

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LIBERTY ENERGY INC. AND LIBERTY ENERGY SERVICES LLC
Petitioners,

v.

U.S. WELL SERVICES, LLC
Patent Owner.

Case No. IPR2025-00066
Patent 10,598,258

**PETITIONERS' REPLY TO
PATENT OWNER'S PRELIMINARY RESPONSE**

UPDATED EXHIBIT LIST

Exhibit No.	Description
1001	U.S. Patent No. 10,598,258 to Oehring <i>et al.</i> entitled “Multi-plunger Pumps and Associated Drive Systems” (the “‘258 Patent”)
1002	File History for U.S. Patent No. 10,598,258
1003	Declaration of Dr. Robert Durham
1004	U.S. Patent Publication No. 2020/0256429 to Buckley, “Electric Drive Pump for Well Stimulation,” (“ <i>Buckley</i> ”) filed September 25, 2018 and published August 13, 2020.
1005	U.S. Provisional Application No. 62/562,943 to Buckley <i>et al.</i> , “Electric Drive Pump for Well Stimulation,” (“ <i>Buckley Provisional</i> ”) filed September 25, 2017.
1006	U.S. Patent Publication No. 2015/0361736 to Bergan <i>et al.</i> , “Heave Compensation Winches,” (“ <i>Bergan</i> ”), filed June 13, 2014 and published December 17, 2015.
1007	United States Patent No. 4,100,822 to Rosman, “Drive System for a Moving Mechanism,” (“ <i>Rosman</i> ”) filed April 19, 1976 and granted July 18, 1978.
1008	U.S. Patent Publication No. 2016/0258267 to Payne <i>et al.</i> , “Well Fracturing Systems with Electrical Motors and Methods of Use” (“ <i>Payne</i> ”), filed March 3, 2016 and published September 8, 2016.
1009	Chinese Publication No. CN103742382A to Yi, “Fracturing Pump Transmission System and Fracturing Truck,” (“ <i>Yi</i> ”), filed December 30, 2013 and published April 23, 2014.
1010	Certified English Translation of <i>Yi</i> and Translator’s Declaration
1011	Merriam-Webster Online Dictionary, “Pinion,” captured by the Internet Archive on August 17, 2017, available at < https://web.archive.org/web/20170817030125/https://www.merriam-webster.com/dictionary/pinion >.
1012	D. T. Jelaska, “ <i>Gears and Gear Drives</i> ,” John Wiley & Sons, 2012.

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1013	Tutterow, V. and McKane, A. T., “Variable Speed Pumping: A Guide to Successful Applications,” Europump and Hydraulic Institute, 2004.
1014	Nesbitt, B., “Handbook of Pumps and Pumping: Pumping Manual International,” Elsevier, 2006.
1015	Camara, John A., “Electrical Engineering Reference Manual for the Electrical and Computer PE Exam,” 6 th ed. (Professional Publications, Inc. 2002), ISBN: 1-888577-56-8.
1016	Gardner Denver GD-2500 Quintuplex Well Servicing Pump Operating and Service Manual, captured by the Internet Archive on Sept. 17, 2005, available at https://web.archive.org/web/20120917102614/http://www.quinceoilfield.com/pdf/3.0%20Gardner%20Denver/2500/GD2500Q%20Op%20&%20Service%20Manual.pdf .
1017	Morton, M., “Unlocking the Earth: A Short History of Hydraulic Fracturing,” GEO ExPro, Vol. 10, No. 6, December 2013 (https://geoexpro.com/unlocking-the-earth-a-short-history-of-hydraulic-fracturing/) (last accessed September 16, 2024).
1018	Merriam-Webster Online Dictionary, “Quintuple,” captured by the Internet Archive on February 2, 2017, available at https://web.archive.org/web/20170202121725/https://www.merriam-webster.com/dictionary/quintuple .
1019	Mark’s Standard Handbook for Mechanical Engineers, Eleventh Edition, McGraw-Hill Companies, New York, 2007.
1020	Langewis, Jr., C. and Gleeson, C. W., “Practical Hydraulics of Positive Displacement Pumps for High-Pressure Waterflood Installations,” Society of Petroleum Engineers, February 1971.
1021	Lewis, M. J. T., “Gearing in the ancient world,” Pergamon Press Ltd. 1993.
1022	Mabie, H. H., Reinholz, C. F., “Mechanics and Dynamics of Machinery,” (4 th Ed., 1987), John Wiley & Sons.
1023	Pawar, P. V. and Kulkarni, P. R., “Design of two stage planetary gear train for high reduction ratio,” <i>International Journal of</i>

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	<i>Research in Engineering and Technology</i> , vol. 4, no. 6, pp. 150-157, June 2015.
1024	Fink, Donald G., STANDARD HANDBOOK FOR ELECTRICAL ENGINEERS, 13 th ed. (McGraw-Hill, New York: 1993), ISBN: 0-07-020984-7.
1025	U.S. Patent Publication No. 2011/0241590 to Horikoshi et al., entitled “Motor Driving Apparatus Having Fault Diagnostic Function” (filed Feb. 11, 2011 and published Oct. 6, 2011).
1026	Roethemeyer, Dale E., Yankaskas, David R., “Evolution of Motor and Variable Frequency Drive Technology,” in <i>ACEEE Summer Study Proceedings on Energy Efficiency in Industry</i> , 1995, pp. 541-552.
1027	U.S. Patent No. 3,186,222 to Martin, “Well Signaling System,” filed July 28, 1960 and issued June 1, 1965.
1028	U.S. Patent No. 3,075,136 to Jones, “Variable Pulse Width Parallel Inverters,” filed August 31, 1961 and issued January 22, 1963.
1029	U.S. Patent No. 3,262,036 to Clarke et al, “Means for Smoothly Varying the Speed of a Star-Connected Polyphase Induction Motor,” filed September 19, 1962 and issued July 19, 1966.
1030	Shepherd, William and Stanway, Jack, “Unbalanced Voltage Control of 3-Phase Loads by the Triggering of Silicon Controlled Rectifiers,” <i>IEEE Transactions on Industry and General Applications</i> , no. 3, pp. 206-216, 1965.
1031	Hickok, H. N., "Adjustable Speed—A Tool for Saving Energy Losses in Pumps, Fans, Blowers, and Compressors," <i>IEEE Transactions on Industry Applications</i> , no. 1, pp. 124-136, 1985.
1032	DeWinter, Frank A. and Kedrosky, Brian J., “The Application of a 3500-hp Variable Frequency Drive for Pipeline Pump Control,” in <i>IEEE Transactions on Industry Applications</i> , Vol. 25, No. 6, 1019-1024 1989.
1033	Perrin, M., Kohn, G., Mugford, S., Seggewiss, G., “Induction Motors, Reciprocating Compressors and Variable Frequency Drives,” <i>Record of Conference Papers. IEEE Industry</i>

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	<i>Applications Society 44th Annual Petroleum and Chemical Industry Conference</i> , 15-17 Sept. 1997 1997, pp. 1-9, doi: 10.1109/PCICON.1997.648162.
1034	Lockley, B., Wood, B., Paes, R., DeWinter, F., “IEEE Std 1566 - The Need for a Large Adjustable Speed Drive Standard,” in <i>2006 Record of Conference Papers - IEEE Industry Applications Society 53rd Annual Petroleum and Chemical Industry Conference</i> , 11-15 Sept. 2006, pp. 1-10, doi: 10.1109/PCICON.2006.359687.
1035	Manz, L. B., "The motor designer's viewpoint of an adjustable speed drive specification," <i>IEEE Industry Applications Magazine</i> , vol. 1, no. 1, pp. 16-21, 1995.
1036	Baseer, M., “Electric Machines and Adjustable Speed Drives,” in University of Bradford Electric and Telecommunications Research Seminar Series, 8 th Workshop Proceedings, April 1, 2009, 131-134.
1037	Declaration of Sylvia Hall-Ellis, Ph.D.
1038	Plaintiff’s Motion for Leave to File the Second Amended Complaint, <i>U.S. Well Services, LLC et al. v. Liberty Energy, Inc. et al.</i> , No. 4:24-cv-00839 (S.D. Tex. September 19, 2024)
1039	Claim Listing for Claims of ’258 Patent
1040	<i>Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation</i> (June 21, 2022)
1041	Federal Court Management Statistics (June 30, 2024), <i>available at</i> https://www.uscourts.gov/sites/default/files/data_tables/fcms_na_appprofile0630.2024.pdf
1042	File History for U.S. Patent No. 11,959,533
1043	Wells, B.A., Wells, K.L, “Shooters – A “Fracking” History,” American Oil & Gas Historical Society, https://aoghs.org/technology/hydraulic-fracturing , last updated March 7, 2024.

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1044	Montgomery, Carl T., Smith, Michael B., “Hydraulic Fracturing, a History of an Enduring Technology,” <i>Journal of Petroleum Technology</i> 62 (12), December 2010.
1045	Bourgoyne, Adam T. Jr., et al., “Applied Drilling Engineering,” <i>Society of Petroleum Engineering Textbook Series, Volume 2</i> , 1986.
1046	Vasilliou, Marius S., “Historical Dictionary of the Petroleum Industry,” Second Edition, Rowman & Littlefield, 2018.
1047	U.S. Patent Publication No. 2013/0306322 to Sanborn et al., entitled “System and Process for Extracing Oil and Gas by Hydraulic Fracturing” (filed Dec. 7, 2012 and published Nov. 21, 2013).
1048	U.S. Patent Publication No. 2012/0255734 to Coli et al., entitled “Mobile, Modular, Electrically Powered System for Use in Fracturing Underground Formations” (filed April 6, 2012 and published Oct. 11, 2012).
1049	U.S. Patent No. 9,410,410 to Broussard et al., entitled “System for Pumping Hydraulic Fracturing Fluid using Electric Pumps” (filed Nov. 16, 2012 and issued Aug. 9, 2016)
1050	Johns, Cort MacLean, “Industrial Revolutions: From Ctesibius to Mars,” ABC Book Center, 2021.
1051	Defendants’ Motion to Stay Pending <i>Inter Partes</i> Review, <i>U.S. Well Services, LLC et al. v. Liberty Energy, Inc. et al.</i> , No. 4:24-cv-00839 (S.D. Tex. March 19, 2025)
1052	Email from Case Manager to Counsel regarding Claim Construction Hearing in <i>U.S. Well Services, LLC et al. v. Liberty Energy, Inc. et al.</i> , No. 4:24-cv-00839 (S.D. Tex. February 12, 2025)
1053	Federal Court Management Statistics (December 31, 2024), available at < https://www.uscourts.gov/sites/default/files/2025-02/fcms_na_distprofile1231.2024.pdf >

Exhibit No.	Description
1054	Plaintiff’s Opening Claim Construction Brief, <i>U.S. Well Services, LLC et al. v. Liberty Energy, Inc. et al.</i> , No. 4:24-cv-00839 (S.D. Tex. February 13, 2025)
1055	Exhibit A to Plaintiff’s Opening Claim Construction Brief, Declaration of Michael R. Chambers, Sr., <i>U.S. Well Services, LLC et al. v. Liberty Energy, Inc. et al.</i> , No. 4:24-cv-00839 (S.D. Tex. February 13, 2025)
1056	<i>Guidance on USPTO’s Recission of “Interim Procedure for Discretionary Denials in AIA Post-Grand Proceedings with Parallel District Court Litigation”</i> (March 24, 2025)

As authorized in a March 14, 2025, email from the Board, Petitioners file this reply to Patent Owner's Preliminary Response ("POPR"). The *Fintiv* factors strongly favor institution, and the Petition's prior art grounds are unique and involve new, non-cumulative obviousness theories that will not be addressed in the parallel district court litigation. Further, one of PO's primary arguments—that a POSITA as defined in the Petition would not have the requisite skill to combine the prior art references or to select gear ratios in the way specified in the claims—is plainly inconsistent with PO's positions made during claim construction briefing in the parallel district court litigation and therefore should carry little weight.

I. THE *FINTIV* FACTORS FAVOR INSTITUTION

Factor 1: While Petitioners have moved for a stay (*see* EX1051), the Board has declined to speculate whether the district court would grant a stay. The absence of a stay is, at most, neutral. *See, e.g., HP Inc. v. Slingshot Printing LLC*, IPR2020-01084, Paper 13, 9 (PTAB Jan. 14, 2021).

Factor 2: The schedule in parallel district court litigation is slipping. The Markman hearing originally scheduled for February 20, 2025, has been taken off the calendar, and subsequent case deadlines are keyed off the Markman Ruling. EX1052; EX2006, p.3. The amount the case will be delayed remains unclear, and the current trial date will likely change.

Moreover, current time-to-trial statistics place the parallel trial in November 2026, over five months *after* the expected date for a Final Written Decision. EX1053, p.36 (indicating 32-month median time to trial in the Southern District of Texas); EX1056, 3 (stating median time-to-trial statistics bear on the proximity of the trial date when applying *Fintiv*). Thus, *Fintiv* factor 2 favors institution.

Factor 3: Petitioners diligently and promptly filed the Petition less than four months after it received PO's infringement contentions on July 18, 2024. EX2006. The Board has recognized that "it is often reasonable for a petitioner to wait to file its petition until it learns which claims are being asserted against it in the parallel proceeding." *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 15, 11 (PTAB May 13, 2020). Further, the Board has credited petitioners for filing petitions as many as four months after receiving infringement contentions. *See, e.g., Corning v. Dali Wireless*, IPR2021-00762, Paper 8, 9-10 (PTAB Oct. 31, 2021).

Similarly, Petitioners filed the Petition within a month of serving initial invalidity contentions in the parallel district court litigation (served on the September 19, 2024 deadline). EX2019, p.34; *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12, 17 (PTAB Dec. 1, 2020) (finding petition filing within two months of invalidity contentions weighed in favor of denying institution).

And the district court has invested minimal effort on invalidity issues. No Markman hearing has been held, and fact discovery does not close until at least July

10, 2025. EX2006. No significant rulings have been made on invalidity or prior art issues. The Board consistently finds that *Fintiv* factor 3 weighs against discretionary denial in similar settings. *Kia Corp. et al., v. Emerging Automotive LLC*, IPR2024-01167, Paper 14, 16-17 (PTAB Jan. 27, 2025) (determining that factor 3 weighs against discretionary denial with Markman hearing upcoming and fact discovery still open); *Samsung Electronics Co., LTD. et al., v. Harbor Island Dynamic, LLC*, IPR2024-01405, Paper 9, 35-36 (PTAB Mar. 24, 2025) (same). Petitioners' diligence in filing the Petition and the district court's minimal investment tip this factor in favor of institution.

Factor 4: Petitioners stipulate that, if the Board institutes IPR in this proceeding on the grounds presented in the Petition, Petitioners will not pursue an invalidity defense in the district court action (C.A. No. 4:24-cv-00839) that the patent claims subject to the instituted IPR are invalid based on the grounds that were raised or any grounds Petitioners reasonably could have raised in the IPR. Thus, *Fintiv* factor 4 weighs "strongly in favor" of not exercising discretion to deny institution. *See Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12, 18-19 (PTAB Dec. 1, 2020) (precedential as to § II.A); EX1056, 2-3 (stating that a *Sotera* stipulation is "highly relevant" to the *Fintiv* analysis).

Factor 5: Petitioners do not dispute that this factor weighs in favor of discretionary denial because it is the Defendant in the parallel district court litigation.

Factor 6: The strength of the Petition strongly favors institution. For Grounds 1A-9A, PO attempts to argue that certain portions of *Buckley* are not supported by *Buckley Provisional*, such that the Petition is not entitled to rely upon those portions of *Buckley* because *Buckley* is not entitled to *Buckley Provisional*'s priority date. POPR, 12-24. This argument points to disclosures from *Buckley* that include additional details that are not explicitly recited in *Buckley Provisional* but are also not relied upon in the Petition. For example, PO argues that the Petition's reliance on Figures 2 and 9 of *Buckley*, and related disclosures in the specification, are not supported by *Buckley Provisional* because *Buckley Provisional* does not disclose the planetary gearbox depicted by Figures 2 and 9 of *Buckley*. *Id.*, 16-20. However, the Petition merely relies on these disclosures from *Buckley* for their teachings regarding the use of multiple motors to power a multi-plunger pump, which are supported by *Buckley Provisional*, rather than any teachings of a particular gearing system. *See* Petition, 23-29. Thus, the subject matter of *Buckley* that is actually relied upon in the Petition is adequately supported by *Buckley Provisional*, and *Buckley* is entitled to *Buckley Provisional*'s priority date.

Further, PO argues that a POSITA would not be able to combine *Buckley* or *Yi* with *Bergan* based in part on the alleged complexity of gearing design. POPR, 25-59. As shown below, this argument is directly contradicted by positions taken in PO's district court claim construction briefing. Moreover, PO does not substantively

address *Yi*'s teachings as relied upon in Grounds 1B-9B. PO's argument regarding *Yi*'s combination with *Bergan* relies on an "assum[ption] that *Yi*'s system works the same as *Buckley* without specifying the gearing system." POPR, 41-42 (internal citations omitted). This assumption is baseless, as *Yi* provides no indication that such an assumption is warranted, nor does PO provide any support for this assumption.

Accordingly, the Petition presents compelling evidence of unpatentability.

II. PO'S ARGUMENTS IN THE PARALLEL LITIGATION DIRECTLY CONTRADICT ITS POPR POSITIONS

PO spends a significant portion of its POPR arguing that the Petition fails to provide a sufficient reason to combine *Bergan*'s planetary gear system with the pumping systems of *Buckley* and *Yi* because "[t]he POSITA as defined by Petitioner's [sic] expert Dr. Durham does not possess the level of skill needed for making such a combination." *See* POPR, 25-37. PO also states that such a POSITA would not have been "able to select gear ratios and motor speeds in the way specified in the claims." *Id.*, 26-27. PO's arguments largely rely on the purported complexities of gearing design, stating that such design "requires a person with specialized engineering experience." *Id.*, 29-37. But in district court claim construction briefing PO advanced several positions that directly contradict these arguments.

First, in the district court PO offers the exact same definition of a POSITA as offered in the Petition:

Plaintiffs propose that the POSITA would have either (1) a Bachelor of Science in Mechanical Engineering, Electrical Engineering, Petroleum Engineering or an equivalent field and 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.

EX1054, 3 (citing the declaration of Michael R. Chambers, Sr., plaintiff's expert, in support of this definition). This definition is *identical* to the definition offered in the Petition and criticized by PO as lacking the skill sufficient to make the prior art combinations or to select gear ratios and motor speeds in the way specified in the claims. Petition, 11-12 (citing EX1003 (Declaration of Robert Durham)); POPR, 26-27. PO's use of this definition in its claim construction briefing seriously undermines PO's attack in its POPR of the very same definition and explains why PO does not offer a definition of a POSITA in the POPR.

Apparently sensing this tension, PO in a footnote attempts to justify its use of this definition in claim construction briefing because, as alleged in the POPR, "a POSITA having the 258 Patent would understood [sic] the terms used in the claims and would have been able to make and use the claimed invention without difficulty, given the detailed disclosure in the specification." POPR, 37 fn. 10. The '258 Patent, however, provides little detail regarding its planetary gearing configuration: outside

of depicting “an exploded schematic view” of “an embodiment of a planetary gear train” in Figure 1, the ’258 Patent dedicates just 12 lines of the specification to describing the planetary gear train, and even that bare description simply explains how the component gears are connected to each other. *See* EX1001, 7:4-5, 7:14-25. Similarly, the ’258 Patent explains in conclusory fashion that “the gear ratios of the planetary drive along with the electric motor-rated speeds may be chosen to limit the maximum pump speed, so as to not exceed the plunger critical speed.” *Id.*, 5:66-6:2. These scant descriptions hardly support the suggestion that the subject matter of the ’258 Patent is so complex that only specialized engineers can understand it. Moreover, for the “selection of a gear ratio” claim limitation, PO proposes a plain and ordinary meaning construction, arguing that the term is “readily understandable;” and to support this position PO’s claim construction expert solely points to the same scant and conclusory paragraph in the specification referenced above. EX1054, 16; EX1055, ¶ 68 (quoting EX1001, 5:64-6:18).

In its POPR, PO also questions the scope of education received by one with a “Bachelor of Science in Mechanical Engineering, Electrical Engineering, Petroleum Engineering or an equivalent field,” arguing that persons with electrical engineering or petroleum engineering degrees “would have received minimal (if any) mechanical engineering education, much less enough to understand and design gear systems for industrial applications,” and persons with mechanical engineering degrees “may take

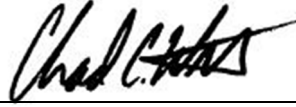
only one course where gear systems are taught, but for that course the discussion of gears is less than 15% of the total course.” POPR, 33-34. Yet in its claim construction briefing, PO argues that a POSITA—as identically defined in the Petition and PO’s opening claim construction brief—would be familiar with selection of gear ratios, and cites testimony from defendants’ expert, Dr. Hilbert, that “*you learn those in mechanical engineering.*” EX1054, 16 (emphasis original, internal citations omitted). This belies PO’s 12+ page POPR argument on the alleged complexity of the gear ratio claim limitations.

Finally, further highlighting the contradictory nature of PO’s arguments and lack of credibility behind its attacks, the education, experience, and qualification sections of neither the declarations of PO’s IPR expert (Dr. Nikolaou, a chemical engineer) nor of its district court expert (Mr. Chambers, a petroleum engineer) identify any formal education or experience with gearing systems. EX2024 ¶¶7-20; EX1055, ¶¶8-33. The word “gear” does not appear in either their qualifications sections or their CVs other than as an acronym of a grant received by Dr. Nikolaou regarding a “novel idea for treatment of persistent bacterial infections.” EX2023 (Nikolaou CV); EX1055, 78-90 (Chambers CV).

PO’s arguments concerning the purported complexity of the ’258 Patent claims and gearing design are contradicted by PO’s own positions in the parallel litigation and therefore should be given little weight.

Respectfully submitted,

BAKER BOTTS L.L.P.



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CERTIFICATE OF SERVICE

In accordance with 37 C.F.R. § 42.6(e), the undersigned certifies that on the 28th day of March 2025, a complete and entire copy of this **PETITIONERS' REPLY TO PATENT OWNER'S PRELIMINARY RESPONSE** and Exhibits 1051-1056 were served on Patent Owner via electronic mail at the following addresses:

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