 112. We therefore do not reach Petitioner’s obviousness grounds.

1. *Indefiniteness of Proposed Substitute Claims 14–26*

Proposed substitute claim 14 recites “a plurality of . . . *pumps* fluidly connected to a well . . . and *configured to pump fluid into the well at high pressure so that the fluid passes from the well into the formation, and fractures the formation.*” Mot. App. A, 1–2 (emphases added). Proposed substitute claim 21 similarly recites “*pumping fluid* with a plurality of . . . *pumps into a wellbore at high pressure so that the fluid passes from the wellbore into the formation, and fractures the formation.*” *Id.* at 4–5 (emphases added). The remaining proposed substitute claims each depend from claim 14 or claim 21. See Mot. App. A.

Petitioner argues the proposed substitute claims are each indefinite because “[t]he term ‘high pressure’ is a subjective term of degree that changes based on several other parameters, and the intrinsic record does not ‘provide objective boundaries for those of skill in the art.’” Mot. Opp. 3–4 (quoting *Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1371 (Fed. Cir. 2018)). Petitioner asserts the term “high pressure” as used in the claims “is ‘purely subjective’ and depends ‘on the unpredictable vagaries of

any one person’s opinion,’ and is thus indefinite.” *Id.* at 4 (quoting *Intellectual Ventures I LLC v. T-Mobile USA, Inc.*, 902 F.3d 1372, 1381 (Fed. Cir. 2018)). Petitioner also asserts the “surrounding claim language does not resolve the indefiniteness of ‘high pressure’” because “whether ‘the fluid passes from the wellbore into the subterranean formation and fractures the subterranean formation’ depends on the fluid, the formation, and a large set of other operational parameters beyond just the ‘pressure.’” *Id.* at 4–5 (citing Ex. 1036 ¶ 19; Ex. 1031, 44:14–46:1); Mot. Sur-reply 4–5. Petitioner argues the ’732 patent specification does not provide guidance regarding the meaning of “high pressure” or “any ‘objective baseline’ to enable a [person of ordinary skill in the art] to differentiate ‘high pressure’ from non-high pressure.” Mot. Opp. 5–6 (citing Ex. 1036 ¶¶ 21–22); Mot. Sur-reply 5.

Petitioner relies on Dr. Durham’s testimony that “there is no universally accepted definition of the term ‘high pressure’ with regard to pumps for hydraulic-fracturing operations.” Mot. Opp. 4 (citing Ex. 1036 ¶ 19); Mot. Sur-reply 5. Petitioner also asserts that Patent Owner’s two witnesses, Mr. Marscher and Mr. Schaaf, do not agree on the definition of “high pressure.” Mot. Opp. 5 (citing Ex. 1030, 111:1–112:21; Ex. 1031, 43:6–46:1); Mot. Sur-reply 5–6.

Patent Owner responds that “[t]he alleged use of a term of degree is insufficient to establish indefiniteness.” Mot. Reply 6 (citing *Interval Licensing*, 766 F.3d at 1370 (“Claim language employing terms of degree has long been found definite where it provided enough certainty to one of skill in the art when read in the context of the invention[.]”)). Patent Owner argues the ’732 patent specification “states that the purpose of its system is to ‘monitor[] and control[] proppant usage in a fracturing operation’

whereby the ‘[f]racturing operations . . . involve pumping fracturing fluid at a high pressure to hydraulically fracture the reservoir rock in the well in order to form fractures and stimulate production of hydrocarbons.’” *Id.* (quoting Ex. 1001, code (57), 1:32–35). Patent Owner asserts “[t]his purpose of the ‘high pressure’ fracturing fluid is also recited in the functional [claim] language (e.g., ‘so that the fluid passes from the wellbore into the subterranean formation, and fractures the subterranean formation’).” *Id.* Patent Owner concludes “it is clear that ‘high pressure’ means the pressure needed for the fluid that passes from the wellbore into the subterranean formation to fracture the subterranean formation.” *Id.*

Patent Owner also argues “[t]he inference from Mr. Marscher’s and Mr. Schaff’s testimony is that both would readily agree that, for example, 10,000 psi would be considered ‘high pressure’ for fracturing fluid used to fracture subterranean formations.” *Id.* at 7. Patent Owner relies on Preliminary Guidance provided by the Board in IPR2021-01316, concerning U.S. Patent No. 10,280,724 B2 (“the ’724 patent”), in which the Board considered whether the claim term “high pressure” might be indefinite in the context of the ’724 patent, and concluded the respective testimonies of Mr. Marscher and Mr. Schaff do “not mean that a [person of ordinary skill in the art] would not understand the meaning of ‘high pressure’ as used in the claims.” *Id.* (citing *Halliburton Energy Services, Inc. v. U.S. Well Services, LLC*, IPR2021-01316, Paper 29 at 8–9 (PTAB Sept. 1, 2022)).

Petitioner replies that Patent Owner’s functional claim construction improperly renders the claim term “high pressure” to be a superfluous nonce term, because proposed substitute claims 14 and 21 both include express verbiage requiring that the pumped fluid “passes from the well[bore] into the

formation, and fractures the formation.” Mot. Sur-reply 2–4. Petitioner also argues that in IPR2021-01316 concerning the ’724 patent, the Board issued a Final Written Decision after the Preliminary Guidance concluding the claim term “high pressure” was indefinite. *Id.* at 2, 5–6 (citing *Halliburton v. U.S. Well Services*, IPR2021-01316, Paper 44 at 63–71 (PTAB Feb. 17, 2023)).

Upon review of the foregoing and the evidence of record, we agree with Petitioner. “Claim language employing terms of degree has long been found definite where it provided enough certainty to one of skill in the art when read in the context of the invention.” *Interval Licensing*, 766 F.3d at 1370. However, “[t]erms of degree are problematic if their baseline is unclear to those of ordinary skill in the art.” *Liberty Ammunition, Inc. v. United States*, 835 F.3d 1388, 1395 (Fed. Cir. 2016). The ’732 patent states that the purpose of its system is to fracture subterranean formations, and refers once to the pressure necessary to perform this hydraulic fracturing as “high pressure.” See Ex. 1001, 1:15–46 (“Fracturing operations are highly complex and involve pumping fracturing fluid at a *high pressure* to hydraulically fracture the reservoir rock in the well in order to form fractures and stimulate production of hydrocarbons.” (emphasis added)). However, both of Patent Owner’s witnesses agree that hydraulic fracturing can be performed at pressures other than “high” pressure. See Ex. 1030, 111:15–17 (Mr. Marscher testifying regarding “[v]ery high pressure”); Ex. 1031, 45:20–46:1 (Mr. Schaaf agreeing that “in some formations . . . the pressure needed to fracture those formations may not necessarily be high pressure”). Thus, the pressure needed for a fluid passing from a wellbore into a

subterranean formation to fracture the formation is not necessarily “high pressure.”⁷

The intrinsic record does not “provide objective boundaries for those of skill in the art” to determine whether a given pressure is “high pressure” as recited in the proposed substitute claims. *See Interval Licensing*, 766 F.3d at 1370–71. Nor does the intrinsic record provide guidance to clarify the meaning of “high pressure.” As noted above, the ’732 patent refers only to “high pressure” without qualification or explanation as to how “high pressure” is determined. The prosecution history does not address “high pressure” in any meaningful way and, therefore, also fails to explain what pressures are “high” pressures. *See generally* Ex. 1003. Thus, the intrinsic record does not explain adequately what pressure(s) qualify as “high pressure,” nor differentiate “high pressure” from other pressures at which hydraulic fracturing can be performed.

The extrinsic record also fails to define “high pressure.” Patent Owner relies on the deposition testimony of its witnesses to provide values to which an ordinarily skilled artisan would understand “high pressure” to refer. *See* Mot. Reply 7. 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

⁷ Further, in the related proceeding discussed by both parties, Patent Owner conceded hydraulic fracturing can be performed using “medium pressure.” *See Halliburton v. U.S. Well Services*, IPR2021-01316, Paper 44 at 65–66.

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

Ex. 1030, 2:1–3, 111:1–112:3 (emphases added).

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. 1031, 1:12–14, 43:6–46:1 (emphases added).

As seen from this deposition testimony, 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. 1030, 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. 1031, 43:6–44:13). Although there are overlapping values in the witness testimony, we agree with Petitioner that the testimony does not evidence clear boundaries for how an ordinarily skilled artisan would interpret "high pressure." See Mot. Sur-reply 6 (citing *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901–02 (2014); *Interval Licensing*, 766 F.3d at 1371). Thus, the testimony of Patent Owner's own witnesses is contrary to Patent Owner's position that an ordinarily skilled artisan would have understood the meaning of "high pressure."

Furthermore, 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 witness 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. We are instead persuaded by the testimony of Petitioner's witness, Dr. Durham, who testifies that "[t]here is [no] general consensus about the precise boundaries of the term 'high pressure,' and different engineers can reasonably come to different conclusions as to the meaning of the term absent further guideposts." Ex. 1036 ¶ 17; see also *id.* ¶ 19 ("There is no universally accepted definition of 'high pressure.'").

Dr. Durham further testifies that “what might be sufficiently ‘high’ pressure for one fracturing application and according to one [person of ordinary skill in the art] may be *not* ‘high’ enough in another fracturing application and to another [such person].” *Id.* ¶ 18; *see also id.* ¶ 19 (“Merely stating that a pump fractures a formation says little to nothing about whether that pump should be deemed ‘high pressure’ or ‘not high pressure.’”).

We have also reviewed the district court’s opinion in litigation between the parties, addressing substantially similar language as the limitations in proposed substitute claims 14 and 21 at issue here. *See* Ex. 1055⁸ (*U.S. Well Services, Inc. v. Halliburton Co.*, Case No. 6:21-cv-00367-ADA (W.D. Tex.), Dkt. No. 74 (Jan. 17, 2022), Memorandum in Support of Claim Construction Order). The district court construed claim 1 of U.S. Patent No. 9,410,410 B2 (“the ’410 patent”), a parent of the ’732 patent at issue here, which recites “electric pumps . . . 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.” *Id.* at 6–7; Ex. 1001, code (63); Ex. 1027, 7:18–28. The district court held the term “high pressure” is fatally indefinite. Ex. 1055, 8–18. Our determination that “high pressure” as used in proposed substitute claims 14 and 21 at issue here is indefinite is not inconsistent with the district court’s opinion.

We have further reviewed the Report and Recommendation of a U.S. Magistrate Judge in *U.S. Well Services, LLC v. TOPS Well Services*, Case No. 3:19-cv-00237, Dkt. No. 124, 2020 WL 9439469 (S.D. Tex. Sept. 18,

⁸ Petitioner’s Opposition mistakenly identifies this opinion as Exhibit 1010. *See* Mot. Opp. 4.

2020) (“*TOPS Well R&R*”). Patent Owner cites the *TOPS Well R&R* as “finding claim language with ‘high pressure’ is not indefinite.” Mot. Reply 7 (citing *TOPS Well R&R*, at *26). Petitioner responds that Patent Owner’s reliance on the *TOPS Well R&R* “is misplaced as the district [court] construed ‘high pressure’ to mean ‘15,000 psi or more,’ further in conflict with” testimony from Patent Owner’s witnesses Mr. Marscher and Mr. Schaaf as discussed above. Mot. Sur-reply 6–7 (citing *TOPS Well R&R*, at *24–26).

We conclude the *TOPS Well R&R* does not aid Patent Owner here, for at least three reasons. First, as Petitioner points out, it simply adds further uncertainty to the meaning of “high pressure” in the context of Patent Owner’s patents. Specifically, the *TOPS Well R&R*’s definition of “high pressure” (at least 15,000 psi) adds another conflicting data point to Mr. Marscher’s testimony (between 5,000 psi and 15,000 psi) and Mr. Schaaf’s testimony (between 8,000 psi and 12,000 psi), discussed above.

Second, the *TOPS Well R&R*’s definition was based almost solely on disclosure found in Patent Owner’s U.S. Patent No. 9,611,728 (“the ’728 patent”), as follows: “The pressure of the slurry can be increased up to around 15,000 psi by pump system 36” in order to be “pumped into the well bore 12 for fracturing the formation 14.” See *TOPS Well R&R*, at *24–26 (identifying the five patents at issue, and citing the ’728 patent’s disclosure at column 4, lines 42–56, as the key intrinsic evidence); IPR2021-01036, Ex. 1001, 4:42–56, Fig. 1. However, the ’732 patent at issue here derives from a different family branch of the ’410 patent than the ’728 patent at issue in the *TOPS Well R&R*. See Ex. 1001, code (63) (identifying the parent applications of the ’732 patent leading back to the ’410 patent);

IPR2021-01036, Ex. 1001, code (63) (identifying the '728 patent as a continuation-in-part of the '410 patent). Importantly, the disclosure in the '728 patent cited in the *TOPS Well* R&R is not found in the '732 patent.

Third, Patent Owner's reliance on the *TOPS Well* R&R is procedurally dubious. Patent Owner objected to the R&R before the District Court, on the basis that the R&R erred in construing "high pressure" to mean at least 15,000 psi. *See U.S. Well Services, LLC v. TOPS Well Services*, Case No. 3:19-cv-00237, Dkt. No. 127. The parties then settled the lawsuit, and jointly moved for the District Court to vacate the R&R. *See id.* at Dkt. Nos. 128–134. The Court accordingly vacated the R&R and dismissed Patent Owner's claims without prejudice. *See id.* at Dkt. No. 135 ("The Report and Recommendation and Order entered on September 18, 2020 (Dkt. 124) is VACATED."). Patent Owner's reliance in this proceeding on an R&R that Patent Owner previously argued was wrongly decided, and then moved successfully to vacate, is not very convincing absent further explanation, which is not provided. *See* Mot. Reply 7; Tr. 23:17–24:9, 31:10–22.

Concerning IPR2021-01316, as Patent Owner correctly points out, the Preliminary Guidance concluded Petitioner had not shown a reasonable likelihood that the term "high pressure" in the context of the '724 patent claims was indefinite. *See Halliburton v. U.S. Well Services*, IPR2021-01316, Paper 29 at 8–9. Later, as Petitioner correctly points out, the Final Written Decision held the term "high pressure" in the context of the '724 patent claims was indefinite, despite the Preliminary Guidance. *See Halliburton v. U.S. Well Services*, IPR2021-01316, Paper 44 at 63–71. Our analysis above in the context of the '732 patent at issue here is substantially

the same as our analysis in the Final Written Decision in IPR2021-01316 in the context of the '724 patent. *See id.*

Accordingly, for the foregoing reasons, we determine that the term “high pressure,” when “viewed in light of the specification and prosecution history,” fails to “inform those skilled in the art about the scope of the invention with reasonable certainty.” *See Nautilus*, 572 U.S. at 910. Thus, Petitioner has shown, by a preponderance of the evidence, that the proposed substitute claims are indefinite, and we accordingly deny the Motion to Amend.

2. *Obviousness of Proposed Substitute Claims 14–26*

We have already determined in Section IV.F.1 above that proposed substitute claims 14–26 are unpatentable based on indefiniteness. Therefore, we need not, and to conserve the Board’s resources we do not, reach Petitioner’s obviousness-based challenges to the proposed substitute claims.

V. SUMMARY OF CONCLUSIONS

We *grant* Patent Owner’s non-contingent request to cancel original claims 1–13 of the '732 patent, and we *deny* Patent Owner’s request to add proposed substitute claims 14–26 to the '732 patent.⁹ Thus, the result of this Decision is summarized by the following two tables.

⁹ 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

Claim(s)	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–13	103	Broussard, Dykstra ¹⁰		
1–8, 11–13	103	Broussard, Dykstra, Case ¹⁰		
1–13	103	Broussard, Krenek ¹⁰		
2	103	Broussard, Dykstra, StarTech ¹⁰		
2	103	Broussard, Dykstra, Case, StarTech ¹⁰		
2	103	Broussard, Krenek, StarTech ¹⁰		
Overall Outcome				

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	

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).

¹⁰ 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.

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 ’732 patent;

FURTHER ORDERED that Patent Owner’s Motion to Amend is *denied* as to the request to add proposed substitute claims 14–26 to the ’732 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.

IPR2022-00074
Patent 10,254,732 B2

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