UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT TRIAL AND APPEAL BOARD

HALLIBURTON ENERGY SERVICES, INC.
Petitioner

v.

U.S. WELL SERVICES, LLC

Patent Owner

Case No. IPR2021-01316
Patent No. 10,280,724

PETITIONER'S SUR-REPLY IN SUPPORT OF OPPOSITION TO PATENT OWNER'S CONTINGENT MOTION TO AMEND

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OTHER AUTHORITIES

IPR2021-01034, Paper 22 3

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LIST OF PETITIONER'S EXHIBITS

Ex.	Description
1001	U.S. Patent No. 10,280,724, Brandon N. Hinderliter, "Hydraulic Fracturing Equipment with Non-Hydraulic Power," filed on July 7, 2017 and issued on May 7, 2019 **(the "'724 Patent")**
1002	File History for U.S. Patent No. 10,280,724
1003	Declaration of Dr. Robert Durham
1004	U.S. Patent No. 9,140,110, Coli, et al., "Mobile, Modular, Electrically Powered System for Use in Fracturing Underground Formations Using Liquid Petroleum Gas," **("Coli")** filed on March 14, 2013 and issued on September 22, 2015
1005	U.S. Patent No. 8,789,601, Joel Broussard et al., "System for Pumping Hydraulic Fracturing Fluid Using Electric Pumps," **("Broussard")** filed on February 26, 2014 and issued on July 29, 2014
1006	U.S. Patent Publication No. 2016/0258267, Payne, et al., "Well Fracturing Systems with Electrical Motors and Methods of Use," **("Payne")** filed on March 3, 2016 and published on September 8, 2016
1007	John A. Camara, Electrical Engineering Reference Manual for the Electrical and Computer PE Exam, 6th ed. (Professional Publications, Inc.: 2002), ISBN: 1-888577-56-8 **("EE-Reference")**
1008	Comprehensive Power, Inc. of Marlborough, Mass., Technical Presentation, October 3, 2013 (available at: https://www.slideshare.net/jeffsable/comprehensive-power-introduction-oct2013?from_action=save) **("TaraTorq-1")**
1009	Comprehensive Power, Inc. of Marlborough, Mass., Technical Presentation, February 27, 2013 (available at: https://documents.pub/document/comprehensive-power-introduction-march-2013.html) **("TaraTorq-2")**

Ex.	Description
1010	National Electrical Manufacturer's Association Standard ANSI/NEMA MG-1, 2011 **("NEMA MG-1 Standard")**
1011	American Petroleum Institute Standard For Form-wound Squirrel-Cage Induction Motors – 500 Horsepower and Larger, E4, 2004 **("API-541 Standard")**
1012	IEEE Standard for Petroleum and Chemical Industry—Premium-Efficiency, Severe-Duty, Totally Enclosed Fan-Cooled (TEFC) Squirrel Cage Induction Motors—Up to and Including 370 kW (500 hp), 2009 **("IEEE-841 Standard")**
1013	December 3, 2021 email from the Board authorizing preliminary reply and sur-reply
1014	Services, Clean Fleet, U.S Well Services, http://uswellservices.com/services/ (last visited Nov. 15, 2021)
1015	U.S. Well Services Press Release (dated Apr. 15, 2021), available at: https://ir.uswellservices.com/news-events/press-releases/detail/53/u-swell-services-inc-files-suit-against-halliburton
1016	H.R. Rep. No. 112-98 (June 1, 2011)
1017	USWS's Disclosure of Extrinsic Evidence dated October 19, 2021
1018	*U.S. Well Services, LLC v. Tops Well Services, LLC*, No. 3:19-cv-237, Dkt. 90 (S.D. Tex. May 19, 2020) (USWS's Opposition to Motion for Summary Judgment of Invalidity Under 35 U.S.C. § 112)
1019	Transcript of Deposition of William Marscher (August 2, 2022)
1020	Transcript of Deposition of William Marscher (June 21, 2022), previously taken in IPR2021-01032 and IPR2021-01034
1021	Transcript of Deposition of William Marscher (July 22, 2022), previously taken in IPR2021-01066, IPR2021-01238, and IPR2021-01315

Ex.	Description
1022	Transcript of Deposition of Robert Schaaf (June 29, 2022), previously taken in IPR2021-01032, IPR2021-01034, IPR2021-01036, and IPR2021-01038
1023	Transcript of Deposition of Robert Schaaf (July 18, 2022), previously taken in IPR2021-01315 and IPR2021-01238
1024	Email from Taylor Evans, counsel for Patent Owner, regarding cross-use of Schaaf and Marscher transcripts from prior proceedings (July 19, 2022)
1025	*U.S. Well Services, Inc. v. Halliburton Co.*, Case No. 6:21-cv-00367-ADA, Dkt. No. 74, Memorandum in Support of Claim Construction Order (Jan. 17, 2022)
1026	U.S. Patent No. 6,808,303 to Gene Fisher, entitled "Ready Mix Batch Hauler System," filed on March 18, 2003 and issued on October 26, 2004 **("Fisher")**
1027	Second Declaration of Dr. Robert A. Durham Regarding U.S. Patent No. 10,280,724 (August 8, 2022)

In its Motion to Amend (Paper 18, "MTA") and Reply Brief (Paper 31, "Reply"), Patent Owner ("PO") has not offered any expert declaration addressing the Substitute Claims. With its Patent Owner Response (Paper 19), PO submitted a declaration from Mr. Marscher, but that declaration addressed only the original claims. Ex. 2015. The Substitute Claims of the '724 Patent (Ex. 1001) are indefinite, add new matter, and are unpatentable over the prior art.

I. THE AMENDED CLAIMS DO NOT COMPLY WITH RULE 42.121

As the Board preliminarily held regarding Substitute Claims 18-26, "the '487 application does not appear to disclose a plurality of transformers supplying power to a single blender as recited in proposed substitute claim 18." Paper 29 at 6. PO's expert, Mr. Marscher, admitted there was no written-description support for the claims as written. Opp. at 2; Ex. 1019 at 57:22-59:5, 66:11-69:22, 75:20-76:6. In its Reply, PO cites two portions from the specification. Reply at 2 (citing Ex. 1001 at 8:40-45 and 8:46-60). However, these simply disclose one transformer supplying two pieces of equipment (8:46-60) and two blenders supplied by two transformers (8:40-45). Ex. 1019 at 75:20-76:6. There is no support for a plurality of transformers supplying power to a single blender. Ex. 1027 ¶¶40-41.

II. SUBSTITUTE CLAIMS 18-34 ARE INDEFINITE

PO does not dispute that "high pressure" is a term of degree, does not cite any intrinsic evidence to understand the term, and does not attempt to explain the

inconsistency in its expert opinions. *See* Reply at 5. The "high pressure" term renders the Substitute Claims indefinite.

A. THE PROPOSED CONSTRUCTION IS INCORRECT

PO adopts the functional construction from the Preliminary Guidance, in which the Board stated, "we understand 'high pressure' as used in the proposed substitute claims to be pressure needed for the fluid that passes from the wellbore into the subterranean formation and to fracture the subterranean formation." Paper 29 at 9. This redundant construction injects a second copy of existing language into the claim. Substitute Claims 18, 27, and 34 already recite:

> electric pump … configured to pump fluid into a wellbore associated with the well at a **high pressure** so that the fluid passes from the wellbore into the subterranean formation and fractures the subterranean formation

The term "high pressure" must mean something more than the Board's functional construction, because the proposed construction renders separate elements in the existing claim language entirely superfluous. *Akzo Nobel Coatings, Inc. v. Dow Chem. Co.*, 811 F.3d 1334, 1340 (Fed. Cir. 2016) (finding that claim constructions rendering terms "entirely superfluous" are "disfavored" when the construction is already covered "by the surrounding claim language"); *see VirnetX Inc. v. Apple Inc.*, 792 F. App'x 796, 811 (Fed. Cir. 2019) (rejecting construction that does not modify the claim in "any meaningful way," when the proposed construction defined the term "entirely by the subsequent listed functions").

Under the proposed construction, there would be no need for the claim to specify that the pump be configured to pump fluid at "high pressure" (instead of any other level of pressure, such as "medium pressure" or simply "pressure"), because the remaining language in the claim already provides this requirement. The term "high" (in "high pressure") is not a nonce word and should be given meaning, independent from the fracturing and flowing through a formation. In the same proceeding from which PO has cited the Schaaf and Marscher testimony, PO has argued that *Coli* "recite[s] pumping fluid into a wellbore at ***medium pressure and a high rate*** or pumping pressurized fluid into a wellbore, but not at ***high pressure***." IPR2021-01034, Paper 22 at 11-12 (emphasis in original); *see* Ex. 1020, 1022 (Schaaf and Marscher transcripts, taken in IPR2021-01032). Thus, the "high pressure" term further limits the claims, and PO asserts it distinguishes prior art.

PO distinguishes prior art based on "high pressure" versus "medium pressure," because not all fracturing and flowing into a formation occurs at "high pressure." According to PO's expert Mr. Schaaf, whether fracturing takes place "depends on the formation you're fracturing. So if you're fracturing—some formations, especially shallower formations, they … don't have to go at high pressures." Ex. 1022 at 44:14-21; *see id.* at 137:3-21 ("[T]he Halliburton fleet … can fracture at high pressures where *Coli* can only fracture at medium pressures."); 139:15-139:23 (the "formation Coli was targeting for fracturing" was "for medium

pressures"). PO's other expert, Mr. Marscher, concurs because although *Coli* discloses "fracturing underground formations," it is not necessarily at high pressure "because there are underground formations that can be fractured without using high pressure." Ex. 1020 at 135:8-138:20. Thus, the Substitute Claims could have been written to simply require fracturing at "a pressure so that fluid passes," but instead were written to require "a high pressure so that fluid passes." The term "high pressure" should not be rendered "functionally meaningless." *See Becton, Dickinson & Co. v. Tyco Healthcare Group, LP*, 616 F.3d 1249, 1257 (claims "must be 'interpreted with an eye toward giving effect to all terms in the claim.'").

B. THE CONSTRUCTION DOES NOT RESOLVE INDEFINITENESS

The proposed construction does not cure indefiniteness, because whether a fluid enters and fractures a formation "depends on the fluid, the formation (e.g., if it is relatively shallow or deep, and what kind of rock is in the formation), and a large set of other operational parameters beyond just the 'pressure.'" Ex. 1027 ¶47. This testimony from Dr. Durham remains undisputed. Thus, the "proposed construction requires that an artisan make a separate infringement determination for every set of circumstances in which the [system] may be used, and when such determinations are likely to result in differing outcomes (sometimes infringing and sometimes not), that construction is likely to be indefinite." *See Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1255 (Fed. Cir. 2008).

C. THE INTRINSIC EVIDENCE DOES NOT RESOLVE INDEFINITENESS

The Preliminary Guidance and PO have not cited to any specific pressures (there are none) in the specification to further understand the "high pressure" term. Rather, the Preliminary Guidance points to functional language in the specification already expressly recited in the claim. Paper 29 at 9. The intrinsic record provides no objective baseline to enable a POSITA to differentiate fracturing at a "high pressure" from fracturing at "medium pressure" or plain "pressure." Ex. 1027 ¶¶49-50; Paper 27 (Opp. to MTA) at 7; *accord* IPR2021-01238, Paper 31 (Preliminary Guidance) at 7-8 (P.T.A.B. Aug. 22, 2022) (finding the phrase "readily movable" indefinite, because "it is unclear whether a 'readily moveable' transmission line (as claimed) would be different … from a transmission line that is just 'moveable'").

D. THE EXTRINSIC EVIDENCE DOES NOT RESOLVE INDEFINITENESS

The extrinsic evidence also does not cure the indefiniteness, because it does not show a widely accepted definition of "high pressure." As Dr. Durham further testified, "[m]erely stating that a pump fractures a formation says little to nothing about whether that pump should be deemed 'high pressure' or 'not high pressure.'" Ex. 1027 ¶47. This is confirmed in the testimony of PO's own two experts, as not even they can agree as to the pressure boundaries encompassed by "high pressure." *Compare* Ex. 1020 at 111:1-112:21 (Marscher providing 5,000-15,000 psi as exemplary "high pressure") *with* Ex. 1022 at 43:6-46:1 (Schaaf identifying 8,000 -

12,000 psi as "high pressure" and would not consider 5,000 psi to be high pressure); *see* Ex. 1022 (Schaaf) at 138:14-139:4 ("there's going to be differences of opinion on what [medium pressure] is," but "generally speaking, you're talking in the range of, probably, 4,000 to 8,000 psi"). Whereas Schaaf would consider 5,000-8,000 psi to be "medium pressure" and not "high pressure," Marscher would consider 5,000 psi to 8,000 psi to be "high pressure." Ex. 1022 at 43:6-46:1, 138:14-139:4; Ex. 1020 at 111:1-112:21.

Though PO's experts contradict one another on the range of "high pressure," the Preliminary Guidance seemed to average the two ranges—the "testimony indicates that such an artisan would consider 10,000 to be a typical value for a 'high pressure' fracturing fluid used to fracture subterranean formations." Paper 31 at 9. The fact that PO's experts can identify a pressure and label it (without any intrinsic support) as "high pressure" does not provide certainty as to the metes and bounds of the claims. Indeed, the focus of an indefiniteness inquiry is the boundaries of the claim—how far the claim extends. *See Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901-902 (2014) ("boundaries should be clear"); *Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1371 (Fed. Cir. 2000) (requiring "objective boundaries" and that the claim term be translated "into meaningfully precise claim scope").

Moreover, the two ranges conjured by PO's experts, 5,000-15,000 psi

(Marscher) and 8,000-12,000 psi (Schaaf), are not even definitional. Had the high-pressure "phrase been cast as a definition instead of an example—if the phrase had been preceded by 'i.e.' instead of 'e.g.'—then it would help provide the clarity that the specification lacks." *Interval Licensing*, 766 F.3d at 1373-74. Here, the disparate pressure ranges are not even examples from the '724 Patent specification, as the specification does not disclose any values for the "pressure," let alone describe which of those unspecified values would be considered "high." Ex. 1027 ¶50. The term is "entirely subjective and user-defined" and thus indefinite. *Intellectual Ventures I LLC v. T-Mobile USA, Inc.*, 902 F.3d 1372, 1381 (Fed. Cir. 2018).

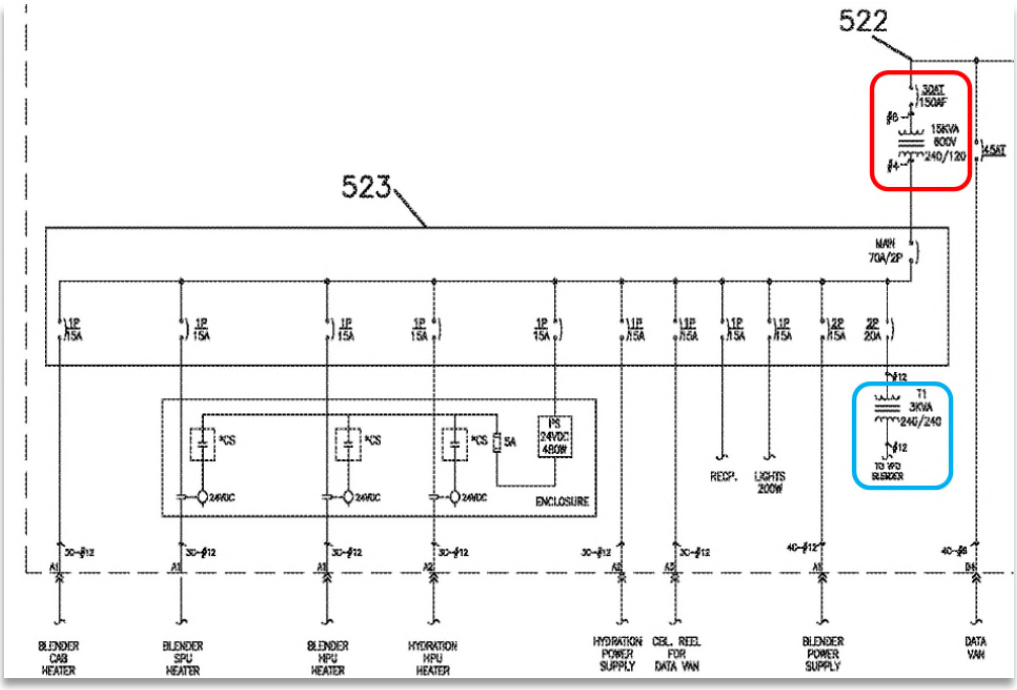
III. OBVIOUSNESS OF CLAIMS 18-26

Petitioner presented evidence for why Claims 18-21 and 23-26 would have been obvious over *Coli* in view of *Payne* (Ground 5), and why Claims 21 and 22 would have been obvious over *Coli/Payne* in view of *Broussard* (Ground 8). Opp. at 8-17. The Board preliminarily held that Claims 18-26 would not have been obvious because *Payne* "does not show a plurality of transformers supplying power at a stepped-down voltage to one blender." Paper 29 at 12-13 (Claim 18). *Payne* discloses at least three transformers supplying stepped-down power to a single blender (only two are required by the Substitute Claims).

A. TRANSFORMER 522 AND TRANSFORMER T1

The Board acknowledged that "the transformer identified by Petitioner with

the red box (*see* Opp. 10), which connects directly to connection point 522" is one transformer that supplies power to a blender. Paper 29 at 12; *see* Ex. 1027 ¶62.



Id. Fig. 4 (extracted and annotated). There are two transformers (identified in red box and blue box) that are in series with one another. The Board then noted that there is no second transformer supplying power to "BLENDER POWER SUPPLY" in *Payne*. Paper 29 at 12 (annotating above figure to label "blender power supply line" at the bottom, second from the right). But as Dr. Durham explained after reviewing all of *Payne* to provide context—in unrebutted testimony—the transformer (annotated in blue) is labeled "TO VFD BLENDER." Though the Board expressed difficulty reading Figure 4 of *Payne* in view of the grainy text, it is readily apparent that transformer T1 is labeled "TO … BLENDER." PO admits in its brief that Petitioner read the figure correctly: "the second transformer is connected to a

blender VFD." Paper 31 (Reply) at 7.

Thus, the VFD ("TO VFD BLENDER") is a component of the blender unit that supplies other components of the blender. As Dr. Durham explained, and PO's experts did not address, the "plurality of transformers (identified in red box and blue box above) step down the voltage from 800 VAC to 240VAC for delivery to the VFD Blender." Ex. 1027 ¶62. PO has not introduced any testimony or other evidence to the contrary.

B. OTHER TRANSFORMERS SUPPLYING THE BLENDER

In addition to the two transformers discussed in the above subsection, viewing Figure 2A and Figure 4 of *Payne* makes it even clearer that *Payne* discloses two transformers supplying a blender. *See* Ex. 1027 ¶63. Figure 2A shows a generator bus (switchgear 200a, annotated in red) and "two blender/hydration transformer units 300i, 300j" (annotated in blue). Ex. 1006 ¶[0044]. The blender transformer unit 300 is located on a trailer and is "configured to change the input voltage to a lower output voltage." *Id.* ¶¶[0043]-[0044]. Transformer unit 300i supplies electrical power to blender 500a (annotated in green). Ex. 1006 ¶[0044], Fig. 2a.

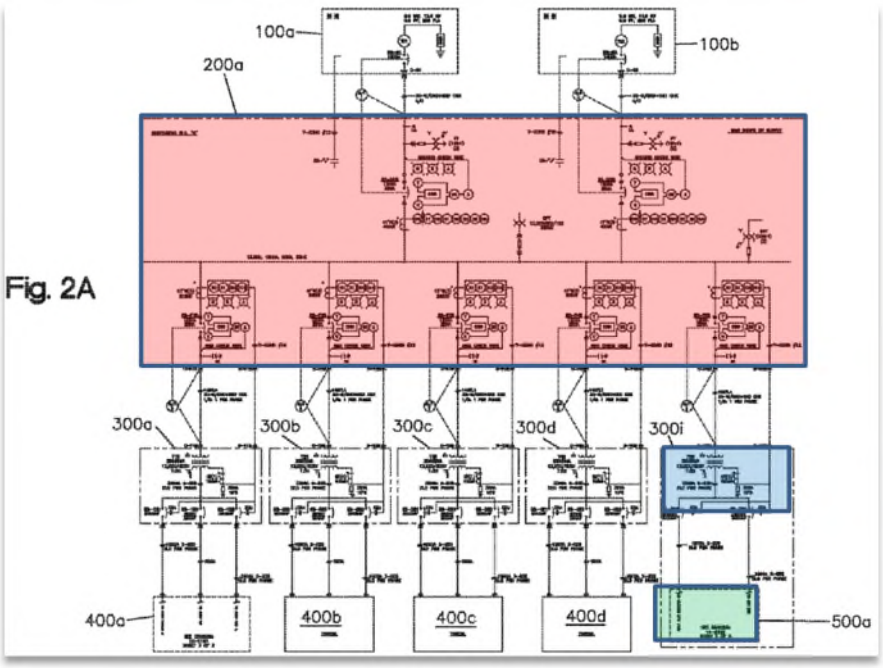
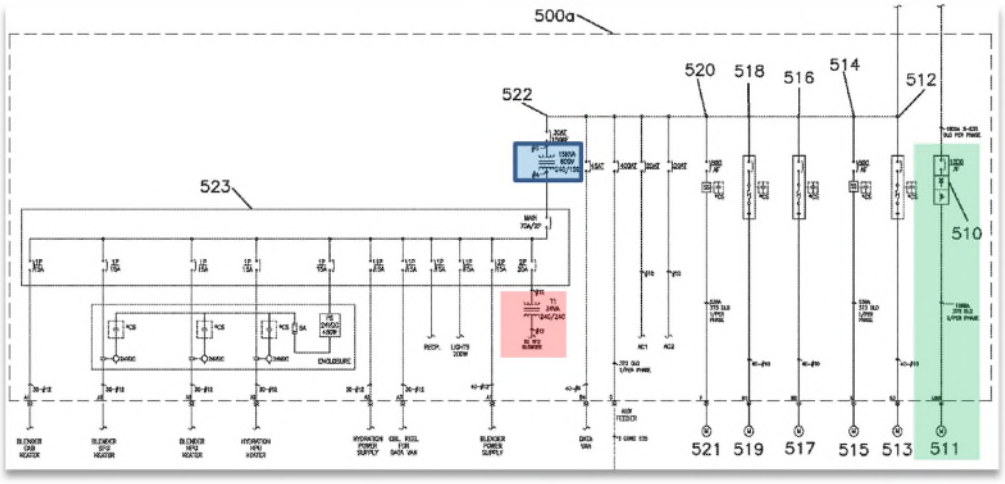


Figure 4 (annotated below) is an electrical one-line drawing for a blender unit. Ex. 1006 ¶[0023]. Figure 4 shows two connections to electric power, with electric power delivery through the 15kVA transformer (annotated blue) and to the "blender power supply" and then through T1 (annotated red) to "VFD Blender."



Ex. 1006 Fig. 4. The other electrical connection feeds "blender unit including a slurry power unit VFD 510 for operating a blurry power unit motor 511 (annotated

in green)." *Id.* ¶[0049]. Also fed from the electric power supply above the 15 kVA transformer are various motors on the blender, including motors 513-521. *Id.* Accordingly, the blender unit in Payne is fed by at least 3 transformers.

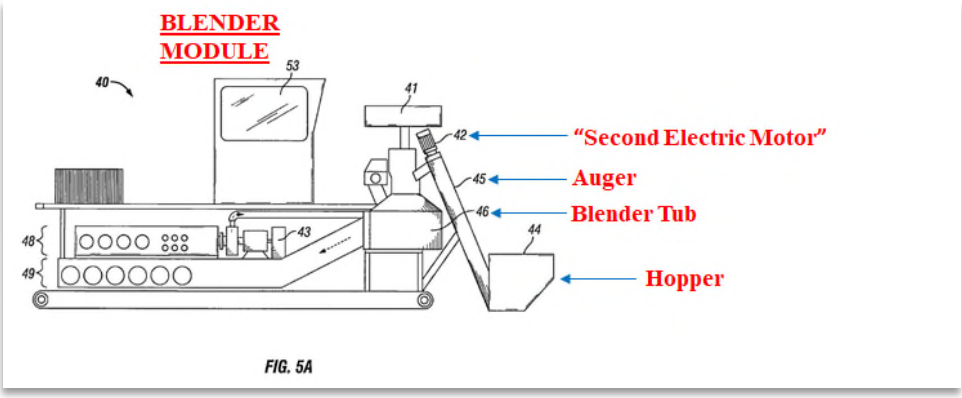
IV. OBVIOUSNESS OF CLAIM 34

The Board preliminarily held that Claim 34 would not have been obvious (Claim 5) because, "[a]s explained above regarding proposed substitute claim 18, Petitioner does not explain persuasively how Payne discloses or suggests a plurality of transformers supplying power to a blender." Paper 29 at 16. In the above section, Petitioner further explained how *Payne* discloses a plurality of transformers supplying a single blender. PO argues that *Payne* "does not explain how the transformer units are equated to a secondary power source." Reply at 7. Though neither the term "secondary power source" nor the acronym for it (SPS) is used in the'724 Patent, PO's expert agreed a transformer is an exemplary secondary power source. Ex. 1019 at 98:1-100:14; *see* 89:3-17; Ex. 1027 ¶¶44, 68-69.

V. OBVIOUSNESS OF CLAIMS 27-33

Petitioner presented evidence for why Claims 27-29 and 31-33 would have been obvious over *Coli* (Ground 6) and over *Coli* in view of *Fisher* (Ground 7), and why Claims 29-30 would have been further obvious over *Broussard* (Ground 9). In preliminarily finding the claims not obvious, the Board stated that "Coli's hopper 44a is a passive blender element that is not described as being driven or actuated by

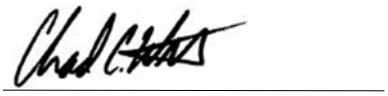
electrical power" and "not driven by any power source" and is instead "a passive, stationary blender element." Paper 29 at 14. Dr. Durham explained, in unrebutted testimony, that *Coli* teaches an "electric powered blender module" and "each piece of critical equipment" is driven by "a dedicated electric motor." The hopper is one such piece of critical equipment. Ex. 1004 at 10:8-59; Ex. 1027 ¶¶79-82. As seen in annotated Fig. 5A, the hopper 44 would have needed to be raised and lowered so as to not drag along the road when being transported to and from fracturing sites—much like the blade on the front of a bulldozer must be raised before driving.



Ex. 1027 ¶80.

The Board also suggested that *Fisher* is not "analogous art." Paper 29 at 15. *Fisher* discloses a truck-mounted system using electric-powered augers and hoppers to deliver sand to a blender unit, where the blender mixes sand and chemicals with water. Ex. 1026 at 4:26-33, 5:29-39; Ex. 1027 ¶89. This is reasonably pertinent to the '711 Patent, which addresses powering "blenders and chemical pumps, with a non-hydraulic power source." Ex. 1001 at 2:28-30; *see* 11:25-28.

Date: November 1, 2022



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CERTIFICATE OF SERVICE

The undersigned hereby certifies on this 1st day of November 2022, a true and correct copy of the foregoing **PETITIONER'S SUR-REPLY IN SUPPORT OF OPPOSITION TO PATENT OWNER'S CONTINGENT MOTION TO AMEND** were served on Patent Owner via electronic mail to:

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