UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/357,271	07/24/2023	Jared Oehring	USWEL-002003	5490

134020 7590 04/16/2024

Henry Patent Law Firm PLLC
8350 N. Central Expwy.
Suite 1750
Dallas, TX 75206

EXAMINER	
ANDREWS, DAVID L	

ART UNIT	PAPER NUMBER
3672	

NOTIFICATION DATE	DELIVERY MODE
04/16/2024	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket@henry.law

APPLICATION NO.	ISSUE DATE	PATENT NO.
18/357,271	16-Apr-2024	11959533

Henry Patent Law Firm PLLC
8350 N. Central Expwy.
Dallas, TX 75206

EGRANT NOTIFICATION

Your electronic patent grant (eGrant) is now available, which can be accessed via Patent Center at https://patentcenter.uspto.gov

The electronic patent grant is the official patent grant under 35 U.S.C. 153. For more information, please visit https://www.uspto.gov/electronicgrants

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/357,271	04/16/2024	11959533	USWEL-002003	5490

134020 7590 03/27/2024

Henry Patent Law Firm PLLC
8350 N. Central Expwy.
Suite 1750
Dallas, TX 75206

ISSUE NOTIFICATION

The projected patent number and issue date are specified above. The patent will issue electronically. The electronically issued patent is the official patent grant pursuant to 35 U.S.C. § 153. The patent may be accessed on or after the issue date through Patent Center at https://patentcenter.uspto.gov/. The patent will be available in both the public and the private sides of Patent Center. Further assistance in electronically accessing the patent, or about Patent Center, is available by calling the Patent Electronic Business Center at 1-888-217-9197.

The USPTO is implementing electronic patent issuance with a transition period, during which period the USPTO will mail a ceremonial paper copy of the electronic patent grant to the correspondence address of record. Additional copies of the patent (i.e., certified and presentation copies) may be ordered for a fee from the USPTO's Certified Copy Center at https://certifiedcopycenter.uspto.gov/index.html. The Certified Copy Center may be reached at (800)972-6382.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Center (https://patentcenter.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

INVENTOR(s) (Please see PATENT CENTER site https://patentcenter.uspto.gov for additional inventors):

Jared Oehring, Willow Park, TX;
Lon Robinson, Willow Park, TX;
Brandon N. Hinderliter, Willow Park, TX;
Alexander James Christinzio, Willow Park, TX;

APPLICANT(s) (Please see PATENT CENTER site https://patentcenter.uspto.gov for additional applicants):

U.S. Well Services Holdings, LLC, Willow Park, TX;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/357,271	07/24/2023	Jared Oehring	USWEL-002003	5490

134020 7590 03/08/2024

Henry Patent Law Firm PLLC
8350 N. Central Expwy.
Suite 1750
Dallas, TX 75206

EXAMINER	
ANDREWS, DAVID L	

ART UNIT	PAPER NUMBER
3672	

NOTIFICATION DATE	DELIVERY MODE
03/08/2024	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket@henry.law

Response to Rule 312 Communication	Application No.	Applicant(s)	
	18/357,271	Oehring et al.	
	Examiner	Art Unit	AIA (FITF) Status
	D Andrews	3672	Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

1. ☑ The amendment filed on 28 February 2024 under 37 CFR 1.312 has been considered, and has been:

a) ☐ entered.

b) ☑ entered as directed to matters of form not affecting the scope of the invention.

c) ☐ disapproved because the amendment was filed after the payment of the issue fee.

Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.

d) ☐ disapproved. See explanation below.

e) ☐ entered in part. See explanation below.

f) ☐ not entered because the supplemental or corrected Application Data sheet (ADS)

☐ was not accompanied by a petition to accept an unintentionally delayed claim under 37 CFR 1.55 or 27 CFR 1.78;

☐ did not identify the information being changed in accordance with 37 CFR 1.76(c)(2);

☐ was not properly signed in accordance with 37 CFR 1.76(e) (or 37 CFR 1.33(b) for applications filed prior to September 16, 2012).

/D. ANDREWS/
Primary Examiner, Art Unit 3672

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	U.S. Well Services Holdings, LLC	Art Unit	:	3672
Serial No.	:	18/357,271	Examiner	:	Andrews, David L
Filed	:	July 24, 2023	Conf. No.	:	5490
Title	:	BELT DRIVEN PEDAL CYCLE EMPLOYING A SLIM PROTECTIVE BELT DRIVE COVER			

MAIL STOP ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUBMISSION PURSUANT TO 37 C.F.R. 1.312

The following amendment is submitted after the Notice of Allowance having a mailing date of December 26, 2023 ("Notice of Allowance"), with or before payment of any issue fee.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	31	4265266		1981-05-05	KIERBOW, et al.	
	32	4432064		1984-02-14	BARKER, et al.	
	33	4442665		1984-04-17	FICK, et al.	
	34	4456092		1984-06-26	KUBOZUKA, et al.	
	35	4506982		1985-03-26	SMITHERS, et al.	
	36	4512387		1985-04-23	RODRIGUEZ, et al.	
	37	4529887		1985-07-16	JOHNSON	
	38	4538916		1985-09-03	ZIMMERMAN	
	39	4676063		1987-06-30	GOEBEL, et al.	
	40	4759674		1988-07-26	SCHRÖDER, et al.	
	41	4783038		1988-11-08	Gilbert et al.	

Change(s) applied to document,
/M.D./
EFS Web 2.1.18
1/18/2024

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/357,271	**03/01/2024 11:37:08 AM Z ET**	**USWEL-002003**

Title of Invention

Multi-Plunger Pumps and Associated Drive Systems

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5490	FILED BY	Ramie Childress
PATENT CENTER #	64516282	FILING DATE	07/24/2023
CUSTOMER #	134020	FIRST NAMED INVENTOR	Jared Oehring
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Sam Udovich

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
Issue Fee_USWEL-002003.pdf	1	Issue Fee Payment (PTO-85B)	184 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
Issue Fee_USWEL-002003.pdf	243A308546C990BE2F191ECC052504105C018B00B591B273B D6CAFF58B518AC710BD78DD810C7C23BE4F3894766DD2CE5 363E3EDE3BE76DBDE3DA427F07AA750

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES
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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/357,271	**03/01/2024 11:37:08 AM Z ET**	**USWEL-002003**

Title of Invention

Multi-Plunger Pumps and Associated Drive Systems

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5490	FILED BY	Ramie Childress
PATENT CENTER #	64516282	AUTHORIZED BY	Sam Udovich
CUSTOMER #	134020	FILING DATE	07/24/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Jared Oehring

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 6047	**E202431B38469652**	**Ramie Childress**

PRE-AUTHORIZED ACCOUNT	PRE-AUTHORIZED CATEGORY
506816	**37 CFR 1.16 (National application filing, search, and examination fees); 37 CFR 1.17 (Patent application and reexamination processing fees); 37 CFR 1.19 (Document supply fees); 37 CFR 1.20 (Post Issuance fees); 37 CFR 1.21 (Miscellaneous fees and charges)**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1501	UTILITY ISSUE FEE	1200.00	1	1200.00
			TOTAL AMOUNT:	**$1,200.00**

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement

Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

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New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via the USPTO patent electronic filing system.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications. **Because electronic patent issuance may occur shortly after issue fee payment, any desired continuing application should preferably be filed prior to payment of this issue fee in order not to jeopardize copendency.**

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

134020 7590 12/26/2023
Henry Patent Law Firm PLLC
8350 N. Central Expwy.
Suite 1750
Dallas, TX 75206

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via the USPTO patent electronic filing system or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/357,271	07/24/2023	Jared Oehring	USWEL-002003	5490

TITLE OF INVENTION: Multi-Plunger Pumps and Associated Drive Systems

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	03/26/2024

EXAMINER	ART UNIT	CLASS-SUBCLASS
ANDREWS, DAVID L	3672	417-410100

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Henry Patent Law Firm PLLC
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: U.S. Well Services Holdings, LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Willow Park, Texas

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☑ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☑ Issue Fee ☐ Publication Fee (if required)

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

☑ Electronic Payment via the USPTO patent electronic filing system ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 506816

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

☐ Applicant asserting small entity status. See 37 CFR 1.27

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

☐ Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Samuel A. Udovich/ Date March 1, 2024

Typed or printed name Samuel A. Udovich Registration No. 59,951

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
18/357,271	07/24/2023	Jared Oehring	USWEL-002003

CONFIRMATION NO. 5490

134020
Henry Patent Law Firm PLLC
8350 N. Central Expwy.
Suite 1750
Dallas, TX 75206

POA ACCEPTANCE LETTER

OC000000068991555

Date Mailed: 02/29/2024

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 02/23/2024.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/atesfai/

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
18/357,271	07/24/2023	3672	3300	USWEL-002003	30	4

CONFIRMATION NO. 5490

REPLACEMENT FILING RECEIPT

134020
Henry Patent Law Firm PLLC
8350 N. Central Expwy.
Suite 1750
Dallas, TX 75206

OC00000006899164?

Date Mailed: 02/29/2024

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Jared Oehring, Willow Park, TX;
Lon Robinson, Willow Park, TX;
Brandon N. Hinderliter, Willow Park, TX;
Alexander James Christinzio, Willow Park, TX;

Applicant(s)

U.S. Well Services Holdings, LLC, Willow Park, TX;

Assignment For Published Patent Application

U.S. Well Services Holdings, LLC, Willow Park, TX

Power of Attorney: The patent practitioners associated with Customer Number 134020

Domestic Priority data as claimed by applicant

This application is a CON of 16/827,166 03/23/2020 ABN
which is a CON of 16/210,807 12/05/2018 PAT 10,598,258
which claims benefit of 62/594,912 12/05/2017

Foreign Applications for which priority is claimed (You may be eligible to benefit from the Patent Prosecution Highway program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 08/07/2023
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 18/357,271**
Projected Publication Date: 11/16/2023
Non-Publication Request: No
Early Publication Request: No
Title

Multi-Plunger Pumps and Associated Drive Systems

Preliminary Class

417

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/357,271	**02/28/2024 10:44:25 AM Z ET**	**USWEL-002003**

Title of Invention

Multi-Plunger Pumps and Associated Drive Systems

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5490	FILED BY	Ramie Childress
PATENT CENTER #	64476300	FILING DATE	07/24/2023
CUSTOMER #	134020	FIRST NAMED INVENTOR	Jared Oehring
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Sam Udovich

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
312 Amendment_USWEL-002003.pdf	7	Amendment after Notice of Allowance (Rule 312)	64 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
312 Amendment_USWEL-002003.pdf	FC612EB8E084D8A54740F867BA9B776C89D7EEF6D0E6C64F24D0A8BE20772A3D15DD1AC16C329CACC66712FF9235F7DD02717D289E90F129FB333F1D5F26457D

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If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	U.S. Well Services Holdings, LLC	Art Unit	:	3672
Serial No.	:	18/357,271	Examiner	:	Andrews, David L
Filed	:	July 24, 2023	Conf. No.	:	5490
Title	:	BELT DRIVEN PEDAL CYCLE EMPLOYING A SLIM PROTECTIVE BELT DRIVE COVER			

MAIL STOP ISSUE FEE
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SUBMISSION PURSUANT TO 37 C.F.R. 1.312

The following amendment is submitted after the Notice of Allowance having a mailing date of December 26, 2023 ("Notice of Allowance"), with or before payment of any issue fee.

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1-20. (Canceled)

21. (Previously Presented) A hydraulic fracturing system for fracturing a subterranean formation, the hydraulic fracturing system comprising:

a multi-plunger hydraulic fracturing pump configured to pump fluid to a wellbore associated with the subterranean formation, the multi-plunger hydraulic fracturing pump comprising a pump crankshaft;

a plurality of motors positioned to power the multi-plunger hydraulic fracturing pump; and

a planetary gear train positioned to translate power from the plurality of motors to the pump crankshaft of the multi-plunger hydraulic fracturing pump, the planetary gear train comprising:

a plurality of input pinion gears connected to the plurality of motors; and

a final drive gear connected to the pump crankshaft of the multi-plunger hydraulic fracturing pump by a plurality of arms extending from the final drive gear.

22. (Previously Presented) The hydraulic fracturing system of claim 21, wherein the plurality of motors comprises a plurality of electric motors, and each of the plurality of input pinion gears is connected to a respective one of the plurality of electric motors.

23. (Previously Presented) The hydraulic fracturing system of claim 21, wherein the multi-plunger hydraulic fracturing pump has three plungers.

24. (Previously Presented) The hydraulic fracturing system of claim 21, wherein the multi-plunger hydraulic fracturing pump has five plungers.

25. (Previously Presented) The hydraulic fracturing system of claim 21, wherein the multi-plunger hydraulic fracturing pump has seven plungers.

26. (Previously Presented) The hydraulic fracturing system of claim 21, wherein the multi-plunger hydraulic fracturing pump has nine plungers.

27. (Previously Presented) The hydraulic fracturing system of claim 21, further comprising a variable frequency drive (VFD) associated with the plurality of motors and configured to control a pump rotational speed of the multi-plunger hydraulic fracturing pump.

28. (Previously Presented) The hydraulic fracturing system of claim 21, wherein the planetary gear train comprises a main gear that contacts each of the plurality of input pinion gears, wherein the main gear comprises external gear teeth that mate with external gear teeth of the plurality of input pinion gears.

29. (Previously Presented) The hydraulic fracturing system of claim 28, wherein the planetary gear train comprises:

a sun gear connected to the main gear by a shaft extending from the main gear; and

a plurality of planetary gears that each contact the sun gear and the final drive gear, wherein each of the plurality of planetary gears comprises external gear teeth that mate with external gear teeth of the sun gear and with internal gear teeth of the final drive gear.

30. (Canceled)

31. (Previously Presented) A hydraulic fracturing method comprising:

by operation of a multi-plunger hydraulic fracturing pump of a hydraulic fracturing system, pumping fluid to a wellbore associated with a subterranean formation, the multiplunger hydraulic fracturing pump comprising a pump crankshaft;

powering the multi-plunger hydraulic fracturing pump with a plurality of motors; and

translating power from the plurality of motors to the multi-plunger hydraulic fracturing pump through a planetary gear train, wherein translating power through the planetary gear train comprises translating power through:

a plurality of input pinion gears that are driven by the plurality of motors; and

a final drive gear that drives the pump crankshaft, wherein the final drive gear is connected to the pump crankshaft by a plurality of arms extending from the final drive gear.

32. (Previously Presented) The hydraulic fracturing method of claim 31, wherein the plurality of motors comprises a plurality of electric motors, and each of the plurality of input pinion gears is driven by a respective one of the plurality of electric motors.

33. (Previously Presented) The hydraulic fracturing method of claim 31, wherein the multi-plunger hydraulic fracturing pump has three plungers.

34. (Previously Presented) The hydraulic fracturing method of claim 31, wherein the multi-plunger hydraulic fracturing pump has five plungers.

35. (Previously Presented) The hydraulic fracturing method of claim 31, wherein the multi-plunger hydraulic fracturing pump has seven plungers.

36. (Previously Presented) The hydraulic fracturing method of claim 31, wherein the multi-plunger hydraulic fracturing pump has nine plungers.

37. (Previously Presented) The hydraulic fracturing method of claim 31, comprising, by operation of a variable frequency drive (VFD), controlling a pump rotational speed of the multi-plunger hydraulic fracturing pump.

38. (Previously Presented) The hydraulic fracturing method of claim 31, wherein translating power through the planetary gear train comprises translating power through a main gear that contacts each of the plurality of input pinion gears, wherein the main gear comprises external gear teeth that mate with external gear teeth of the plurality of input pinion gears.

39. (Previously Presented) The hydraulic fracturing method of claim 38, wherein translating power through the planetary gear train comprises translating power through:

a sun gear connected to the main gear by a shaft extending from the main gear; and

a plurality of planetary gears that contact the sun gear and the final drive gear, wherein each of the plurality of planetary gears comprises external gear teeth that mate with external gear teeth of the sun gear and with internal gear teeth of the final drive gear.

40. (Previously Presented) The hydraulic fracturing method of claim 31, comprising limiting a maximum pump speed of the multi-plunger hydraulic fracturing pump, wherein

the maximum pump speed is limited by a selection of a gear ratio of the planetary gear train and a speed at which the plurality of motors operate.

41. (Previously Presented) The hydraulic fracturing method of claim 40, wherein the maximum pump speed correlates with a critical plunger speed of the multi-plunger hydraulic fracturing pump.

42. (Previously Presented) The hydraulic fracturing method of claim 40, wherein the maximum pump speed is 5% over a critical plunger speed of the multi-plunger hydraulic fracturing pump.

43. (Currently Amended) A hydraulic fracturing system for fracturing a subterranean formation, the hydraulic fracturing system comprising:

a plurality of electric motors;

a planetary gear train connected to the plurality of electric motors, the planetary gear train comprising:

a plurality of input pinion gears, each driven by a respective one of the plurality of electric motors;

a main gear driven by the plurality of input pinion gears, the main gear comprising external gear teeth that mate with external gear teeth of the plurality of input pinion gears;

a sun gear driven by the main gear and connected to the main gear by a shaft;

planetary gears driven by the sun gear, the planetary gears each comprising external gear teeth that mate with external gear teeth of the sun gear; and

a final drive gear driven by the planetary gears, the final drive gear comprising internal gear teeth that mate with the external gear teeth of the planetary gears; and

a multi-plunger hydraulic fracturing pump that pumps fluid to a wellbore and comprises a pump crankshaft that is driven by the final drive gear of the planetary gear train, the final drive gear connected to the pump crankshaft by a plurality of arms extending from the final drive gear.

44. (Previously Presented) The hydraulic fracturing system of claim 43, further comprising a variable frequency drive (VFD) associated with the plurality of motors and configured to control a pump rotational speed of the multi-plunger hydraulic fracturing pump.

45. (Previously Presented) The hydraulic fracturing system of claim 44, wherein the multi-plunger hydraulic fracturing pump comprises seven plungers.

46. (Previously Presented) The hydraulic fracturing system of claim 44, wherein the multi-plunger hydraulic fracturing pump comprises nine plungers.

47. – 50. (Canceled)

LIBERTY EXHIBIT 1002, Page 26

REMARKS

Claims 21-29 and 31-46 were allowed in the Notice of Allowance dated December 26, 2023 ("Notice of Allowance"). The present submission is made after the mailing of the Notice of Allowance, but before payment of any issue fee. Consideration and entry of the present amendment is respectfully requested under 37 C.F.R. 1.312.

Claim 43 is currently amended as set forth above. It is respectfully submitted that no new matter has been added to the Application by the present amendments.

No fees are believed to be due. However, the Director is hereby authorized to apply any necessary charges or credits to Deposit Account No. 506816, referencing Attorney Docket No. USWEL-002003.

Respectfully submitted,

Date: February 23, 2024

/Samuel A. Udovich/
Samuel A. Udovich
Reg. No. 59,951

CUSTOMER NUMBER 134020
Henry Patent Law Firm PLLC
8350 N. Central Expy.
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Dallas, Texas 75206
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Email: docket@henry.law

PTO/AIA/80 (07-17)
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I hereby appoint:

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OR

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Assignee name and address: U.S. Well Services Holdings, LLC
333 Shops Blvd, Suite 301
Willow Park, Texas 76087

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee.

Signature	Date 1/25/2024
Name Steven Scrogham	Telephone 224.515.6079
Title Corporate Secretary	

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
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Doc Code: R46C.REQ
Document Description: Request under 37 CFR 1.46(c) to correct, update or change the applicant.

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REQUEST TO CORRECT OR UPDATE THE NAME OF THE APPLICANT UNDER 37 CFR 1.46(c)(1), OR CHANGE THE APPLICANT UNDER 37 CFR 1.46(c)(2)
(FOR USE ONLY IN APPLICATIONS FILED ON OR AFTER SEPTEMBER 16, 2012)

Application Number	18/357,271
Filing Date	July 24, 2023
First Named Inventor	Jared Oehring
Art Unit	3672
Examiner Name	David L Andrews
Practitioner Docket Number	USWEL-002003

To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Applicant hereby **requests that the name of the applicant be corrected or updated under 37 CFR 1.46(c)(1), or that the applicant be changed under 37 CFR 1.46(c)(2),** in the above-identified application. **Requests under 37 CFR 1.46(c)(1) or (c)(2) cannot be submitted after payment of the issue fee or if the application has been patented.**

Please check the applicable box(es) below.

☐ 1. This request is to **correct or update the name of the applicant** (**under 37 CFR 1.46(c)(1)**) and includes:

☐ An application data sheet (ADS) in accordance with 37 CFR 1.76(c) with the corrected or updated information shown with markings (*e.g.*, underlining for insertions, strikethrough for deletions). A Corrected Web-based ADS may be used.

Note: Requests under 37 CFR 1.46(c)(1) may be filed to correct typographical errors in the name of the § 1.46 applicant, or for updating the name of the § 1.46 applicant (*i.e.*, where there is no change in the applicant itself but just in the applicant's name). See the Manual of Patent Examining Procedure (MPEP) section 605.01.

☒ 2. This request is to **change the applicant** (**under 37 CFR 1.46(c)(2)**) and includes:

☒ An application data sheet (ADS) in accordance with 37 CFR 1.76(c) that identifies the changes with proper markings (underlining for insertions and strikethrough for deletions). A Corrected Web-based ADS may be used.

☒ A Statement Under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent). See MPEP 325.

I am the

☐ applicant* ☒ attorney or agent of record Registration number 59,951 ☐ attorney or agent acting under 37 CFR 1.34 Registration number _____

Signature /Samuel A. Udovich/
Typed or printed name Samuel A. Udovich
Date February 23, 2024

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. *Juristic entities must be represented by a patent practitioner (See 37 CFR 1.31, applicable to any paper filed on or after September 16, 2012 that is presented on behalf of a juristic entity, regardless of application filing date). Submit multiple forms if more than one signature is required, see below**.

☒ ** Total of 3 forms are submitted.

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STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: U.S. Well Services Holdings, LLC

Application No./Patent No.: 18/357,271 Filed/Issue Date: July 24, 2023

Titled: Multi-Plunger Pumps and Associated Drive Systems

U.S. Well Services Holdings, LLC, a limited liability company

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

B. ☑ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Inventors Oehring, Robinson, Hinderliter, and Christinzio To: U.S. Well Services, Inc.

   The document was recorded in the United States Patent and Trademark Office at
   Reel 066262, Frame 0760, or for which a copy thereof is attached.

2. From: U.S. Well Services, Inc. To: U.S. Well Services Holdings, LLC

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This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450**.

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3. From: _____ To: _____

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4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☑ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Samuel A. Udovich/	February 23, 2024
Signature	Date
Samuel A. Udovich	59,951
Printed or Typed Name	Title or Registration Number

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	USWEL-002003
	Application Number	18/357,271
Title of Invention	Multi-Plunger Pumps and Associated Drive Systems	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Jared		Oehring	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Willow Park	State/Province	TX	Country of Residence	US

Mailing Address of Inventor:

Address 1	333 Shops Boulevard, Suite 301		
Address 2			
City	Willow Park	State/Province	TX
Postal Code	76087	Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Lon		Robinson	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Willow Park	State/Province	TX	Country of Residence	US

Mailing Address of Inventor:

Address 1	333 Shops Boulevard, Suite 301		
Address 2			
City	Willow Park	State/Province	TX
Postal Code	76087	Country	US

Inventor 3 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Brandon	N.	Hinderliter	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	USWEL-002003
	Application Number	18/357,271
Title of Invention	Multi-Plunger Pumps and Associated Drive Systems	

City	Willow Park	State/Province	TX	Country of Residence	US

Mailing Address of Inventor:

Address 1	333 Shops Boulevard, Suite 301		
Address 2			
City	Willow Park	State/Province	TX
Postal Code	76087	Country	US

Inventor 4 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Alexander	James	Christinzio	

Residence Information (Select One) (•) US Residency ( ) Non US Residency ( ) Active US Military Service

City	Willow Park	State/Province	TX	Country of Residence	US

Mailing Address of Inventor:

Address 1	333 Shops Boulevard, Suite 301		
Address 2			
City	Willow Park	State/Province	TX
Postal Code	76087	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	134020		
Email Address	docket@henry.law	Add Email	Remove Email

Application Information:

Title of the Invention	Multi-Plunger Pumps and Associated Drive Systems		
Attorney Docket Number	USWEL-002003	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	10	Suggested Figure for Publication (if any)	

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	USWEL-002003
	Application Number	18/357,271
Title of Invention	Multi-Plunger Pumps and Associated Drive Systems	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	134020		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	16/827166	2020-03-23

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	USWEL-002003
	Application Number	18/357,271
Title of Invention	Multi-Plunger Pumps and Associated Drive Systems	

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
16/827166	Continuation of	16/210807	2018-12-05	10598258	2020-03-24

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
16/210807	Claims benefit of provisional	62/594912	2017-12-05

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

			Remove
Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	USWEL-002003
	Application Number	18/357,271
Title of Invention	Multi-Plunger Pumps and Associated Drive Systems	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	USWEL-002003
	Application Number	18/357,271
Title of Invention	Multi-Plunger Pumps and Associated Drive Systems	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◉ Assignee	○ Legal Representative under 35 U.S.C. 117	○ Joint Inventor
○ Person to whom the inventor is obligated to assign.	○ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☑

Organization Name	~~U.S. Well Services, LLC~~ U.S. Well Services Holdings, LLC		
Mailing Address Information For Applicant:			
Address 1	333 Shops Boulevard, Suite 301		
Address 2			
City	Willow Park	**State/Province**	TX
Country	US	Postal Code	76087
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	USWEL-002003
	Application Number	18/357,271
Title of Invention	Multi-Plunger Pumps and Associated Drive Systems	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☑

Organization Name	~~U.S. Well Services, LLC~~ U.S. Well Services Holdings, LLC

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1	333 Shops Boulevard, Suite 301		
Address 2			
City	Willow Park	**State/Province**	TX
Country	US	Postal Code	76087
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Samuel A. Udovich/			Date (YYYY-MM-DD)	2024-02-23
First Name	Samuel	Last Name	Udovich	Registration Number	59,951

Additional Signature may be generated within this form by selecting the Add button.

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	USWEL-002003
	Application Number	18/357,271
Title of Invention	Multi-Plunger Pumps and Associated Drive Systems	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3 A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/357,271	**02/23/2024 01:00:11 PM Z ET**	**USWEL-002003**

Title of Invention

Multi-Plunger Pumps and Associated Drive Systems

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5490	FILED BY	Ramie Childress
PATENT CENTER #	64426402	FILING DATE	07/24/2023
CUSTOMER #	134020	FIRST NAMED INVENTOR	Jared Oehring
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Sam Udovich

Documents

TOTAL DOCUMENTS: 4

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
Request to Correct the Name of the Applicant_USWEL-002003.pdf	2	Request under 37CFR1.46(c) to correct, update, change applicant	179 KB
Corrected ADS_USWEL-002003.pdf	9	Application Data Sheet	298 KB
Warning: This is not a USPTO supplied ADS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.			
Statement 3.73_USWEL-002003.pdf	3	Assignee showing of ownership per 37 CFR 3.73	77 KB
USWEL_Holdings_POA.pdf	2	Power of Attorney	202 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
Request to Correct the Name of the Applicant_USWEL-002003.pdf	E63BD897FBAE701738C007CEBCD992E6A71FBDEDC248B717CFE02814CAE508C3E5D0511DF3FF4A1B7171BB3F5AC507CCFA0F9E2E60D0F1A304204C8AD78F6FE1
Corrected ADS_USWEL-002003.pdf	9E9CB178E847B6FE7F1E7AE7679BC3B5B1484B6A75C4E159AFE5FDBB0F08CF36AF830E334E5CFDED2991AC96D3A31EFE36ECBE536BF28D7693BAB6980751C7C7
Statement 3.73_USWEL-002003.pdf	00687503EE4FFC5B08662584B73192C1A6631672CA823063958C4C8D42F2399B1C05BDF36DD060894F320AEBE1E831C0A06454A80DD89D9D7E9982A2D7C66A8F
USWEL_Holdings_POA.pdf	5C4542AD241C3301CFBC0A9294A5353AB26680D66D72950D2193F0793CC39F912C7AABAC8C7205777AF45F0273447DC848ECCD9A0B360E872F70DF66AF244E76

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/357,271	07/24/2023	Jared Oehring	USWEL-002003	5490

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8350 N. Central Expwy.
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Dallas, TX 75206

EXAMINER	
ANDREWS, DAVID L	

ART UNIT	PAPER NUMBER
3672	

NOTIFICATION DATE	DELIVERY MODE
02/22/2024	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket@henry.law

Response to Rule 312 Communication	Application No. 18/357,271	Applicant(s)
	Examiner	Art Unit

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

1. ☒ The amendment filed on *09 February 2024* under 37 CFR 1.312 has been considered, and has been:

a) ☒ entered.

b) ☐ entered as directed to matters of form not affecting the scope of the invention.

c) ☐ disapproved because the amendment was filed after the payment of the issue fee.
Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.

d) ☐ disapproved. See explanation below.

e) ☐ entered in part. See explanation below.

Kimberly Payne

Publishing Division

REPLACEMENT SHEET

4/31

Plunger Critical Speed Calculations

Plunger Critical Speed= 32 in/sec (based on 120 rpm crankshaft speed on 8" stroke pump)

Plunger Maximum Speed= 40 in/sec (based on 150 rpm crankshaft speed on 8" stroke pump)

	Pump Stroke (in.)	Volume per rev. (BBL)				Crankshaft rpm		Discharge Rates, (BPM) at Critical Speed				Discharge Rates, (BPM) at Maximum Speed			
		Triplex	Quint	9 Plunger	13 Plunger	Critical	Maximum	Triplex	Quint	9 Plunger	13 Plunger	Triplex	Quint	9 Plunger	13 Plunger
2.75" Bore	8	0.01496	0.02449	0.04408	0.06367	120.00	150.00								
	9	0.01653	0.02755	0.04959	0.07163	106.67	133.33								
	10	0.01837	0.03061	0.05510	0.07959	96.00	120.00	1.76	2.94	5.29	7.64	2.20	3.67	6.61	9.55
	11	0.02020	0.03367	0.06061	0.08754	87.27	109.09								
	12	0.02204	0.03673	0.06612	0.09550	80.00	100.00								
	13	0.02388	0.03979	0.07163	0.10346	73.85	92.31								
3.0" Bore	8	0.01794	0.02914	0.05246	0.07577	120.00	150.00								
	9	0.01967	0.03279	0.05901	0.08524	106.67	133.33								
	10	0.02186	0.03643	0.06557	0.09471	96.00	120.00	2.10	3.50	6.29	9.09	2.62	4.37	7.87	11.37
	11	0.02404	0.04007	0.07213	0.10419	87.27	109.09								
	12	0.02623	0.04371	0.07869	0.11366	80.00	100.00								
	13	0.02841	0.04736	0.08524	0.12313	73.85	92.31								

TO FIG. 4B

FIG. 4A

FROM FIG. 4A

Plunger Critical Speed Calculations

Plunger Critical Speed= 32 in/sec (based on 120 rpm crankshaft speed on 8" stroke pump)
Plunger Maximum Speed= 40 in/sec (based on 150 rpm crankshaft speed on 8" stroke pump)

	Pump Stroke (in.)	Volume per rev, (BBL)				Crankshaft rpm		Discharge Rates, (BPM) at Critical Speed				Discharge Rates, (BPM) at Maximum Speed			
		Triplex	Quint	9 Plunger	13 Plunger	Critical	Maximum	Triplex	Quint	9 Plunger	13 Plunger	Triplex	Quint	9 Plunger	13 Plunger
3.25" Bore	8	0.02052	0.03420	0.06156	0.08839	120.00	150.00	2.46	4.10	7.39	10.67	3.08	5.13	9.23	13.34
	9	0.02309	0.03848	0.06926	0.10004	106.67	133.33								
	10	0.02565	0.04275	0.07696	0.11116	96.00	120.00								
	11	0.02822	0.04703	0.08465	0.12227	87.27	109.09								
	12	0.03078	0.05130	0.09235	0.13339	80.00	100.00								
	13	0.03335	0.05558	0.10004	0.14450	73.85	92.31								

	Pump Stroke (in.)	Volume per rev, (BBL)				Crankshaft rpm		Discharge Rates, (BPM) at Critical Speed				Discharge Rates, (BPM) at Maximum Speed			
		Triplex	Quint	9 Plunger	13 Plunger	Critical	Maximum	Triplex	Quint	9 Plunger	13 Plunger	Triplex	Quint	9 Plunger	13 Plunger
3.5" Bore	8	0.02380	0.03967	0.07140	0.10313	120.00	150.00	2.86	4.76	8.57	12.38	3.57	5.95	10.71	15.47
	9	0.02677	0.04462	0.08032	0.11602	106.67	133.33								
	10	0.02975	0.04958	0.08925	0.12892	96.00	120.00								
	11	0.03272	0.05454	0.09817	0.14181	87.27	109.09								
	12	0.03570	0.05950	0.10710	0.15470	80.00	100.00								
	13	0.03867	0.06446	0.11602	0.16759	73.85	92.31								

TO FIG. 4C

FIG. 4B

FROM FIG. 4B

Plunger Critical Speed Calculations

Plunger Critical Speed= 32 in/sec (based on 120 rpm crankshaft speed on 8" stroke pump)

Plunger Maximum Speed= 40 in/sec (based on 150 rpm crankshaft speed on 8" stroke pump)

	Pump Stroke (in.)	Volume per rev, (BBL)				Crankshaft rpm		Discharge Rates, (BPM) at Critical Speed				Discharge Rates, (BPM) at Maximum Speed			
		Triplex	Quint	9 Plunger	13 Plunger	Critical	Maximum	Triplex	Quint	9 Plunger	13 Plunger	Triplex	Quint	9 Plunger	13 Plunger
4.0" Bore	8	0.03109	0.05181	0.09326	0.13470	120.00	150.00	3.73	6.22	11.19	16.16	4.66	7.77	13.99	20.21
	9	0.03497	0.05829	0.10491	0.15154	106.67	133.33								
	10	0.03886	0.06476	0.11657	0.16838	96.00	120.00								
	11	0.04274	0.07124	0.12823	0.18522	87.27	109.09								
	12	0.04663	0.07771	0.13989	0.20206	80.00	100.00								
	13	0.05051	0.08419	0.15154	0.21889	73.85	92.31								

	Pump Stroke (in.)	Volume per rev, (BBL)				Crankshaft rpm		Discharge Rates, (BPM) at Critical Speed				Discharge Rates, (BPM) at Maximum Speed			
		Triplex	Quint	9 Plunger	13 Plunger	Critical	Maximum	Triplex	Quint	9 Plunger	13 Plunger	Triplex	Quint	9 Plunger	13 Plunger
4.5" Bore	8	0.03934	0.06557	0.11803	0.17049	120.00	150.00	4.72	7.87	14.16	20.46	5.90	9.84	17.70	25.57
	9	0.04426	0.07377	0.13278	0.19180	106.67	133.33								
	10	0.04918	0.08196	0.14754	0.21311	96.00	120.00								
	11	0.05410	0.09016	0.16229	0.23442	87.27	109.09								
	12	0.05901	0.09836	0.17704	0.25573	80.00	100.00								
	13	0.06393	0.10655	0.19180	0.27704	73.85	92.31								

TO FIG. 4D

FIG. 4C

REPLACEMENT SHEET
6/31

Attorney Docket No.: USWEL-002003

FROM FIG. 4C

Plunger Critical Speed Calculations

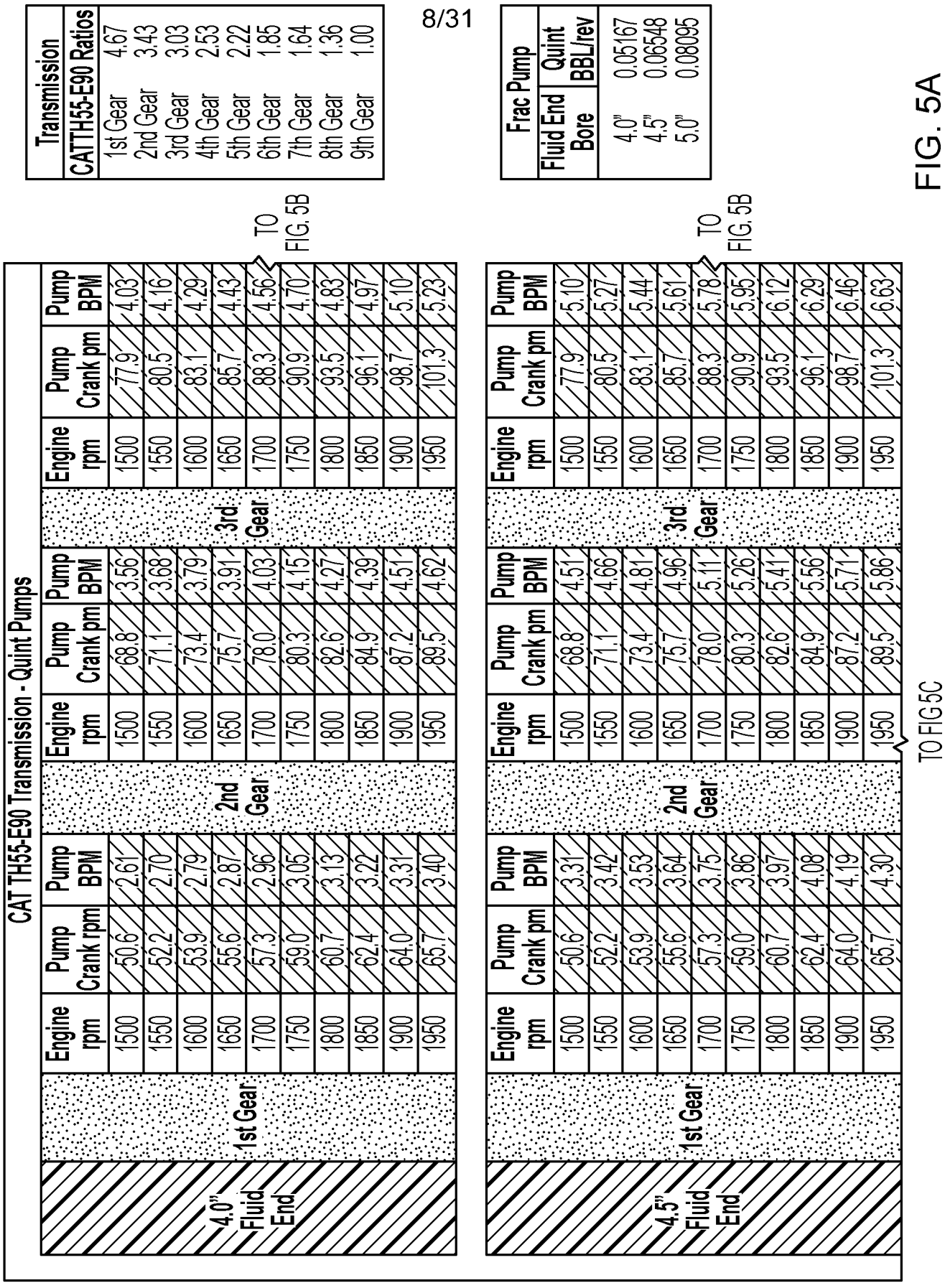
Plunger Critical Speed= 32 in/sec (based on 120 rpm crankshaft speed on 8" stroke pump)
Plunger Maximum Speed= 40 in/sec (based on 150 rpm crankshaft speed on 8" stroke pump)

	Pump Stroke (in.)	Volume per rev, (BBL)				Crankshaft rpm		Discharge Rates, (BPM) at Critical Speed				Discharge Rates, (BPM) at Maximum Speed			
		Triplex	Quint	9 Plunger	13 Plunger	Critical	Maximum	Triplex	Quint	9 Plunger	13 Plunger	Triplex	Quint	9 Plunger	13 Plunger
5.0" Bore	8	0.04857	0.08095	0.14571	0.21048	120.00	150.00	5.83	9.71	17.49	25.26	7.29	12.14	21.86	31.57
	9	0.05464	0.09107	0.16393	0.23678	106.67	133.33								
	10	0.06071	0.10119	0.18214	0.26309	96.00	120.00								
	11	0.06679	0.11131	0.20036	0.28940	87.27	109.09								
	12	0.07286	0.12143	0.21857	0.31571	80.00	100.00								
	13	0.07893	0.13155	0.19180	0.34202	73.85	92.31								

FIG. 4D

REPLACEMENT SHEET

8/31



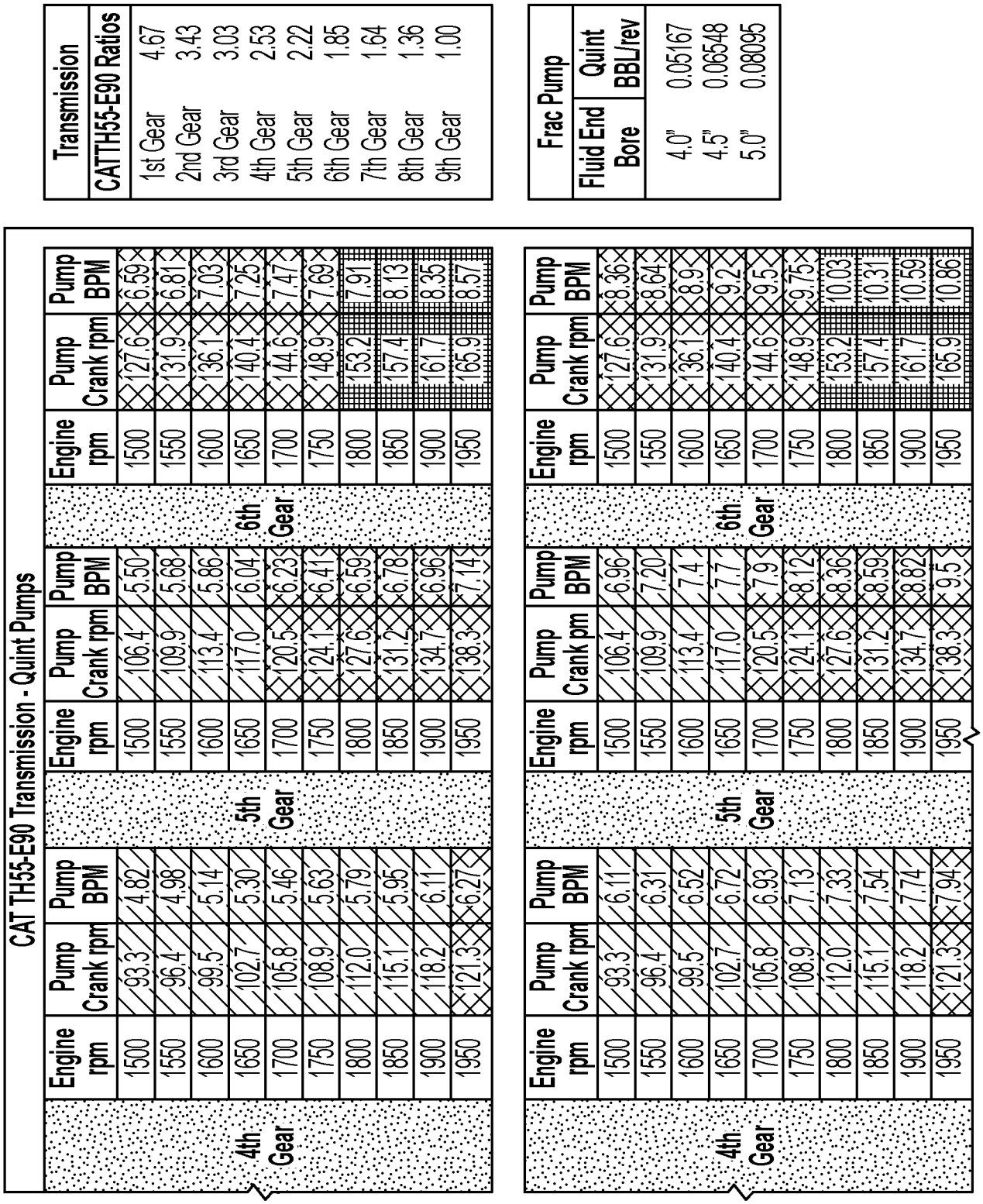
Transmission	
CATTH55-E90	Ratios
1st Gear	4.67
2nd Gear	3.43
3rd Gear	3.03
4th Gear	2.53
5th Gear	2.22
6th Gear	1.85
7th Gear	1.64
8th Gear	1.36
9th Gear	1.00

Frac Pump	
Fluid End Bore	Quint BBL/rev
4.0"	0.05167
4.5"	0.06548
5.0"	0.08095

FIG. 5A

REPLACEMENT SHEET

9/31



Transmission	
CATTH55-E90 Ratios	
1st Gear	4.67
2nd Gear	3.43
3rd Gear	3.03
4th Gear	2.53
5th Gear	2.22
6th Gear	1.85
7th Gear	1.64
8th Gear	1.36
9th Gear	1.00

Frac Pump	
Fluid End Bore	Quint BBL/rev
4.0"	0.05167
4.5"	0.06548
5.0"	0.08095

FIG. 5B

REPLACEMENT SHEET

10/31

Transmission	
CATTH55-E90 Ratios	
1st Gear	4.67
2nd Gear	3.43
3rd Gear	3.03
4th Gear	2.53
5th Gear	2.22
6th Gear	1.85
7th Gear	1.64
8th Gear	1.36
9th Gear	1.00

Frac Pump	
Fluid End Bore	Quint BBL/rev
4.0"	0.05167
4.5"	0.06548
5.0"	0.08095

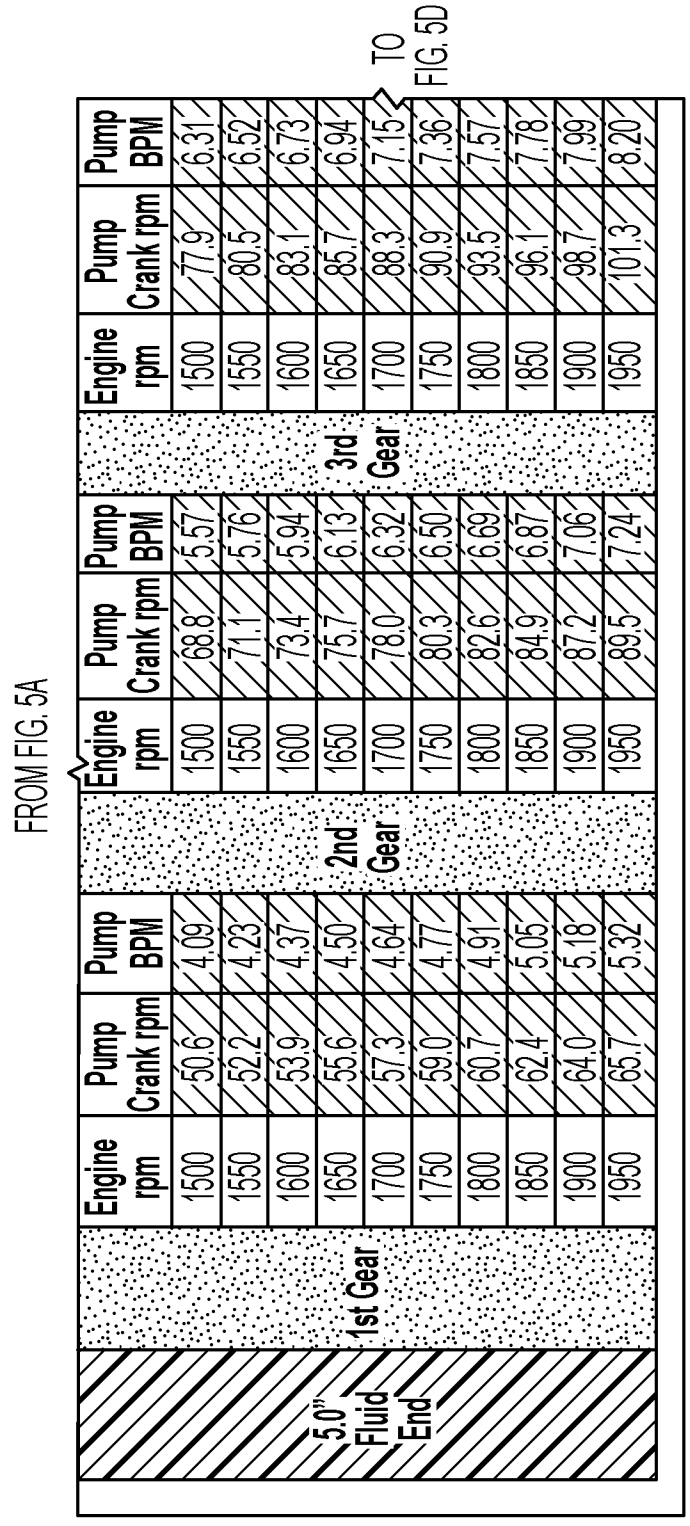


FIG. 5C

REPLACEMENT SHEET

11/31

Transmission	
CATTH55-E90 Ratios	
1st Gear	4.67
2nd Gear	3.43
3rd Gear	3.03
4th Gear	2.53
5th Gear	2.22
6th Gear	1.85
7th Gear	1.64
8th Gear	1.36
9th Gear	1.00

Frac Pump	
Fluid End Bore	Quint BBL/rev
4.0"	0.05167
4.5"	0.06548
5.0"	0.08095

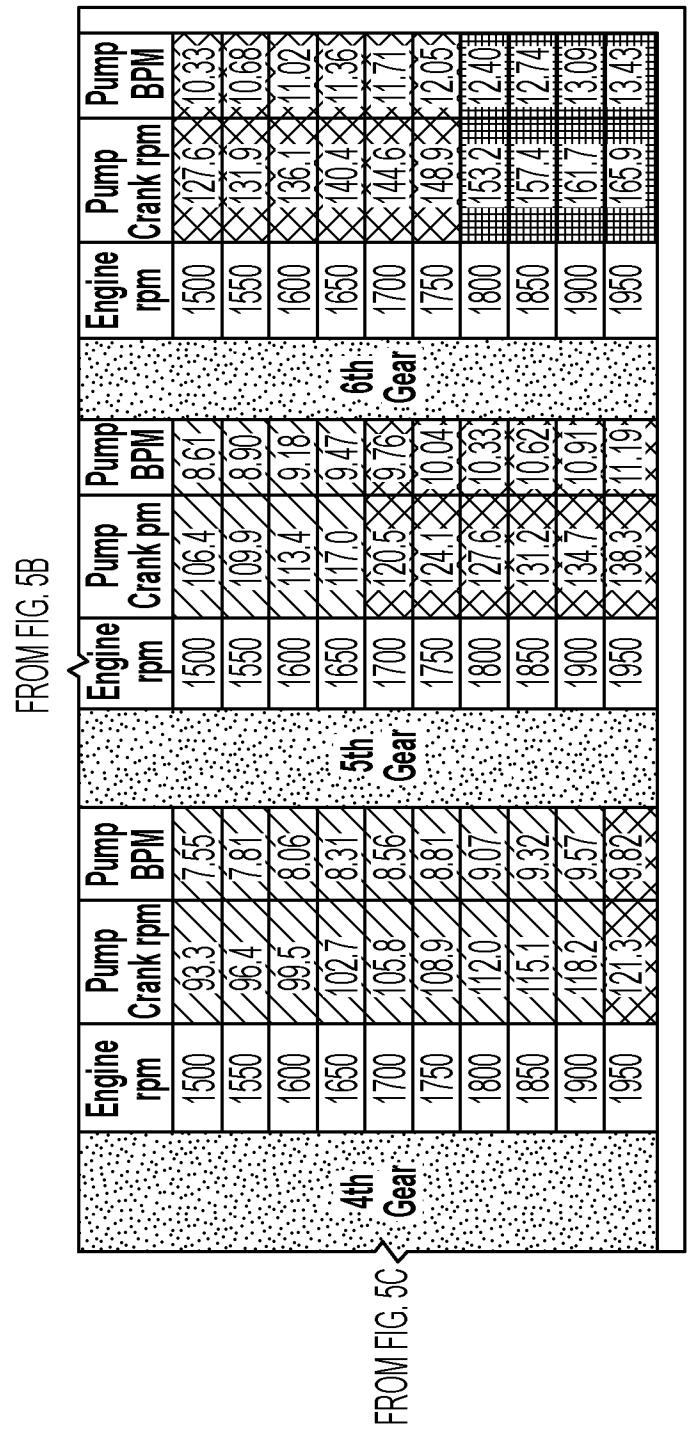


FIG. 5D

REPLACEMENT SHEET

12/31

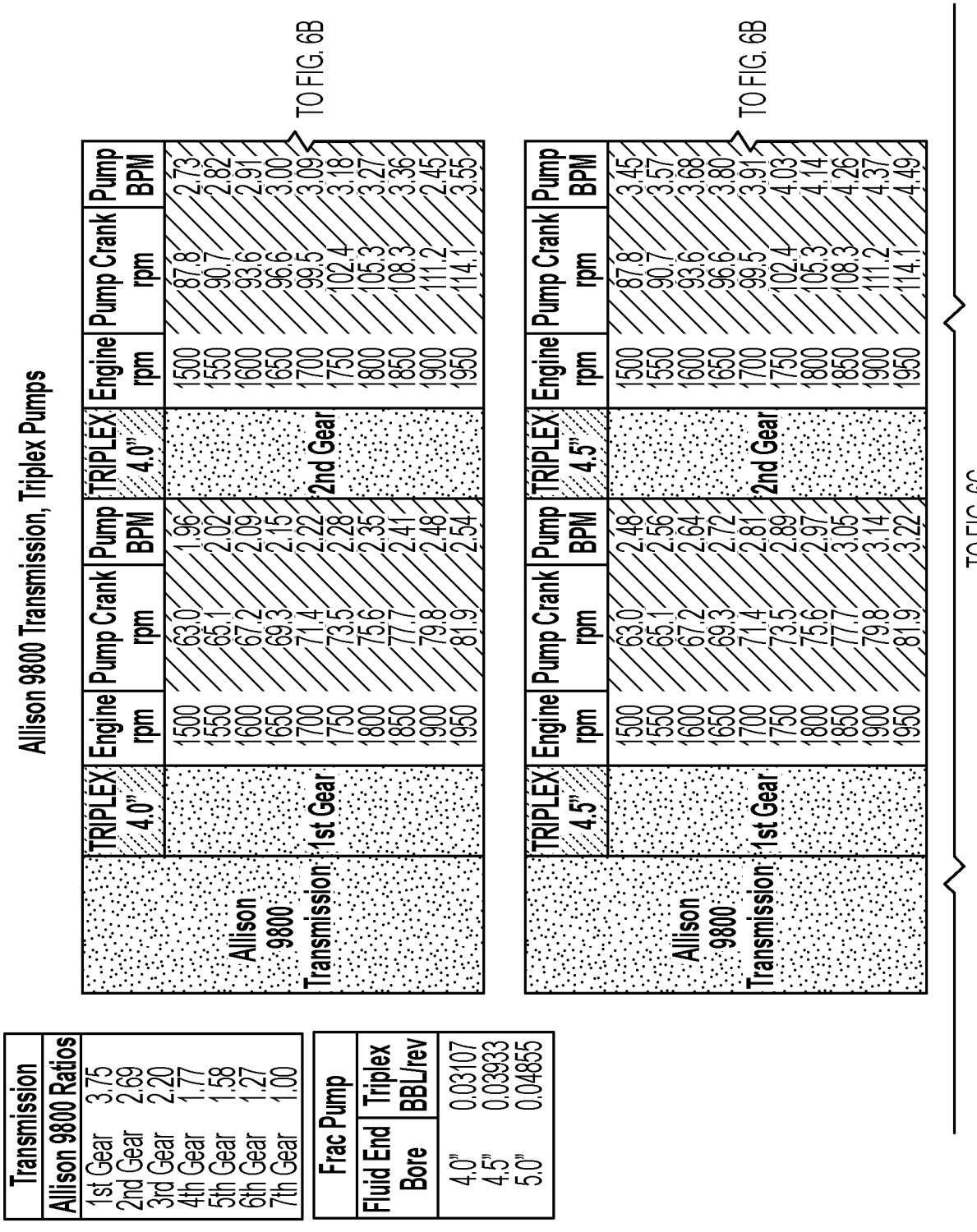


FIG. 6A

REPLACEMENT SHEET

13/31

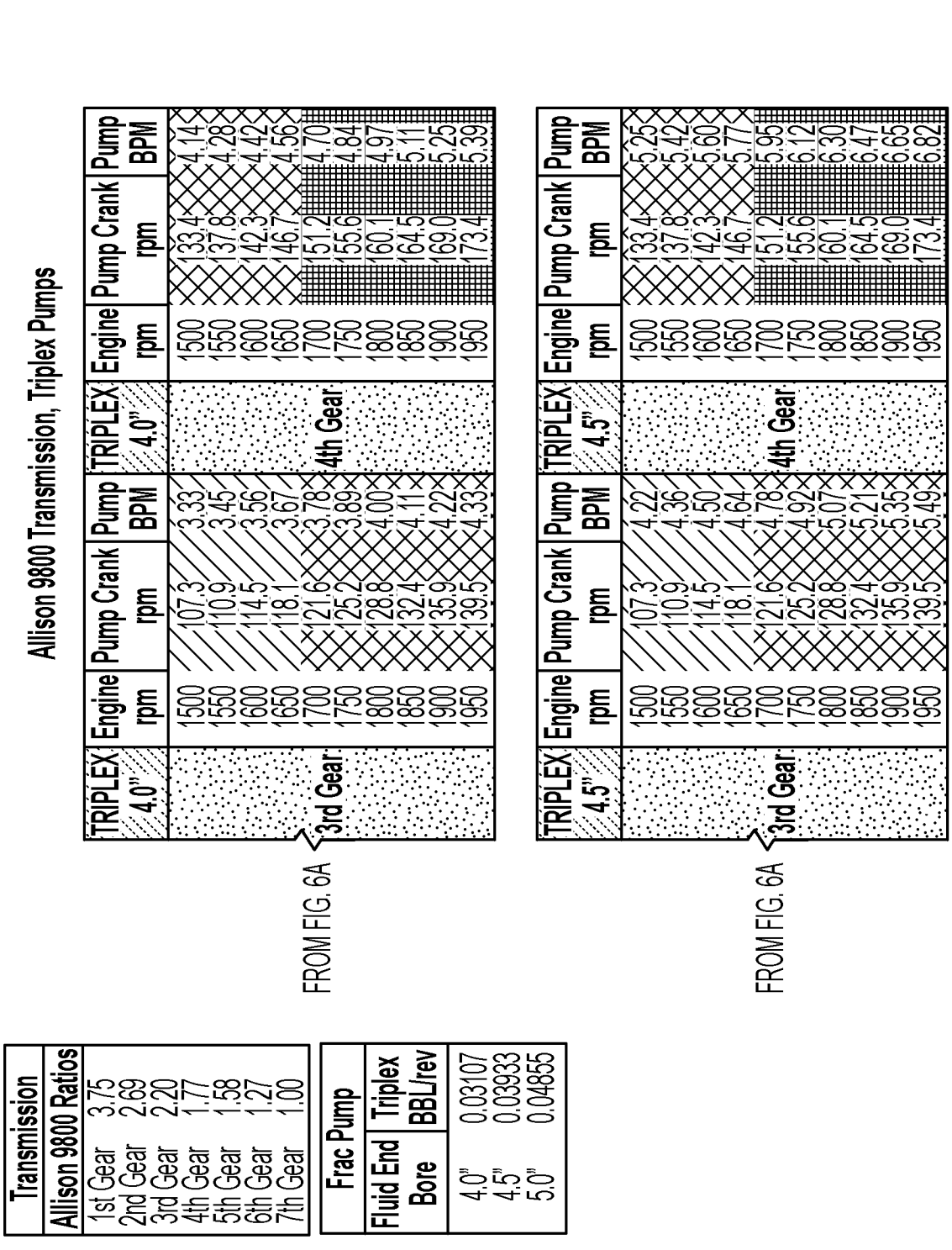
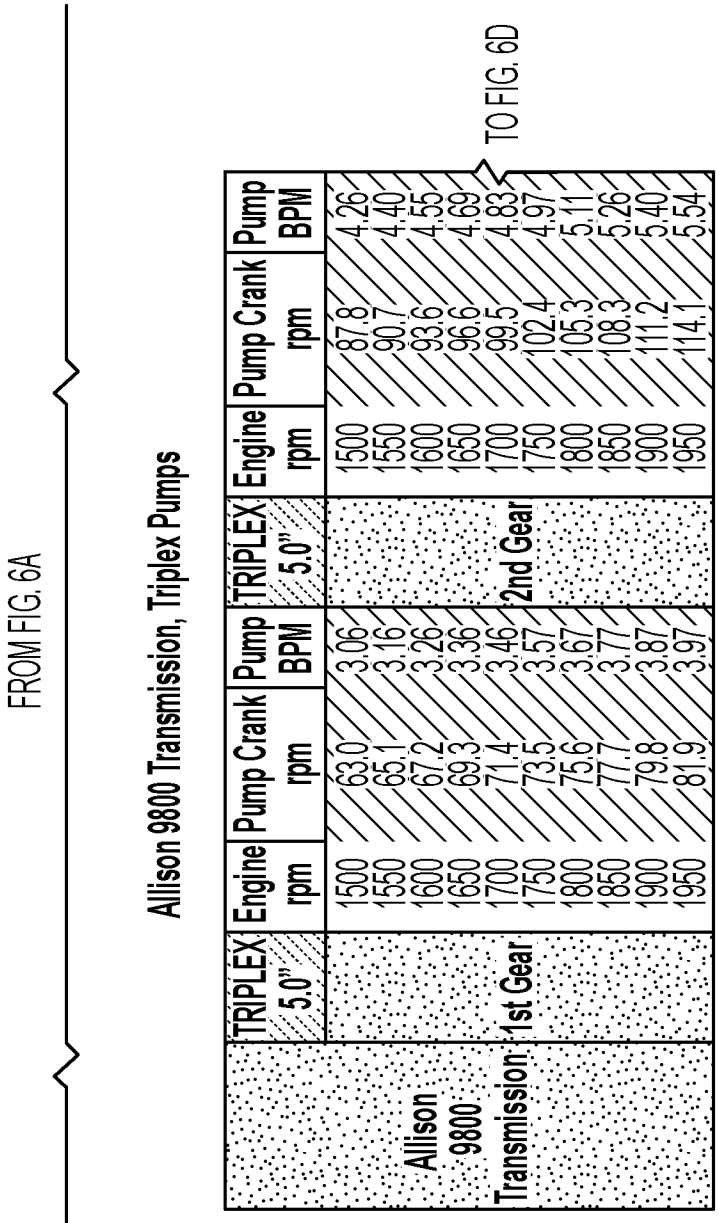


FIG. 6B

REPLACEMENT SHEET

14/31



Transmission	
Allison 9800 Ratios	
1st Gear	3.75
2nd Gear	2.69
3rd Gear	2.20
4th Gear	1.77
5th Gear	1.58
6th Gear	1.27
7th Gear	1.00

Frac Pump	
Fluid End Bore	Triplex BBL/rev
4.0"	0.03107
4.5"	0.03933
5.0"	0.04855

FIG. 6C

REPLACEMENT SHEET

15/31

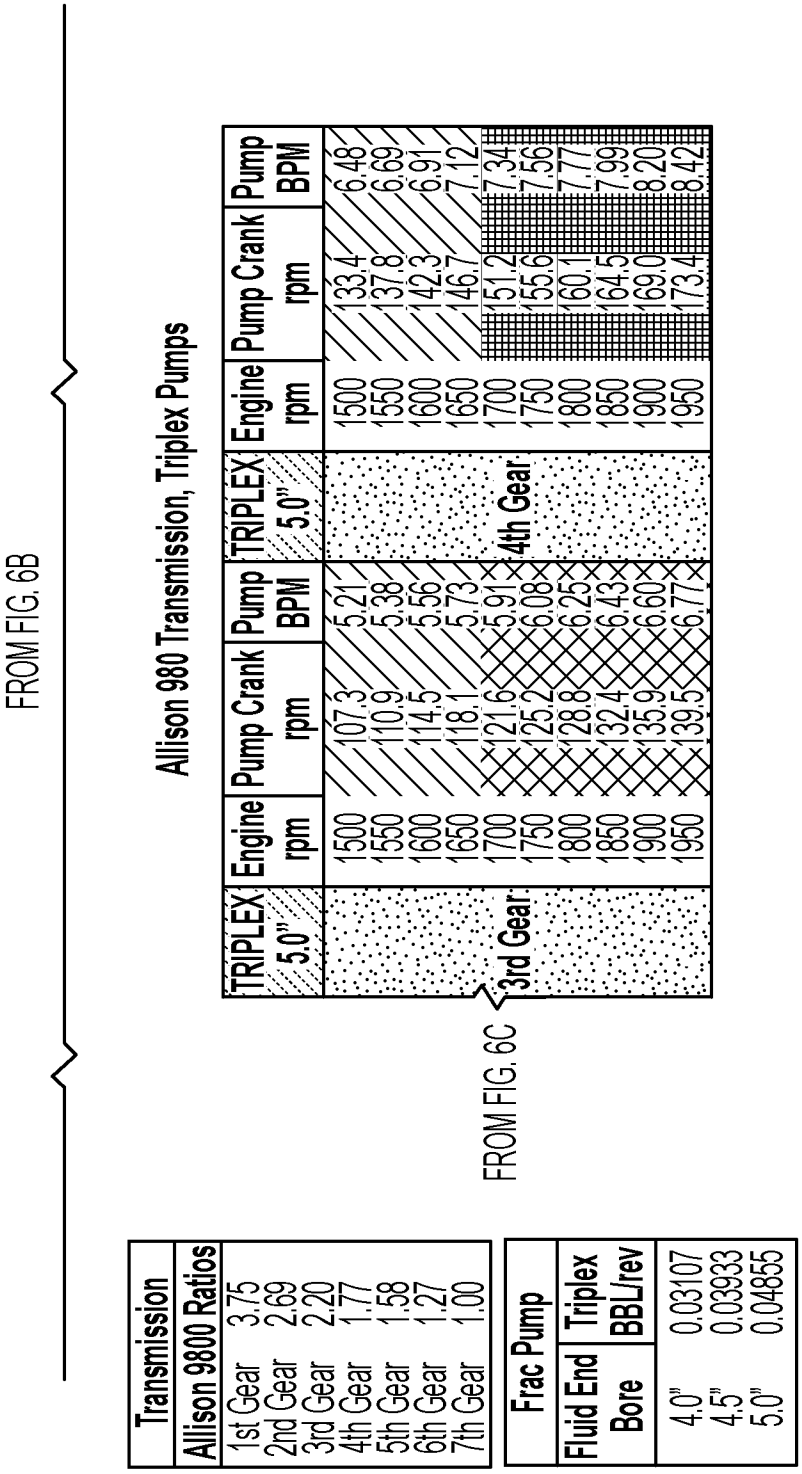


FIG. 6D

REPLACEMENT SHEET

16/31

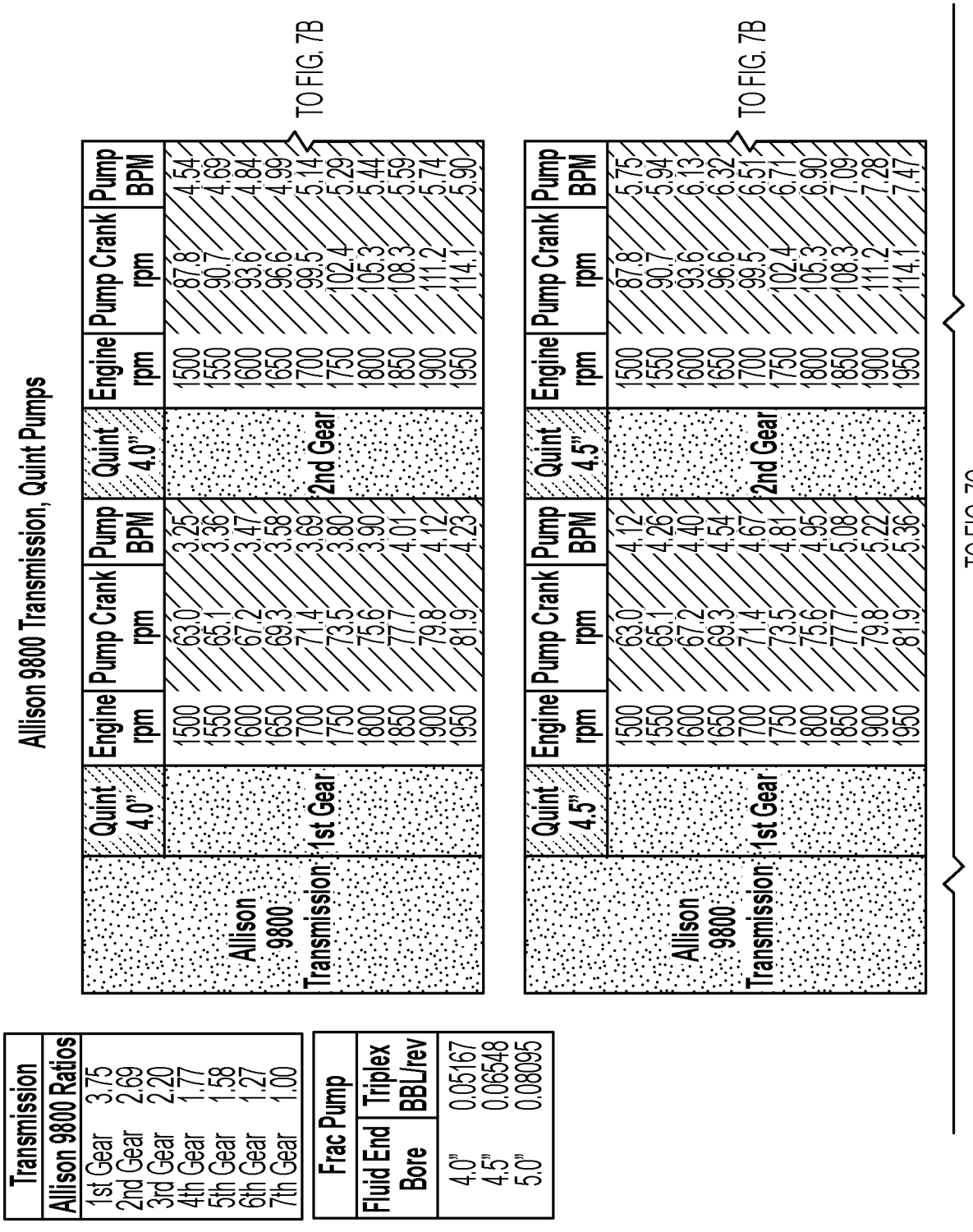


FIG. 7A

REPLACEMENT SHEET

17/31

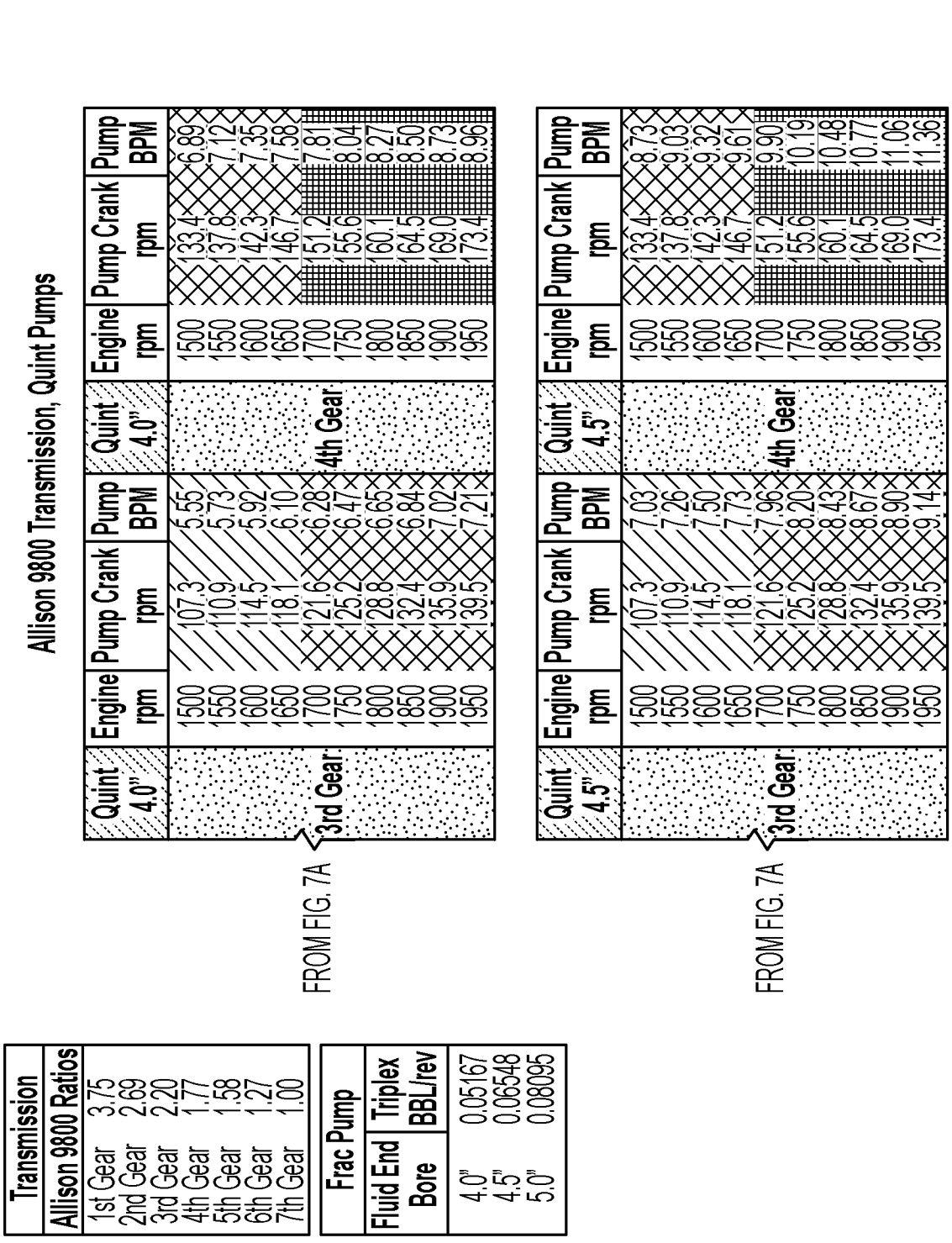
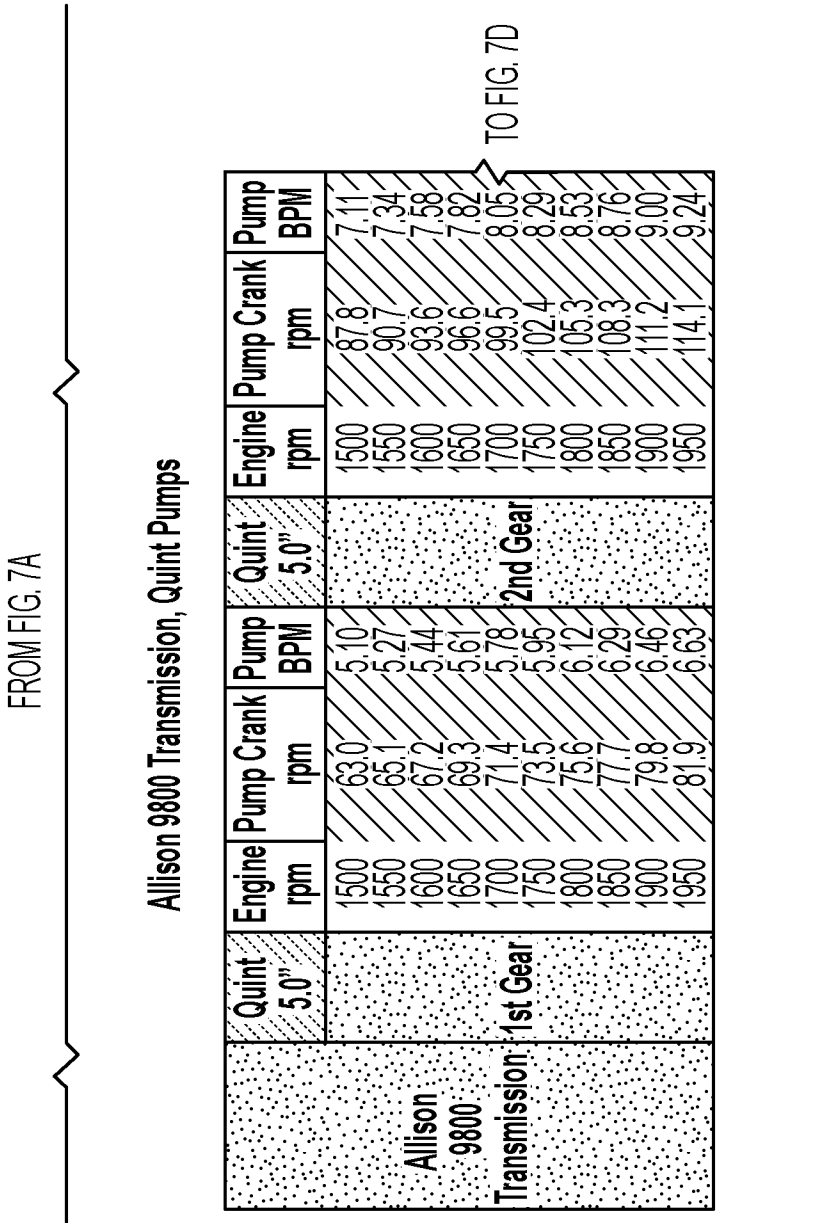


FIG. 7B

REPLACEMENT SHEET

18/31



Transmission	
Allison 9800 Ratios	
1st Gear	3.75
2nd Gear	2.69
3rd Gear	2.20
4th Gear	1.77
5th Gear	1.58
6th Gear	1.27
7th Gear	1.00

Frac Pump	
Fluid End Bore	Triplex BBL/rev
4.0"	0.05167
4.5"	0.06548
5.0"	0.08095

FIG. 7C

REPLACEMENT SHEET

19/31

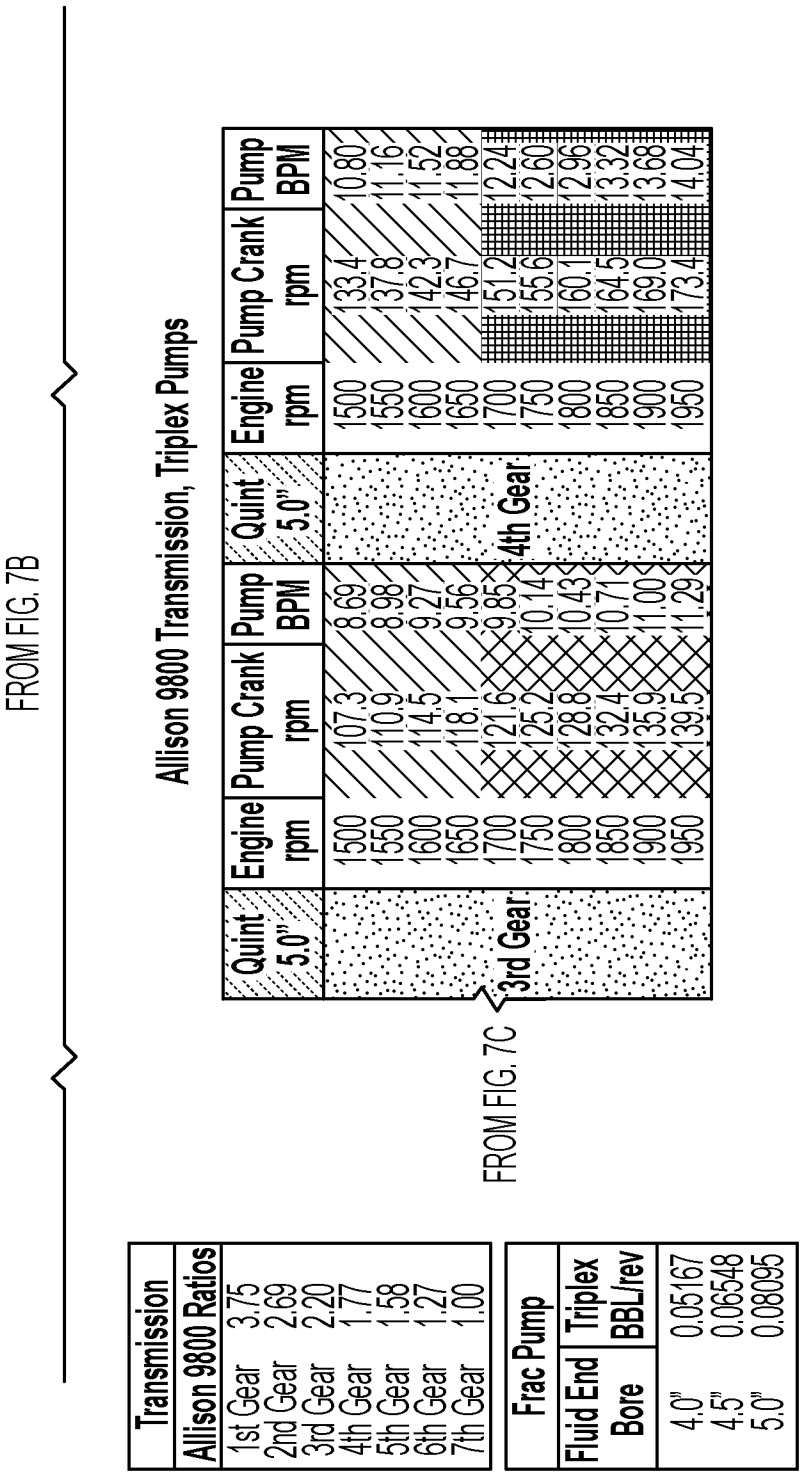


FIG. 7D

REPLACEMENT SHEET

20/31

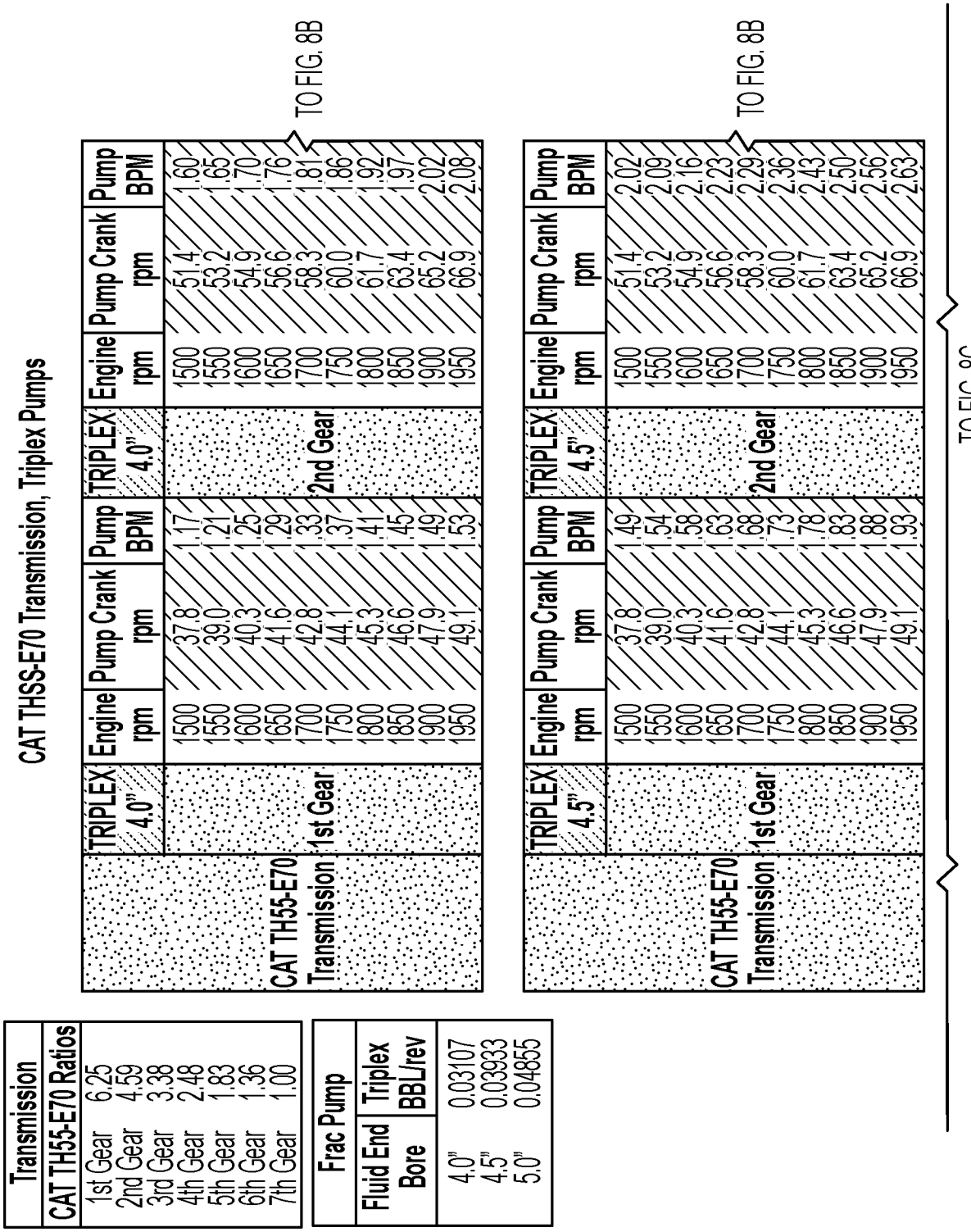


FIG. 8A

REPLACEMENT SHEET

21/31

CAT THSS-E70 Transmission, Triplex Pumps

TRIPLEX 4.0"	Engine rpm	Pump Crank rpm	Pump BPM
FROM FIG. 8A			
3rd Gear	1500	69.9	2.17
	1550	72.2	2.24
	1600	74.5	2.32
	1650	76.8	2.39
	1700	79.2	2.46
4th Gear	1750	81.5	2.53
	1800	83.8	2.60
	1850	86.2	2.68
	1900	88.5	2.75
	1950	90.8	2.82
5th Gear	1500	95.2	2.96
	1550	98.4	3.06
	1600	101.6	3.16
	1650	104.7	3.25
	1700	107.9	3.35
	1750	111.1	3.45
	1800	114.2	3.55
	1850	117.4	3.65
	1900	120.6	3.75
	1950	123.8	3.85

TRIPLEX 4.5"	Engine rpm	Pump Crank rpm	Pump BPM
FROM FIG. 8A			
3rd Gear	1500	69.9	2.75
	1550	72.2	2.84
	1600	74.5	2.93
	1650	76.8	3.02
	1700	79.2	3.11
4th Gear	1750	81.5	3.21
	1800	83.8	3.30
	1850	86.2	3.39
	1900	88.5	3.48
	1950	90.8	3.57
5th Gear	1500	95.2	3.74
	1550	98.4	3.87
	1600	101.6	3.99
	1650	104.7	4.12
	1700	107.9	4.24
	1750	111.1	4.37
	1800	114.2	4.49
	1850	117.4	4.62
	1900	120.6	4.74
	1950	123.8	4.87

Pump Crank rpm	Pump BPM
129.0	4.01
133.3	4.14
137.6	4.28
141.9	4.41
146.2	4.54
150.5	4.68
154.8	4.81
159.1	4.94
163.4	5.08
167.7	5.21

Pump Crank rpm	Pump BPM
129.0	5.07
133.3	5.24
137.6	5.41
141.9	5.58
146.2	5.75
150.5	5.92
154.8	6.09
159.1	6.26
163.4	6.43
167.7	6.60

TO FIG. 8D

Transmission	
CAT TH55-E70 Ratios	
1st Gear	6.25
2nd Gear	4.59
3rd Gear	3.38
4th Gear	2.48
5th Gear	1.83
6th Gear	1.36
7th Gear	1.00

Frac Pump	
Fluid End Bore	Triplex BBL/rev
4.0"	0.03107
4.5"	0.03933
5.0"	0.04855

FIG. 8B

REPLACEMENT SHEET

22/31

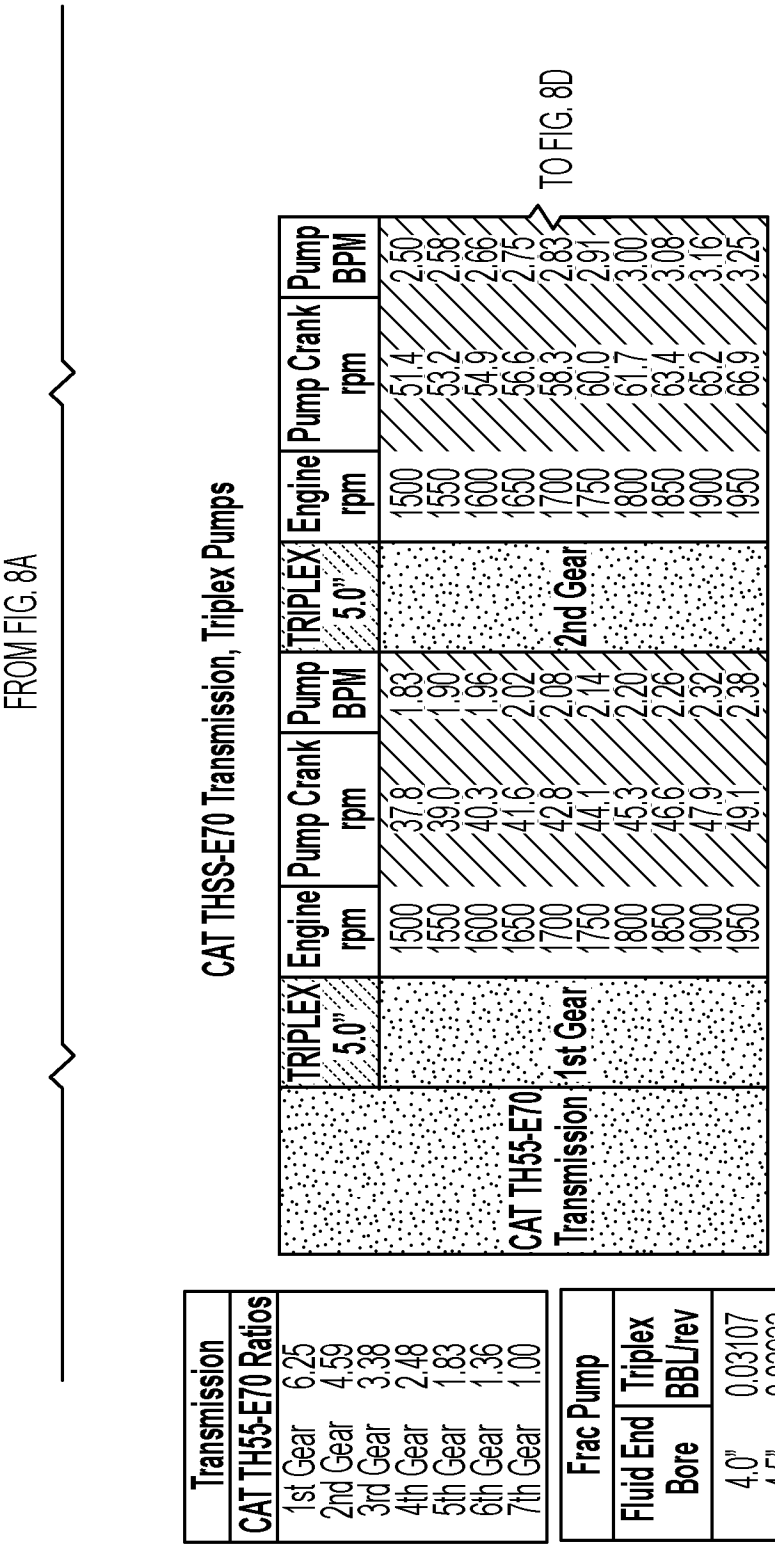
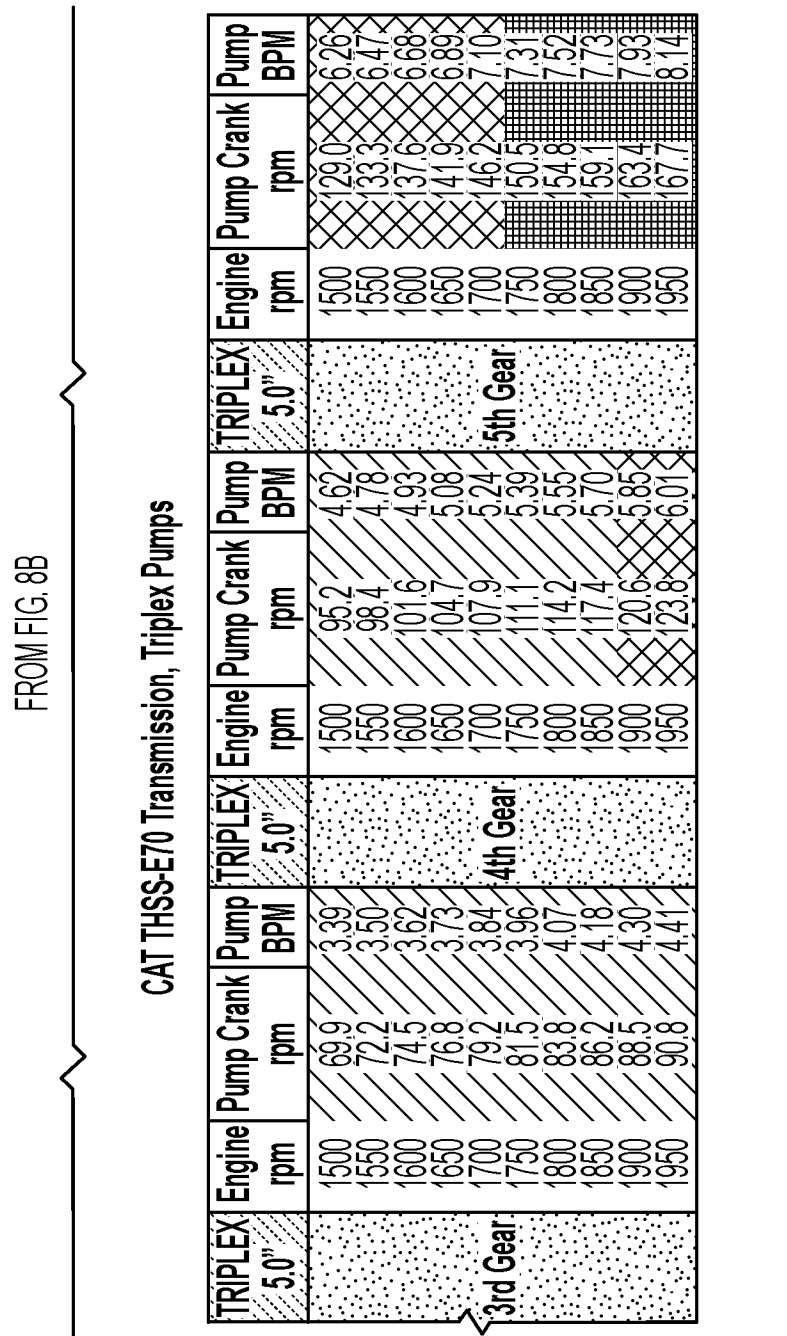


FIG. 8C

REPLACEMENT SHEET

23/31



Transmission	
CAT TH55-E70 Ratios	
1st Gear	6.25
2nd Gear	4.59
3rd Gear	3.38
4th Gear	2.48
5th Gear	1.83
6th Gear	1.36
7th Gear	1.00

Frac Pump	
Fluid End Bore	Triplex BBL/rev
4.0"	0.03107
4.5"	0.03933
5.0"	0.04855

FIG. 8D

REPLACEMENT SHEET

24/31

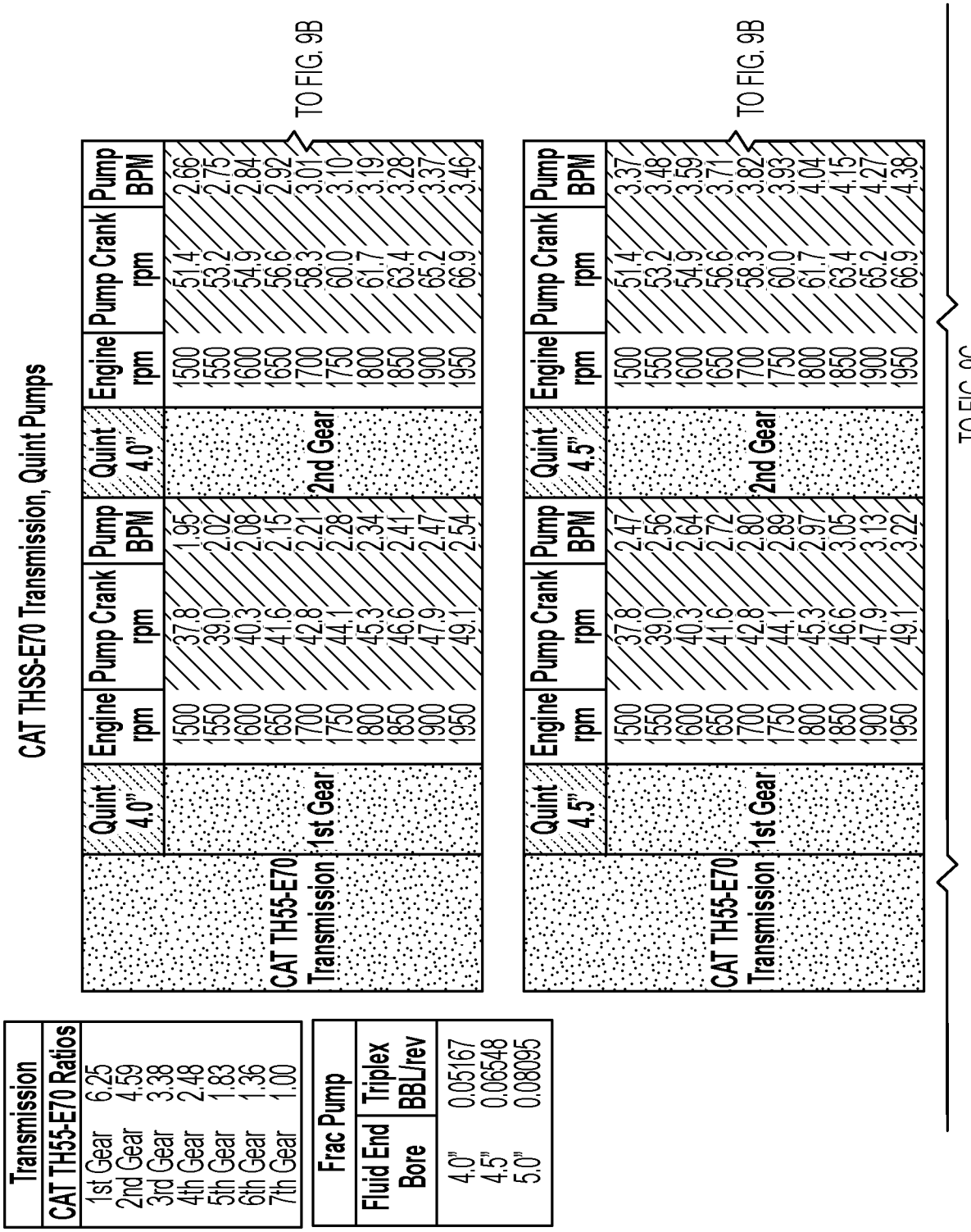


FIG. 9A

REPLACEMENT SHEET

25/31

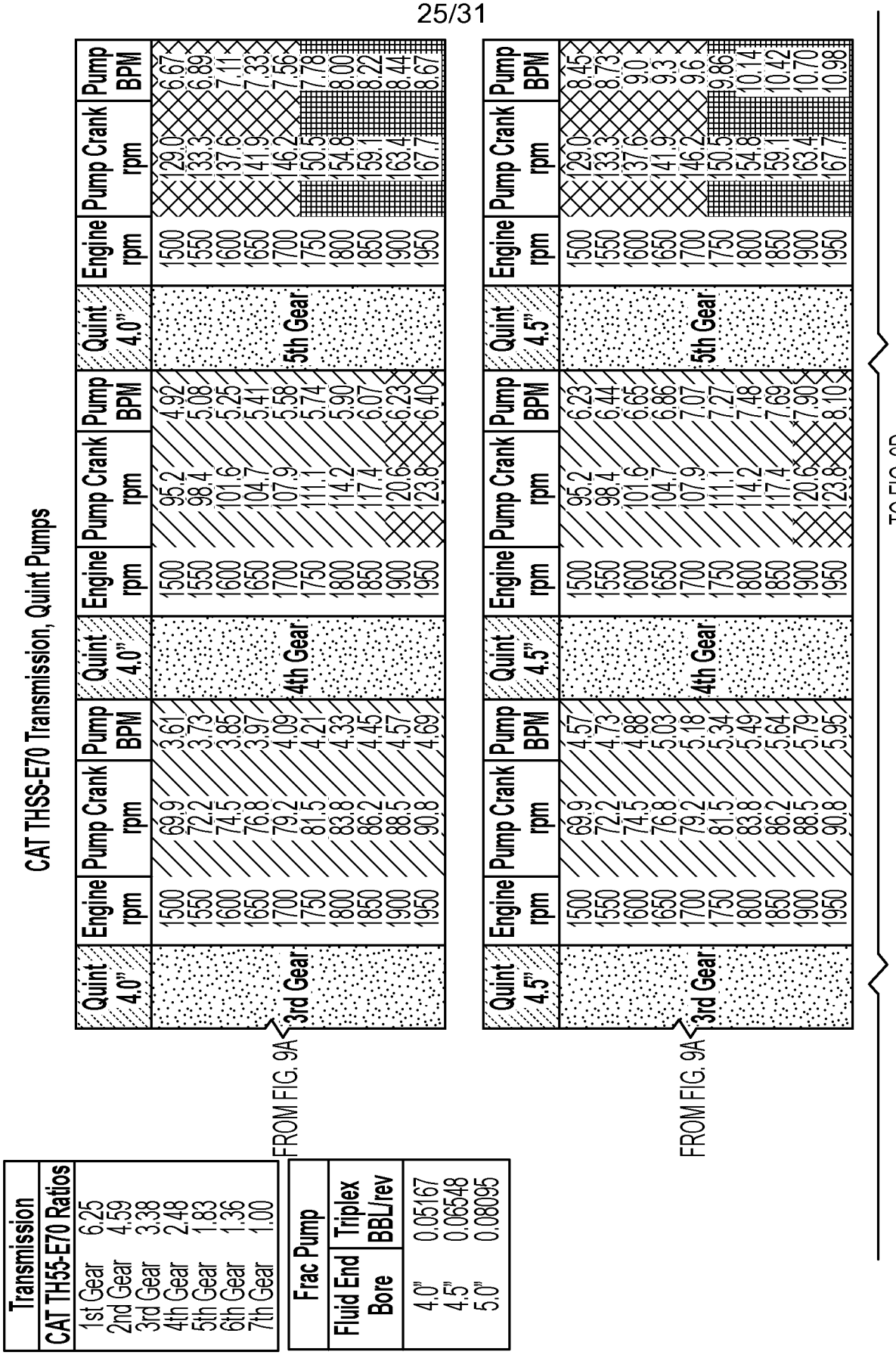
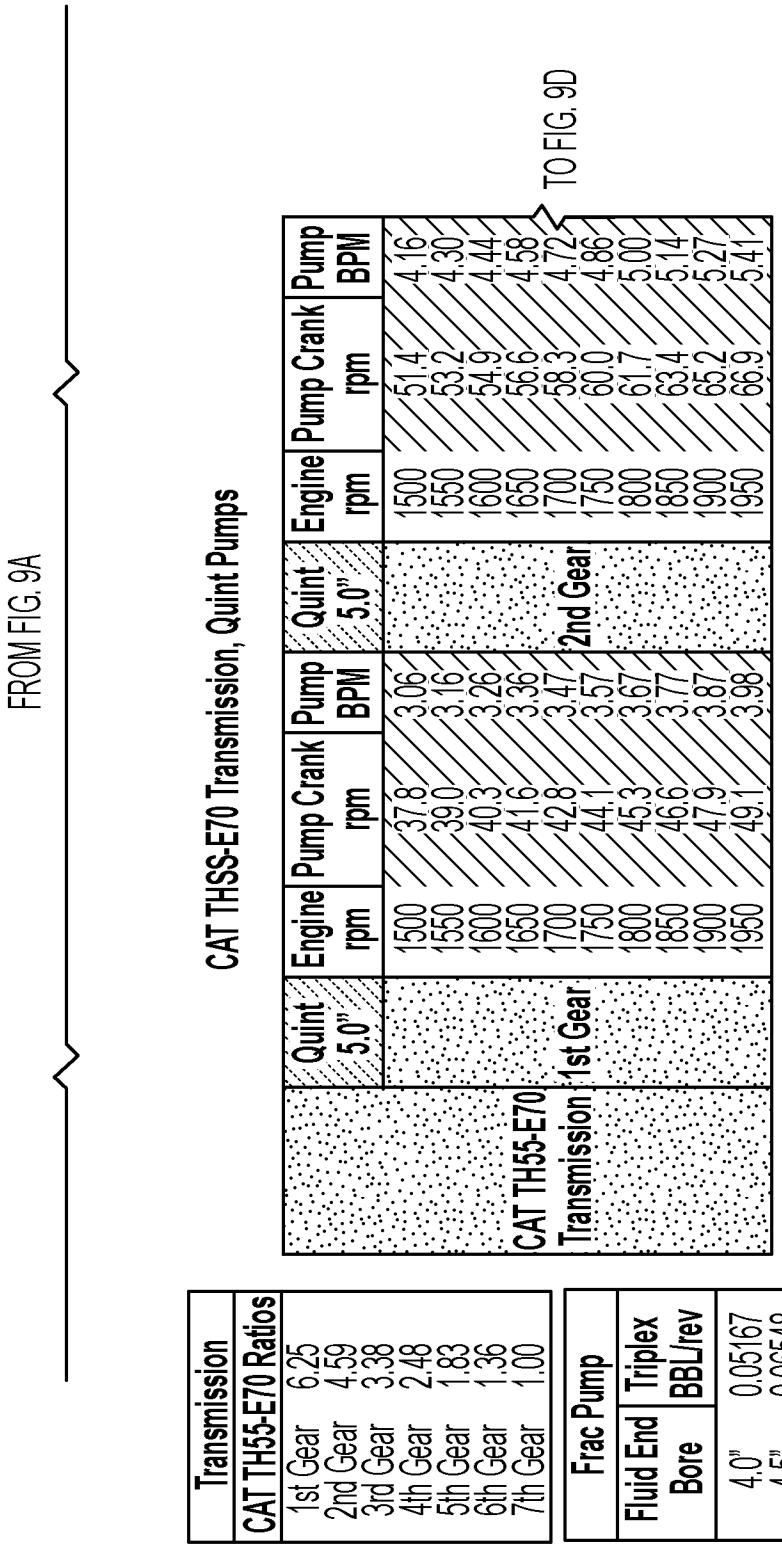


FIG. 9B

REPLACEMENT SHEET

26/31



Transmission	
CAT TH55-E70 Ratios	
1st Gear	6.25
2nd Gear	4.59
3rd Gear	3.38
4th Gear	2.48
5th Gear	1.83
6th Gear	1.36
7th Gear	1.00

Frac Pump	
Fluid End Bore	Triplex BBL/rev
4.0"	0.05167
4.5"	0.06548
5.0"	0.08095

FIG. 9C

REPLACEMENT SHEET

27/31

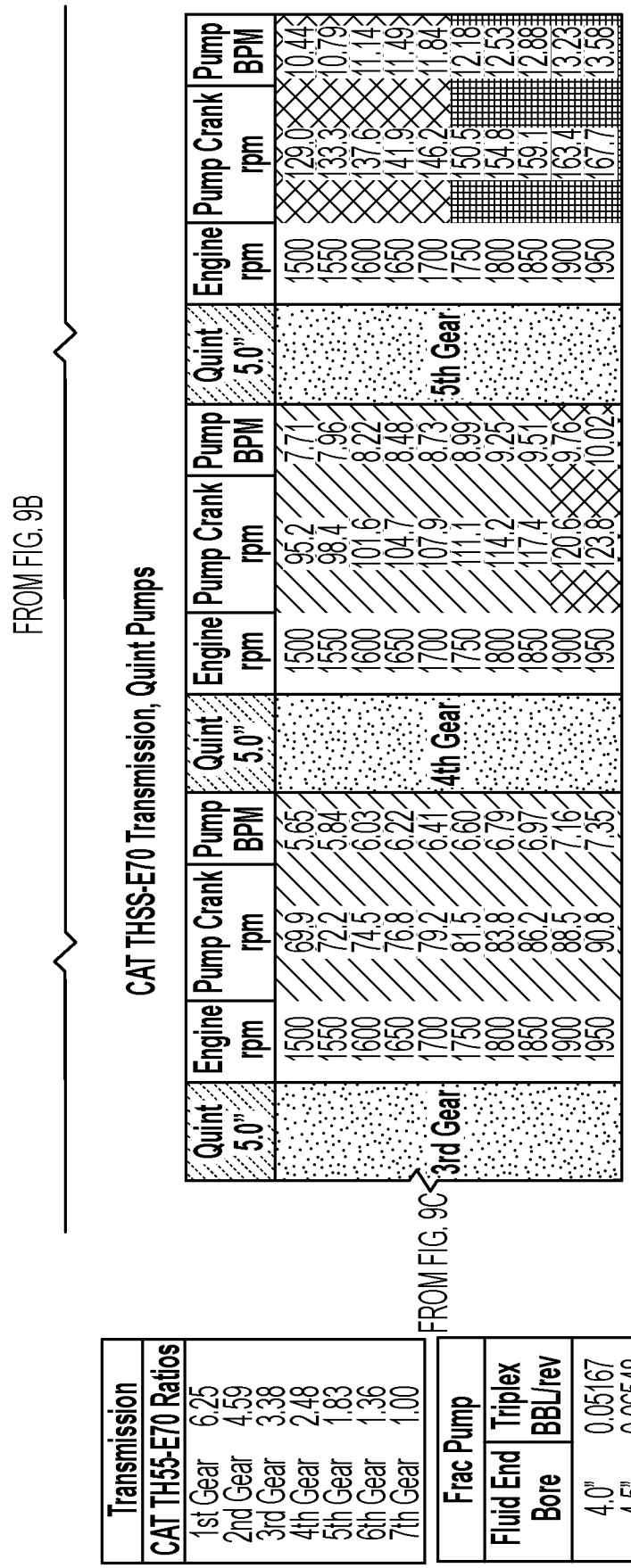
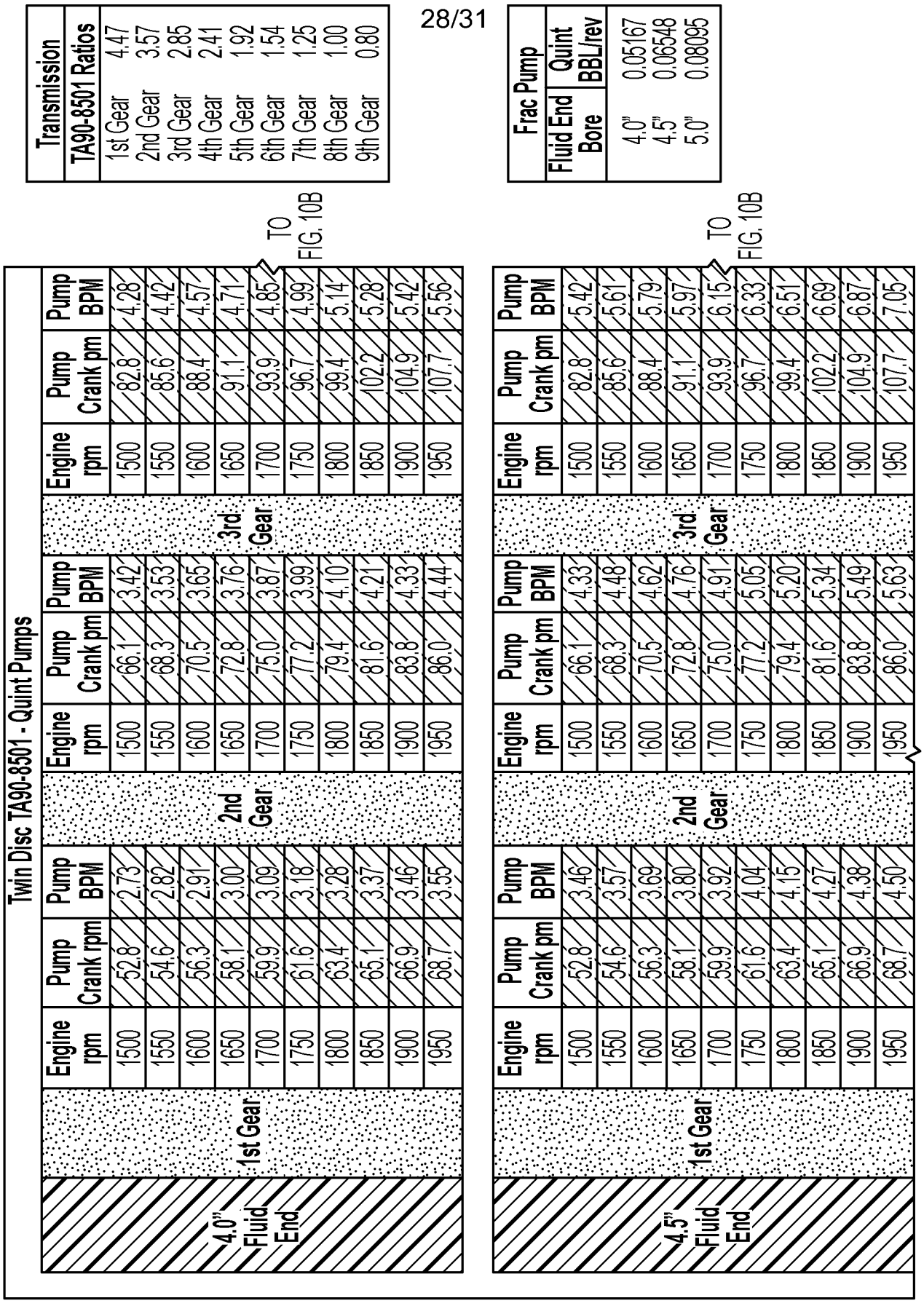


FIG. 9D

REPLACEMENT SHEET

28/31



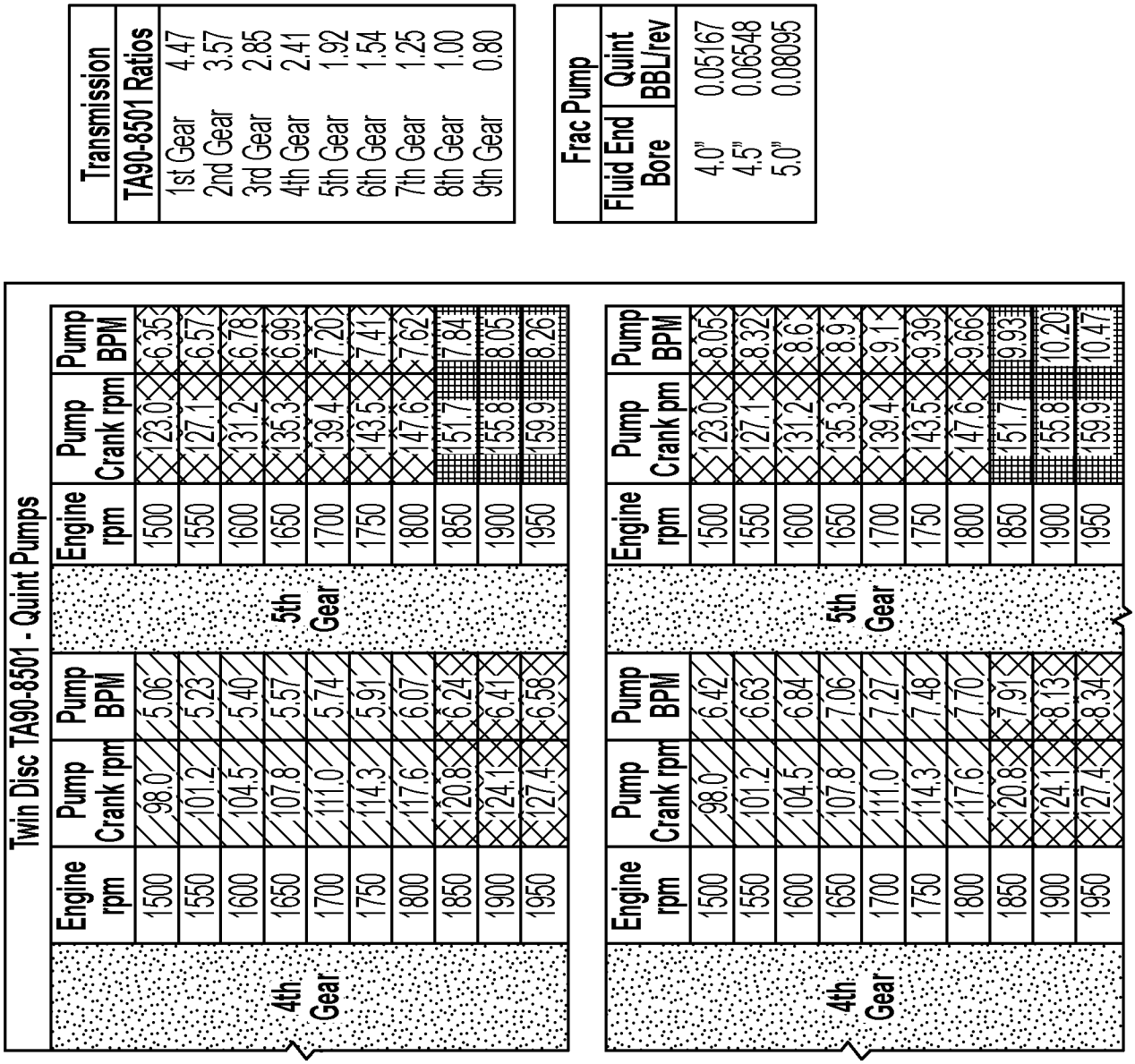
Transmission	
TA90-8501	Ratios
1st Gear	4.47
2nd Gear	3.57
3rd Gear	2.85
4th Gear	2.41
5th Gear	1.92
6th Gear	1.54
7th Gear	1.25
8th Gear	1.00
9th Gear	0.80

Frac Pump	
Fluid End Bore	Quint BBL/rev
4.0"	0.05167
4.5"	0.06548
5.0"	0.08095

FIG. 10A

REPLACEMENT SHEET

29/31



Transmission	
TA90-8501 Ratios	
1st Gear	4.47
2nd Gear	3.57
3rd Gear	2.85
4th Gear	2.41
5th Gear	1.92
6th Gear	1.54
7th Gear	1.25
8th Gear	1.00
9th Gear	0.80

Frac Pump	
Fluid End Bore	Quint BBL/rev
4.0"	0.05167
4.5"	0.06548
5.0"	0.08095

FIG. 10B

REPLACEMENT SHEET

30/31

Transmission	
TA90-8501 Ratios	
1st Gear	4.47
2nd Gear	3.57
3rd Gear	2.85
4th Gear	2.41
5th Gear	1.92
6th Gear	1.54
7th Gear	1.25
8th Gear	1.00
9th Gear	0.80

Frac Pump	
Fluid End Bore	Quint BBL/rev
4.0"	0.05167
4.5"	0.06548
5.0"	0.08095

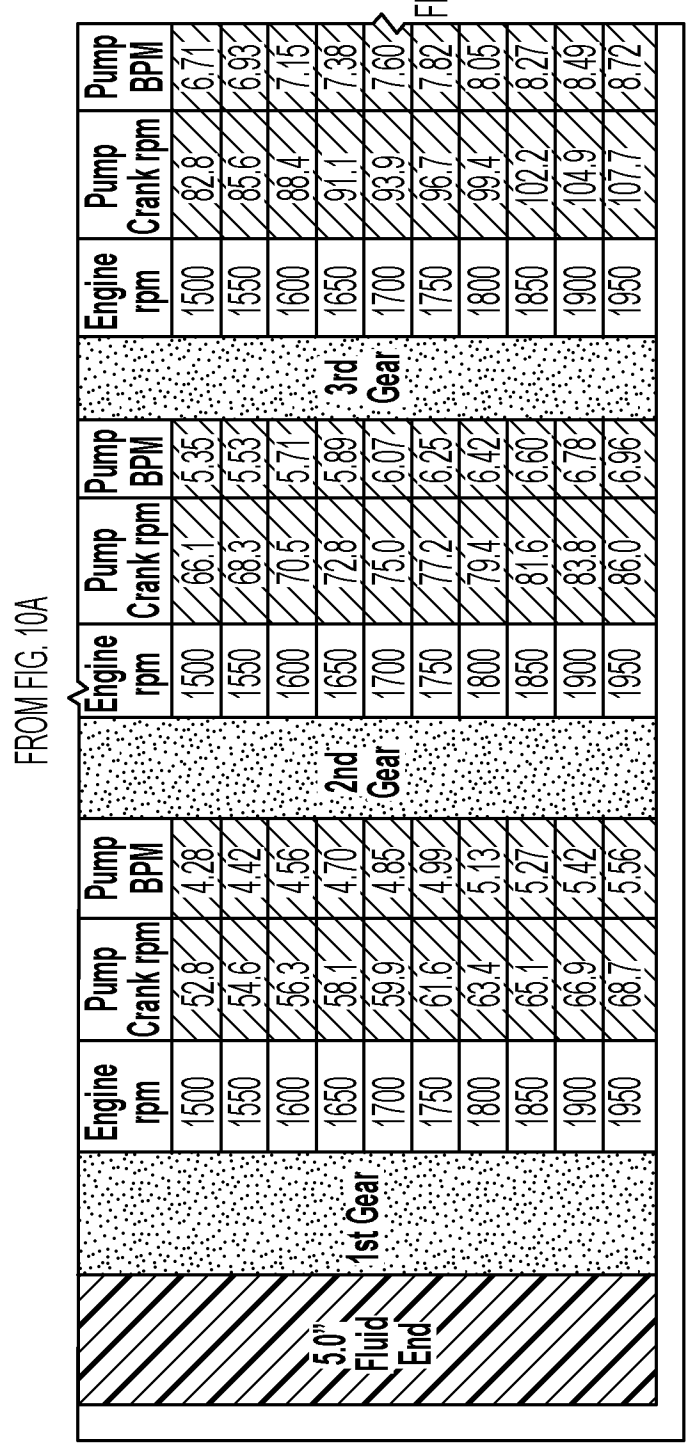


FIG. 10C

REPLACEMENT SHEET

31/31

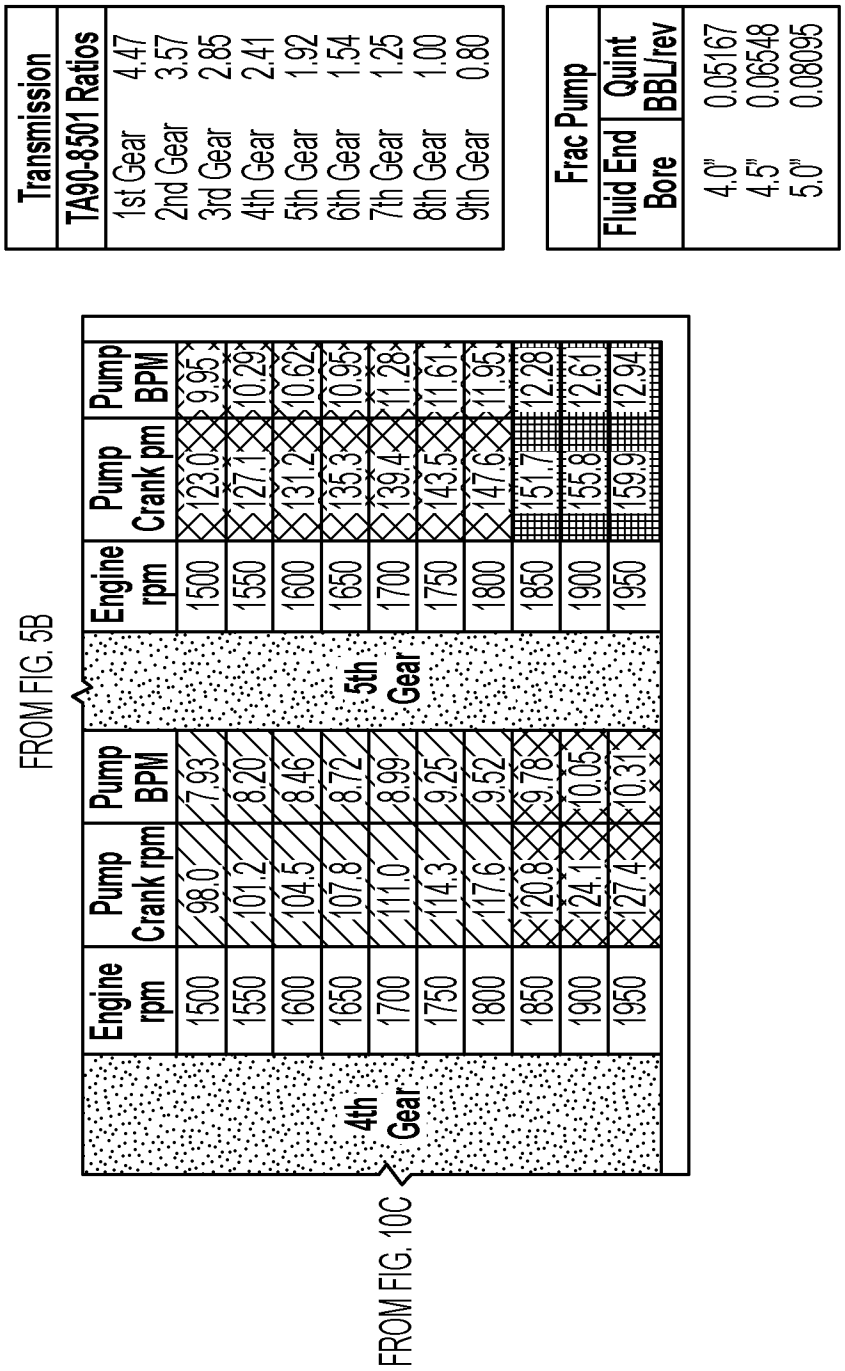


FIG. 10D

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PATENT AND TRADEMARK OFFICE

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Alexandria, VA 22313 - 1450
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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/357,271	**02/09/2024 03:58:24 PM Z ET**	**USWEL-002003**

Title of Invention

Multi-Plunger Pumps and Associated Drive Systems

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5490	FILED BY	April Reasoner
PATENT CENTER #	64277663	FILING DATE	07/24/2023
CUSTOMER #	134020	FIRST NAMED INVENTOR	Jared Oehring
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Sam Udovich

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
Amendment After Allowance-312_USWEL-002003.pdf	5	Amendment after Notice of Allowance (Rule 312)	57 KB
Replacement Sheets_USWEL-002003.pdf	28	Drawings-only black and white line drawings	3421 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
Amendment After Allowance-312_USWEL-002003.pdf	7562747BAD46E65E704EB17966233FEAD781B8B8A3E0CBF5F9A0EBAC7683FAFB31619569A25D9EDB3BF3E40DAB04EC4ADCC3A7A3354F83ED7E148F247B4DB116
Replacement Sheets_USWEL-	5F31119E8C5E423B581648A9406FB2ADF4417DBDE447C643D

002003.pdf

97F60A955F54D882CE1FCF4E928447041658D69B903852CF7690E142E1BC9E9131C60B4C2CC00EA

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	U.S. Well Services, LLC	Art Unit	:	3672
Serial No.	:	18/357,271	Examiner	:	Andrews, David L
Filed	:	July 24, 2023	Conf. No.	:	5490
Title	:	MULTI-PLUNGER PUMPS AND ASSOCIATED DRIVE SYSTEMS			

MAIL STOP ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUBMISSION PURSUANT TO 37 C.F.R. 1.312

The following amendment is submitted after the Notice of Allowance having a mailing date of December 26, 2023 ("Notice of Allowance"), with or before payment of any issue fee.

AMENDMENTS TO THE SPECIFICATION

Please amend paragraph [0028] on page 7 of the Specification as filed as follows:

~~FIG. 4 is a table~~ FIGS. 4A-4D are tables showing calculations of plunger pump critical speeds according to embodiments of the present technology.

Please amend paragraph [0029] on page 8 of the Specification as filed as follows:

~~FIG. 5 is a table~~ FIGS. 5A-5D are tables showing data related to certain pumps and transmissions in an example application, rneant to highlight certain embodiments of the present technology.

Please amend paragraph [0030] on page 8 of the Specification as filed as follows:

FIGS. 6A-10D ~~6-10~~ are tables showing additional data related to certain pumps and transmissions in further example applications, meant to further highlight embodiments of the present technology.

Please amend paragraph [0036] on page 9 of the Specification as filed as follows:

For example, one of the most common transmissions utilized in hydraulic fracturing pump applications is the Caterpillar model TH55-E90, which is a 9-speed transmission. As shown in FIGS. 5A-5D ~~FIG. 5~~, when this transmission is in 5th gear and the engine is operating at 1700 rpm, the critical speed of 120 rpm on an 8-inch stroke pump is reached, Therefore, running the pump with the transmission in any of gears 6 through 9 could cause pump cavitation and damage accumulation lo the fluid end.

Please amend paragraph [0037] on page 10 of the Specification as filed as follows:

Similarly, the common hydraulic fracturing application transmissions known in the art may exhibit the same issues in higher gears, as shown below in FIGS. 6A-10D ~~6-10~~. For example, as shown in ~~FIG. 6~~ FIGS. 6A-6D and FIGS. 7A-7D ~~FIG. 7~~, the critical plunger speed is reached in the 3rd gear, such that use of gears 4-7 may cause cavitation and damage accumulation. Similarly, as shown in FIGS. 8A-8D ~~FIG. 8~~ and FIGS. 9A-9D ~~FIG. 9~~, the critical

plunger speed is reached in the 4th gear, such that use of gears 5-7 may cause cavitation and damage accumulation. In FIGS. 10A-10D ~~FIG. 10~~, the critical plunger speed is reached in the 4th gear, such that use of gears 5-9 may result in cavitation and damage accumulation.

LIBERTY EXHIBIT 1002, Page 80

AMENDMENTS TO THE DRAWINGS

Submitted herewith are replacement sheets 4A-10D. Applicant respectfully submits that no new matter has been added.

LIBERTY EXHIBIT 1002, Page 81

REMARKS

In response to the Notice to File Corrected Application Papers mailed on January 12, 2024, replacement FIGS. 4A-10D are submitted herewith. Additionally, the Specification has been amended herein to be consistent with the replacement drawings. It is respectfully submitted that no new matter has been added to the Application by the present amendments.

Claims 21-29 and 31-46 were allowed in the Notice of Allowance dated December 26, 2023 ("Notice of Allowance"). The present submission is made after the mailing of the Notice of Allowance, but before payment of any issue fee. Consideration and entry of the present amendment is respectfully requested under 37 C.F.R. 1.312.

No fees are believed to be due. However, the Director is hereby authorized to apply any necessary charges or credits to Deposit Account No. 506816, referencing Attorney Docket No. USWEL-002003.

Respectfully submitted,

Date: February 9, 2024

/Samuel A. Udovich/
Samuel A. Udovich
Reg. No. 59,951

CUSTOMER NUMBER 134020
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8350 N. Central Expy.
Suite 1750
Dallas, Texas 75206
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UNITED STATES PATENT AND TRADEMARK OFFICE

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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/357,271	07/24/2023	Jared Oehring	USWEL-002003	5490

134020 7590 01/25/2024

Henry Patent Law Firm PLLC
8350 N. Central Expwy.
Suite 1750
Dallas, TX 75206

EXAMINER	
ANDREWS, DAVID L	

ART UNIT	PAPER NUMBER
3672	

NOTIFICATION DATE	DELIVERY MODE
01/25/2024	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket@henry.law

Supplemental ***Notice of Allowability***	**Application No.** 18/357,271	**Applicant(s)** Oehring et al.	
	Examiner D Andrews	**Art Unit** 3672	**AIA (FITF) Status** Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to the IDS filed 1/12/2024.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 21-29 and 31-46 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information , please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some* c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/D. ANDREWS/
Primary Examiner, Art Unit 3672

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
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(Not for submission under 37 CFR 1.99)

Application Number	18357271
Filing Date	2023-07-24
First Named Inventor	Jared Oehring
Art Unit	3672
Examiner Name	DAVID L ANDREWS
Attorney Docket Number	USWEL-002003

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	3672
	Examiner Name	DAVID L ANDREWS
	Attorney Docket Number	USWEL-002003

	1	UAE Ministry of Economy, Office Action issued in Application No. P6000843/2020 on December 13, 2023 (USWEL-002AE1), 8 pages	☐

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Examiner Signature	/D. ANDREWS/	Date Considered	01/23/2024

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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(Not for submission under 37 CFR 1.99)

Application Number	18357271
Filing Date	2023-07-24
First Named Inventor	Jared Oehring
Art Unit	3672
Examiner Name	DAVID L ANDREWS
Attorney Docket Number	USWEL-002003

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☒ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Samuel A. Udovich/	Date (YYYY-MM-DD)	2024-01-12
Name/Print	Samuel A. Udovich	Registration Number	59951

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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Art Unit	3672
Examiner Name	DAVID L ANDREWS
Attorney Docket Number	USWEL-002003

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	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	3672
	Examiner Name	DAVID L ANDREWS
	Attorney Docket Number	USWEL-002003

	1	UAE Ministry of Economy, Office Action issued in Application No. P6000843/2020 on December 13, 2023 (USWEL-002AE1), 8 pages	☐

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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Art Unit	3672
Examiner Name	DAVID L ANDREWS
Attorney Docket Number	USWEL-002003

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☒ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Samuel A. Udovich/	Date (YYYY-MM-DD)	2024-01-12
Name/Print	Samuel A. Udovich	Registration Number	59951

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/357,271	**01/12/2024 10:47:57 AM Z ET**	**USWEL-002003**

Title of Invention

Multi-Plunger Pumps and Associated Drive Systems

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5490	FILED BY	April Reasoner
PATENT CENTER #	63932143	FILING DATE	07/24/2023
CUSTOMER #	134020	FIRST NAMED INVENTOR	Jared Oehring
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Sam Udovich

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
IDS_USWEL-002003.pdf	4	Information Disclosure Statement (IDS) Form (SB08)	1234 KB
NPL_UAE.pdf	8	Non Patent Literature	74 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
IDS_USWEL-002003.pdf	D08FB9F3E1817F22A51DDCC8F6FAC8DEDDF426AEBAD2AF4 D0CB5ED1422945703AFCE87F463DA42B64C3AEDF6C5C3767 0B742614B5EB3B88971FEE719EC56B242

NPL_UAE.pdf

3C1B34B998AC487D5872677830BD631691528510 5DB14108A5
5A9C75EFC8B0B68D273E978FDD0C4082461C5642DE859AC38
6A79598B83EC0D4AC0774201F1C0E

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/357,271	01/12/2024 10:47:57 AM Z ET	USWEL-002003

Title of Invention

Multi-Plunger Pumps and Associated Drive Systems

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5490	FILED BY	April Reasoner
PATENT CENTER #	63932143	AUTHORIZED BY	Sam Udovich
CUSTOMER #	134020	FILING DATE	07/24/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Jared Oehring

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 6047	E20241BA48358412	April Reasoner

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1806	SUBMISSION OF AN INFORMATION DISCLOSURE STATEMENT	260.00	1	260.00
			TOTAL AMOUNT:	$260.00

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/357,271	07/24/2023	Jared Ochring	USWEL-002003	5490

134020 7590 01/12/2024

Henry Patent Law Firm PLLC
8350 N. Central Expwy.
Suite 1750
Dallas, TX 75206

EXAMINER
ANDREWS, DAVID L

ART UNIT	PAPER NUMBER
3672	

NOTIFICATION DATE	DELIVERY MODE
01/12/2024	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket@henry.law

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Application No. : 18357271
Applicant : Oehring
Filing Date : 07/24/2023
Date Mailed : 01/12/2024

NOTICE TO FILE CORRECTED APPLICATION PAPERS

Notice of Allowance Mailed

This application has been accorded an Allowance Date and is being prepared for issuance. The application, however, is incomplete for the reasons below.

Applicant is given two (2) months from the mail date of this Notice within which to respond. This time period for reply is extendable under 37 CFR 1.136(a) for only TWO additional MONTHS.

The informalities requiring correction are indicated in the attachment(s). If the informality pertains to the abstract, specification (including claims) or drawings, the informality must be corrected with an amendment in compliance with 37 CFR 1.121 (or, if the application is a reissue application, 37 CFR 1.173). Such an amendment may be filed after payment of the issue fee if limited to correction of informalities noted herein. See Waiver of 37 CFR 1.312 for Documents Required by the Office of Patent Publication, 1280 Off. Gaz. Patent Office 918 (March 23, 2004). In addition, if the informality is not corrected until after payment of the issue fee, for purposes of 35 U.S.C. 154(b)(1)(iv), "all outstanding requirements" will be considered to have been satisfied when the informality has been corrected. A failure to respond within the above-identified time period will result in the application being ABANDONED.

See attachment(s).

A copy of this notice MUST be returned with the reply. Please address response to "Mail Stop Issue Fee, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450".

/Tim Ritter/
Publication Branch
Office of Data Management
(571) 272-4200

Application No. 18357271 **Drawings filed: 07/24/2023**

IDENTIFICATION OF DRAWING DEFICIENCIES

- [ ] There is a hole or the image thereof within the illustration. FIG(s)
- [ ] The illustration is penetrated or traversed by a solid or broken line that is not intended to be part of the drawing, such as a dark line caused by a flaw in the copying process. FIG(s)
- [ ] An ink stamp or the image thereof obscures part of the illustration. FIG(s)
- [ ] The drawing is marred by black smudges, obliterations, or fax/copier marks (for example, speckles or dots in a substantial portion of the drawing). FIG(s)
- [ ] Figure numbers are duplicated or missing. FIG(s)
- [ ] Drawing sheet or figure is missing. FIG(s)
- [ ] Numbers, letters, or reference characters in the drawing have been crossed out or are illegibly handwritten. FIG(s)
- [X] The character of the lines, numbers, and letters is poor. FIG(s) 4-10
- [ ] The drawing's background shows that the original drawing was made on graph paper or other paper with a pattern or decoration. FIG(s)
- [ ] The FIG. number label is placed in a location that causes the drawing to be read upside down. FIG(s)
- [ ] Data, a reference number, or part of the drawing is truncated or missing, or a lead line has no reference number. FIG(s)
- [ ] The drawing and/or the FIG. label contain(s) foreign language. FIG(s)
- [ ] This utility application contains a photograph of a view that is capable of being illustrated as a line drawing. FIG(s)
- [ ] A petition under 37 CFR 1.84(a)(2) to accept color drawings has been granted, but the brief description of the drawings in the specification does not contain (or has not been amended to contain) the paragraph required by 37 CFR 1.84(a)(2)(iii).
- [ ] This reissue application contains added and/or amended drawings that are not labeled as “New” or “Amended” or “Canceled” as required by 37 CFR 1.173(b)(3). FIG(s)
- [ ] This Design reissue application contains a drawing that is labeled as “Canceled” but is not surrounded by brackets, or a drawing that is surrounded by brackets but is not labeled as “Canceled.” See 37 CFR 1.173(b)(3). FIG(s)
- [ ] OTHER:
- [ ] COMMENTS:

TO: docket@henry.law
FROM: noreply@uspto.gov
CC: patentcenter_eofficeaction@uspto.gov
SUBJECT: USPTO: Patent Electronic System - e-Postcard Notification for Customer Number 134020

Tue Jan 02 05:18:33 EST 2024

Dear Patent Center Customer:

Correspondence Address:

Henry Patent Law Firm PLLC
8350 N. Central Expwy.
Suite 1750
Dallas,TEXAS,75206
UNITED STATES

An email notification regarding the correspondence was sent to the following email address(es) associated with customer number 134020:

docket@henry.law

This is a courtesy reminder that new correspondence is available for the application. If you have not done so already, please review the correspondence listed below. The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

Application	Document	Mailroom Date	Attorney Docket No.
18357271	NOA	12/26/2023	USWEL-002003
18357271	1449	12/26/2023	USWEL-002003

To view your correspondence online, please sign in to Patent Center and then select Workbench/View correspondence. Or to update your email addresses, select Manage/Manage customer numbers.

If you have any questions, please contact the Patent Electronic Business Center (EBC) at ebc@uspto.gov or 866-217-9197 Monday – Friday, 6 a.m. to midnight ET.

Please do not reply to this email as it was sent from an unmonitored mailbox.

Sincerely,

The Patent Center Team

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

134020 7590 12/26/2023

Henry Patent Law Firm PLLC
8350 N. Central Expwy.
Suite 1750
Dallas, TX 75206

EXAMINER	
ANDREWS, DAVID L	
ART UNIT	PAPER NUMBER
3672	

DATE MAILED: 12/26/2023

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/357,271	07/24/2023	Jared Oehring	USWEL-002003	5490

TITLE OF INVENTION: Multi-Plunger Pumps and Associated Drive Systems

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	03/26/2024

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 40% the amount of undiscounted fees, and micro entity fees are 20% the amount of undiscounted fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via the USPTO patent electronic filing system.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications. **Because electronic patent issuance may occur shortly after issue fee payment, any desired continuing application should preferably be filed prior to payment of this issue fee in order not to jeopardize copendency.**

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

134020 7590 12/26/2023
Henry Patent Law Firm PLLC
8350 N. Central Expwy.
Suite 1750
Dallas, TX 75206

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via the USPTO patent electronic filing system or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/357,271	07/24/2023	Jared Oehring	USWEL-002003	5490

TITLE OF INVENTION: Multi-Plunger Pumps and Associated Drive Systems

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	03/26/2024

EXAMINER	ART UNIT	CLASS-SUBCLASS
ANDREWS, DAVID L	3672	417-410100

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑ Issue Fee ❑ Publication Fee (if required)

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via the USPTO patent electronic filing system ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

❑ Applicant asserting small entity status. See 37 CFR 1.27

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

❑ Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/357,271	07/24/2023	Jared Oehring	USWEL-002003	5490

134020 7590 12/26/2023

Henry Patent Law Firm PLLC
8350 N. Central Expwy.
Suite 1750
Dallas, TX 75206

EXAMINER	
ANDREWS, DAVID L	
ART UNIT	PAPER NUMBER
3672	

DATE MAILED: 12/26/2023

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

LIBERTY EXHIBIT 1002, Page 103

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013).
https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf

Routine uses of the information in this record may include disclosure to:

1) law enforcement, in the event that the system of records indicates a violation or potential violation of law;
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5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record;
6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations;
7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals;
8) another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c));
9) the Office of Personnel Management (OPM) for personnel research purposes; and
10) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

Notice of Allowability	Application No. 18/357,271	Applicant(s) Oehring et al.	
	Examiner D Andrews	Art Unit 3672	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to the amendment filed 12/4/2023.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 21-29 and 31-46 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information , please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some* c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☑ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/D. ANDREWS/
Primary Examiner, Art Unit 3672

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement filed 12/5/2023 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because it lists "documents" (i.e. the listed "File Wrappers") which have no "publication date". Further, these submitted listings are comprised of multiple documents which each may have a different publication date. It has been placed in the application file, but the information referred to therein **and denoted with strikethrough has not been considered as to the merits**. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to D Andrews whose telephone number is (571)272-6558. The examiner can normally be reached M-F, 7-3.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Abby Flynn can be reached on 571-272-9855. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. ANDREWS/
Primary Examiner, Art Unit 3672

12/7/2023

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/357,271	Oehring et al.
	Examiner	**Art Unit**
	D Andrews	3672

CPC - Searched*		
Symbol	**Date**	**Examiner**
E21B 37/00	11/06/2023	DA
E21B 43/20,26	11/06/2023	DA
F16H 3/52, 39/02, 2200/2007	11/06/2023	DA
F04B 15/02, 17/03, 23/04, 47/02, 49/20	11/06/2023	DA

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
inventor name search in PALM	11/06/2023	DA
global dossier search	11/06/2023	DA
see attached SEARCH history	11/06/2023	DA
see SEARCH history 16/827166, 16/210807	11/06/2023	DA
updated above, see attached SEARCH history	12/07/2023	DA

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/357,271	Oehring et al.
	Examiner	Art Unit
	D Andrews	3672

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	see attached SEARCH history	12/07/2023	DA

LIBERTY EXHIBIT 1003, Page 139

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/357,271	Oehring et al.
	Examiner	**Art Unit**
	D Andrews	3672

CPC						
Symbol					**Type**	**Version**
F16H	/	3	/	52	F	2013-01-01
F04B	/	17	/	03	I	2013-01-01
F04B	/	23	/	04	I	2013-01-01
E21B	/	43	/	20	I	2013-01-01
F04B	/	15	/	02	I	2013-01-01
F04B	/	47	/	02	I	2013-01-01
E21B	/	37	/	00	I	2013-01-01
F04B	/	49	/	20	I	2013-01-01
E21B	/	43	/	2607	I	2020-05-01
E21B	/	43	/	26	I	2013-01-01
F16H	/	2200	/	2007	A	2013-01-01

CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	25	
/D. ANDREWS/ Primary Examiner, Art Unit 3672	07 December 2023	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20231207a

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/357,271	Oehring et al.
	Examiner	**Art Unit**
	D Andrews	3672

INTERNATIONAL CLASSIFICATION					
CLAIMED					
E21B43/26	/	43	/	26	
NON-CLAIMED					
	/		/		

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 25	
/D. ANDREWS/ Primary Examiner, Art Unit 3672 (Primary Examiner)	07 December 2023 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/357,271	Oehring et al.
	Examiner	**Art Unit**
	D Andrews	3672

☑ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	25	
/D. ANDREWS/ Primary Examiner, Art Unit 3672	07 December 2023	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office

Part of Paper No.: 20231207a

Bibliographic Data

Application No: 18/357,271

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☐ No ☐ Met After Allowance

Verified and Acknowledged: /D. ANDREWS/ Examiner's Signature | Initials

Title: Multi-Plunger Pumps and Associated Drive Systems

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
07/24/2023	417	3672	
RULE			

APPLICANTS

U.S. Well Services, LLC, Willow Park, TX, UNITED STATES

INVENTORS

Jared Oehring,

Lon Robinson, Willow Park, TX, UNITED STATES

Brandon N. Hinderliter, Willow Park, TX, UNITED STATES

Alexander James Christinzio, Willow Park, TX, UNITED STATES

CONTINUING DATA

This application is a CON of 16827166 03/23/2020ABN

16827166 is a CON of 16210807 12/05/2018 PAT 10598258

16210807 has PRO of 62594912 12/05/2017

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

08/07/2023

STATE OR COUNTRY

ADDRESS

FILING FEE RECEIVED

$7,640

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	48	f16h3/52.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:54 AM
L2	1632	f04b15/02.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:54 AM
L3	3233	f04b17/03.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:54 AM
L4	931	f04b23/04.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:54 AM
L5	2806	f04b47/02.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:54 AM
L6	1535	f04b49/20.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:55 AM
L8	465	f16h39/02.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:55 AM
L9	2722	f16h2200/2007.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:55 AM
L10	2214	e21b37/00.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:56 AM
L11	10027	e21b43/20,26.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:57 AM
L12	3859	(L1 L2 L3 L4 L5 L6 L8 L9) AND (planetary frac fracturing)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:57 AM
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L14	1	(16/683057).APP.	(USPAT; USOCR)	OR	ON	ON	2023/11/06 06:03 AM
L15	0	(16/834412).APP.	(USPAT; USOCR)	OR	ON	ON	2023/11/06 06:04 AM
L16	1	(16/647844).APP.	(USPAT; USOCR)	OR	ON	ON	2023/11/06 06:05 AM
L17	33	(Artificial Intelligence) More like doc: US-20190249754-A1 Text: (WO-2019113147-A1 OR US-10598258-B2 OR CA-3084596-A1 OR US-20210041009-A1 OR AR-113611-A1 OR US-10119381-B2 OR US-10934824-B2 OR US-11408404-B2 OR US-20220325706-A1 OR US-20210095648-A1 OR WO-2020257350-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/11/06 06:06 AM

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L18	23	("4100822" | "10598258" | "20030027682" | "20030143093" | "20120127820" | "20140010671" | "20140161632" | "20150252661" | "20150300336" | "20160036308" | "20160177675" | "20160208592" | "20160273328" | "20160362284" | "20170016433" | "20170030177" | "20170036178" | "20170051732" | "20170225559" | "20170305736" | "20190249754").pn. OR ("11339769").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 06:06 AM
L19	72463	(variable ADJ frequency) OR (vfd) AND L11	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 06:09 AM
L20	355	((variable ADJ frequency) OR (vfd)) AND L11	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 06:09 AM
L21	0	plunger WITH (seven nine 7 9)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 07:19 AM
L22	0	e21b.cpcl. AND plunger WITH (seven nine 7 9)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 07:20 AM
L23	31	e21b.cpcl. AND plunger WITH (seven nine)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 07:20 AM
L24	134	e21b.cpcl. AND plunger WITH (any WITH number)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 07:21 AM
L25	9	((US-20200256429-A1 OR US-20120255734-A1 OR US-20130213892-A1 OR US-20130306322-A1 OR US-20140096974-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB,	OR	ON	ON	2023/11/06 09:19 AM

		A1 OR US-20140138079-A1 OR US-20140251623-A1 OR US-20210246968-A1).did. AND PGPB.dbnm.) OR ((US-4100822-A).did. AND USPT.dbnm.)	HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L26	30	(Artificial Intelligence) More like doc: US-20200256429-A1 Text: (US-20210246968-A1 OR CA-3073853-C OR US-11339769-B2 OR WO-2019060922-A1 OR CA-3073853-A1 OR US-20230265839-A1 OR US-20220381235-A1 OR US-11635066-B2 OR US-11598324-B2 OR WO-2019204323-A1 OR CA-3179532-A1 OR US-11408404-B2 OR US-20200224645-A1 OR CA-3079229-C OR US-20220220949-A1 OR CA-3079229-A1 OR US-11313359-B2 OR US-11692532-B2 OR US-20210095648-A1 OR US-20220356871-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/11/06 09:19 AM
L27	2	"10598258".pn.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/11/06 10:14 AM
L28	4153	planetary WITH gear WITH arm	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 07:16 AM
L29	572	planetary ADJ gear WITH arms	(US-PGPUB; USPAT; USOCR)	OR	OFF	ON	2023/12/07 07:16 AM

L30	2270	planetary ADJ gear SAME arm WITH (drive shaft)	(US-PGPUB; USPAT; USOCR)	OR	OFF	ON	2023/12/07 07:41 AM
L31	26	planetary ADJ gear SAME arm WITH (drive shaft) AND e21b.cpcl.	(US-PGPUB; USPAT; USOCR)	OR	OFF	ON	2023/12/07 07:41 AM
L32	219	planetary ADJ gear SAME arm WITH (drive ADJ shaft)	(US-PGPUB; USPAT; USOCR)	OR	OFF	ON	2023/12/07 07:52 AM
L33	1573	gear WITH arms WITH (drive ADJ shaft)	(US-PGPUB; USPAT; USOCR)	OR	OFF	ON	2023/12/07 07:54 AM
L34	20	gear WITH arms WITH (drive ADJ shaft) AND e21b.cpcl.	(US-PGPUB; USPAT; USOCR)	OR	OFF	ON	2023/12/07 07:55 AM
L35	206	pump AND gear WITH arms WITH (drive ADJ shaft)	(US-PGPUB; USPAT; USOCR)	OR	OFF	ON	2023/12/07 07:55 AM
L36	405	cage WITH gear WITH arm	(US-PGPUB; USPAT; USOCR)	OR	OFF	ON	2023/12/07 08:01 AM
L37	49	f16h3/52.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
L38	1652	f04b15/02.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
L39	3262	f04b17/03.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
L40	950	f04b23/04.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
L41	2817	f04b47/02.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
L42	1549	f04b49/20.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
L43	467	f16h39/02.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
L44	2737	f16h2200/2007.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
L45	2223	e21b37/00.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
L46	9995	e21b43/20,26.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
L47	3890	(L1 L2 L3 L4 L5 L6 L8 L9) AND (planetary frac fracturing)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
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L49	1	(16/683057).APP.	(USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
L50	0	(16/834412).APP.	(USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
L51	1	(16/647844).APP.	(USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM

L52	32	(Artificial Intelligence) More like doc: US-20190249754-A1 Text: (WO-2019113147-A1 OR US-10598258-B2 OR CA-3084596-A1 OR US-20210041009-A1 OR US-20230366450-A1 OR AR-113611-A1 OR US-11408404-B2 OR US-20220325706-A1 OR WO-2020257350-A1 OR US-20210095648-A1 OR CA-3143991-A1 OR US-20220220949-A1 OR US-11313359-B2 OR US-20200256429-A1 OR US-11339769-B2 OR CA-3073853-A1 OR US-20170051732-A1 OR US-20210396120-A1 OR CA-3122532-A1 OR US-10221856-B2).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/07 08:38 AM
L53	23	("4100822" | "10598258" | "20030027682" | "20030143093" | "20120127820" | "20140010671" | "20140161632" | "20150252661" | "20150300336" | "20160036308" | "20160177675" | "20160208592" | "20160273328" | "20160362284" | "20170016433" | "20170030177" | "20170036178" | "20170051732" | "20170225559" | "20170305736" | "20190249754").pn. OR ("11339769").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
L54	72828	(variable ADJ frequency) OR (vfd) AND L11	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
L55	337	((variable ADJ frequency) OR (vfd)) AND L11	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM

L56	0	plunger WITH (seven nine 7 9)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
L57	0	e21b.cpcl. AND plunger WITH (seven nine 7 9)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
L58	33	e21b.cpcl. AND plunger WITH (seven nine)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
L59	135	e21b.cpcl. AND plunger WITH (any WITH number)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
L60	9	((US-20200256429-A1 OR US-20120255734-A1 OR US-20130213892-A1 OR US-20130306322-A1 OR US-20140096974-A1 OR US-20140138079-A1 OR US-20140251623-A1 OR US-20210246968-A1).did. AND PGPB.dbnm.) OR ((US-4100822-A).did. AND USPT.dbnm.)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/07 08:38 AM
L61	30	(Artificial Intelligence) More like doc: US-20200256429-A1 Text: (US-20210246968-A1 OR CA-3073853-C OR US-11339769-B2 OR WO-2019060922-A1 OR CA-3073853-A1 OR US-20230265839-A1 OR US-20220381235-A1 OR US-11635066-B2 OR US-11598324-B2 OR WO-2019204323-A1 OR CA-3179532-A1 OR US-11408404-B2 OR US-20200224645-A1 OR CA-3079229-C OR US-20220220949-A1 OR CA-3079229-A1 OR US-11313359-B2 OR US-11692532-B2 OR US-20210095648-A1 OR US-20220356871-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/12/07 08:38 AM
L62	2	"10598258".pn.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA,	OR	ON	ON	2023/12/07 08:38 AM

			EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L63	4153	planetary WITH gear WITH arm	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/12/07 08:38 AM
L64	572	planetary ADJ gear WITH arms	(US-PGPUB; USPAT; USOCR)	OR	OFF	ON	2023/12/07 08:38 AM
L65	2270	planetary ADJ gear SAME arm WITH (drive shaft)	(US-PGPUB; USPAT; USOCR)	OR	OFF	ON	2023/12/07 08:38 AM
L66	26	planetary ADJ gear SAME arm WITH (drive shaft) AND e21b.cpcl.	(US-PGPUB; USPAT; USOCR)	OR	OFF	ON	2023/12/07 08:38 AM
L67	219	planetary ADJ gear SAME arm WITH (drive ADJ shaft)	(US-PGPUB; USPAT; USOCR)	OR	OFF	ON	2023/12/07 08:38 AM
L68	1573	gear WITH arms WITH (drive ADJ shaft)	(US-PGPUB; USPAT; USOCR)	OR	OFF	ON	2023/12/07 08:38 AM
L69	20	gear WITH arms WITH (drive ADJ shaft) AND e21b.cpcl.	(US-PGPUB; USPAT; USOCR)	OR	OFF	ON	2023/12/07 08:38 AM
L70	206	pump AND gear WITH arms WITH (drive ADJ shaft)	(US-PGPUB; USPAT; USOCR)	OR	OFF	ON	2023/12/07 08:38 AM
L71	405	cage WITH gear WITH arm	(US-PGPUB; USPAT; USOCR)	OR	OFF	ON	2023/12/07 08:38 AM

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N1	56	(planetary pump gear crankshaft).clm.	(US-PGPUB)	AND	OFF	ON	2023/12/07 08:33 AM

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18357271
Filing Date	2023-07-24
First Named Inventor	Jared Oehring
Art Unit	3672
Examiner Name	Andrews, David L
Attorney Docket Number	USWEL-002003

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

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U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

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	Attorney Docket Number	USWEL-002003

	1	The American Heritage dictionary of the English Language, Fifth edition, Fiftieth Anniversary, 2018, page 911	☐
	2	~~File Wrapper of U.S. Pat Appln. No. 62/323,303, filed April 15, 2016, 62 pages~~	☐
	3	~~File Wrapper of U.S. Pat. No 10,020,711, filed April 14, 2017, 250 pages~~	☐
	4	Ryan Davis, "Albright Says He'll Very Rarely Put Cases On Hold For PTAB," Law 360, https://www.law360.com/articles/1381597/print?section=ip, May 11, 2021, 2 pages	☐
	5	~~File Wrapper of U.S. Pat. No. 9,840,901, filed October 14, 2016, 216 pages~~	☐
	6	~~File Wrapper of U.S. Pat. No. 9,893,500, filed April 14, 2017, 291 pages~~	☐
	7	~~File Wrapper of U.S. Pat. No. 9,970,278, filed October 15, 2015, 310 pages~~	☐
	8	U.S. Department of Labor - Occupational Safety and Health Administration, Hazard Alert- Worker Exposure to Silica during Hydraulic Fracturing, 2012, 7 pages	☐
	9	U.S. Department of Labor - Occupational Safety and Health Administration, Hydraulic Fracturing and Flowback Hazards Other than Respirable Silica, 2014, 27 pages	☐
	10	~~Excerpt of File Wrapper of U.S. Pat. No. 10,119,381, filed May 3, 2016, 24 pages~~	☐
	11	~~Excerpt of File Wrapper of U.S. Pat. No. 10,934,824, filed October 12, 2018, 24 pages~~	☐

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	13	~~File Wrapper of U.S. Appln. No. 62/180,280, filed June 16, 2015, 32 pages~~	☐
	14	~~File Wrapper of U.S. Pat No. 10,526,882, filed June 15, 2016, 845 pages~~	☐
	15	~~File Wrapper of U.S. Pat. Appln. No. 62/204,331, filed August 12, 2015, 22 pages~~	☐
	16	~~File Wrapper of U.S. Pat. Appln. No. 62/242,173, filed October 15 2015, 17 pages~~	☐
	17	~~File Wrapper of U.S. Pat. Appln. No. 62/242,566, filed October 16, 2015, 34 pages~~	☐
	18	~~File Wrapper of U.S. Pat. Appln. No. 62/323,168, filed April 15, 2016, 41 pages~~	☐
	19	~~File Wrapper of U.S. Pat. No 8,789,601, filed February 26, 2014, 159 pages~~	☐
	20	~~File Wrapper of U.S. Pat. No. 10, 254,732, filed August 12, 2016, 552 pages~~	☐
	21	~~File Wrapper of U.S. Pat. No. 10, 408,031, filed October 15, 2018, 734 pages~~	☐
	22	~~File Wrapper of U.S. Pat. No. 10,280,724, filed July 7, 2017, 668 pages~~	☐

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	24	File Wrapper of U.S. Pat. No. 10,408,030, filed July 18, 2017, 401 pages	☐
	25	File Wrapper of U.S. Pat. No. 10,648,311, filed December 5, 2018, 804 pages	☐
	26	File Wrapper of U.S. Pat. No. 9,410,410, filed November 16, 2012, 269 pages	☐
	27	File Wrapper of U.S. Pat. No. 9,745,840, filed October 12, 2016, 213 pages	☐

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EXAMINER SIGNATURE

Examiner Signature	/D. ANDREWS/	Date Considered	12/07/2023

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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Art Unit	3672
Examiner Name	Andrews, David L
Attorney Docket Number	USWEL-002003

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Samuel A. Udovich/	Date (YYYY-MM-DD)	2023-12-05
Name/Print	Samuel A. Udovich	Registration Number	59951

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

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First Named Inventor	Jared Oehring
Art Unit	3672
Examiner Name	Andrews, David L
Attorney Docket Number	USWEL-002003

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	1							☐

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

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	17	File Wrapper of U.S. Pat. Appln. No. 62/242,566, filed October 16, 2015, 34 pages	☐
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	21	File Wrapper of U.S. Pat. No. 10, 408,031, filed October 15, 2018, 734 pages	☐
	22	File Wrapper of U.S. Pat. No. 10,280,724, filed July 7, 2017, 668 pages	☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	3672
	Examiner Name	Andrews, David L
	Attorney Docket Number	USWEL-002003

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Samuel A. Udovich/	Date (YYYY-MM-DD)	2023-12-05
Name/Print	Samuel A. Udovich	Registration Number	59951

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/357,271	12/05/2023 11:22:23 AM Z ET	USWEL-002003

Title of Invention

Multi-Plunger Pumps and Associated Drive Systems

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5490	FILED BY	Ramie Childress
PATENT CENTER #	63489482	AUTHORIZED BY	Sam Udovich
CUSTOMER #	134020	FILING DATE	07/24/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Jared Oehring

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 6047	E2023B5B23219024	Ramie Childress

PRE-AUTHORIZED ACCOUNT	PRE-AUTHORIZED CATEGORY
506816	37 CFR 1.16 (National application filing, search, and examination fees); 37 CFR 1.17 (Patent application and reexamination processing fees); 37 CFR 1.19 (Document supply fees); 37 CFR 1.20 (Post Issuance fees); 37 CFR 1.21 (Miscellaneous fees and charges)

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1806	SUBMISSION OF AN INFORMATION DISCLOSURE STATEMENT	260.00	1	260.00
			TOTAL AMOUNT:	$260.00

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/357,271	**12/05/2023 11:22:23 AM Z ET**	**USWEL-002003**

Title of Invention

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APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5490	FILED BY	Ramie Childress
PATENT CENTER #	63489482	FILING DATE	07/24/2023
CUSTOMER #	134020	FIRST NAMED INVENTOR	Jared Oehring
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Sam Udovich

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
IDS_USWEL-002003.pdf	6	Information Disclosure Statement (IDS) Form (SB08)	78 KB

Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.

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DOCUMENT	MESSAGE DIGEST(SHA-512)
IDS_USWEL-002003.pdf	686DBFD2FCAC8AF025DA3D075C511BCF060835D67FF61E90 40C77442C5274024OC50231B48894F5A43D293C62CE060D959

AB25635E3F9850CB3B2952F47606B3

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/357,271	**12/04/2023 05:34:07 PM Z ET**	**USWEL-002003**

Title of Invention

Multi-Plunger Pumps and Associated Drive Systems

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5490	FILED BY	Ramie Childress
PATENT CENTER #	63482222	FILING DATE	07/24/2023
CUSTOMER #	134020	FIRST NAMED INVENTOR	Jared Oehring
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Sam Udovich

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
Office Action Response_USWEL-002003.pdf	10	Amendment/Request for Reconsideration-After Non-Final Rejection	102 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
Office Action Response_USWEL-002003.pdf	CB526E2D0C10FEEAD7C1FC5F0D9EA59481C747CE6536951F CDF4451335C118BA0462610D644562752B1EA2288002931 8B23AEFEBEF2673418EA9BD40344E2FF6

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	U.S. Well Services, LLC	Art Unit	:	3672
Serial No.	:	18/357,271	Examiner	:	Andrews, David L.
Filed	:	July 24, 2023	Conf. No.	:	5490
Title	:	MULTI-PLUNGER PUMPS AND ASSOCIATED DRIVE SYSTEMS			

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO NON-FINAL OFFICE ACTION

The following is submitted in response to the non-final Office Action having a mailing date of November 13, 2023.

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1-20. (Canceled)

21. (Currently Amended) A hydraulic fracturing system for fracturing a subterranean formation, the hydraulic fracturing system comprising:

a multi-plunger hydraulic fracturing pump configured to pump fluid to a wellbore associated with the subterranean formation, the multi-plunger hydraulic fracturing pump comprising a pump crankshaft;

a plurality of motors positioned to power the multi-plunger hydraulic fracturing pump; and

a planetary gear train positioned to translate power from the plurality of motors to the pump crankshaft of the multi-plunger hydraulic fracturing pump, the planetary gear train comprising:

a plurality of input pinion gears connected to the plurality of motors; and

a final drive gear connected to the pump crankshaft of the multi-plunger hydraulic fracturing pump by a plurality of arms extending from the final drive gear.

22. (Previously Presented) The hydraulic fracturing system of claim 21, wherein the plurality of motors comprises a plurality of electric motors, and each of the plurality of input pinion gears is connected to a respective one of the plurality of electric motors.

23. (Previously Presented) The hydraulic fracturing system of claim 21, wherein the multi-plunger hydraulic fracturing pump has three plungers.

24. (Previously Presented) The hydraulic fracturing system of claim 21, wherein the multi-plunger hydraulic fracturing pump has five plungers.

25. (Previously Presented) The hydraulic fracturing system of claim 21, wherein the multi-plunger hydraulic fracturing pump has seven plungers.

26. (Previously Presented) The hydraulic fracturing system of claim 21, wherein the multi-plunger hydraulic fracturing pump has nine plungers.

27. (Previously Presented) The hydraulic fracturing system of claim 21, further comprising a variable frequency drive (VFD) associated with the plurality of motors and configured to control a pump rotational speed of the multi-plunger hydraulic fracturing pump.

28. (Previously Presented) The hydraulic fracturing system of claim 21, wherein the planetary gear train comprises a main gear that contacts each of the plurality of input pinion gears, wherein the main gear comprises external gear teeth that mate with external gear teeth of the plurality of input pinion gears.

29. (Previously Presented) The hydraulic fracturing system of claim 28, wherein the planetary gear train comprises:

a sun gear connected to the main gear by a shaft extending from the main gear; and

a plurality of planetary gears that each contact the sun gear and the final drive gear, wherein each of the plurality of planetary gears comprises external gear teeth that mate with external gear teeth of the sun gear and with internal gear teeth of the final drive gear.

30. (Canceled)

31. (Currently Amended) A hydraulic fracturing method comprising:

by operation of a multi-plunger hydraulic fracturing pump of a hydraulic fracturing system, pumping fluid to a wellbore associated with a subterranean formation, the multiplunger hydraulic fracturing pump comprising a pump crankshaft;

powering the multi-plunger hydraulic fracturing pump with a plurality of motors; and

translating power from the plurality of motors to the multi-plunger hydraulic fracturing pump through a planetary gear train, wherein translating power through the planetary gear train comprises translating power through:

a plurality of input pinion gears that are driven by the plurality of motors; and

a final drive gear that drives the pump crankshaft, wherein the final drive gear is connected to the pump crankshaft by a plurality of arms extending from the final drive gear.

32. (Previously Presented) The hydraulic fracturing method of claim 31, wherein the plurality of motors comprises a plurality of electric motors, and each of the plurality of input pinion gears is driven by a respective one of the plurality of electric motors.

33. (Previously Presented) The hydraulic fracturing method of claim 31, wherein the multi-plunger hydraulic fracturing pump has three plungers.

34. (Previously Presented) The hydraulic fracturing method of claim 31, wherein the multi-plunger hydraulic fracturing pump has five plungers.

35. (Previously Presented) The hydraulic fracturing method of claim 31, wherein the multi-plunger hydraulic fracturing pump has seven plungers.

36. (Previously Presented) The hydraulic fracturing method of claim 31, wherein the multi-plunger hydraulic fracturing pump has nine plungers.

37. (Previously Presented) The hydraulic fracturing method of claim 31, comprising, by operation of a variable frequency drive (VFD), controlling a pump rotational speed of the multi-plunger hydraulic fracturing pump.

38. (Previously Presented) The hydraulic fracturing method of claim 31, wherein translating power through the planetary gear train comprises translating power through a main gear that contacts each of the plurality of input pinion gears, wherein the main gear comprises external gear teeth that mate with external gear teeth of the plurality of input pinion gears.

39. (Previously Presented) The hydraulic fracturing method of claim 38, wherein translating power through the planetary gear train comprises translating power through:

a sun gear connected to the main gear by a shaft extending from the main gear; and

a plurality of planetary gears that contact the sun gear and the final drive gear, wherein each of the plurality of planetary gears comprises external gear teeth that mate with external gear teeth of the sun gear and with internal gear teeth of the final drive gear.

40. (Previously Presented) The hydraulic fracturing method of claim 31, comprising limiting a maximum pump speed of the multi-plunger hydraulic fracturing pump, wherein

the maximum pump speed is limited by a selection of a gear ratio of the planetary gear train and a speed at which the plurality of motors operate.

41. (Currently Amended) The hydraulic fracturing method of claim 40 [[31]], wherein the maximum pump speed correlates with a critical plunger speed of the multi-plunger hydraulic fracturing pump.

42. (Currently Amended) The hydraulic fracturing method of claim 40 [[31]], wherein the maximum pump speed is 5% over a critical plunger speed of the multi-plunger hydraulic fracturing pump.

43. (Currently Amended) A hydraulic fracturing system for fracturing a subterranean formation, the hydraulic fracturing system comprising:

a plurality of electric motors;

a planetary gear train connected to the plurality electric motors, the planetary gear train comprising:

a plurality of input pinion gears, each driven by a respective one of the plurality of electric motors;

a main gear driven by the plurality of input pinion gears, the main gear comprising external gear teeth that mate with external gear teeth of the plurality of input pinion gears;

a sun gear driven by the main gear and connected to the main gear by a shaft;

planetary gears driven by the sun gear, the planetary gears each comprising external gear teeth that mate with external gear teeth of the sun gear; and

a final drive gear driven by the planetary gears, the final drive gear comprising internal gear teeth that mate with the external gear teeth of the planetary gears; and

a multi-plunger hydraulic fracturing pump that pumps fluid to a wellbore and comprises a pump crankshaft that is driven by the final drive gear of the planetary gear train, the final drive gear connected to the pump crankshaft by a plurality of arms extending from the final drive gear.

44. (Previously Presented) The hydraulic fracturing system of claim 43, further comprising a variable frequency drive (VFD) associated with the plurality of motors and configured to control a pump rotational speed of the multi-plunger hydraulic fracturing pump.

45. (Previously Presented) The hydraulic fracturing system of claim 44, wherein the multi-plunger hydraulic fracturing pump comprises seven plungers.

46. (Previously Presented) The hydraulic fracturing system of claim 44, wherein the multi-plunger hydraulic fracturing pump comprises nine plungers.

47. – 50. (Canceled)

LIBERTY EXHIBIT 1002, Page 144

REMARKS

Claims 21-50 were pending upon issuance of the non-final Office Action dated November 13, 2023 (*Office Action*), with claims 21, 31, 43, and 47 being independent claims. In the Office Action, claims 21-29 and 31-50 were rejected. Claim 30 was indicated as reciting allowable subject matter but was objected to as being dependent upon a rejected base claim.

Claims 21, 31 and 41-43 are currently amended as set forth above; claims 30 and 47-50 are currently canceled without prejudice or disclaimer. Thus, claims 21-29 and 31-46 are currently pending in the Application. It is submitted that no new matter has been added to the Application by the present amendments.

Reconsideration of the Application in accordance with the following remarks is respectfully requested.

Application Placed in Condition for Allowance

The Office Action indicates that claim 30 will be allowed if amended to recite the subject matter of the independent base claim and any intervening claims.

The Office Action's reasons for allowance refer to the features of claim 30, without reference to the intervening claims, and independent claim 21 is currently amended to include features that were previously recited in claim 30. Thus, it is respectfully submitted that claim 21 is allowable for at least the same reasons that claim 30 was indicated as allowable. Independent claims 31 and 43 are currently amended to include analogous features, and it is respectfully submitted that claims 31 and 43 are allowable for analogous reasons.

Accordingly, it is respectfully submitted that the Application is placed in condition for allowance, and a Notice of Allowance is respectfully requested.

Examiner Interview Summary

On November 17, 2023, an Examiner interview was conducted by telephone. Examiner Andrews and the Applicant's representative Michael Henry participated. The

Applicant's representative noted that the reasons for allowance in the Office Action refer to the features recited in claim 30. The Examiner acknowledged this and further indicated that an updated search may be required to confirm that the allowability of claim 30 does not depend on the features recited in the intervening claims 28-29. The Applicant's representative indicated that a written response would be filed. No formal agreement was reached.

Information Disclosure Statement

The Office Action indicates that certain items in the information disclosure statement (IDS) filed on October 23, 2023 were not fully considered by the Examiner. Without acquiescing to the basis for non-consideration, the indicated items are currently re-submitted with a supplemental IDS. Applicant respectfully requests consideration of each item listed in the supplemental IDS.

Double Patenting Rejections

Claims 21-27, 31-37, 40-42, 47, 49, and 50 were rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over claims 1-20 of U.S. Pat. No. 10,598,258. The rejections are respectfully traversed.

Furthermore, it is respectfully submitted that the rejections are rendered moot by the present amendments. In particular, the obviousness-type double patenting rejection was not applied to the subject matter of claim 30, which has been incorporated into independent claims 21, 31 and 43.

Accordingly, withdrawal of the obviousness-type double patenting rejections is respectfully requested.

Claim Rejections Under 35 U.S.C. § 112

Claims 41-42 were rejected under 35 U.S.C. § 112(b). Without conceding the rejections, it is respectfully submitted that the rejections are rendered moot by the present amendment of claims 41-42. Accordingly, withdrawal of the rejections under 35 U.S.C. § 112(b) is respectfully requested.

Claim Rejections Under 35 U.S.C. § 103

Claims 21-29 and 31-50 were rejected under 35 U.S.C. § 103, as follows:

- Claims 21-24, 31-34, 40, and 47-48 were rejected as allegedly being unpatentable over U.S. Pat. Pub. No. 2020/0256429 of Buckley (*Buckley*) in view of U.S. Pat. Pub. No. 2015/0361736 of Bergan et al. (*Bergan*).
- Claims 25-27, 35-37, and 49-50 were rejected as allegedly being unpatentable over *Buckley* in view of *Bergan* and further in view of U.S. Pat. Pub. No. 2017/0114625 of Norris (*Norris*).
- Claims 28-29, 38-39, and 43 were rejected as allegedly being unpatentable over *Buckley* in view of *Bergan* and further in view of U.S. Pat. No. 4,100,822 to Rosman (*Rosman*).
- Claims 41-42 were rejected as allegedly being unpatentable over *Buckley* in view of *Bergan* and further in view of U.S. Pat. No. 8,851,860 to Mail (*Mail*).
- Claims 44-46 were rejected as allegedly being unpatentable over *Buckley* in view of *Bergan*, *Rosman*, and *Norris*.

The rejections are respectfully traversed because the cited references have not been shown to disclose the features recited in the claims.

Furthermore, it is respectfully submitted that the rejections are rendered moot by the present amendments. In particular, independent claims 21, 31 and 43 are currently amended to include subject matter that was indicated as allowable. Thus, independent claims 21, 31 and 43 and their respective dependent claims are allowable for at least the reasons indicated in the Office Action.

Accordingly, withdrawal of the rejections under 35 U.S.C. § 103 is respectfully requested.

CONCLUSION

Any circumstance in which this response has (a) addressed certain comments of the examiner does not mean that other comments of the examiner are conceded, (b) presented arguments for the patentability of some claims does not mean that there are not other good reasons for patentability of those claims and other claims, or (c) amended or canceled a claim does not mean that any of the examiner's positions with respect to that claim or other claims are conceded.

If the present application is not allowed and/or if one or more of the rejections is maintained, a telephone conference with the Examiner is here by requested, and it is further requested that the Examiner contact the undersigned attorney to schedule the telephone conference.

No fees are believed to be due at this time. The Commissioner is hereby authorized to charge any necessary fees or credit any overpayments to deposit account 506816, referencing the attorney docket number shown above.

Respectfully submitted,

Date: December 4, 2023

/Samuel A. Udovich/
Samuel A. Udovich
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PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 18/357,271	Filing Date 07/24/2023	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $480 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	12/04/2023	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 25	Minus	** 30	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 4	= 0		x $480 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	SLIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/CRYSTAL JETER/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/357,271	07/24/2023	Jared Oehring	USWEL-002003	5490

134020 7590 11/22/2023

Henry Patent Law Firm PLLC
8350 N. Central Expwy.
Suite 1750
Dallas, TX 75206

EXAMINER	
ANDREWS, DAVID L	

ART UNIT	PAPER NUMBER
3672	

NOTIFICATION DATE	DELIVERY MODE
11/22/2023	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket@henry.law

Applicant-Initiated Interview Summary	**Application No.** 18/357,271	**Applicant(s)** Oehring et al.		
	Examiner D Andrews	**Art Unit** 3672	**AIA (First Inventor to File) Status** Yes	**Page** 1 of 1

All Participants (applicant, applicants representative, PTO personnel)	**Title**	**Type**
D Andrews	Primary Examiner	Telephonic
Michael Henry	Attorney of Record	

Date of Interview: 17 November 2023

Issues Discussed:

Proposed Amendment(s)

The Office action mailed 11/13/2023 was discussed. It was discussed if the limitations of claim 30 alone, as potentially amended into claim 21, without intervening claims 28-29, would be sufficient to distinguish claim 21 over the prior art. The examiner agreed the prior art as previously applied did not appear contain this limitation (with or without the intervening claims), but a review and further search would be required to determine allowability.

/D. ANDREWS/ Primary Examiner, Art Unit 3672	

Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04
Please further see:
MPEP 713.04
Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b)
37 CFR § 1.2 Business to be transacted in writing

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
18/357,271	07/24/2023	Jared Oehring	USWEL-002003

CONFIRMATION NO. 5490

134020
Henry Patent Law Firm PLLC
8350 N. Central Expwy.
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Dallas, TX 75206

PUBLICATION NOTICE

OC000000064635933

Date Mailed: 11/16/2023

Title: Multi-Plunger Pumps and Associated Drive Systems

Publication No.US-2023-0366450-A1
Publication Date:11/16/2023

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/357,271	07/24/2023	Jared Oehring	USWEL-002003	5490

134020 7590 11/13/2023

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EXAMINER	
ANDREWS, DAVID L	

ART UNIT	PAPER NUMBER
3672	

NOTIFICATION DATE	DELIVERY MODE
11/13/2023	ELECTRONIC

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Office Action Summary	Application No. 18/357,271	Applicant(s) Oehring et al.	
	Examiner D Andrews	Art Unit 3672	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 7/24/2023.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 21-50 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 21-29 and 31-50 is/are rejected.

8) ☑ Claim(s) 30 is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 7/24/2023 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

The preliminary amendment filed 7/24/2023 has been entered.

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Information Disclosure Statement

Multiple information disclosure statements filed 10/23/2023 fail to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because they contain submissions with no date information and therefore cannot be evaluated as to if they qualify as prior art. They has been placed in the application file, but the information referred to therein **and denoted with strikethrough** has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

Claim Interpretation

The following is a quotation of 35 U.S.C. 112(f):

> (f) Element in Claim for a Combination. – An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

The following is a quotation of pre-AIA 35 U.S.C. 112, sixth paragraph:

> An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

This application includes one or more claim limitations that use the word "means" or "step" but are nonetheless not being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph because the claim limitation(s) recite(s) sufficient structure, materials, or acts to entirely perform the recited function. **Such claim limitation(s) is/are**: "means for transferring power" in claim 47, where the sufficient structure is also recited in claim 47 as "a planetary gear train".

Because this/these claim limitation(s) is/are **not** being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, it/they is/are **not** being interpreted to cover only the corresponding structure, material, or acts described in the specification as performing the claimed function, and equivalents thereof.

If applicant intends to have this/these limitation(s) interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, applicant may: (1) amend the claim limitation(s) to remove the structure, materials, or acts that performs the claimed function; or (2) present a sufficient showing that the claim limitation(s) does/do not recite sufficient structure, materials, or acts to perform the claimed function.

Claim Rejections - 35 USC § 112

The following is a quotation of 35 U.S.C. 112(b):

> (b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 41 and 42 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention.

Claims 41 and 42 lack antecedent basis for "the maximum pump speed". For further examination purposes these claims will be assumed dependent upon claim 40.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21-24, 31-34, 40, and 47-48 is/are rejected under 35 U.S.C. 103 as being unpatentable over Buckley (US 2020/0256429) in view of Bergan et al. (US 2015/0361736).

Examiner's Note: Buckley (US 2020/0256429) has priority to two provisional applications 62/562,943 and 62/658,139, where only the 62/562,943 application with a filing date of 9/25/2017 has a date prior to the instant application's effective filing date (as having priority to provisional application 62/594,912 filed 12/5/2017). Therefore Buckley (US 2020/0256429) is only relied upon below insofar as to disclosure supported

within the 62/562,943 provisional application, where annotations below are generally directed to the disclosure of '943.

In regard to claim 21, Buckley (as in '943) discloses a hydraulic fracturing system for fracturing a subterranean formation, the hydraulic fracturing system comprising: a multi-plunger hydraulic fracturing pump (fig 2 from '943, see annotated figure below) configured to pump fluid to a wellbore associated with the subterranean formation (paragraph 9, also page 4, lines 11+ of '943), the multi-plunger hydraulic fracturing pump comprising a pump crankshaft (inherent that crankshaft runs down axis of power end, as annotated below, also see page 5, lines 1-5 of '943; also see instant application figure 3, where crankshaft 360 is similarly positioned as known for such pumps); a plurality of motors (see annotated figure 2 from '943 below) positioned to power the multi-plunger hydraulic fracturing pump. Buckley does not disclose a planetary gear train positioned to translate power from the plurality of motors to the pump crankshaft of the multi-plunger hydraulic fracturing pump, the planetary gear train comprising: a plurality of input pinion gears connected to the plurality of motors; and a final drive gear connected to the pump crankshaft of the multi-plunger hydraulic fracturing pump.

Bergen et al. disclose a system wherein a plurality of motors (78) are positioned to power a rotating shaft (as rotating 74) via a planetary gear train (as in fig 5) positioned to translate power from the plurality of motors to the shaft, the planetary gear train comprising: a plurality of input pinion gears (extending from motors 78 in fig 5 and engaging 110) connected to the plurality of motors; and a final drive gear (98) connected to the shaft (104). It would have been obvious to one of ordinary skill in the art before the time of effective filing to provide the planetary gear arrangement, as

taught by Bergan et al. with the system of Buckley since choosing from a finite number of identified predictable solutions (for the gearing of Buckley) with a reasonable expectation of success is considered obvious to one of ordinary skill.

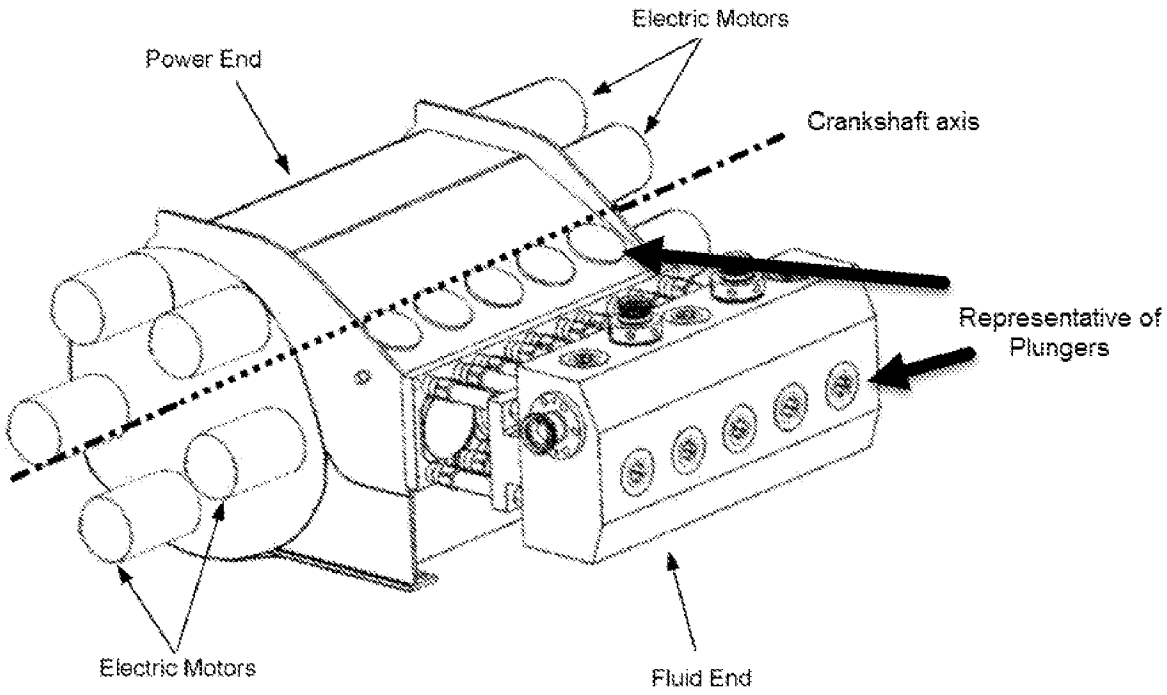


FIG. 2 (from 62/562,943 with annotation)

In regard to claim 22, Buckley discloses wherein the plurality of motors comprises a plurality of electric motors (as in fig 2 of '943), and each of the plurality of input pinion gears is connected to a respective one of the plurality of electric motors (as in the combination with Bergan et al. above).

In regard to claim 23, Buckley discloses wherein the multi-plunger hydraulic fracturing pump has three plungers (as annotated in figure above, pump appears to have 5 plungers).

In regard to claim 24, Buckley discloses wherein the multi-plunger hydraulic fracturing pump has five plungers (as annotated in figure above, pump appears to have 5 plungers).

In regard to claim 31, Buckley discloses a hydraulic fracturing method comprising: by operation of a multi-plunger hydraulic fracturing pump of a hydraulic fracturing system, pumping fluid to a wellbore associated with a subterranean formation (as in '943 pages 2-5), the multi-plunger hydraulic fracturing pump comprising a pump crankshaft (inherent that crankshaft runs down axis of power end, as annotated in figure above, also see page 5, lines 1-5 of '943; also see instant application figure 3, where crankshaft 360 is similarly positioned as known for such pumps); powering the multi-plunger hydraulic fracturing pump with a plurality of motors (fig 2 of '943 as shown in annotated figure above); and translating power from the plurality of motors to the multi-plunger hydraulic fracturing pump. Buckley does not disclose a planetary gear train, or translating power through the planetary gear train comprising translating power through a plurality of input pinion gears that are driven by the plurality of motors and a final drive gear.

Bergen et al. disclose a method wherein a plurality of motors (78) are positioned to power a rotating shaft (as rotating 74) via a planetary gear train (as in fig 5); translating power from the plurality of motors to the shaft, the planetary gear train comprising: a plurality of input pinion gears (extending from motors 78 in fig 5 and engaging 110) that are driven by the plurality of motors; and a final drive gear (98) connected to the shaft (104). It would have been obvious to one of ordinary skill in the art before the time of effective filing to provide the planetary gear arrangement, as

taught by Bergan et al. with the method of Buckley since choosing from a finite number of identified predictable solutions (for the gearing of Buckley) with a reasonable expectation of success is considered obvious to one of ordinary skill.

In regard to claim 32, Buckley discloses wherein the plurality of motors comprises a plurality of electric motors (as in fig 2 of '943), and each of the plurality of input pinion gears is driven by a respective one of the plurality of electric motors (as combined with Bergen et al. above).

In regard to claim 33, Buckley discloses wherein the multi-plunger hydraulic fracturing pump has three plungers (as in fig 2 of '943, pump appears to have 5 plungers).

In regard to claim 34, Buckley discloses wherein the multi-plunger hydraulic fracturing pump has five plungers (as in fig 2 of '943, pump appears to have 5 plungers).

In regard to claim 40, Buckley discloses limiting a maximum pump speed of the multi-plunger hydraulic fracturing pump (inherent as any assembled embodiment would have such a maximum pump speed), wherein the maximum pump speed is limited by a selection of a gear ratio of the planetary gear train and a speed at which the plurality of motors operate (inherent to construction of any such system as would be limited by components).

In regard to claim 47, Buckley discloses a hydraulic fracturing system for fracturing a subterranean formation, the hydraulic fracturing system comprising: a multi-plunger hydraulic fracturing pump (as in fig 2 of '943) that pumps fluid to a wellbore associated with the subterranean formation; a plurality of motors that operate in parallel

to power the multi-plunger hydraulic fracturing pump (as in fig 2 of '943, pages 5-6 as described). Buckley does not disclose means for transferring power from the plurality of motors to the multi-plunger hydraulic fracturing pump, the means for transferring power comprising a planetary gear train.

Bergen et al. disclose a system wherein a plurality of motors (78) include means for transferring power from the plurality of motors (as in fig 5) comprising a planetary gear train (as in fig 5). It would have been obvious to one of ordinary skill in the art before the time of effective filing to provide the planetary gear arrangement, as taught by Bergan et al. with the system of Buckley since choosing from a finite number of identified predictable solutions (for the gearing of Buckley) with a reasonable expectation of success is considered obvious to one of ordinary skill.

In regard to claim 48, Bergen et al. disclose wherein the planetary gear train comprises a plurality of input pinion gears (as extending from 78 and engaging 110 in fig 5), a main gear (110), a sun gear (104), a plurality of planetary gears (102), and a final drive gear (98).

Claim(s) 25-27, 35-37 and 49-50 is/are rejected under 35 U.S.C. 103 as being unpatentable over Buckley in view of Bergen et al. as applied to claim 21 or claim 31 above, and further in view of Norris et al. (US 2017/0114625).

In regard to claim 25, Buckley and Bergen et al. disclose all the limitations of this claim as applied to claim 21 above, except for wherein the multi-plunger hydraulic fracturing pump has seven plungers. Norris et al. teach a system wherein a multi-plunger pump may have any number of plungers (paragraph 38). It would have been

obvious to one of ordinary skill in the art before the time of effective filing to provide the system of Buckley, as modified by Bergen et al., with seven plungers, as taught by Norris et al. in order to increase capacity of the system, as suitable to the operation (as in paragraph 38 of Norris et al.).

In regard to claim 26, Buckley and Bergen et al. disclose all the limitations of this claim as applied to claim 21 above, except for wherein the multi-plunger hydraulic fracturing pump has nine plungers. Norris et al. teach a system wherein a multi-plunger pump may have any number of plungers (paragraph 38). It would have been obvious to one of ordinary skill in the art before the time of effective filing to provide the system of Buckley, as modified by Bergen et al., with nine plungers, as taught by Norris et al. in order to increase capacity of the system, as suitable to the operation (as in paragraph 38 of Norris et al.).

In regard to claim 27, Buckley and Bergen et al. disclose all the limitations of this claim as applied to claim 21 above, except for a variable frequency drive. Norris et al. disclose a system comprising a variable frequency drive (paragraph 55) configured to control a pump rotational speed of the multi-plunger hydraulic fracturing pump (as varying operation of the pump as in paragraph 55). It would have been obvious to one of ordinary skill in the art before the time of effective filing to provide the system of Buckley, as modified by Bergen et al., with a variable frequency drive, as taught by Norris et al. in order to control operation of the pump (as in paragraph 55 of Norris et al.).

In regard to claim 35, Buckley and Bergen et al. disclose all the limitations of this claim, as applied to claim 31 above, except for wherein the multi-plunger hydraulic

fracturing pump has seven plungers. Norris et al. teach a method wherein a multi-plunger pump may have any number of plungers (paragraph 38). It would have been obvious to one of ordinary skill in the art before the time of effective filing to provide the method of Buckley, as modified by Bergen et al., with seven plungers, as taught by Norris et al. in order to increase capacity of the system, as suitable to the operation (as in paragraph 38 of Norris et al.).

In regard to claim 36, Buckley and Bergen et al. disclose all the limitations of this claim, as applied to claim 31 above, except for wherein the multi-plunger hydraulic fracturing pump has nine plungers. Norris et al. teach a method wherein a multi-plunger pump may have any number of plungers (paragraph 38). It would have been obvious to one of ordinary skill in the art before the time of effective filing to provide the method of Buckley, as modified by Bergen et al., with nine plungers, as taught by Norris et al. in order to increase capacity of the system, as suitable to the operation (as in paragraph 38 of Norris et al.).

In regard to claim 37, Buckley and Bergen et al. disclose all the limitations of this claim as applied to claim 31 above, except for a variable frequency drive. Norris et al. disclose a method comprising a variable frequency drive (paragraph 55) configured to control a pump rotational speed of the multi-plunger hydraulic fracturing pump (as varying operation of the pump as in paragraph 55). It would have been obvious to one of ordinary skill in the art before the time of effective filing to provide the method of Buckley, as modified by Bergen et al., with a variable frequency drive, as taught by Norris et al. in order to control operation of the pump (as in paragraph 55 of Norris et al.).

In regard to claim 49, Buckley and Bergen et al. disclose all the limitations of this claim, as applied to claim 47 above, except for wherein the multi-plunger hydraulic fracturing pump has seven plungers. Norris et al. teach a method wherein a multi-plunger pump may have any number of plungers (paragraph 38). It would have been obvious to one of ordinary skill in the art before the time of effective filing to provide the method of Buckley, as modified by Bergen et al., with seven plungers, as taught by Norris et al. in order to increase capacity of the system, as suitable to the operation (as in paragraph 38 of Norris et al.).

In regard to claim 50, Buckley and Bergen et al. disclose all the limitations of this claim, as applied to claim 47 above, except for wherein the multi-plunger hydraulic fracturing pump has nine plungers. Norris et al. teach a method wherein a multi-plunger pump may have any number of plungers (paragraph 38). It would have been obvious to one of ordinary skill in the art before the time of effective filing to provide the method of Buckley, as modified by Bergen et al., with nine plungers, as taught by Norris et al. in order to increase capacity of the system, as suitable to the operation (as in paragraph 38 of Norris et al.).

Claims 28-29, 38-39, and 43 are rejected under 35 U.S.C. 103 as being unpatentable over Buckley in view of Bergen et al. as applied to claim 21 or claim 31 above, and further in view of Rosman (US 4,100,822).

In regard to claim 28, Buckley and Bergen et al. disclose all the limitations of this claim, as applied to claim 21 above and Bergan et al. including wherein the planetary gear train comprises a main gear (110) that contacts each of the plurality of input pinion

gears (as in fig 5), wherein the main gear comprises gear teeth that mate with external gear teeth of the plurality of input pinion gears (as in fig 5 at 110). Buckley nor Bergen et al. disclose that the main gear comprises external gear teeth that mate with the plurality of input pinion gears.

Rosman et al. disclose a system including a planetary gear arrangement and teach a main gear (15) comprising external gear teeth (as in fig 2) to mate with a plurality of input pinion gears (16). It would have been obvious to one of ordinary skill in the art before the time of effective filing to substitute a main gear with internal gear teeth, as taught by Buckley as modified by Bergen et al., for a main gear with external gear teeth, as taught by Rosman since the simple substitution of one known element for another (as taught as equilvalent by Rosman, i.e. fig 2 with external gear teeth vs fig 1 with internal gear teeth) to obtain predictable results is considered obvious to one of ordinary skill.

In regard to claim 29, Bergen et al. disclose wherein the planetary gear train comprises: a sun gear (104) connected to the main gear (110) by a shaft extending from the main gear (as in fig 5, as described paragraphs 32-33); and a plurality of planetary gears (102, as in fig 6) that each contact the sun gear and the final drive gear (as in fig 6), wherein each of the plurality of planetary gears comprises external gear teeth (as in fig 6) that mate with external gear teeth of the sun gear and with internal gear teeth of the final drive gear (as in fig 6).

In regard to claim 38, Buckley and Bergen et al. disclose all the limitations of this claim, as applied to claim 31 above and Bergan et al. including wherein translating power through the planetary gear train comprises translating through a main gear (110)

that contacts each of the plurality of input pinion gears (as in fig 5), wherein the main gear comprises gear teeth that mate with external gear teeth of the plurality of input pinion gears (as in fig 5 at 110). Buckley nor Bergen et al. disclose that the main gear comprises external gear teeth that mate with the plurality of input pinion gears.

Rosman et al. disclose a system including a planetary gear arrangement and teach a main gear (15) comprising external gear teeth (as in fig 2) to mate with a plurality of input pinion gears (16). It would have been obvious to one of ordinary skill in the art before the time of effective filing to substitute a main gear with internal gear teeth, as taught by Buckley as modified by Bergen et al., for a main gear with external gear teeth, as taught by Rosman since the simple substitution of one known element for another (as taught as equilvalent by Rosman, i.e. fig 2 with external gear teeth vs fig 1 with internal gear teeth) to obtain predictable results is considered obvious to one of ordinary skill.

In regard to claim 39, Bergen et al. disclose wherein translating power through the planetary gear train comprises translating power through: a sun gear (104) connected to the main gear (110) by a shaft extending from the main gear (as in fig 5, as described paragraphs 32-33); and a plurality of planetary gears (102, as in fig 6) that each contact the sun gear and the final drive gear (as in fig 6), wherein each of the plurality of planetary gears comprises external gear teeth (as in fig 6) that mate with external gear teeth of the sun gear and with internal gear teeth of the final drive gear (as in fig 6).

In regard to claim 43: (Examiner's Note: Buckley (US 2020/0256429) has priority to two provisional applications 62/562,943 and 62/658,139, where only the 62/562,943

application with a filing date of 9/25/2017 has a date prior to the instant application's effective filing date (as having priority to provisional application 62/594,912 filed 12/5/2017). Therefore Buckley (US 2020/0256429) is only relied upon below insofar as to disclosure supported within the 62/562,943 provisional application, where annotations below are generally directed to the disclosure of '943.)

Buckley discloses a hydraulic fracturing system for fracturing a subterranean formation, the hydraulic fracturing system comprising: a plurality of electric motors (as in fig 2 of '943); and a multi-plunger hydraulic fracturing pump (as in fig 2 of '943) that pumps fluid to a wellbore and comprises a pump crankshaft (inherent that crankshaft runs down axis of power end, as annotated above, also see page 5, lines 1-5 of '943; also see instant application figure 3, where crankshaft 360 is similarly positioned as known for such pumps). Buckley does not disclose a planetary gear train connected to the plurality electric motors, the planetary gear train comprising: a plurality of input pinion gears, each driven by a respective one of the plurality of electric motors; a main gear driven by the plurality of input pinion gears, the main gear comprising external gear teeth that mate with external gear teeth of the plurality of input pinion gears; a sun gear driven by the main gear and connected to the main gear by a shaft; planetary gears driven by the sun gear, the planetary gears each comprising external gear teeth that mate with external gear teeth of the sun gear; and a final drive gear driven by the planetary gears, the final drive gear comprising internal gear teeth that mate with the external gear teeth of the planetary gears.

Bergen et al. disclose a system wherein a planetary gear train (as in fig 5) connected to a plurality electric motors (78), the planetary gear train comprising: a

plurality of input pinion gears (extending from motors 78 in fig 5 and engaging 110), each driven by a respective one of the plurality of electric motors; a main gear (110) driven by the plurality of input pinion gears (as in fig 5), the main gear comprising gear teeth that mate with external gear teeth of the plurality of input pinion gears (as in fig 5); a sun gear (104) driven by the main gear and connected to the main gear by a shaft (as in fig 5); planetary gears (102) driven by the sun gear, the planetary gears each comprising external gear teeth that mate with external gear teeth of the sun gear (as in fig 6); and a final drive gear (98) driven by the planetary gears, the final drive gear comprising internal gear teeth that mate with the external gear teeth of the planetary gears (as in fig 6). It would have been obvious to one of ordinary skill in the art before the time of effective filing to provide the planetary gear arrangement, as taught by Bergan et al. with the system of Buckley since choosing from a finite number of identified predictable solutions (for the gearing of Buckley) with a reasonable expectation of success is considered obvious to one of ordinary skill. Bergen et al. also do not disclose that the main gear comprises external gear teeth that mate with the plurality of input pinion gears.

Rosman et al. disclose a system including a planetary gear arrangement and teach a main gear (15) comprising external gear teeth (as in fig 2) to mate with a plurality of input pinion gears (16). It would have been obvious to one of ordinary skill in the art before the time of effective filing to substitute a main gear with internal gear teeth, as taught by Buckley as modified by Bergen et al., for a main gear with external gear teeth, as taught by Rosman since the simple substitution of one known element for another (as taught as equilvalent by Rosman, i.e. fig 2 with external gear teeth vs fig 1

with internal gear teeth) to obtain predictable results is considered obvious to one of ordinary skill.

Claim(s) 41 and 42 is/are rejected under 35 U.S.C. 103 as being unpatentable over Buckley in view of Bergen et al. as applied to claim 40 above, and further in view of Mail (US 8,851,860).

In regard to claim 41, Buckley and Bergen et al. disclose all the limitations of this claim as applied to claim 40 above except for wherein the maximum pump speed correlates with a critical plunger speed of the multi-plunger hydraulic fracturing pump.

Mail discloses a method wherein a maximum pump speed correlates with a critical plunger speed associated with a hydraulic pump having a plunger (col. 1, lines 47-62, maximum speed that will not cause "overstressing" of components). The "critical plunger speed" may be arbitrary defined as that speed which causes an overstressing. It would have been obvious to one of ordinary skill in the art before the time of effective filing to modify the method of Buckley, as modified by Bergen et al., to correlate a maximum pump speed with a critical plunger speed, as taught by Mail, in order to provide efficient pumping (Mail, col. 1, lines 63+) and avoid overstressing of components (Mail, col. 1, lines 47+, col. 2, lines 1+).

In regard to claim 42, none of Buckley, Bergen et al. or Mail explicitly disclose wherein a maximum pump speed is 5% over a critical plunger speed of the multi-plunger hydraulic fracturing pump. However, considering the correlation above, as applied to claim 41, it would have been obvious to one of ordinary skill in the art before the time of effective filing to provide a maximum pump speed as 5% over a critical

plunger speed in order to avoid overstressing of components (as in Mail above). Note the "critical plunger speed" is arbitrarily defined and therefore may be defined as a speed 5% over an overstressing speed, which would provide the maximum speed as 5% over a critical plunger speed.

Claim(s) 44-46 is/are rejected under 35 U.S.C. 103 as being unpatentable over Buckley in view of Bergen et al. and Rosman as applied to claim 43 above, and further in view of Norris et al. (US 2017/0114625).

In regard to claim 44, Buckley, Bergen et al. and Rosman disclose all the limitations of this claim as applied to claim 43 above, except for a variable frequency drive. Norris et al. disclose a system comprising a variable frequency drive (paragraph 55) configured to control a pump rotational speed of a multi-plunger hydraulic fracturing pump (as varying operation of the pump as in paragraph 55). It would have been obvious to one of ordinary skill in the art before the time of effective filing to provide the system of Buckley, as modified by Bergen et al. and Rosman, with a variable frequency drive, as taught by Norris et al. in order to control operation of the pump (as in paragraph 55 of Norris et al.).

In regard to claim 45, Buckley, Bergen et al. and Rosman disclose all the limitations of this claim as applied to claim 43 above, except for wherein the multi-plunger hydraulic fracturing pump has seven plungers. Norris et al. teach a system wherein a multi-plunger pump may have any number of plungers (paragraph 38). It would have been obvious to one of ordinary skill in the art before the time of effective filing to provide the system of Buckley, as modified by Bergen et al. and Rosman, with

seven plungers, as taught by Norris et al. in order to increase capacity of the system, as suitable to the operation (as in paragraph 38 of Norris et al.).

In regard to claim 46, Buckley, Bergen et al. and Rosman disclose all the limitations of this claim as applied to claim 43 above, except for wherein the multi-plunger hydraulic fracturing pump has nine plungers. Norris et al. teach a system wherein a multi-plunger pump may have any number of plungers (paragraph 38). It would have been obvious to one of ordinary skill in the art before the time of effective filing to provide the system of Buckley, as modified by Bergen et al. and Rosman, with nine plungers, as taught by Norris et al. in order to increase capacity of the system, as suitable to the operation (as in paragraph 38 of Norris et al.).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*,

686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP § 2146 *et seq.* for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The filing of a terminal disclaimer by itself is not a complete reply to a nonstatutory double patenting (NSDP) rejection. A complete reply requires that the terminal disclaimer be accompanied by a reply requesting reconsideration of the prior Office action. Even where the NSDP rejection is provisional the reply must be complete. See MPEP § 804, subsection I.B.1. For a reply to a non-final Office action, see 37 CFR 1.111(a). For a reply to final Office action, see 37 CFR 1.113(c). A request for reconsideration while not provided for in 37 CFR 1.113(c) may be filed after final for consideration. See MPEP §§ 706.07(e) and 714.13.

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The actual filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal

Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/apply/applying-online/eterminal-disclaimer.

Claims 21-27, 31-37, 40-42, 47, 49 and 50 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 10,598,258. Although the claims at issue are not identical, they are not patentably distinct from each other because, for example, claim 21 is generic to all that is recited in claim 1 of the patent. Although '258 only recites "a planetary gear train" such a train would inherently contain at least a "final drive gear" as claimed and the "multi-plunger hydraulic fracturing pump" as in claim 1 of '258 inherently contains a crankshaft connected to the planetary gear train. Therefore claim 1 of '258 fully encompasses the subject matter of claim 21 and therefore anticipates claim 21. Similarly claims 22-27, 31-37, 40-42, 47, 49 and 50 are anticipated by the additional subject matter recited in the claims of '258.

Allowable Subject Matter

Claim 30 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record, alone or in combination do not appear to fairly teach or suggest wherein a final drive gear is connected to the pump crankshaft by a plurality of

arms extending from the final drive gear, in combination with the other limitations as specifically recited in claim 30.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to D Andrews whose telephone number is (571)272-6558. The examiner can normally be reached M-F, 7-3.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Abby Flynn can be reached on 571-272-9855. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For

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Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. ANDREWS/
Primary Examiner, Art Unit 3672

11/6/2023

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	Examiner D Andrews	Art Unit 3672	Page 1 of 1

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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/357,271	Oehring et al.
	Examiner	**Art Unit**
	D Andrews	3672

CPC - Searched*		
Symbol	**Date**	**Examiner**
E21B 37/00	11/06/2023	DA
E21B 43/20,26	11/06/2023	DA
F16H 3/52, 39/02, 2200/2007	11/06/2023	DA
F04B 15/02, 17/03, 23/04, 47/02, 49/20	11/06/2023	DA

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
inventor name search in PALM	11/06/2023	DA
global dossier search	11/06/2023	DA
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Interference Search			
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LIBERTY EXHIBIT 1002, Page 178

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Filing Date	2023-07-24
First Named Inventor	Jared Oehring
Art Unit	
Examiner Name	
Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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	52	20090188181		2009-07-30	FORBIS, et al.	
	53	20090200035		2009-08-13	BJERKREIM, et al.	
	54	20090260826		2009-10-22	SHERWOOD, et al.	
	55	20090308602		2009-12-17	BRUINS, et al.	
	56	20090315297		2009-12-24	NADEAU, et al.	
	57	20100000508		2010-01-07	CHANDLER	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	58	20100019574		2010-01-28	BALDASSARRE, et al.	
	59	20100038907		2010-02-18	HUNT, et al.	
	60	20100045109		2010-02-25	ARNOLD	
	61	20100051272		2010-03-04	LOREE, et al.	
	62	20100101785		2010-04-29	KHVOSHCHEV, et al.	
	63	20100132949		2010-06-03	DEFOSSE, et al.	
	64	20100146981		2010-06-17	MOTAKEF, et al.	
	65	20100172202		2010-07-08	BORGSTADT	
	66	20100193057		2010-08-05	GARNER	
	67	20100200224		2010-08-12	NGUETE, et al.	
	68	20100250139		2010-09-30	HOBBS, et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	69	20100281876		2010-11-11	KHAN, et al.	
	70	20100293973		2010-11-25	ERICKSON	
	71	20100303655		2010-12-02	SCEKIC	
	72	20100322802		2010-12-23	KUGELEV	
	73	20110017468		2011-01-27	BIRCH, et al.	
	74	20110052423		2011-03-03	GAMBIER, et al.	
	75	20110085924		2011-03-14	SHAMPINE, et al.	
	76	20110061855		2011-03-17	CASE, et al.	
	77	20110081268		2011-04-07	OCHOA, et al.	
	78	20110110793		2011-05-12	LEUGEMORS, et al.	
	79	20110166046		2011-07-07	WEAVER, et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	80	20110175397		2011-07-21	AMRINE JR, et al.	
	81	20110197988		2011-08-18	VAN VLIET, et al.	
	82	20110241590		2011-10-06	HORIKOSHI, et al.	
	83	20110247878		2011-10-13	RASHEED, et al.	
	84	20110272158		2011-11-10	NEAL	
	85	20120018016		2012-01-26	GIBSON, et al.	
	86	20120049625		2012-03-01	HOPWOOD	
	87	20120063936		2012-03-15	BAXTER, et al.	
	88	20120085541		2012-04-12	LOVE, et al.	
	89	20120112757		2012-05-10	VRANKOVIC, et al.	
	90	20120127635		2012-05-24	GRINDELAND	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	91	20120150455		2012-06-14	FRANKLIN, et al.	
	92	20120152716		2012-06-21	KIKUKAWA, et al.	
	93	20120205301		2012-08-16	MCGUIRE, et al.	
	94	20120205400		2012-08-16	DEGARAY, et al.	
	95	20120222865		2012-09-06	LARSON, et al.	
	96	20120232728		2012-09-13	KARIMI, et al.	
	97	20120247783		2012-10-04	BERNER, JR., et al.	
	98	20120255734		2012-10-11	COLI, et al.	
	99	20130009469		2013-01-10	GILLETT	
	100	20130025706		2013-01-31	DEGARAY, et al.	
	101	20130078114		2013-03-28	VAN RIJSWICK, et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	102	20130138254		2013-05-30	SEALS	
	103	20130175038		2013-07-11	CONRAD	
	104	20130175039		2013-07-11	GUIDRY	
	105	20130180722		2013-07-18	OLARTE CARO	
	106	20130189629		2013-07-25	CHANDLER	
	107	20130199617		2013-08-08	DEGARAY, et al.	
	108	20130233542		2013-09-12	SHAMPINE, et al.	
	109	20130255271		2013-10-03	YU, et al.	
	110	20130284278		2013-10-31	WINBORN	
	111	20130284455		2013-10-31	KAJARIA, et al.	
	112	20130299167		2013-11-14	FORDYCE, et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	113	20130306322		2013-11-21	SANBORN, et al.	
	114	20130317750		2013-11-28	HUNTER	
	115	20130341029		2013-12-26	ROBERTS, et al.	
	116	20130343858		2013-12-26	FLUSCHE	
	117	20140000899		2014-01-02	NEVISON	
	118	20140010671		2014-01-09	CRYER, et al.	
	119	20140054965		2014-02-27	JAIN	
	120	20140060658		2014-03-06	HAINS, et al.	
	121	20140077607		2014-03-20	CLARKE, et al.	
	122	20140095114		2014-04-03	THOMEER, et al.	
	123	20140096974		2014-04-10	COLI, et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	124	20140124162		2014-05-08	LEAVITT	
	125	20140138079		2014-05-22	BROUSSARD, et al.	
	126	20140174717		2014-06-26	BROUSSARD, et al.	
	127	20140219824		2014-08-07	BURNETTE	
	128	20140238683		2014-08-28	KORACH, et al.	
	129	20140246211		2014-09-04	GUIDRY, et al.	
	130	20140251623		2014-09-11	LESTZ, et al.	
	131	20140255214		2014-09-11	BURNETTE	
	132	20140277772		2014-09-18	LOPEZ, et al.	
	133	20140290768		2014-10-02	RANDLE, et al.	
	134	20140294603		2014-10-02	BEST	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	135	20140379300		2014-12-25	DEVINE, et al.	
	136	20150027712		2015-01-29	VICKNAIR, et al.	
	137	20150053426		2015-02-26	SMITH, et al.	
	138	20150068724		2015-03-12	COLI, et al.	
	139	20150068754		2015-03-12	COLI, et al.	
	140	20150075778		2015-03-19	WALTERS, et al.	
	141	20150083426		2015-03-26	LESKO, et al.	
	142	20150097504		2015-04-09	LAMASCUS, et al.	
	143	20150114652		2015-04-30	LESTZ, et al.	
	144	20150136043		2015-05-21	SHAABAN, et al.	
	145	20150144336		2015-05-28	HARDIN, et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	146	20150147194		2015-05-28	FOOTE	
	147	20150159911		2015-06-11	HOLT	
	148	20150175013		2015-06-25	CRYER, et al.	
	149	20150176386		2015-06-25	CASTILLO, et al.	
	150	20150211512		2015-07-30	WIEGMAN, et al.	
	151	20150211524		2015-07-30	BROUSSARD, et al.	
	152	20150217672		2015-08-06	SHAMPINE, et al.	
	153	20150225113		2015-08-13	LUNGU, et al.	
	154	20150233530		2015-08-20	SANDIDGE	
	155	20150252661		2015-09-10	GLASS	
	156	20150300145		2015-10-22	COLI, et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	157	20150314225		2015-11-05	PARSONS, et al.	
	158	20150330172		2015-11-19	ALLMARAS, et al.	
	159	20150354322		2015-12-10	VICKNAIR, et al.	
	160	20150361736		2015-12-17	BERGAN, et al.	
	161	20160006311		2016-01-07	LI	
	162	20160032703		2016-02-04	BROUSSARD, et al.	
	163	20160102537		2016-04-14	LOPEZ	
	164	20160105022		2016-04-14	OEHRING, et al.	
	165	20160160889		2016-06-09	HOFFMAN, et al.	
	166	20160177675		2016-06-23	MORRIS, et al.	
	167	20160177678		2016-06-23	MORRIS, et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	168	20160186531		2016-06-30	HARKLESS, et al.	
	169	20160208592		2016-07-21	OEHRING	
	170	20160208593		2016-07-21	COLI, et al.	
	171	20160208594		2016-07-21	COLI, et al.	
	172	20160208595		2016-07-21	TANG, et al.	
	173	20160221220		2016-08-04	PAIGE	
	174	20160230524		2016-08-11	DUMOIT, et al.	
	175	20160230525		2016-08-11	LESTZ, et al.	
	176	20160258267		2016-09-08	PAYNE, et al.	
	177	20160265457		2016-09-15	STEPHENSON, et al.	
	178	20160273328		2016-09-22	OEHRING	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	179	20160273456		2016-09-22	ZHANG	
	180	20160281484		2016-09-29	LESTZ, et al.	
	181	20160290114		2016-10-06	OEHRING, et al.	
	182	20160290563		2016-10-06	DAVID A. DIGGINS,	
	183	20160312108		2016-10-27	LESTZ, et al.	
	184	20160319650		2016-11-03	OEHRING, et al.	
	185	20160326853		2016-11-10	FREDD, et al.	
	186	20160326854		2016-11-10	BROUSSARD, et al.	
	187	20160326855		2016-11-10	COLI, et al.	
	188	20160341281		2016-11-24	BRUNVOLD, et al.	
	189	20160348479		2016-12-01	OEHRING, et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	190	20160349728		2016-12-01	OEHRING, et al.	
	191	20160369609		2016-12-22	MORRIS, et al.	
	192	20170016433		2017-01-19	CHONG, et al.	
	193	20170021318		2017-01-26	MCIVER	
	194	20170022788		2017-01-26	OEHRING, et al.	
	195	20170022807		2017-01-26	DURSUN, et al.	
	196	20170028368		2017-02-02	OEHRING, et al.	
	197	20170030177		2017-02-02	OEHRING, et al.	
	198	20170030178		2017-02-02	OEHRING, et al.	
	199	20170036178		2017-02-09	COLI, et al.	
	200	20170036872		2017-02-09	WALLACE	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	201	20170037718		2017-02-09	COLI, et al.	
	202	20170043280		2017-02-16	VANKOUWENBERG	
	203	20170051732		2017-02-23	HERNANDEZ, et al.	
	204	20170074076		2017-03-16	JOSEPH, et al.	
	205	20170082033		2017-03-23	WU, et al.	
	206	20170096885		2017-04-06	OEHRING, et al.	
	207	20170096889		2017-04-06	BLANCKAERT, et al.	
	208	20170104389		2017-04-13	MORRIS, et al.	
	209	20170114625		2017-04-27	NORRIS, et al.	
	210	20170130743		2017-05-11	ANDERSON	
	211	20170138171		2017-05-18	RICHARDS, et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	212	20170145918		2017-05-25	OEHRING, et al.	
	213	20170146189		2017-05-25	HERMAN, et al.	
	214	20170159570		2017-06-08	BICKERT	
	215	20170159654		2017-06-08	KENDRICK	
	216	20170175516		2017-06-22	ESLINGER	
	217	20170204852		2017-07-20	BARNETT, JR.	
	218	20170212535		2017-07-27	SHELMAN, et al.	
	219	20170218727		2017-08-03	OEHRING, et al.	
	220	20170218843		2017-08-03	OEHRING, et al.	
	221	20170222409		2017-08-03	OEHRING, et al.	
	222	20170226838		2017-08-10	CIEZOBKA, et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	223	20170226839		2017-08-10	BROUSSARD, et al.	
	224	20170226842		2017-08-10	OMONT, et al.	
	225	20170234250		2017-08-17	JANIK	
	226	20170241221		2017-08-24	SESHADRI, et al.	
	227	20170259227		2017-09-14	MORRIS, et al.	
	228	20170292513		2017-10-12	HADDAD, et al.	
	229	20170313499		2017-11-02	HUGHES, et al.	
	230	20170314380		2017-11-02	OEHRING, et al.	
	231	20170328179		2017-11-16	DYKSTRA, et al.	
	232	20170369258		2017-12-28	DEGARAY, et al.	
	233	20170370639		2017-12-28	BARDON, et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	234	20180028992		2018-02-01	STEGEMOELLER, et al.	
	235	20180038216		2018-02-08	ZHANG, et al.	
	236	20180045331		2018-02-15	LOPEZ, et al.	
	237	20180090914		2018-03-29	JOHNSON, et al.	
	238	20180156210		2018-06-07	OEHRING, et al.	
	239	20180181830		2018-06-28	LUHARUKA, et al.	
	240	20180183219		2018-06-28	OEHRING, et al.	
	241	20180216455		2018-08-02	ANDREYCHUK, et al.	
	242	20180238147		2018-08-23	SHAHRI, et al.	
	243	20180245428		2018-08-30	RICHARDS	
	244	20180258746		2018-09-13	BROUSSARD, et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	245	20180259080		2018-09-13	DALE, et al.	
	246	20180266217		2018-09-20	FUNKHOUSER, et al.	
	247	20180266412		2018-09-20	STOKKEVÅG, et al.	
	248	20180274446		2018-09-27	OEHRING, et al.	
	249	20180284817		2018-10-04	COOK, et al.	
	250	20180291713		2018-10-11	JEANSON	
	251	20180298731		2018-10-18	BISHOP, et al.	
	252	20180312738		2018-11-01	RUTSCH, et al.	
	253	20180313677		2018-11-01	WARREN, et al.	
	254	20180320483		2018-11-08	ZHANG, et al.	
	255	20180343125		2018-11-29	CLISH, et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	256	20180363437		2018-12-20	COLI, et al.	
	257	20180363640		2018-12-20	KAJITA, et al.	
	258	20190003329		2019-01-03	MORRIS, et al.	
	259	20190010793		2019-01-10	HINDERLITER	
	260	20190040727		2019-02-07	OEHRING, et al.	
	261	20190063309		2019-02-28	DAVIS	
	262	20190100989		2019-04-09	STEWART, et al.	
	263	20190112910		2019-04-18	OEHRING, et al.	
	264	20190119096		2019-04-25	HAILE, et al.	
	265	20190120024		2019-04-25	OEHRING, et al.	
	266	20190128080		2019-05-02	ROSS, et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	267	20190128104		2019-05-02	GRAHAM, et al.	
	268	20190145251		2019-05-16	JOHNSON	
	269	20190154020		2019-05-23	GLASS	
	270	20190162061		2019-05-30	STEPHENSON	
	271	20190169971		2019-06-06	OEHRING, et al.	
	272	20190178057		2019-06-13	HUNTER	
	273	20190178235		2019-06-13	COSKREY, et al.	
	274	20190203567		2019-07-04	ROSS, et al.	
	275	20190203572		2019-07-04	MORRIS, et al.	
	276	20190211661		2019-07-11	RECKELS, et al.	
	277	20190226317		2019-07-25	PAYNE, et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	278	20190245348		2019-08-08	HINDERLITER, et al.	
	279	20190249527		2019-08-15	KRAYNEK	
	280	20190257462		2019-08-22	ROGERS	
	281	20190292866		2019-09-26	ROSS, et al.	
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18357271
Filing Date	2023-07-24
First Named Inventor	Jared Oehring
Art Unit	
Examiner Name	
Attorney Docket Number	USWEL-002003

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] ¡	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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Examiner Signature	/D. ANDREWS/	Date Considered	11/06/2023

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Samuel A. Udovich/	Date (YYYY-MM-DD)	2023-10-22
Name/Print	Samuel A. Udovich	Registration Number	59951

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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	25	Office Action mailed June 22, 2020 in relate U.S. Patent Application No. 16/377,861	☐
	26	Office Action mailed June 29, 2020 in related U.S. Patent Application No. 16/404,283	☐
	27	Office Action mailed June 29, 2020 in related U.S. Patent Application No. 16/728,359	☐
	28	Office Action mailed June 7, 2019 in corresponding US Application No. 16/268,030	☐
	29	Office Action mailed March 1, 2019 in related Canadian Patent Application No. 2,943,275.	☐
	30	Office Action mailed May 10, 2019 in corresponding US Application No. 16/268,030	☐
	31	Office Action mailed October 11, 2019 in related U.S. Patent Application No. 16/385,070	☐
	32	Office Action mailed October 2, 2019 in related U.S. Patent Application No. 16/152,732	☐
	33	Office Action mailed September 11, 2019 in related U.S. Patent Application No. 16/268,030	☐

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	34	Office Action mailed September 20, 2019 in related U.S. Patent Application No. 16/443,273	☐
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☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

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A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Samuel A. Udovich/	Date (YYYY-MM-DD)	2023-10-23
Name/Print	Samuel A. Udovich	Registration Number	59951

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U.S.PATENTS

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8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	48	f16h3/52.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:54 AM
L2	1632	f04b15/02.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:54 AM
L3	3233	f04b17/03.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:54 AM
L4	931	f04b23/04.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:54 AM
L5	2806	f04b47/02.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:54 AM
L6	1535	f04b49/20.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:55 AM
L8	465	f16h39/02.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:55 AM
L9	2722	f16h2200/2007.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:55 AM
L10	2214	e21b37/00.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:56 AM
L11	10027	e21b43/20,26.cpc.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:57 AM
L12	3859	(L1 L2 L3 L4 L5 L6 L8 L9) AND (planetary frac fracturing)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:57 AM
L13	89	(L1 L2 L3 L4 L5 L6 L8 L9) AND (planetary AND (frac fracturing))	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 05:57 AM
L14	1	(16/683057).APP.	(USPAT; USOCR)	OR	ON	ON	2023/11/06 06:03 AM
L15	0	(16/834412).APP.	(USPAT; USOCR)	OR	ON	ON	2023/11/06 06:04 AM
L16	1	(16/647844).APP.	(USPAT; USOCR)	OR	ON	ON	2023/11/06 06:05 AM
L17	33	(Artificial Intelligence) More like doc: US-20190249754-A1 Text: (WO-2019113147-A1 OR US-10598258-B2 OR CA-3084596-A1 OR US-20210041009-A1 OR AR-113611-A1 OR US-10119381-B2 OR US-10934824-B2 OR US-11408404-B2 OR US-20220325706-A1 OR US-20210095648-A1 OR WO-2020257350-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/11/06 06:06 AM

		US-20220220949-A1 OR CA-3143991-A1 OR US-11313359-B2 OR US-11035207-B2 OR WO-2019084283-A1 OR US-20190120024-A1 OR US-11339769-B2 OR US-20200386077-A1 OR US-10655435-B2).did.					
L18	23	("4100822" | "10598258" | "20030027682" | "20030143093" | "20120127820" | "20140010671" | "20140161632" | "20150252661" | "20150300336" | "20160036308" | "20160177675" | "20160208592" | "20160273328" | "20160362284" | "20170016433" | "20170030177" | "20170036178" | "20170051732" | "20170225559" | "20170305736" | "20190249754").pn. OR ("11339769").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 06:06 AM
L19	72463	(variable ADJ frequency) OR (vfd) AND L11	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 06:09 AM
L20	355	((variable ADJ frequency) OR (vfd)) AND L11	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 06:09 AM
L21	0	plunger WITH (seven nine 7 9)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 07:19 AM
L22	0	e21b.cpcl. AND plunger WITH (seven nine 7 9)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 07:20 AM
L23	31	e21b.cpcl. AND plunger WITH (seven nine)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 07:20 AM
L24	134	e21b.cpcl. AND plunger WITH (any WITH number)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2023/11/06 07:21 AM
L25	9	((US-20200256429-A1 OR US-20120255734-A1 OR US-20130213892-A1 OR US-20130306322-A1 OR US-20140096974-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB,	OR	ON	ON	2023/11/06 09:19 AM

		A1 OR US-20140138079-A1 OR US-20140251623-A1 OR US-20210246968-A1).did. AND PGPB.dbnm.) OR ((US-4100822-A).did. AND USPT.dbnm.)	HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L26	30	(Artificial Intelligence) More like doc: US-20200256429-A1 Text: (US-20210246968-A1 OR CA-3073853-C OR US-11339769-B2 OR WO-2019060922-A1 OR CA-3073853-A1 OR US-20230265839-A1 OR US-20220381235-A1 OR US-11635066-B2 OR US-11598324-B2 OR WO-2019204323-A1 OR CA-3179532-A1 OR US-11408404-B2 OR US-20200224645-A1 OR CA-3079229-C OR US-20220220949-A1 OR CA-3079229-A1 OR US-11313359-B2 OR US-11692532-B2 OR US-20210095648-A1 OR US-20220356871-A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/11/06 09:19 AM
L27	2	"10598258".pn.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/11/06 10:14 AM

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18357271
Filing Date	2023-07-24
First Named Inventor	Jared Oehring
Art Unit	
Examiner Name	
Attorney Docket Number	USWEL-002003

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

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	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	1	File Wrapper of U.S. Pat. No. 9,840,901, 218 pages	☐
	2	File Wrapper of U.S. Pat. No. 9,893,500, 291 pages	☐
	3	File Wrapper of U.S. Pat. No. 9,970,278, 310 pages	☐
	4	Final Office Action issued in corresponding Application No. 14/622,532 dated December 21, 2015	☐
	5	Final Office Action issued in corresponding Application No. 14/622,532 dated December 7, 2016.	☐
	6	Final Office Action issued in corresponding Application No. 15/145,491 dated January 20,2017.	☐
	7	Final Office Action issued in corresponding Application No. 15/145,491 dated September 6, 2017.	☐
	8	Final Office Action issued in corresponding Application No. 15/294,349 dated July 6, 2017,	☐
	9	Final Office Action mailed February 4, 2021 in US 16/597,014	☐
	10	Final Office Action mailed January 11, 2021 in US 16/404,283	☐
	11	Final Office Action mailed January 21, 2021 in US 16/458,696	☐

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

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	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	~~12~~	~~Flowline Products and Services, FMC Technologies, http://www.fmctechnologies.com, 80 pages~~	☐
	13	Gardner Denver, 3" 1502 Male Hammer Union Discharge Flange, 2005, 13 pages	☐
	14	Gardner Denver, Well Servicing Pump Model GD-2500Q Quintuplex - Operating and Service Manual, August 2005, 46 pages	☐
	15	Gardner Denver, Well Servicing Pump Model GD-2500Q, GD-2500Q-HD, Quintuplex Pumps, September 2011, 45 pages	☐
	16	GOODWIN, "High-voltage auxiliary switchgear for power stations," Power Engineering Journal, 1989, 10 pg. (Year 1989)	☐
	17	Halliburton, Halliburton All-Electric Fracturing Reducing Emissions and Cost Brochure, 2021, 6 pages	☐
	18	Hart Energy, Hydraulic Fracturing Techbook, 2015, 99 pages	☐
	19	HAZARD ALERT - Worker exposure to Silica during Hydraulic Fracturing, United States Department of Labor, https://web.archive.org/web/20120808200919/http://www.osha.gov/dts/hazardalerts/hydraulic_frac_hazard_alert.html, accesed June 13, 2021, 5 pages	☐
	20	Henry Chajet, "OSHA Issues Alert on Non-Silica Fracking Hazards," January 30, 2015, National Law Review Newsroom, 2 pages	☐
	21	IEEE Authoritative Dictionary of IEEE Standards Terms Seventh Edition, 2000, 7 pages	☐
	22	IEEE Power Engineering Society, 112 IEEE Standard Test Procedure for Polyphase Induction Motors and Generators, 2004, 87 pages	☐

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	Attorney Docket Number	USWEL-002003

	23	Industrial Safety & Hygiene News, OSHA issues Hazard alert for fracking and drilling, January 6, 2015, 1 page	☐
	24	Industry/Hazard Alerts, United States Department of Labor, https://web.archive.org/web/20120801064838/http://www.osha.gov:80/hazardindex.html, accessed June 13, 2021, 1 page	☐
	25	International Search and Report and Written Opinion mailed January 2, 2019 in related PCT Patent Application No. PCT/US18/54542	☐
	26	international Search and Written Opinion Mailed August 28, 2020 in PCT/US20/23821	☐
	27	International Search report and Written Opinion dated September 19, 2018 in related PCT Patent Application No. PCT/US2018/040683.	☐
	28	International Search Report and Written Opinion issued in PCT/US2020/023809 mailed June 2, 2020.	☐
	29	International Search Report and Written Opinion mailed April 10, 2019 in corresponding PCT Application No. PCT/US2019/016635	☐
	30	International Search Report and Written Opinion mailed December 14, 2020 in PCT/ US2020/53980	☐
	31	International Search Report and Written Opinion mailed December 31, 2018 in related PCT Patent Application No. PCT/US18/55913	☐
	32	International Search Report and Written Opinion mailed February 15, 2019 in related PCT Application No. PCT/US18/63977.	☐
	33	International Search Report and Written Opinion mailed February 2, 2021 in PCT/US20/58906	☐

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	Examiner Name	
	Attorney Docket Number	USWEL-002003

	34	International Search Report and Written Opinion mailed February 3, 2021 in PCT/US20/58899	☐
	35	International Search Report and Written Opinion mailed February 4, 2021 in PCT/US20/59834	☐
	36	International Search Report and Written Opinion mailed in PCT/US/67526 mailed May 6, 2021	☐
	37	International Search Report and Written Opinion mailed in PCT/US20/67146 mailed March 29, 2021	☐
	38	International Search Report and Written Opinion mailed in PCT/US20/67523 mailed March 22, 2021	☐
	39	International Search Report and Written Opinion mailed in PCT/US20/67528 mailed March 19, 2021.	☐
	40	International Search Report and Written Opinion mailed in PCT/US20/67608 mailed March 30, 2021	☐
	41	International Search Report and Written Opinion mailed in PCT/US2020/066543 mailed May 11, 2021	☐
	42	International Search Report and Written Opinion mailed January 2, 2019 in related PCT Patent Application No. PCT/US18/54548	☐
	43	International Search Report and Written Opinion mailed January 2, 2020 in related PCT Application No. PCT/US19/55325	☐
	44	International Search Report and Written Opinion mailed January 4, 2019 in related PCT Patent Application No. PCT/US18/57539	☐

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	Examiner Name	
	Attorney Docket Number	USWEL-002003

	45	International Search Report and Written Opinion mailed July 22, 2020 in corresponding PCT Application No. PCT/US20/00017	☐
	46	International Search Report and Written Opinion mailed July 9, 2019 in corresponding PCT Application No. PCT/US2019/027584	☐
	47	International Search Report and Written Opinion mailed June 23, 2020 in corresponding PCT Application No. PCT/US20/23912	☐
	48	International Search Report and Written Opinion mailed March 5, 2019 in related PCT Application No. PCT/US18/63970.	☐
	49	International Search Report and Written Opinion mailed November 26, 2019 in related PCT Application No. PCT/US19/51018	☐
	50	International Search Report and Written Opinion mailed September 11, 2019 in related PCT Application No. PCT/US2019/037493	☐

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature	/D. ANDREWS/	Date Considered	11/06/2023

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Samuel A. Udovich/	Date (YYYY-MM-DD)	2023-10-23
Name/Print	Samuel A. Udovich	Registration Number	59951

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

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Approved for use through 05/31/2024. OMB 0651-0031
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Filing Date	2023-07-24
First Named Inventor	Jared Oehring
Art Unit	
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Attorney Docket Number	USWEL-002003

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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	6	U.S. Well Services, Inc and U.S. Well Services, LLC v Halliburton Company and Cimarex Energy Co., Case No. 6:21-cv-00367-ADA, Doc 56, Defendants' Opening Claim Construction Brief, October 27, 2021, 46 pages	☐
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Examiner Name	
Attorney Docket Number	USWEL-002003

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Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Samuel A. Udovich/	Date (YYYY-MM-DD)	2023-10-23
Name/Print	Samuel A. Udovich	Registration Number	59951

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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U.S.PATENTS

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	50	Non-Final Office Action mailed January 10, 2020 in related U.S. Patent Application No. 16/597,014	☐

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EXAMINER SIGNATURE

Examiner Signature	/D. ANDREWS/	Date Considered	11/06/2023

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.A./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Samuel A. Udovich/	Date (YYYY-MM-DD)	2023-10-23
Name/Print	Samuel A. Udovich	Registration Number	59951

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-22)
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U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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U.S.PATENT APPLICATION PUBLICATIONS

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FOREIGN PATENT DOCUMENTS

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

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	1	Declaration of Dr. Robert Durham, IPR2021-01065, June 18, 2021, 138 pages	☐
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	3	Declaration of Duncan Hall, July 23, 2021, https://web.archive.org/web/20031219231426/http://ppi2pass.com:80/catalog/servlet/MyPpi_pg_aboutppi.html, 12 pages	☐
	4	Declaration of Joel N. Broussard, Case Nos. IPR2021-01032 & IPR2021-01033, October 13, 2021, 9 pages	☐
	5	Declaration of Joel N. Broussard, IPR2021-01034, IPR2021-01035, IPR2021-01036, and IPR2021-01037, October 20, 2021, 11 pages	☐
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	8	Declaration of Nathaniel E. Frank-White, Internet Archive, February 17, 2022, http://web.archive.org/web/20140329090440/http://www.enidline.com/pdffiles/WR_catalog_2012.pdf, 82 pages	☐
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	12	Declaration of Robert Schaaf, Case Nos. IPR-2021-01032 and IPR2021-01033, October 12, 2021, 45 pages	☐
	13	Declaration of Robert Schaaf, IPR2021-01034, October 20, 2021, 47 pages	☐
	14	Declaration of Robert Schaaf, IPR2021-01035, October 20, 2021, 51 pages	☐
	15	Declaration of Robert Schaaf, IPR2021-01037, October 20, 2021, 52 pages	☐
	16	Declaration of Robert Schaaf, IPR2021-01038, November 10, 2021, 40 pages	☐
	17	Declaration of Robert Schaaf, IPR2021-01065, November 10, 2021, 33 pages	☐
	18	Declaration of Robert Schaaf, IPR2021-01238, November 17, 2021, 38 pages	☐
	19	Declaration of Robert Schaaf, IPR2021-01315, November 19, 2021, 39 pages	☐
	20	Declaration of Robert Schaaf, IPR2021-01316, November 19, 2021, 33 pages	☐
	21	Declaration of Robert Schaaf, IPR2021-01538, December 28, 2021, 40 pages	☐
	22	Declaration of Robert Schaaf, IPR2021-01539, January 25, 2022, 37 pages	☐

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	23	Declaration of Robert Schaaf, IPR2022-00074, February 17, 2022, 36 pages	☐
	24	Declaration of Sylvia D. Hall-Ellis, IPR2022-00610, February 28, 2022, 98 pages	☐
	25	Declaration of Sylvia D. Hall-Ellis, Ph.D., Case Nos. IPR2021-01032, IPR2021-01033, and IPR2021-01034, June 18, 2021, 173 pages	☐
	26	Department of Transportation, Federal Motor Carrier Safety Administration, 49 CFR Parts 390, 392 and 393 - Parts and Accessories Necessary for Safe Operation; General Amendments; final Rule, Federal Register, August 15, 2005, Vol. 70, No. 156, 49 pages	☐
	27	Donald G. Fink, "Standard Handbook for Electrical Engineers - Thirteenth Edition," 1993, McGraw-Hill Inc., pgs.10-3, 20-21, 20-22, 20-85, 20-20, 20-89, 20-90, 20-91, 22-12, 22-13, 22-14, 22-15 and 22-16	☐
	28	Dr. Nedelcut et al., "Online and Off-line Monitoring- Diagnosis System (MDS) for Power Transformers, "IEEE, 2008 International Conference on Condition Monitoring and Diagnosis, Beijing, China, April 21-24, 2008, 7 pages	☐
	29	Email from Michael See on June 10, 2021 regarding API-541 Fourt Edition: Public Availability, 2 pages	☐
	30	Eugene A. Avallone, Marks' Standard Handbook for Mechanical Engineers: 11th Edition, 2007, pg.16-4 and 16-22	☐
	31	Eugene A. Avallone, Marks' Standard Handbook for Mechanical Engineers: 11th Edition, 2007, Section 14, 18 pages	☐
	~~32~~	~~Excerpt of File Wrapper of U.S. Pat. No. 10,119, 381, 24 pages~~	☐
	~~33~~	~~Excerpt of File Wrapper of U.S. Pat. No. 10,934,824, 24 pages~~	☐

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	34	File Wrapper Excerpt of U.S. Pat. No. 9,893,500, 108 pages	☐
	35	File Wrapper of U.S. Appln. No. 62/180,289, 32 pages	☐
	36	File Wrapper of U.S. Pat No. 10,526,882, 845 pages	☐
	37	File Wrapper of U.S. Pat. Appln. No. 62/204,331, 22 pages	☐
	38	File Wrapper of U.S. Pat. Appln. No. 62/242,173, 17 pages	☐
	39	File Wrapper of U.S. Pat. Appln. No. 62/242,566, 34 pages	☐
	40	File Wrapper of U.S. Pat. Appln. No. 62/323,168, 41 pages	☐
	41	File Wrapper of U.S. Pat. No 8,780,691, 159 pages	☐
	42	File Wrapper of U.S. Pat. No. 10, 254,732, 552 pages	☐
	43	File Wrapper of U.S. Pat. No. 10, 408,031, 734 pages	☐
	44	File Wrapper of U.S. Pat. No. 10,280,724, 668 pages	☐

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	~~46~~	~~File Wrapper of U.S. Pat. No. 10,408,030, 401 pages~~	☐
	~~47~~	~~File Wrapper of U.S. Pat. No. 10,648,311, 1,804 pages~~	☐
	~~48~~	~~File Wrapper of U.S. Pat. No. 9,410,410, 263 pages~~	☐
	49	File Wrapper of U.S. Pat. No. 9,410,410, Excerpt - Response to Non-Final Office Action filed February 3, 2016, 57 pages	☐
	~~50~~	~~File Wrapper of U.S. Pat. No. 9,745,840, 215 pages~~	☐

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U.S.PATENTS

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U.S.PATENT APPLICATION PUBLICATIONS

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

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	17	Declaration of Robert Schaaf, IPR2021-01065, November 10, 2021, 33 pages	☐
	18	Declaration of Robert Schaaf, IPR2021-01238, November 17, 2021, 38 pages	☐
	19	Declaration of Robert Schaaf, IPR2021-01315, November 19, 2021, 39 pages	☐
	20	Declaration of Robert Schaaf, IPR2021-01316, November 19, 2021, 33 pages	☐
	21	Declaration of Robert Schaaf, IPR2021-01538, December 28, 2021, 40 pages	☐
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	30	Eugene A. Avallone, Marks' Standard Handbook for Mechanical Engineers: 11th Edition, 2007, pg.16-4 and 16-22	☐
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	36	File Wrapper of U.S. Pat No. 10,526,882, 845 pages	☐
	37	File Wrapper of U.S. Pat. Appln. No. 62/204,331, 22 pages	☐
	38	File Wrapper of U.S. Pat. Appln. No. 62/242,173, 17 pages	☐
	39	File Wrapper of U.S. Pat. Appln. No. 62/242,566, 34 pages	☐
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	41	File Wrapper of U.S. Pat. No 8,789,601, 159 pages	☐
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☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

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Signature	/Samuel A. Udovich/	Date (YYYY-MM-DD)	2023-10-23
Name/Print	Samuel A. Udovich	Registration Number	59951

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	2	Transcend Shipping Systems LLC v Mediterranean Shipping Company S.A., Case No. 6:21-cv-00040, Doc 27, Order of Dismissal with Prejudice, December 7, 2021, 1 page	☐
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	6	U.S. Well Services, Inc and U.S. Well Services, LLC v Halliburton Company and Cimarex Energy Co., Case No. 6:21-cv-00367-ADA, Doc 56, Defendants' Opening Claim Construction Brief, October 27, 2021, 46 pages	☐
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4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/SB/08a (01-22)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18357271
Filing Date	2023-07-24
First Named Inventor	Jared Oehring
Art Unit	
Examiner Name	
Attorney Docket Number	USWEL-002003

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

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	1	International Search Report and Written Opinion Mailed September 3, 2020 in PCT/US2020/36932	☐
	2	Janice Hoppe-Spiers, "Deploying Change," Energy & Mining International, Spring 2017, http://www.emi-magazine.com, 5 pages	☐
	3	Jim Harris, "U.S. Well Services LLC - Energy and Mining Magazine," Energy & Mining International, October 12, 2021, https://www.emi-magazine.com/sections/profiles/1221-us-well-services-llc, 3 pages	☐
	4	John A. Camera, PE, Electrical Engineering Reference Manual for the Electrical and Computer PE Exam, Sixth Edition, 2002, 102 pages	☐
	5	John Daniel, "8.30 DEP Industry Observations: New Flac Fleet; New Fleet Designs Forthcoming," Daniel Energy Partners, August 30, 2020, 13 pages	☐
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	8	Ledcomm LLC v Signify North America Corp., Signify Holding B.V., and Signify N.V., Case No. 6:20-cv-01056-ADA, Document 24, Scheduling Order, AUgust 13, 2021, 4 pages	☐
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	10	Lionel B. Roe, Practices and Procedures of Industrial Electrical Design, 1972, McGraw-Hill, Inc., Chapter 2: The Basic Electric System, 11 pages	☐
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	12	M. E. Rahman et al., "Wire rope isolators for vibration isolation of equipment and structures - A review," IOP Conference Series Materials Science and Engineering, April 2015, 12 pages	☐
	13	M. Hodowanec et al., "Introduction to API Standard 541, 4th Edition - Form-Wound Squirrel Cage Induction Motors - Larger than 500 Horsepower," 2003, IEEE, Paper No. PCIC-2003-33, 9 pages	☐
	14	Maxwell James Clerk 1868, On Governors, proc. R. Soc. Lond., pp.16270-283	☐
	15	Michael Quentin Morton, Unlocking the Earth: A Short History of Hydraulic Fracturing (2013), GeoExpro, Vol. 10, No. 6, 5 pages	☐
	16	Mike Soraghan, OSHA issues hazard alert for fracking and drilling, E&E, December 10, 2014, 1 page	☐
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	18	Morris et al., 62/526.869; Hydration-Blender Transport and Electric Power Distribution for Fracturing Operation; 28 June 2018; USPTO; see entire document	☐
	19	Moxa 802.11 ethernet to Serial, Moxastore, http://www.moxastore.com/ Moxa_802_11_Wi_Fi_Ethernet_to_Serial_s/587.html, May 24, 2016, 1 page	☐
	20	National Electrical Manufacturers Association, NEMA ICS 61800-4 Adjustable Speed Electrical Power Drive Systems, Part 4: general requirements - rafting Specifications for A.C. Power Drive Systems above 1000 V a.c. and Not Exceeding 35 kV, 2004 22 pages	☐
	21	Non- Final Office Action issued in corresponding Application No. 14/622,532 dated May 17, 2016.	☐
	22	Non-Final Action issued in corresponding Application No. 15/293,681 dated February 16,2017.	☐

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	23	Non-Final Office Action issue din corresponding Application No. 15/291,842 dated January 6, 2017.	☐
	24	Non-Final Office Action issued in corresponding Application No. 14/622,532 dated August 5, 2015	☐
	25	Non-Final Office Action issued in corresponding Application No. 14/884,363 dated September 5, 2017.	☐
	26	Non-Final Office Action issued in corresponding Application No. 15/145,443 dated February 7,2017.	☐
	27	Non-Final Office Action issued in Corresponding Application No. 15/145,491 on May 15, 2017.	☐
	28	Non-Final Office Action issued in corresponding Application No. 15/145,491 on September 12, 2016	☐
	29	Non-Final Office Action issued in corresponding Application No. 15/217,040 dated November 29, 2016.	☐
	30	Non-Final Office Action issued in corresponding Application No. 15/235,788 dated December 14, 2016.	☐
	31	Non-Final Office Action issued in corresponding Application No. 15/294,349 dated March 14,2017.	☐
	32	Non-Final Office Action issued in corresponding Application No. 15/486,970 dated June 22, 2017.	☐
	33	Non-Final Office Action issued in corresponding Application No. 15/487,656 dated June 23, 2017.	☐

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	Attorney Docket Number	USWEL-002003

	34	Non-Final Office Action issued in corresponding Application No. 15/487,694 dated June 26,2017.	☐
	35	Non-Final Office Action issued in US Application No. 14/881,525 mailed July 21, 2021	☐
	36	Non-Final Office Action issued in US Application No. 16/404,283 mailed July 21, 2021	☐
	37	Non-Final Office Action issued in US Application No. 16/871,928 mailed August 25, 2021	☐
	38	Non-Final Office Action issued in US Application No. 16/943,727 mailed August 3, 2021	☐
	39	Non-Final Office Action issued in US Patent Application 14/881,535 mailed May 20, 2020	☐
	40	Non-Final Office Action issued in US Patent Application No. 15/145,443 mailed May 8, 2020	☐
	41	Non-Final Office Action issued in US Patent Application No. 16/458,696 mailed May 22, 2020	☐
	42	Non-Final Office Action issued November 13, 2017 in related application no 15/644,487.	☐
	43	Non-Final Office Action issued November 29, 2017 in related application no. 15/145,414	☐
	44	Non-Final Office Action issued October 6, 2017 in related application no. 14/881,535	☐

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	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	45	Non-Final Office action Mailed August 31, 2020 in US Patent Application 16/167,083	☐
	46	Non-Final Office Action mailed December 23, 2019 in related U.S. Patent Application No. 16/597,008.	☐
	47	Non-Final Office Action mailed December 6, 2019 in related U.S. Patent Application No. 16/564,186.	☐
	48	Non-final Office Action mailed February 12, 2019 in related U.S. Patent Application No. 16/170,695.	☐
	49	Non-Final Office Action mailed February 25, 2019 in related U.S. Patent Application No. 16/210,749.	☐
	50	Non-Final Office Action mailed January 10, 2020 in related U.S. Patent Application No. 16/597,014	☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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(Not for submission under 37 CFR 1.99)

Application Number	18357271
Filing Date	2023-07-24
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Art Unit	
Examiner Name	
Attorney Docket Number	USWEL-002003

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Samuel A. Udovich/	Date (YYYY-MM-DD)	2023-10-23
Name/Print	Samuel A. Udovich	Registration Number	59951

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

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APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/357,271	**10/23/2023 03:22:00 PM ET**	**USWEL-002003**

Title of Invention

Multi-Plunger Pumps and Associated Drive Systems

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5490	FILED BY	Ramie Childress
PATENT CENTER #	63057868	FILING DATE	07/24/2023
CUSTOMER #	134020	FIRST NAMED INVENTOR	Jared Oehring
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Sam Udovich

Documents

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	1	"Kerr Pumps & FlowVale Awards for Excellence in Well Completion, Northeast 2017 - Awarded to: U.S. Well Services," https://www.oilandgasawards.com/winner/noertheast-2017-kerr-pumps-flowvales-awards..", accessed October 5, 2021, 4 pages	☐
	2	"Petroleum Alumnus and Team Develop Mobile Fracturing Unit that Alleviates Environmental Impact," 2015, LSU, https://www.lsu.edu/eng/news/2015/07/20150713-mobile-fracturing-unit.php, accessed September 22, 2021, 2 pages	☐
	3	A.H. Bonnett et al., "Squirrel Cage Rotor Options for A.C. Induction Motors," IEEE, accessed May 18, 2021, 4 pages	☐
	4	A.T. Dufresne, How reliable are trial dates relied on by the PTAB in the Fintiv analysis?" Perkins Cole, 2021, 3 pages	☐
	5	Affidavit of Duncan Hall, Internet Archives on June 7, 2021, https://web.archive.org/web/20120917102614/http:/www.quincieoilfield.com/pdf/3.0%20Gardner%20Denver/2500/GD2500Q%200p%20&%20Service%20Manual.pdf, 76 pages	☐
	6	Austin H. Bonnett, "Root Cause Failure Analysis for AC Induction Motors in the Petroleum and Chemical Industry," 2010, IEEE, Paper No. PCIC-2010-43, 13 pages	☐
	7	Carolyn Davis "Natural Gas Finding Niche in E- Fracking, But Diesel Still Rules." September 6, 2019, Natural Gas Intel, https://www.naturalgasintel.com/natural-gas-finding-niche-in-e-fracking-but-still-rules, 9 pages	☐
	8	D. Bogh et al., "A User's Guide to Factory Testing of Large Motors: What Should Your Witness Expect," IEEE accessed June 10, 2021, 8 pages	☐
	9	Dani Kass, "Fintiv Fails: PTAB Uses 'Remarkably Inaccurate' Trail Dates," November 2, 2021, Law 360, 1 page	☐
	10	Declaration of Dr. Mark Ehsani, IPR2021-01066, July 2, 2021, 213 pages	☐
	11	Declaration of Robert Schaaf, IPR2021-01066, November 17, 2021, 43 pages	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Attorney Docket Number	USWEL-002003

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	23	Standing Order Governing Proceedings - Patent Cases, in the United States district Court for the Western District of Texas, Waco Division, filed November 17, 2021, 11 pages	☐
	24	Steven C. Carlson, Weaponizing IPRs, Landslide, September 22, 2019, 10 pages	☐
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	37	"U.S. Well Services, Inc. files suit against Halliburton Company and Cimarex Energy Co. for patent infringement", April 15, 2021, PR Newswire, https://www.prnewswire.com/news-releases/us-well-services-inc-files-suit-against-halliburton-comapny-and-climax-energy-co-for-patent-infringement-301270118.html, 2 pages	☐

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☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Samuel A. Udovich/	Date (YYYY-MM-DD)	2023-10-23
Name/Print	Samuel A. Udovich	Registration Number	59951

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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	1	File Wrapper of U.S. Pat. No. 9,840,901, 216 pages	☐
	2	File Wrapper of U.S. Pat. No. 9,893,500, 291 pages	☐
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	4	Final Office Action issued in corresponding Application No. 14/622,532 dated December 21, 2015	☐
	5	Final Office Action issued in corresponding Application No. 14/622,532 dated December 7, 2016.	☐
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	7	Final Office Action issued in corresponding Application No. 15/145,491 dated September 6, 2017.	☐
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	10	Final Office Action mailed January 11, 2021 in US 16/404,283	☐
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	21	IEEE Authoritative Dictionary of IEEE Standards Terms Seventh Edition, 2000, 7 pages	☐
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	23	Industrial Safety & Hygiene News, OSHA issues Hazard alert for fracking and drilling, January 6, 2015, 1 page	☐
	24	Industry/Hazard Alerts, United States Department of Labor, https://web.archive.org/web/20120801064838/http://www.osha.gov:80/hazardindex.html, accessed June 13, 2021, 1 page	☐
	25	International Search and Report and Written Opinion mailed January 2, 2019 in related PCT Patent Application No. PCT/US18/54542	☐
	26	international Search and Written Opinion Mailed August 28, 2020 in PCT/US20/23821	☐
	27	International Search report and Written Opinion dated September 19, 2018 in related PCT Patent Application No. PCT/US2018/040683.	☐
	28	International Search Report and Written Opinion issued in PCT/US2020/023809 mailed June 2, 2020.	☐
	29	International Search Report and Written Opinion mailed April 10, 2019 in corresponding PCT Application No. PCT/US2019/016635	☐
	30	International Search Report and Written Opinion mailed December 14, 2020 in PCT/ US2020/53980	☐
	31	International Search Report and Written Opinion mailed December 31, 2018 in related PCT Patent Application No. PCT/US18/55913	☐
	32	International Search Report and Written Opinion mailed February 15, 2019 in related PCT Application No. PCT/US18/63977.	☐
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	34	International Search Report and Written Opinion mailed February 3, 2021 in PCT/US20/58899	☐
	35	International Search Report and Written Opinion mailed February 4, 2021 in PCT/US20/59834	☐
	36	International Search Report and Written Opinion mailed in PCT/US/67526 mailed May 6, 2021	☐
	37	International Search Report and Written Opinion mailed in PCT/US20/67146 mailed March 29, 2021	☐
	38	International Search Report and Written Opinion mailed in PCT/US20/67523 mailed March 22, 2021	☐
	39	International Search Report and Written Opinion mailed in PCT/US20/67528 mailed March 19, 2021.	☐
	40	International Search Report and Written Opinion mailed in PCT/US20/67608 mailed March 30, 2021	☐
	41	International Search Report and Written Opinion mailed in PCT/US2020/066543 mailed May 11, 2021	☐
	42	International Search Report and Written Opinion mailed January 2, 2019 in related PCT Patent Application No. PCT/US18/54548	☐
	43	International Search Report and Written Opinion mailed January 2, 2020 in related PCT Application No. PCT/US19/55325	☐
	44	International Search Report and Written Opinion mailed January 4, 2019 in related PCT Patent Application No. PCT/US18/57539	☐

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	45	International Search Report and Written Opinion mailed July 22, 2020 in corresponding PCT Application No. PCT/US20/00017	☐
	46	International Search Report and Written Opinion mailed July 9, 2019 in corresponding PCT Application No. PCT/US2019/027584	☐
	47	International Search Report and Written Opinion mailed June 23, 2020 in corresponding PCT Application No. PCT/US20/23912	☐
	48	International Search Report and Written Opinion mailed March 5, 2019 in related PCT Application No. PCT/US18/63970.	☐
	49	International Search Report and Written Opinion mailed November 26, 2019 in related PCT Application No. PCT/US19/51018	☐
	50	International Search Report and Written Opinion mailed September 11, 2019 in related PCT Application No. PCT/US2019/037493	☐

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Signature	/Samuel A. Udovich/	Date (YYYY-MM-DD)	2023-10-23
Name/Print	Samuel A. Udovich	Registration Number	59951

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18357271
Filing Date	2023-07-24
First Named Inventor	Jared Oehring
Art Unit	
Examiner Name	
Attorney Docket Number	USWEL-002003

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

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	Attorney Docket Number	USWEL-002003

	1	Non-Final Office Action mailed January 29, 2021 in US 16/564,185.	☐
	2	Non-Final Office Action mailed January 4, 2021 in US 16/522,043.	☐
	3	Non-Final Office Action mailed March 6, 2019 in related U.S. Patent Application No. 15/183,387.	☐
	4	Non-Final Office Action Mailed September 2, 2020 in US Patent Application No. 16/356,263	☐
	5	Non-Final Office Action Mailed September 29, 2020 in US Patent Application No. 16/943,727	☐
	6	Non-Final Office Mailed October 26, 2020 in US Patent Application 15/356,436	☐
	7	Non-Final Office Mailed October 5, 2020 in US Patent Application No. 16/443,273	☐
	8	Notice of Allowance and Notice of Allowability issued in US Application No. 15/829,419 mailed July 26, 2021	☐
	9	Notice of Allowance issued in corresponding Application No. 14/622,532 dated March 27,2017.	☐
	10	Notice of Allowance issued in corresponding Application No. 15/217,040 dated March 28, 2017.	☐
	11	Notice Of Allowance mailed April 23, 2019 in corresponding U.S. Patent Application No. 15/635,028	☐

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	19	Office Action dated October 4, 2018 in related U.S. Patent Application No. 15/217,081	☐
	20	Office Action mailed August 19, 2019 in related U.S. Patent Application No. 15/356,436	☐
	21	Office Action mailed August 4, 2020 in related U.S. Patent Application No. 16/385,070	☐
	22	Office Action mailed December 12, 2018 in related U.S. Patent Application No. 16/160,708	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	23	Office Action mailed January 30, 2019 in related Canadian Patent Application No. 2,936,997.	☐
	24	Office Action mailed June 11, 2019 in corresponding US Application No. 16/210,749	☐
	25	Office Action mailed June 22, 2020 in relate U.S. Patent Application No. 16/377,861	☐
	26	Office Action mailed June 29, 2020 in related U.S. Patent Application No. 16/404,283	☐
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	45	Stan Gibilisco, The Illustrated Dictionary of Electronics: Audio/Video Consumer Electronics Wireless Technology - Eighth Edition, 2001, pg. 667	☐
	46	Stephen Cary et al, "Electric Rotating Machine Standards Part II: Magnetic Wedge Design & Monitoring Methods," 2011 IEEE, Paper No. PCIC-2011-41, 8 pages	☐
	47	Stewart & Stevenson, "Stimulation Systems," 2007, 20 pages	☐
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	49	Testimony of Judge Paul R. Michel (Ret.) United Stated Court of Appeals for the Federal Circuit Before the Subcommittee on Intellectual Property, U.S. Senate committee on the Judiciary, June 4, 2019, 8 pages	☐
	50	The American Heritage dictionary of the English Language, Fifth edition, Fiftieth Anniversary, page 911	☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Samuel A. Udovich/	Date (YYYY-MM-DD)	2023-10-23
Name/Print	Samuel A. Udovich	Registration Number	59951

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

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	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	3	1671436		1928-05-29	MELOTT	
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	Examiner Name	
	Attorney Docket Number	USWEL-002003

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	Filing Date	2023-07-24
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	Attorney Docket Number	USWEL-002003

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	Filing Date	2023-07-24
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	Attorney Docket Number	USWEL-002003

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	Filing Date	2023-07-24
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	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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	Examiner Name	
	Attorney Docket Number	USWEL-002003

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	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18357271
Filing Date	2023-07-24
First Named Inventor	Jared Oehring
Art Unit	
Examiner Name	
Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	"Global Cache iTach, IP to Serial with PoE (IP2SL-P)," Global Cache, https://www.amazon.com/Global-Cache-iTech-Serial-IP2SL-P/dp/B003BFVNS4/, October 30, 2014, 3 pages	☐
	2	"Griswold Model 811 Pumps: Installation, Operation and Maintenance Manual, ANSI Process Pump", 2010, 60 pages.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	3	"Halliburton Delivers Successful Grid-Powered Frac Operation, "https://www.halliburton.com/en/about-us/press-release/halliburton-delivers-first-successful-grid-powered- fracturing-operation, accessed September 27, 2021, 4 pages	☐
	4	"Heat Exchanger" (https://en.wiklpedia.org/w/index.php?title=Heat_exchanger&oldid=89300146) 12-18-19 April 2019 (18.04.2019), entire document, especially para (0001]	☐
	5	"Process Burner" (https://www.cebasrt.com/productsloii-gaslprocess-burner) 06 September 6, 2018 (06.09.2018), entire document, especially para (Burners for refinery Heaters)	☐
	6	"SainSmart TCP/IP Ethernet to Serial RS232 RS485 Intelligent Communication Converter," SainSmart, http://www.amazon.com/SainSmart-Ethernet-Intelligent-Communication-Converter/dp/B008GLUHW, August 17, 2024, 4 pages	☐
	7	"Screenshot of USWS Clean Fleet System Video," 1 page	☐
	8	"Services - U.S. Well Services," http://uswellservices.com/services/, accessed November 13, 2021, 10 pages	☐
	9	"StarTech NETRS2321E 1 Port RS-232/422/485 Serial over IP Ethernet Device Server," StarTech, https://www.amazon.com/StarTech-NETRS2321E-RS232-Serial-Ethernet/dp/B000YN0N0S, May 31, 2014, 4 pages	☐
	10	"StarTech.com 1 Port RS232 Serial to IP Ethernet Converter (NETRS2321P)," StarTech, hhttps://www.amazon.com/StarTech-com-Serial-Ethernet-Converter-NETRS232IP/dp/B00FJEHNSO, October 9, 2014, 4 pages	☐
	11	"TCP/IP Ethernet to Serial RS232 RS485 RS422 Converter," Atc, http://www.amazon.com/Ethernet-Serial-RS232-RS485-Converter/dp/B00ATV2DX2, February 1, 2014, 2 pages	☐
	12	"Water and Glycol Heating Systems (https://www.heat-inc.com/wg-series-water-glycol-systems/) 18 June 2018 (18.06.2018), entire document, especially WG Series Water Glycol Systems	☐
	13	A. Abbott, Crippling the Innovation Economy: Regulatory Overreach at the Patent Office, Regulatory Transparency Project, August 14, 2017, 35 pages	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	14	A.B. Lobo Roberio et al., "Multipoint- Fiber-Optic Hot Spot Sensing Network Integrated Into High Power Transformer for Continuous Monitoring," IEEE Sensor Journal, July 2008, Vol. 8, No. 7, pp. 1264-1267	☐
	15	About Us, Moxastore, http://www.moxastore.com/aboutus.asp, March 8, 2015, 1 page	☐
	16	Accommodating Seismic Movement, Victaulic Company, 2015, https://web.archive.org/web/20150412042941/http://www.victauluic.com:80/en/business-solutions/solutions/accommoda..., 2 pages	☐
	17	AGS Large Diameter Solutions, Victaulic Company 2015, https://web.archive.org/web/20150419063052/http://www.victaulic.com:80/en/businesses-solutions/solutions/adavanced-gr...,2 pages	☐
	18	ALBONE, "Mobile Compressor Stations for Natural Gas Transmission Service," ASME 67-GT-33, Turbo Expo, Power for Land, Sea and Air, Vol 79887, p. 1-10, 1967	☐
	19	America Invents Act, H.R. Rep. No. 112-98, June 1, 2011, 165 pages	☐
	20	American Petroleum Insitute, "Form -wound Squirrel-Cage Induction Motors - 500 Horsepower and Larger," June 2004, Fourth Edition, ANSI/API Standard 541-2003, 88 pages	☐
	21	Approved American National Standard, ANSI/NEMA MG 1-2011, American National Standard Motors and Generators, December 9, 2021, 636 pages	☐
	22	Assignment record of US Pat. No. 9,366,114 accessed August 19, 2021, 2 pages	☐
	23	ASTM International, "Standard Specification for Steel Bars, carbon and Alloy, Hot-Wrought, General Requirements" October 13, 2006, 16 pages	☐
	24	Bernard D. Goldstein, The Role of Toxicological Science in Meeting the Challenges and Opportunities of Hydraulic Fracturing, 2014, Toxicological Sciences, Vol. 139, No. 2, pp. 271-283	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	25	Bill Lockley and Barry Wood, " What do the API Motor/ Generator Features Cost and What Do They Buy You?" 2010 IEEE, Paper No. PCIC-2010-22, 10 pages	☐
	26	C.F.R. Part 393 (Oct. 1, 2006), 36 pages	☐
	27	Canadian Office Action dated April 18, 2018 in related Canadian Patent Application No. 2,298,711	☐
	28	Canadian Office Action dated June 22, 2018 in related Canadian Patent Application No. 2,886,697	☐
	29	Canadian Office Action dated March 2, 2018 in related Canadian Patent Application No. 2,833,711.	☐
	30	Canadian Office Action dated September 28, 2018 in related Canadian Patent Application No. 2,945,281.	☐
	31	Canadian Office Action issued August 31, 2020 in Candian Patent Application No. 2,944,980	☐
	32	Canadian Office Action issued September 22, 2020 in Canadian Application No. 2,982,974	☐
	33	Canadian Office Action issued September 8, 2020 in Candian Patent Application No. 2,928,707	☐
	34	Canadian Office Action mailed August 17, 2020 in related CA Patent Application No. 2,944,968	☐
	35	Canadian Office Action mailed August 18, 2020 in related CA Patent Application No. 2,933,444	☐

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	Filing Date	2023-07-24
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	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	36	Canadian Office Action mailed June 20, 2019 in corresponding CA Application No. 2,964,597	☐
	37	Canadian Office Action mailed May 30, 2019 in corresponding CA Application No. 2,833,711.	☐
	38	Canadian Office Action mailed October 1, 2019 in related Canadian Patent Application No. 2,936,997	☐
	39	Centers for Disease Control and Prevention, NIOSH Numbered Publications, https://web.archive.org/web/20120721180008/http://www.cdc.org/niosh/pubs/all_date_esc_nopubnumbers.htlm, 2021, 57 pages	☐
	40	Chiksan Original Swivel Joints, FMC, 1997, 16 pages	☐
	41	Clean Fleet Reduces Emissions by 99% at Hydraulic Fracturing Sites," Fluid Power Journal, https://fluidpowerjournal.com/clean-fleet-reduces-emissions/, accessed September 22, 2021, 5 pages	☐
	42	Collins English Dictionary, Twelfth Edition, 2014, page 1005	☐
	43	Comprehensive Power: Power it Up, Brochure, 26 pages	☐
	44	Comprehensive Power: Power it Up, February 27, 2013, 28 pages	☐
	45	CoorsTek Flowguard Products, 2012, 8 pages	☐
	46	D. Heidel, Safety and Health Management Aspects for Handling Silica-based Products and Engineered Nanoparticles in Sequence of Shale Reservoir Stimulations Operations, Society of Petroleum Engineers, 2004, 4 pages	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18357271
	Filing Date	2023-07-24
	First Named Inventor	Jared Oehring
	Art Unit	
	Examiner Name	
	Attorney Docket Number	USWEL-002003

	47	Declaration of Dr. L. Brun Hilbert, Jr., P.E., IPR2021-01538, September 22, 2021, 99 pages	☐
	48	Declaration of Dr. L. Brun Hilbert, P.E., IPR2021-01037 and IPR2021-01038, June 21, 2021, 124 pages	☐
	49	Declaration of Dr. Mark Ehsani, IPR2021-01035, June 18, 2021, 188 pages	☐
	50	Declaration of Dr. Robert Durham, Case Nos. IPR2021-01033, IPR2021-01032 and IPR2021-01034, June 18, 2021, 179 pages	☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(**Not for submission under 37 CFR 1.99)**

Application Number	18357271
Filing Date	2023-07-24
First Named Inventor	Jared Oehring
Art Unit	
Examiner Name	
Attorney Docket Number	USWEL-002003

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Samuel A. Udovich/	Date (YYYY-MM-DD)	2023-10-22
Name/Print	Samuel A. Udovich	Registration Number	59951

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/357,271	07/24/2023	Jared Oehring	USWEL-002003	5490

134020 7590 08/30/2023

Henry Patent Law Firm PLLC
8350 N. Central Expwy.
Suite 1750
Dallas, TX 75206

EXAMINER	
CENTRAL, DOCKET	

ART UNIT	PAPER NUMBER
OPAP	

NOTIFICATION DATE	DELIVERY MODE
08/30/2023	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket@henry.law

Decision Granting Request for Prioritized Examination (Track I)	**Application No.** 18/357,271	**Applicant(s)** Oehring et al.	
	Examiner CHERYL P GIBSON BAYLOR	**Art Unit** OPET	**AIA (FITF) Status** Yes

1. THE REQUEST FILED 24 July 2023 IS **GRANTED** .

The above-identified application has met the requirements for prioritized examination

A. ☑ for an original nonprovisional application (Track I).
B. ☐ for an application undergoing continued examination (RCE).

2. **The above-identified application will undergo prioritized examination**. The application will be accorded special status throughout its entire course of prosecution until one of the following occurs:

A. filing a **petition for extension of time** to extend the time period for filing a reply;

B. filing an **amendment to amend the application to contain more than four independent claims, more than thirty total claims** , or a multiple dependent claim;

C. filing a **request for continued examination** ;

D. filing a notice of appeal;

E. filing a request for suspension of action;

F. mailing of a notice of allowance;

G. mailing of a final Office action;

H. completion of examination as defined in 37 CFR 41.102; or

I. abandonment of the application.

Telephone inquiries with regard to this decision should be directed to CHERYL GIBSON BAYLOR at (571)272-3213. In his/her absence, calls may be directed to Petition Help Desk at (571) 272-3282.

/CHERYL GIBSON BAYLOR/ Paralegal Specialist, OPET	

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
18/357,271	07/24/2023		3300	USWEL-002003	30	4

CONFIRMATION NO. 5490

FILING RECEIPT

134020
Henry Patent Law Firm PLLC
8350 N. Central Expwy.
Suite 1750
Dallas, TX 75206

OC00000060302110

Date Mailed: 08/09/2023

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Jared Oehring, Willow Park, TX;
Lon Robinson, Willow Park, TX;
Brandon N. Hinderliter, Willow Park, TX;
Alexander James Christinzio, Willow Park, TX;

Applicant(s)

U.S. Well Services, LLC, Willow Park, TX;

Assignment For Published Patent Application

U.S. Well Services, LLC, Willow Park, TX

Power of Attorney: The patent practitioners associated with Customer Number 134020

Domestic Priority data as claimed by applicant

This application is a CON of 16/827,166 03/23/2020
which is a CON of 16/210,807 12/05/2018 PAT 10,598,258
which claims benefit of 62/594,912 12/05/2017

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 08/07/2023

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 18/357,271**

Projected Publication Date: 11/16/2023

Non-Publication Request: No

Early Publication Request: No

Title

Multi-Plunger Pumps and Associated Drive Systems

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

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Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 18/357,271

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	320
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	700
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	800
TOTAL CLAIMS (37 CFR 1.16(i))	30 minus 20 =	* 10			OR	x 100 =	1000
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4 minus 3 =	* 1				x 480 =	480
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	2300

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)	OR	RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/357,271	**07/24/2023 11:41:41 AM ET**	**USWEL-002003**

Title of Invention

Multi-Plunger Pumps and Associated Drive Systems

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5490	FILED BY	Ramie Childress
PATENT CENTER #	62488894	FILING DATE	-
CUSTOMER #	134020	FIRST NAMED INVENTOR	Jared Oehring
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Ke Sun

Documents

TOTAL DOCUMENTS: 11

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
Utility Transmittal_USWEL-002003.pdf	2	Transmittal of New Application	188 KB
Fee Transmittal_USWEL-002003.pdf	2	Fee Worksheet (SB06)	178 KB
ADS_USWEL-002003.pdf	9	Application Data Sheet	110 KB
Warning: This is not a USPTO supplied ADS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.			
Track One Request_USWEL-002003.pdf	2	Track One Request	126 KB

Preliminary Amendment_USWEL-002003.pdf		8	Preliminary Amendment	77 KB
Final application_USWEL-002003.pdf		22	-	2097 KB
Final application_USWEL-002003-SPEC.pdf	(1-16)	16	Specification	1699 KB
Final application_USWEL-002003-CLM.pdf	(17-21)	5	Claims	342 KB
Final application_USWEL-002003-ABST.pdf	(22-22)	1	Abstract	62 KB
Final drawings_USWEL-002003.pdf		10	Drawings-only black and white line drawings	1050 KB
Executed Declaration_USWEL-002003.pdf		4	Oath or Declaration filed	905 KB
Executed POA_USWEL.pdf		1	Power of Attorney	1655 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
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Preliminary Amendment_USWEL-002003.pdf	EC56D755C9F0D9D4F5E7088059BE331517BCD3FDFF4F9A0033AE7A5B1EC4D3B93140D0273C1F2476BB418EA4E479599BFF8304C1F04C7AF11FF02729CEED73FE
Final application_USWEL-002003.pdf	1DD7A787FEBAFFC05FF567756C1829672583C99D2A5307EF60B20D73947AD3189D7C1EFA48CCE7E761AE4DEBFF41353C0CBA37473011C183703F9FCCEFEEA257
Final application_USWEL-002003-SPEC.pdf	6A06BE0FE419EAE542A89A0D675F9B6E332AED8025EA9F2EA3C26DE9BEC325E084B725D686BDE4086C4D45A6F5703E25719FBCB99C0A1FDBF35597EDCC291B4D
Final application_USWEL-002003-CLM.pdf	ED380B693307324A1C8714846850D967298D9A3BD82607BF42D057730B65BCBD1F47F600CBEA9347A4C5CE1E4BAD77E87FF0BCBC1F9549B186F605BB32770435
Final application_USWEL-002003-ABST.pdf	82CD078A0AD9243D1880E0CDC72236E43A1375F84393BB52A52D9429A030003D96ED85DABB8D3480999783C004C2053AAED1468A539C87ECA049F9243FDCD648
Final drawings_USWEL-002003.pdf	3C75118518DF609165481AF7797F59D4EA42A9BA91356EA3A57FD421180397ACE3D22BA3BEEBE15F1CBCB86493A52804B6723CAD99525BB7C8C05157DCC56AB5
Executed Declaration_USWEL-002003.pdf	0E18F2628570CA59AD00FA16088C69F9F11B36AA76593FDAF9B8D9C12DBCDDE499A89C8CC42BD7F068BB978810A25E5116A5D0CCB58DAEC9137C16B31CA89F0F
Executed POA_USWEL.pdf	87E6162D60831B289A6A73D39816B369F86178C6E18FC3F03BA7159A932964AC27E8307DB2369A44F3765F3FA5398BCB6A6F8A587E1F8754CA38C0CF16D44B03

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APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/357,271	07/24/2023 11:41:41 AM ET	USWEL-002003

Title of Invention

Multi-Plunger Pumps and Associated Drive Systems

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5490	FILED BY	Ramie Childress
PATENT CENTER #	62488894	AUTHORIZED BY	Ke Sun
CUSTOMER #	134020	FILING DATE	-
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Jared Oehring

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 6047	E20237NB44097720	Ramie Childress

PRE-AUTHORIZED ACCOUNT	PRE-AUTHORIZED CATEGORY
506816	37 CFR 1.16 (National application filing, search, and examination fees); 37 CFR 1.17 (Patent application and reexamination processing fees); 37 CFR 1.19 (Document supply fees); 37 CFR 1.20 (Post Issuance fees); 37 CFR 1.21 (Miscellaneous fees and charges)

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1830	PROCESSING FEE, EXCEPT IN PROVISIONAL APPLICATIONS	140.00	1	140.00
1817	REQUEST FOR PRIORITIZED EXAMINATION	4200.00	1	4200.00
1111	UTILITY PATENT APPL. SEARCH FEE	700.00	1	700.00
1011	BASIC FILING FEE - UTILITY (PAPER FILING ALSO REQUIRES NON-	320.00	1	320.00

	ELECTRONIC FILING FEE UNDER 1.16(T))			
1311	PATENT APPL. EXAMINATION FEE	800.00	1	800.00
1202	EACH CLAIM IN EXCESS OF 20	100.00	10	1000.00
1201	EACH INDEPENDENT CLAIM IN EXCESS OF THREE	480.00	1	480.00
			TOTAL AMOUNT:	**$7,640.00**

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PATENT APPLICATION

ATTORNEY DOCKET NO.: 047158.100035

INVENTOR(S):
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MULTI-PLUNGER PUMPS AND ASSOCIATED DRIVE SYSTEMS

MULTI-PLUNGER PUMPS AND ASSOCIATED DRIVE SYSTEMS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to and the benefit of U.S. Provisional Patent Application No. 62/594,912, filed December 5, 2017, the full disclosure of which is hereby incorporated by reference herein for all purposes.

BACKGROUND

[0002] 1. Technical Field

[0003] This disclosure relates generally to drive systems for reciprocating plunger-style pumps used in hydraulic fracturing operations, and more particularly to multi-plunger hydraulic fracturing pumps and associated drive systems.

[0004] 2. Background

[0005] With advancements in technology over the past few decades, the ability to reach unconventional sources of hydrocarbons has tremendously increased. Horizontal drilling and hydraulic fracturing are two such ways that new developments in technology have led to hydrocarbon production from previously unreachable shale formations. Hydraulic fracturing (fracking) operations typically require powering numerous components in order to recover oil and gas resources from the ground. For example, hydraulic fracturing usually includes pumps that inject fracking fluid down the wellbore, blenders that mix proppant into the fluid, cranes, wireline units, and many other components that all must perform different functions to carry out fracking operations.

[0006] Hydraulic fracturing operations commonly use diesel-powered pumps to transmit fluid media down the well bore, the transmissions for the diesel-powered pumps often having seven

speeds or more. When one or more pumps go offline during operation, for example due to system failure or for scheduled maintenance, the speed of the remaining operating pumps is increased accordingly. However, many of the top gears in these diesel transmissions provide speeds that are above the critical speed for the associated plunger pumps. Thus, compensating for the downed pump or pumps by up-shifting operation of the remaining pumps to these higher gears, above the critical speed for the pumps, can result in damage to the pumps. There is a need for hydraulic fracturing pumps that are capable of operation at or below the critical speed, without sacrificing pump rate, efficiency, and efficacy.

SUMMARY

[0007] One of the most common transmissions utilized in hydraulic fracturing pump applications is a nine-speed transmission, often driven by a diesel-powered engine. When this transmission is in fifth gear and the engine is running at 1700 rotations per minute (rpm), for example, the critical speed of 120 rpm on an associated 8-inch stroke pump is reached. Therefore, running the pump with the transmission operating in any of gears six through nine, above the critical speed reached at gear five, could cause pump cavitation and damage accumulation to the fluid end of the pump.

[0008] It has historically been believed that pump cavitation is caused by air entering the pump. Through testing and data-gathering, however, Applicants have observed that pump cavitation and damage are caused by the formation of vacuum bubbles as a result of fluid being accelerated too fast through the pump. A heightened speed of operation creates low pressure within the pumps, creating vacuum bubbles. As the pump plungers retract, the vacuum bubbles implode, causing damage (cavitation) to the pump and engine systems. Although the risks of operating the pumps at too great of speeds may be known, concerns about lowered pump rates and lost

efficiency resulting from maintaining slower transmission speeds commonly lead to disregard of the risks as an unavoidable consequence of maintaining pump efficiency.

[0009] In seeking to avoid such pump damage, Applicants have observed that, by operating transmissions such that pumps are maintained at or below critical pump speeds, such formation of vacuum bubbles and resulting pump cavitation and damage may be avoided. Further still, Applicants have observed that use of electric- or hydraulic-powered pumps may allow for better control of pump speeds at or below the critical speed due to the smaller increments between gear speeds as compared to those of pumps driven by diesel-powered engines.

[0010] Operation below critical pump speeds has previously been avoided as being considered inefficient and ineffective for pump usage in fracking, as slower pump speeds are historically believed to be directly tied to pump rates. Applicant has observed, however, that the introduction of multiple electric- or hydraulic-powered motors driving planetary gear trains can provide effective and efficient pumping power, thereby maintaining a consistent pump rate for fluid transfer, while also sustaining a pumping speed at or below the critical speed for the plungers. For example, Applicant discovered that varying pump bore sizes and stroke lengths, as well as number of plungers, allowed for operation at slower pump speeds while maintaining or increasing fluid pump rates. Applicant also discovered, through testing and analysis, that certain bore size, stroke length, and plunger number combinations provided maximum pump rate efficiency at a usable and economically effective overall pump size.

[0011] The present disclosure is directed to hydraulic fracturing system for fracturing a subterranean formation, according to various embodiments. In an embodiment, the hydraulic fracturing system can include a multi-plunger hydraulic fracturing pump fluidly connected to a well associated with the subterranean formation, and the multi-plunger pump can be 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. In an embodiment, the system can further include a plurality of motors positioned to power the multi-plunger pump, and a planetary gear train having a plurality of input pinion gears in rotational contact with each of the plurality of motors. In an embodiment, a gear ratio of the planetary gear train and a speed at which the plurality of motors operates can be selected so as to limit a maximum pump speed associated with the multi-plunger pump.

[0012] In an embodiment, the system can include a plurality of speed reduction gearboxes positioned between the plurality of input pinion gears and the plurality of motors so as to achieve a desired pump rate.

[0013] In an embodiment, the plurality of motors can include one of a plurality of electric motors or a plurality of hydraulic motors.

[0014] In an embodiment, the maximum pump speed can correlate to a critical plunger speed associated with each of the plurality of hydraulic pumps.

[0015] In an embodiment, the maximum pump speed can be 5% or less over a critical plunger speed associated with each of the plurality of hydraulic pumps.

[0016] In an embodiment, the plurality of hydraulic pumps includes an odd number of plungers greater than or equal to five plungers.

[0017] In an embodiment, a stroke length of each of the plungers associated with the plurality of hydraulic pumps can be selected to inversely relate to a pump speed associated with the plurality of hydraulic pumps so as to achieve a predetermined flow rate.

[0018] In an embodiment, the system can include a variable frequency drive (VFD) connected to the plurality of motors to control the speed of the plurality of motors. The VFD can be positioned

to accelerate or decelerate pump rotational speeds associated with each of the plurality of hydraulic pumps, according to an embodiment.

[0019] In an embodiment, the VFD can include a plurality of VFDs, and the plurality of VFDs can be configured to share a load required to power the plurality of hydraulic pumps.

[0020] In an embodiment, the plurality of VFDs can be configured to automatically shut off in the event of an overpressure event with respect to the plurality of hydraulic pumps.

[0021] The present disclosure is also related to a hydraulic fracturing system for fracturing a subterranean formation, according to an embodiment. In an embodiment, the system can include a multi-plunger hydraulic fracturing pump fluidly connected to a well associated with the subterranean formation, and the multi-plunger pump can be 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. In an embodiment, a plurality of motors can be positioned to power the multi-plunger pump. The system can further include a variable frequency drive connected to the plurality of motors to control the speeds of the plurality of electric motors, according to an embodiment. In an embodiment, the system can include a planetary gear train having a plurality of input pinion gears in rotational contact with each of the plurality of motors. In an embodiment, a gear ratio of the planetary gear train and a speed at which the plurality of motors operates can be selected so as to limit a maximum pump speed associated with the multi-plunger pump.

[0022] The present disclosure is also directed to a method for pumping fluid into a wellbore associated with a subterranean formation. In an embodiment, the method can include fluidly connecting a multi-plunger hydraulic fracturing pump to a well associated with the subterranean formation such that the multi-plunger pump pumps fluid into the wellbore at a high pressure so

that fluid passes from the wellbore into the subterranean formation and fractures the subterranean formation. In an embodiment, the method can include powering the multi-plunger pump with a plurality of motors. In an embodiment, the method can further include providing a planetary gear train having a plurality of input pinion gears in rotational contact with each of the plurality of motors so as to translate power from the plurality of motors into a desired pump rate of the multi-plunger pump.

[0023] Other aspects and features of the present disclosure will become apparent to those of ordinary skill in the art after reading the detailed description herein and the accompanying figures.

BRIEF DESCRIPTION OF DRAWINGS

[0024] Some of the features and benefits of the present invention having been stated, others will become apparent as the description proceeds when taken in conjunction with the accompanying drawings, in which:

[0025] FIG. 1 is an exploded schematic example of a planetary gear train having multiple input pinions for direct connection to an electric motor, according to an embodiment.

[0026] FIG. 2 is an exploded schematic example of a planetary gear train having a speed reduction gearbox mounting for connection to an electric motor, according to an embodiment.

[0027] FIG. 3 is a schematic example of a multi-plunger pump having nine plungers and four electric motors mounted for driving the multi-plunger pump, according to an embodiment.

[0028] FIG. 4 is a table showing calculations of plunger pump critical speeds according to embodiments of the present technology.

[0029] FIG. 5 is a table showing data related to certain pumps and transmissions in an example application, meant to highlight certain embodiments of the present technology.

[0030] FIGS. 6-10 are tables showing additional data related to certain pumps and transmissions in further example applications, meant to further highlight embodiments of the present technology.

[0031] While the invention will be described in connection with the preferred embodiments, it will be understood that the included description is not intended to limit the invention to the described preferred embodiments. On the contrary, the description is intended to cover all alternatives, modifications, and equivalents, as may be included within the spirit and scope of the invention as defined by the appended claims.

DETAILED DESCRIPTION OF INVENTION

[0032] The method and system of the present disclosure will now be described more fully hereinafter with reference to the accompanying drawings in which embodiments are shown. The method and system of the present disclosure may be in many different forms and should not be construed as limited to the illustrated embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey its scope to those skilled in the art. Like numbers refer to like elements throughout.

[0033] It is to be further understood that the scope of the present disclosure is not limited to the exact details of construction, operation, exact materials, or embodiments shown and described, as modifications and equivalents will be apparent to one skilled in the art. In the drawings and specification, there have been disclosed illustrative embodiments and, although specific terms are employed, they are used in a generic and descriptive sense only and not for the purpose of limitation.

[0034] Described herein is an example of a method and system for providing reciprocating, plunger-style pumps as part of a multi-plunger system for use in hydraulic fracturing operations. Also described are various drive systems for use with the described reciprocating, plunger-style pumps. In various embodiments, the pumps and drive systems may be utilized by conventionally powered (i.e., diesel engine-driven) hydraulic fracturing pumping systems, or in other embodiments by hydraulically powered or electrically powered hydraulic fracturing pumping systems.

[0035] Multi-plunger hydraulic fracturing pumps, though known in the art, are typically limited to either triplex (three plungers) or quintuplex (five plungers) arrangements. Common hydraulic fracturing pumps often utilize 8-inch, 10-inch, and 11-inch stroke triplex and quintuplex hydraulic fracturing pumps. Hydraulic fracturing pumps are commonly driven by an engine (usually a 2500 horsepower (HP) diesel engine) and a multiple speed transmission, usually having seven speeds or more. However, many of the top gears, depending on the manufacturer and gear ratios, provide speeds that are above the critical speed of a plunger pump. FIG. 4 details calculations of such plunger critical speeds.

[0036] For example, one of the most common transmissions utilized in hydraulic fracturing pump applications is the Caterpillar model TH55-E90, which is a 9-speed transmission. As shown in FIG. 5, when this transmission is in 5th gear and the engine is operating at 1700 rpm, the critical speed of 120 rpm on an 8-inch stroke pump is reached. Therefore, running the pump with the transmission in any of gears 6 through 9 could cause pump cavitation and damage accumulation to the fluid end.

[0037] Similarly, the common hydraulic fracturing application transmissions known in the art may exhibit the same issues in higher gears, as shown below in FIGS. 6-10. For example, as shown in FIG. 6 and FIG. 7, the critical plunger speed is reached in the 3rd gear, such that use of gears 4-7 may cause cavitation and damage accumulation. Similarly, as shown in FIG. 8 and FIG. 9, the critical plunger speed is reached in the 4th gear, such that use of gears 5-7 may cause cavitation and damage accumulation. In FIG. 10, the critical plunger speed is reached in the 4th gear, such that use of gears 5-9 may result in cavitation and damage accumulation.

[0038] Use of the multi-plunger hydraulic fracturing pumps according to the present disclosure may eliminate the need for a diesel engine and transmission. As shown above, diesel engines and transmissions often include multiple gears that accelerate the plunger speed above critical operating speeds. This elimination of the typical engine and transmission from hydraulic fracturing pump units may enable the pumps to be driven by multiple electric motors, according to some embodiments, or multiple hydraulic motors according to other embodiments. These electric or hydraulic motors may have fewer gears such that operation in gears that increase the plunger speeds above their critical speeds can be avoided. By using multiple motors, whether hydraulic or electric, to drive a single pump, pump rates can be increased without exceeding critical plunger speeds.

[0039] Use of electric or hydraulic motors, rather than diesel motors, may also make maintenance, repair, and replacement of the electric motors safer and faster than single or double electric motor-driven pumps. This configuration may prevent the fracturing pumps from being run at speeds higher than the critical plunger speed, which may help to minimize pump cavitation and damage accumulation, thus greatly extending the usable life of the pump fluid ends. For example, as discussed in more detail below, the system could be designed to allow only a slight

overspeed of the pumps beyond the identified critical pump speed as a safety margin in the event that one of the fleet's pumps were taken offline for repairs or maintenance, and an additional rate of the remaining online pumps were required to complete the stage being pumped.

[0040] In the multiple electric motor-driven embodiment of the present disclosure, the electric motors may directly drive the pump, and 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. However, the gear ratios and electric motor-rated speeds may also be chosen to allow only a slight percentage of overspeed (higher than critical plunger speed) as a safe margin to enable a fleet of operating pumps to achieve a desired pump rate, for example when one pump is taken off line, as is often the case in hydraulic fracturing. For example, the gear ratios and electric motor-rated speeds may be chosen to operate 5% or less above the critical plunger speed according to some examples; 10% or less above the critical plunger speed according to some examples; or any other acceptable range as will be readily understood by one having ordinary skill in the art. Repairs or maintenance are generally performed as quickly as possible so that the offline pump is available by the next sequential fracturing stage. This same logic could be applied to the hydraulic motor driven system or the system that utilizes speed reduction gearboxes driving a single ring gear.

[0041] By the present disclosure, multi-plunger hydraulic fracturing pumps utilizing higher multiples of plungers, such as 7, 9, 11, 13, etc. (septenplex, novenplex, undenplex, tredenplex, etc.), are described. In some embodiments, more than 13 plungers may be utilized, as will be readily understood by one having ordinary skill in the art. In some embodiments, odd numbers of plungers may be chosen so that the pump flow ripple magnitude is minimized. For example, in multi-plunger hydraulic fracturing pumps having higher numbers of plungers, the plunger ripple

frequency may be increased, thereby reducing the amount of time between ripples, which may provide a smoother pressure performance for the pumps.

[0042] In some embodiments, longer stroke lengths of the plunger pumps may be utilized to reduce plunger speed. For example, a 10-inch stroke pump of a given plunger size may be run at a slower speed than an 8-inch stroke pump of the same plunger size, in order to accomplish the same flow rate. Slowing the plunger down may also decrease the possibility of pump cavitation. For example, when triplex and quintuplex pumps, as are known in the art, are operated at higher rates, conditions for cavitation to occur are measurably higher. According to an embodiment, a critical pump speed may be 120 rpm of the pump crankshaft. With this pump speed, on the currently used 8-inch stroke pumps, the rotational speed translates to an average linear speed of the plungers at a velocity of 32 inches per second. At higher speeds, with every stroke of the plungers, fluid is accelerated into and out of the pump fluid end, creating a likelihood of low pressure regions within the fluid end that approach or dip below vapor pressure values for the fluid, thereby causing cavitation, and ultimately damage accumulation, to occur. The use of longer stroke plungers accordingly contributes critically to longer fluid end life.

[0043] Various drive systems for powering multi-plunger hydraulic fracturing pumps are contemplated. According to an embodiment, multiple electric motors may be utilized to power the multi-plunger hydraulic fracturing pump. The number of motors utilized may be selected based on the output hydraulic horsepower for which the pump is designed, in some examples. In other examples, the number of motors could be determined on an "n plus 1" basis, in which "n" number of motors would be adequate to provide enough input power according to the output hydraulic horsepower for which the pump is designed, and one ("1") additional motor would be included to allow for a single motor failure or maintenance situation. In such a situation, the

failed motor (or motor purposefully removed for maintenance) could be disconnected from the electrical circuit and allowed to freewheel, while the remaining operational motors would still provide adequate power for the pump, according to an embodiment.

[0044] In the example illustrated in FIG. 1, an exploded schematic view shows an embodiment of a planetary gear train 100 in which the multiple input pinion gears 135 are directly connected to the electric motors 130. According to the illustrated embodiment, both ends of the pump crankshaft 105 may be powered with an identical planetary gear train 120 and electric motors 130 to enable the motors 130 to be sized small enough to simplify motor removal and installation as compared to a larger single electric motor, or a double electric motor drive system.

[0045] In the illustrated embodiment of FIG. 1, eight electric motors 130 may correspond to and drive eight input pinion gears 135 associated with a single main planetary gear 125. The main planetary gear 125 may in turn drive the sun gear 115 positioned central to three planetary gears 120. The final drive gear 110 may have internal gear teeth positioned to catch the external gear teeth of the three planetary gears 120, which may cause rotation of the pump crankshaft 105. In this way, a plurality of electric motors 130 may provide power to a pump crankshaft 105, which may in turn drive a multi-plunger pump, for example as illustrated in FIG. 3 and discussed in greater detail below.

[0046] In another embodiment, multiple hydraulic motors may be utilized to power a multi-plunger hydraulic fracturing pump, in which a planetary gear train system 100 similar to that illustrated in FIG. 1 could also be utilized. In an example, a planetary gear train system may be utilized on one or both ends of the pump crankshaft to allow for smaller hydraulic motors to be utilized.

[0047] According to an alternate embodiment, for example as illustrated in FIG. 2, a plurality of electric motors or hydraulic motors 230 each may be mounted to a plurality of speed reduction gearboxes 245. FIG. 2 illustrates an exploded schematic example of a planetary gear train 200 having a plurality of speed reduction gearbox 245 mountings for connection to a plurality of electric motors 230, according to an embodiment. The speed reduction gearboxes 245 may, in turn, power a single ring gear 240 to turn the pump crankshaft 205 at the proper rpm needed to drive the multi-plunger pumps at the desired pump rate. In some examples, this configuration may not require use of a multi-planetary gear train system as described above and illustrated in FIG. 1, for example. For example, as illustrated in the embodiment of FIG. 2, the plurality of electric motors 230 may drive the main planetary gear in the form of a ring gear 240 through speed reduction gearboxes 245, and the ring gear 240 may directly turn the pump crankshaft 205. In such an example additional planetary gears 120, as illustrated in the embodiment of FIG. 1, for example, may not be included.

[0048] In an embodiment utilizing multiple electric motors, the fleet of fracturing pumps may be powered by multiple electric motors, and overall electric power may be generated by one or more diesel or gas turbines. When the pumps are being brought online to pump fluids into the well, the power may be switched via appropriate switchgear to the electric motors.

[0049] In some embodiments, the speed of the motors may be controlled by one or more variable frequency drives (VFD), which may accelerate or decelerate the pump rotational speeds using an S curve. The pump operator may select the various pump speeds via a human-machine interface (HMI) according to some embodiments, for example from inside a data van, or from a "suitcase," which is a portable, standalone HMI. The HMI or suitcase may allow on/off control of the pumps as well as speed control of the pumps, to allow the pumps to run at speeds from

zero crankshaft rpm up to the maximum speed, which would correlate with the plunger critical speed.

[0050] According to an embodiment, one of the VFDs may be designated as the master VFD, and the remaining VFDs may be designed to share the load required to power the pump under all load conditions. In the case of an overpressure event, the hydraulic fracturing controls may automatically turn the VFD off using the on/off signal for rapid shutdown, instead of using the rpm command, which uses an S curve to control the acceleration and/or deceleration. A manual emergency shutdown may also be included, which uses an HMI (such as a push button or other HMI, which may be electronic and/or manual) to shut off the VFD using the on/off function. This manual emergency shutdown feature may be configured to shut down all VFDs simultaneously, thereby shutting down the entire site. The emergency shutdown may also be configured to stop the VFD on the blender discharge pumps, and may or may not be tied into the electrical microgrid to open breakers, thereby stopping the flow and/or generation of electricity and/or gas compression.

[0051] The HMI may be designed to allow only a slight percentage of overspeed (higher than critical plunger speed) as a safe margin to enable a fleet of operating pumps to achieve a desired pump rate when one pump is taken offline, for example, as is often the case in hydraulic fracturing. Repairs or maintenance are generally performed as quickly as possible so that the offline pump is available by the next sequential fracturing stage. This same logic could be applied to the hydraulic motor driven system or the system that utilizes speed reduction gearboxes driving a single ring gear.

[0052] FIG. 3 illustrates a schematic example of a multi-plunger pump 300 with four electric motors mounted to the pump for driving the multi-plunger pump, according to an embodiment.

In the illustrated embodiment, the multi-plunger pump 300 may include nine plungers positioned at the multi-plunger fluid end 350 of the multi-plunger pump 300. In other embodiments, various other numbers of plungers may be included, as will be readily understood by one having ordinary skill in the art.

[0053] A crankshaft centerline 360 may bisect the multi-plunger pump 300 between the multi-plunger fluid end 350 and the pump power end 355. Two electric motors 330 may be positioned on opposing sides of the multi-plunger pump 300, across the crankshaft centerline 360. The four total electric motors 330 may drive the crankshaft associated with the nine plungers, as described above with respect to FIGS. 1 and 2. For example, in some embodiments the four electric motors 330 may drive the crankshaft via one or more planetary gear trains. In some embodiments, a plurality of speed reduction gearboxes may be positioned between the electric motors 330 and the one or more planetary gear trains so as to control the rotational speed of the one or more planetary gear trains and, ultimately, the pump rate of the plungers.

[0054] The present invention described herein, therefore, is well adapted to carry out the objects and attain the ends and advantages mentioned, as well as others inherent therein. While a presently preferred embodiment of the invention has been given for purposes of disclosure, numerous changes exist in the details of procedures for accomplishing the desired results. These and other similar modifications will readily suggest themselves to those skilled in the art, and are intended to be encompassed within the spirit of the present invention disclosed herein and the scope of the appended claims.

CLAIMS

What is claimed is:

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

a multi-plunger hydraulic fracturing pump fluidly connected to a well associated with the subterranean formation, the multi-plunger 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;

a plurality of motors positioned to power the multi-plunger pump; and

a planetary gear train having a plurality of input pinion gears in rotational contact with each of the plurality of motors,

wherein a gear ratio of the planetary gear train and a speed at which the plurality of motors operates are selected so as to limit a maximum pump speed associated with the multi-plunger pump.

2. The system of claim 1, the system further comprising a plurality of speed reduction gearboxes positioned between the plurality of input pinion gears and the plurality of motors so as to achieve a desired pump rate.

3. The system of claim 1, wherein the plurality of motors comprises one of a plurality of electric motors or a plurality of hydraulic motors.

4. The system of claim 1, wherein the maximum pump speed correlates to a critical plunger speed associated with each of the plurality of hydraulic pumps.

5. The system of claim 1, wherein the maximum pump speed is 5% or less over a critical plunger speed associated with each of the plurality of hydraulic pumps.

6. The system of claim 1, wherein the plurality of hydraulic pumps comprises an odd number of plungers greater than or equal to five plungers.

7. The system of claim 6, wherein a stroke length of each of the plungers associated with the plurality of hydraulic pumps is selected to inversely relate to a pump speed associated with the plurality of hydraulic pumps so as to achieve a predetermined flow rate.

8. The system of claim 1, further comprising:

a variable frequency drive (VFD) connected to the plurality of motors to control the speed of the plurality of motors, wherein the VFD is positioned to accelerate or decelerate pump rotational speeds associated with each of the plurality of hydraulic pumps.

9. The system of claim 8, wherein the VFD comprises a plurality of VFDs and wherein the plurality of VFDs are configured to share a load required to power the plurality of hydraulic pumps.

10. The system of claim 9, wherein the plurality of VFDs are configured to automatically shut off in the event of an overpressure event with respect to the plurality of hydraulic pumps.

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

a multi-plunger hydraulic fracturing pump fluidly connected to a well associated with the subterranean formation, the multi-plunger 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;

a plurality of motors positioned to power the multi-plunger pump;

a variable frequency drive connected to the plurality of motors to control the speeds of the plurality of electric motors; and

a planetary gear train having a plurality of input pinion gears in rotational contact with each of the plurality of motors,

wherein a gear ratio of the planetary gear train and a speed at which the plurality of motors operates are selected so as to limit a maximum pump speed associated with the multi-plunger pump.

12. The system of claim 11, the system further comprising a plurality of speed reduction gearboxes positioned between the plurality of input pinion gears and the plurality of motors so as to achieve a desired pump rate.

13. The system of claim 11, wherein the plurality of motors comprises one of a plurality of electric motors or a plurality of hydraulic motors.

14. The system of claim 11, wherein the maximum pump speed correlates to a critical plunger speed associated with each of the plurality of hydraulic pumps.

15. A method for pumping fluid into a wellbore associated with a subterranean formation, the method comprising:

fluidly connecting a multi-plunger hydraulic fracturing pump to a well associated with the subterranean formation such that the multi-plunger pump pumps fluid into the wellbore at a high pressure so that fluid passes from the wellbore into the subterranean formation and fractures the subterranean formation;

powering the multi-plunger pump with a plurality of motors;

providing a planetary gear train having a plurality of input pinion gears in rotational contact with each of the plurality of motors so as to translate power from the plurality of motors into a desired pump rate of the multi-plunger pump.

16. The method of claim 15, further comprising:

positioning a plurality of speed reduction gearboxes between the plurality of input pinion gears and the plurality of motors so as to achieve the desired pump rate.

17. The method of claim 15, wherein the plurality of motors comprises one of a plurality of electric motors or a plurality of hydraulic motors.

18. The method of claim 15, wherein the maximum pump speed correlates to a critical plunger speed associated with each of the plurality of hydraulic pumps.

19. The method of claim 15, further comprising:

connecting a variable frequency drive (VFD) to the plurality of motors so as to control the speed of the plurality of motors, wherein the VFD is positioned to accelerate or decelerate pump rotational speeds associated with each of the plurality of hydraulic pumps.

20. The method of claim 19, the method further comprising:

detecting an overpressure event with respect to the plurality of hydraulic pumps; and

automatically shutting off the plurality of VFDs.

ABSTRACT

A hydraulic fracturing system for fracturing a subterranean formation is described according to various embodiments. In an embodiment, the system can include a multi-plunger hydraulic fracturing pump fluidly connected to a well associated with the subterranean formation, the multi-plunger 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. In an embodiment, a plurality of motors can be positioned to power the multi-plunger pump, and a planetary gear train can have a plurality of pinion gears in rotational contact with each of the plurality of motors. In an embodiment, a gear ratio of the planetary gear train and a speed at which the plurality of motors operates can be selected so as to limit a maximum pump speed associated with the multi-plunger pump.

PTO/SB/17 (12-22)
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FEE TRANSMITTAL

Complete if known	
Application Number	
Filing Date	
First Named Inventor	Jared Oehring
Examiner Name	
Art Unit	
Practitioner Docket No.	USWEL-002003

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29. Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

TOTAL AMOUNT OF PAYMENT ($) 7640

METHOD OF PAYMENT (check all that apply)

☐ Check ☑ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☑ Deposit Account Deposit Account Number: 506816 Deposit Account Name: Henry Patent Law Firm

For the above-identified deposit account, the Director is hereby authorized to (check all that apply):

☐ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, **except for the filing fee**

☑ Charge any additional fee(s) or underpayment of fee(s) under 37 CFR 1.16 and 1.17 ☑ Credit any overpayment of fee(s)

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES (U = undiscounted fee; S = small entity fee; M = micro entity fee)

	FILING FEES			SEARCH FEES			EXAMINATION FEES			
Application Type	**U ($)**	**S ($)**	**M ($)**	**U ($)**	**S ($)**	**M ($)**	**U ($)**	**S ($)**	**M ($)**	**Fees Paid ($)**
Utility	320	128*	64	700	280	140	800	320	160	1820
Design	220	88	44	160	64	32	640	256	128	0
Plant	220	88	44	440	176	88	660	264	132	0
Reissue	320	128	64	700	280	140	2,320	928	464	0
Provisional	300	120	60	0	0	0	0	0	0	0

* The $128 small entity filing fee for a utility application is further reduced to $64 for a small entity applicant who files the application via Patent Center or EFS-Web.

2. EXCESS CLAIM FEES

Fee Description	**Undiscounted Fee ($)**	**Small Entity Fee ($)**	**Micro Entity Fee ($)**
Each claim over 20 (including Reissues)	100	40	20
Each independent claim over 3 (including Reissues)	480	192	96
Multiple dependent claims	860	344	172

Total Claims		**Extra Claims**	**Fee ($)**		**Fee Paid ($)**
30	-20 or HP =	10	x 100	=	1,000

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims		**Extra Claims**	**Fee ($)**		**Fee Paid ($)**
4	-3 or HP =	1	x 480	=	480

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims	**Fee ($)**	**Fee Paid ($)**
	0	0

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $420 ($168 for small entity) ($84 for micro entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets		**Extra Sheets**		**Number of each additional 50 or fraction thereof**	**Fee ($)**		**Fee Paid ($)**
0	- 100 =	0	/ 50 =	0 (round **up** to a whole number)	x 420	=	0

4. OTHER FEE(S)

	Fees Paid ($)
Non-English specification, $140 fee ($56 for small entity) ($28 for micro entity)	0.00
Non-electronic filing fee under 37 CFR 1.16(t) for a utility application, $400 fee ($200 small or micro entity)	0.00
Other (e.g., late filing surcharge): Track One Fee & Processing Fee	4340

SUBMITTED BY

Signature	/KE SUN/	Registration No. (Attorney/Agent) 78,914	Telephone
Name (Print/Type)	Ke Sun		Date July 24, 2023

A Federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with an information collection subject to the requirements of the Paperwork Reduction Act of 1995, unless the information collection has a currently valid OMB Control Number. The OMB Control Number for this information collection is 0651-0032. Public burden for this form is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden to the Chief Administrative Officer, United States Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450 or email InformationCollection@uspto.gov. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS.** If filing this completed form by mail, send to: **Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Routine uses of the information in this record may include disclosure to: 1) law enforcement, in the event that the system of records indicates a violation or potential violation of law; 2) a Federal, state, local, or international agency, in response to its request; 3) a contractor of the USPTO having need for the information in order to perform a contract; 4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record; 5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record; 6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations; 7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals; 8) another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)); 9) the Office of Personnel Management (OPM) for personnel research purposes; and 9) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

Additional Uses

Additional USPTO uses of the information in this record may include disclosure to: 1) the International Bureau of the World Intellectual Property Organization, if the record is related to an international application filed under the Patent Cooperation Treaty; 2) the public i) after publication of the application pursuant to 35 U.S.C. 122(b), ii) after issuance of a patent pursuant to 35 U.S.C. 151, iii) if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections, or an issued patent, or iv) without publication of the application or patent under the specific circumstances provided for by 37 CFR 1.14(a)(1)(v)-(vii); and/or 3) the National Archives and Records Administration, for inspection of records.

Doc Code: TRACK1.REQ
Document Description: TrackOne Request

PTO/AIA/424 (04-14)

CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION UNDER 37 CFR 1.102(e) (Page 1 of 1)

First Named Inventor:	Jared Oehring	Nonprovisional Application Number (if known):	
Title of Invention:	Multi-Plunger Pumps and Associated Drive Systems		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently $0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.

2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed.

3. The applicable box is checked below:

I. ☑ Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)

i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.

---OR---

(b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.

ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, or the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application.

II. ☐ Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)

i. A request for continued examination has been filed with, or prior to, this form.
ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature /KE SUN/	Date July 24, 2023
Name (Print/Typed) Ke Sun	Practitioner Registration Number 78914

Note: *This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.**

☑ *Total of 1 forms are submitted.

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The information provided by you in this form will be subject to the following routine uses:

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/AIA/14 (02-18)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	USWEL-002003
	Application Number	
Title of Invention	Multi-Plunger Pumps and Associated Drive Systems	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Jared		Oehring	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Willow Park	State/Province	TX	Country of Residence	US

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Address 2			
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Postal Code	76087	Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
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Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

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Mailing Address of Inventor:

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Inventor 3 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
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Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	USWEL-002003
	Application Number	
Title of Invention	Multi-Plunger Pumps and Associated Drive Systems	

City	Willow Park	State/Province	TX	Country of Residence	US

Mailing Address of Inventor:

Address 1	333 Shops Boulevard, Suite 301		
Address 2			
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Residence Information (Select One) (•) US Residency ( ) Non US Residency ( ) Active US Military Service

City	Willow Park	State/Province	TX	Country of Residence	US

Mailing Address of Inventor:

Address 1	333 Shops Boulevard, Suite 301		
Address 2			
City	Willow Park	State/Province	TX
Postal Code	76087	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	134020		
Email Address	docket@henry.law	Add Email	Remove Email

Application Information:

Title of the Invention	Multi-Plunger Pumps and Associated Drive Systems		
Attorney Docket Number	USWEL-002003	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	10	Suggested Figure for Publication (if any)	

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	USWEL-002003
	Application Number	
Title of Invention	Multi-Plunger Pumps and Associated Drive Systems	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	134020		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	16/827166	2020-03-23

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	USWEL-002003
	Application Number	
Title of Invention	Multi-Plunger Pumps and Associated Drive Systems	

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
16/827166	Continuation of	16/210807	2018-12-05	10598258	2020-03-24

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
16/210807	Claims benefit of provisional	62/594912	2017-12-05

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

			Remove
Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	USWEL-002003
	Application Number	
Title of Invention	Multi-Plunger Pumps and Associated Drive Systems	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	USWEL-002003
	Application Number	
Title of Invention	Multi-Plunger Pumps and Associated Drive Systems	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◉ Assignee	○ Legal Representative under 35 U.S.C. 117	○ Joint Inventor
○ Person to whom the inventor is obligated to assign.	○ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☑

Organization Name	U.S. Well Services, LLC		
Mailing Address Information For Applicant:			
Address 1	333 Shops Boulevard, Suite 301		
Address 2			
City	Willow Park	**State/Province**	TX
Country	US	Postal Code	76087
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	USWEL-002003
	Application Number	
Title of Invention	Multi-Plunger Pumps and Associated Drive Systems	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☑

Organization Name	U.S. Well Services, LLC

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1	333 Shops Boulevard, Suite 301		
Address 2			
City	Willow Park	**State/Province**	TX
Country	US	Postal Code	76087
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/KE SUN/			Date (YYYY-MM-DD)	2023-07-24
First Name	Ke	Last Name	Sun	Registration Number	78914

Additional Signature may be generated within this form by selecting the Add button.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	USWEL-002003
	Application Number	
Title of Invention	Multi-Plunger Pumps and Associated Drive Systems	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1 The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3 A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	USWEL-002003
First Named Inventor	Jared Oehring
Title	Multi-Plunger Pumps and Associated Drive Systems
Priority Mail Express® Label No.	

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. [✓] **Fee Transmittal Form** (PTO/SB/17 or equivalent)
2. [ ] **Applicant asserts small entity status.** See 37 CFR 1.27
3. [ ] **Applicant certifies micro entity status.** See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.
4. [✓] **Specification** [*Total Pages* 22] Both the claims and abstract must start on a new page. *(See MPEP § 608.01(a) for information on the preferred arrangement)*
5. [✓] **Drawing(s)** (35 U.S.C. 113) [*Total Sheets* 10]
6. **Inventor's Oath or Declaration** [*Total Pages* 4] *(including substitute statements under 37 CFR 1.64 and assignments serving as an oath or declaration under 37 CFR 1.63(e))*
   a. [ ] Newly executed (original or copy)
   b. [✓] A copy from a prior application (37 CFR 1.63(d))
7. [✓] **Application Data Sheet** ** See note below.* See 37 CFR 1.76 (PTO/AIA/14 or equivalent)
8. **CD-ROM or CD-R** in duplicate, large table, or Computer Program (*Appendix*)
   [ ] Landscape Table on CD
9. **Nucleotide and/or Amino Acid Sequence Submission** (*if applicable, items a. – c. are required*)
   a. [ ] Computer Readable Form (CRF)
   b. [ ] Specification Sequence Listing on:
      i. [ ] CD-ROM or CD-R (2 copies); or
      ii. [ ] Paper
   c. [ ] Statements verifying identity of above copies

ADDRESS TO: **Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450**

ACCOMPANYING APPLICATION PAPERS

10. [ ] **Assignment Papers** (cover sheet & document(s)) Name of Assignee _____
11. [ ] **37 CFR 3.73(c) Statement** (*when there is an assignee*) [✓] **Power of Attorney**
12. [ ] **English Translation Document** (*if applicable*)
13. [ ] **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    [ ] Copies of citations attached
14. [✓] **Preliminary Amendment**
15. [ ] **Return Receipt Postcard** (*MPEP § 503*) (*Should be specifically itemized*)
16. [ ] **Certified Copy of Priority Document(s)** (*if foreign priority is claimed*)
17. [ ] **Nonpublication Request** Under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
18. [✓] **Other:** Track 1 Request

***Note:** (1) Benefit claims under 37 CFR 1.78 and foreign priority claims under 1.55 **must** be included in an Application Data Sheet (ADS).
(2) For applications filed under 35 U.S.C. 111, the application must contain an ADS specifying the applicant if the applicant is an assignee, person to whom the inventor is under an obligation to assign, or person who otherwise shows sufficient proprietary interest in the matter. See 37 CFR 1.46(b).

19. CORRESPONDENCE ADDRESS

[✓] The address associated with Customer Number: 134020 **OR** [ ] Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone		Email	

Signature	/KE SUN/	Date	July 24, 2023
Name (Print/Type)	Ke Sun	Registration No. (Attorney/Agent)	78,914

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

[X] Practitioners associated with Customer Number: 134020

OR

[ ] Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

[X] The address associated with Customer Number: 134020

OR

[ ] Firm or individual name: Henry Patent Law Firm PLLC

Address:

City | State | Zip

Country

Telephone | Email

Assignee name and address: U.S. Well Services, LLC
333 Shops Blvd, Suite 301
Willow Park, Texas 76087

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee.

Signature	Date July 13, 2023
Name Robert Willette	Telephone 817-212-3377
Title Corporate Secretary	

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

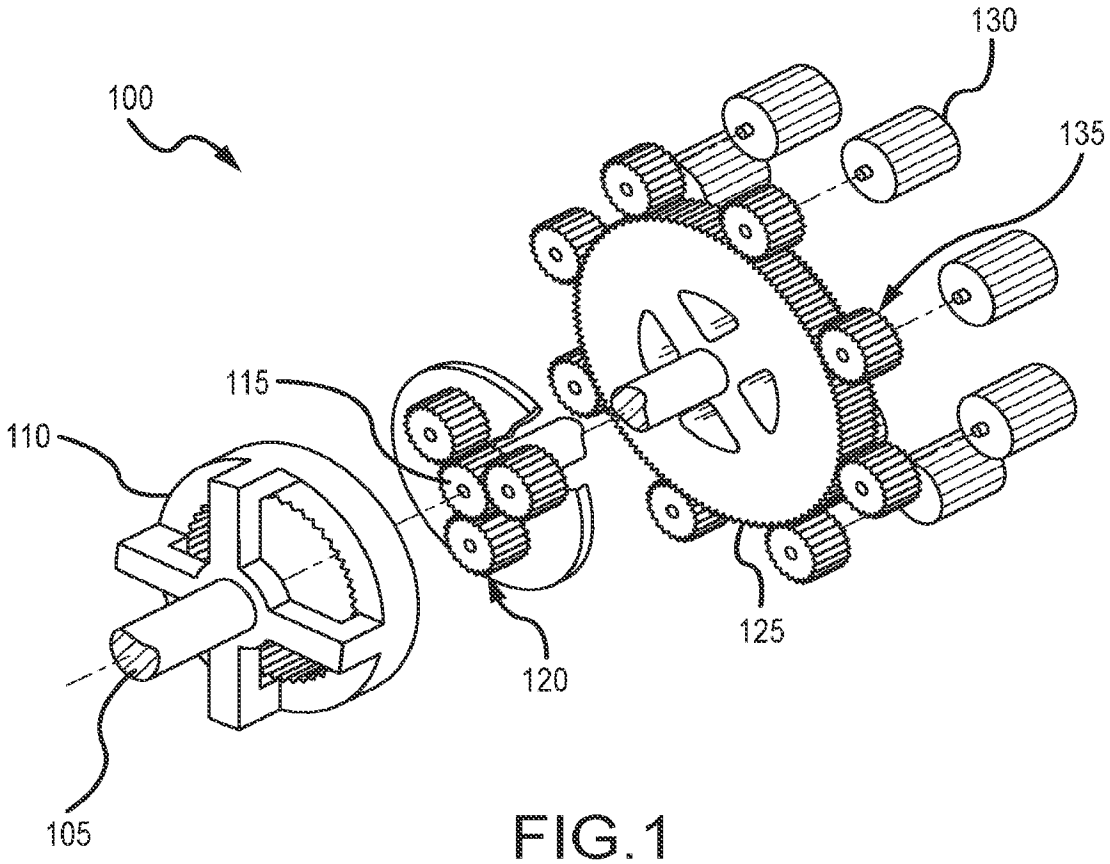


FIG. 1

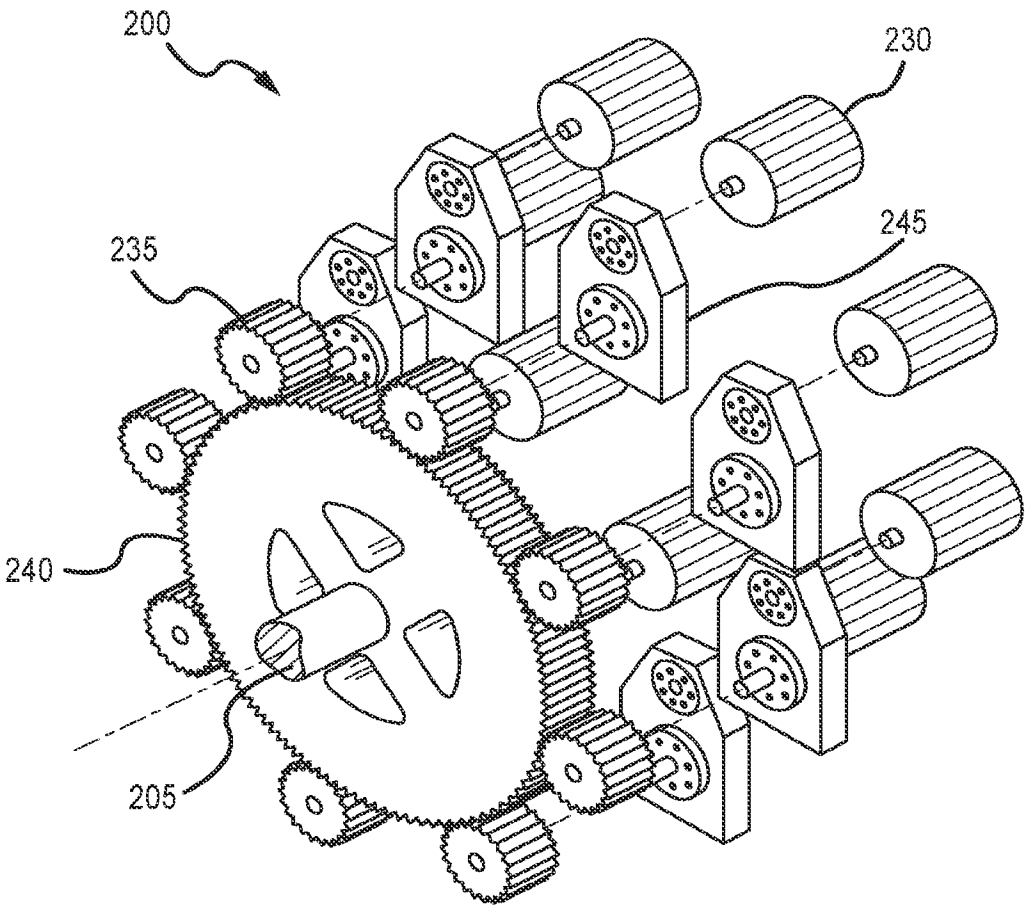


FIG.2

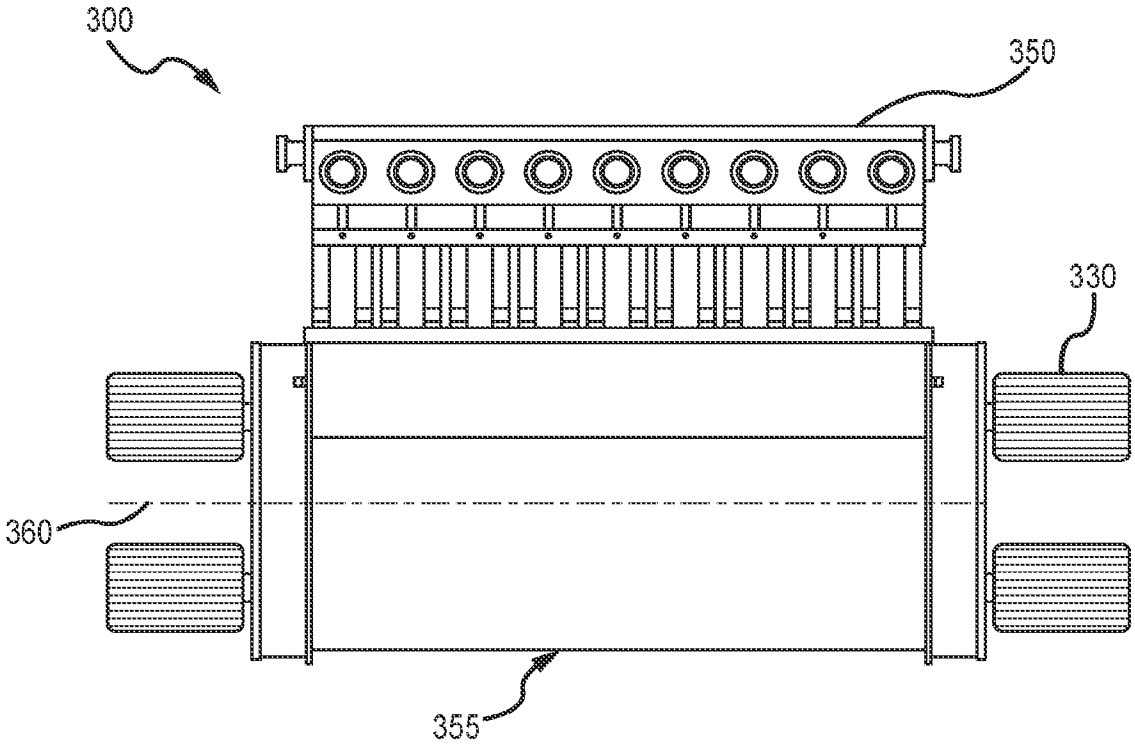


FIG.3

Plunger Critcal Speed Calculations

Plunger Critical Speed = 32 in/sec (based on 120 rpm crankshaft speed on 8" stroke pump)
Plunger Maximum Speed = 40 in/sec (based on 150 rpm crankshaft speed on 8" stroke pump)

	Pump	Volume per rev, (BBL)				Crankshaft rpm		Discharge Rates, (BPM) at Critical Speed				Discharge Rates, (BPM) at Maximum Speed			
	Stroke (in.)	Triplex	Quint	9 Plunger	13 Plunger	Critical	Maximum	Triplex	Quint	9 Plunger	13 Plunger	Triplex	Quint	9 Plunger	13 Plunger
2.75" Bore	8	0.01666	0.02449	0.04408	0.06367	120.00	150.00	1.76	2.94	5.29	7.64	2.20	3.67	6.61	9.55
	9	0.01653	0.02755	0.04959	0.07162	106.67	133.33								
	10	0.01837	0.03061	0.05510	0.07959	96.00	120.00								
	11	0.02020	0.03367	0.06061	0.08754	87.27	109.09								
	12	0.02204	0.03673	0.06612	0.09550	80.00	100.00								
	13	0.02388	0.03979	0.07163	0.10346	73.85	92.31								

	Pump	Volume per rev, (BBL)				Crankshaft rpm		Discharge Rates, (BPM) at Critical Speed				Discharge Rates, (BPM) at Maximum Speed			
	Stroke (in.)	Triplex	Quint	9 Plunger	13 Plunger	Critical	Maximum	Triplex	Quint	9 Plunger	13 Plunger	Triplex	Quint	9 Plunger	13 Plunger
3.0" Bore	8	0.01749	0.02914	0.05246	0.07577	120.00	150.00	2.10	3.50	6.29	9.09	2.62	4.37	7.87	11.37
	9	0.01967	0.03279	0.05901	0.08524	106.67	133.33								
	10	0.02186	0.03643	0.06557	0.09471	96.00	120.00								
	11	0.02404	0.04007	0.07213	0.10419	87.27	109.09								
	12	0.02623	0.04371	0.07869	0.11366	80.00	100.00								
	13	0.02841	0.04736	0.08524	0.12313	73.85	92.31								

	Pump	Volume per rev, (BBL)				Crankshaft rpm		Discharge Rates, (BPM) at Critical Speed				Discharge Rates, (BPM) at Maximum Speed			
	Stroke (in.)	Triplex	Quint	9 Plunger	13 Plunger	Critical	Maximum	Triplex	Quint	9 Plunger	13 Plunger	Triplex	Quint	9 Plunger	13 Plunger
3.25" Bore	8	0.02052	0.03420	0.06156	0.08893	120.00	150.00	2.46	4.10	7.39	10.67	3.08	5.13	9.23	13.34
	9	0.02309	0.03848	0.06926	0.10004	106.67	133.33								
	10	0.02565	0.04275	0.07696	0.11116	96.00	120.00								
	11	0.02822	0.04703	0.08465	0.12227	87.27	109.09								
	12	0.03078	0.05130	0.09235	0.13339	80.00	100.00								
	13	0.03335	0.05558	0.10004	0.14450	73.85	92.31								

	Pump	Volume per rev, (BBL)				Crankshaft rpm		Discharge Rates, (BPM) at Critical Speed				Discharge Rates, (BPM) at Maximum Speed			
	Stroke (in.)	Triplex	Quint	9 Plunger	13 Plunger	Critical	Maximum	Triplex	Quint	9 Plunger	13 Plunger	Triplex	Quint	9 Plunger	13 Plunger
3.5" Bore	8	0.02380	0.03967	0.07140	0.10313	120.00	150.00	2.86	4.76	8.57	12.38	3.57	5.95	10.71	15.47
	9	0.02677	0.04462	0.08032	0.11602	106.67	133.33								
	10	0.02975	0.04958	0.08925	0.12892	96.00	120.00								
	11	0.03272	0.05454	0.09817	0.14181	87.27	109.09								
	12	0.03570	0.05950	0.10710	0.15470	80.00	100.00								
	13	0.03867	0.06446	0.11602	0.16759	73.85	92.31								

	Pump	Volume per rev, (BBL)				Crankshaft rpm		Discharge Rates, (BPM) at Critical Speed				Discharge Rates, (BPM) at Maximum Speed			
	Stroke (in.)	Triplex	Quint	9 Plunger	13 Plunger	Critical	Maximum	Triplex	Quint	9 Plunger	13 Plunger	Triplex	Quint	9 Plunger	13 Plunger
4.0" Bore	8	0.03108	0.05181	0.09326	0.13476	120.00	150.00	3.73	6.22	11.19	16.16	4.66	7.77	13.99	20.21
	9	0.03497	0.05829	0.10491	0.15154	106.67	133.33								
	10	0.03886	0.06476	0.11657	0.16832	96.00	120.00								
	11	0.04274	0.07124	0.12822	0.18509	87.27	109.09								
	12	0.04663	0.07771	0.13985	0.20206	80.00	100.00								
	13	0.05053	0.08419	0.15154	0.21885	73.85	92.31								

	Pump	Volume per rev, (BBL)				Crankshaft rpm		Discharge Rates, (BPM) at Critical Speed				Discharge Rates, (BPM) at Maximum Speed			
	Stroke (in.)	Triplex	Quint	9 Plunger	13 Plunger	Critical	Maximum	Triplex	Quint	9 Plunger	13 Plunger	Triplex	Quint	9 Plunger	13 Plunger
4.5" Bore	8	0.03934	0.06557	0.11803	0.17049	120.00	150.00	4.72	7.87	14.16	20.46	5.90	9.84	17.70	25.57
	9	0.04426	0.07377	0.13278	0.19180	106.67	133.33								
	10	0.04918	0.08196	0.14754	0.21311	96.00	120.00								
	11	0.05410	0.09016	0.16229	0.23442	87.27	109.09								
	12	0.05901	0.09836	0.17704	0.25573	80.00	100.00								
	13	0.06393	0.10655	0.19180	0.27704	73.85	92.31								

	Pump	Volume per rev, (BBL)				Crankshaft rpm		Discharge Rates, (BPM) at Critical Speed				Discharge Rates, (BPM) at Maximum Speed			
	Stroke (in.)	Triplex	Quint	9 Plunger	13 Plunger	Critical	Maximum	Triplex	Quint	9 Plunger	13 Plunger	Triplex	Quint	9 Plunger	13 Plunger
5.0" Bore	8	0.04857	0.08095	0.14571	0.21048	120.00	150.00	5.83	9.71	17.49	25.26	7.29	12.14	21.86	31.57
	9	0.05464	0.09107	0.16393	0.23678	106.67	133.33								
	10	0.06071	0.10119	0.18214	0.26309	96.00	120.00								
	11	0.06678	0.11131	0.20036	0.28940	87.27	109.09								
	12	0.07286	0.12143	0.21857	0.31571	80.00	100.00								
	13	0.07893	0.13155	0.23680	0.34202	73.85	92.31								

FIG. 4

Transmission	
CAT TH55-E90 Series	
1st Gear	4.07
2nd Gear	3.45
3rd Gear	2.65
4th Gear	2.38
5th Gear	2.22
6th Gear	1.81
7th Gear	1.69
8th Gear	1.36
9th Gear	1.00

Frac Pump	
Rod End	Quint
Bore	BBL/rev
4.0"	0.051167
4.5"	0.065548
5.0"	0.080988

CAT TH55-E90 Transmission - Quint Pumps

		1st Gear				2nd Gear				3rd Gear				4th Gear				5th Gear				6th Gear				7th Gear				8th Gear				9th Gear		
		Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM
4.0" Fluid End	1st Gear	1500	368.8	7.37	2nd Gear	1500	368.8	3.68	3rd Gear	1500	368.8	2.78	4th Gear	1500	368.8	2.49	5th Gear	1500	368.8	2.32	6th Gear	1500	368.8	1.89	7th Gear	1500	368.8	1.77	8th Gear	1500	368.8	1.42	9th Gear	1500	368.8	1.05
		1550	381.1	7.62		1550	381.1	3.81		1550	381.1	2.87		1550	381.1	2.57		1550	381.1	2.40		1550	381.1	1.95		1550	381.1	1.83		1550	381.1	1.47		1550	381.1	1.08
		1600	393.5	7.87		1600	393.5	3.93		1600	393.5	2.97		1600	393.5	2.65		1600	393.5	2.48		1600	393.5	2.02		1600	393.5	1.89		1600	393.5	1.52		1600	393.5	1.12
		1650	405.8	8.12		1650	405.8	4.06		1650	405.8	3.06		1650	405.8	2.74		1650	405.8	2.56		1650	405.8	2.08		1650	405.8	1.95		1650	405.8	1.57		1650	405.8	1.16
		1700	418.1	8.36		1700	418.1	4.18		1700	418.1	3.15		1700	418.1	2.82		1700	418.1	2.64		1700	418.1	2.15		1700	418.1	2.01		1700	418.1	1.62		1700	418.1	1.19
		1750	430.4	8.61		1750	430.4	4.30		1750	430.4	3.24		1750	430.4	2.91		1750	430.4	2.72		1750	430.4	2.21		1750	430.4	2.07		1750	430.4	1.67		1750	430.4	1.23
		1800	442.7	8.85		1800	442.7	4.43		1800	442.7	3.33		1800	442.7	2.99		1800	442.7	2.80		1800	442.7	2.28		1800	442.7	2.13		1800	442.7	1.72		1800	442.7	1.27
		1850	455.1	9.10		1850	455.1	4.55		1850	455.1	3.42		1850	455.1	3.07		1850	455.1	2.87		1850	455.1	2.34		1850	455.1	2.19		1850	455.1	1.77		1850	455.1	1.30
		1900	467.4	9.35		1900	467.4	4.67		1900	467.4	3.51		1900	467.4	3.15		1900	467.4	2.95		1900	467.4	2.40		1900	467.4	2.25		1900	467.4	1.82		1900	467.4	1.34
		1950	479.8	9.60		1950	479.8	4.80		1950	479.8	3.60		1950	479.8	3.23		1950	479.8	3.03		1950	479.8	2.46		1950	479.8	2.31		1950	479.8	1.87		1950	479.8	1.37
4.5" Fluid End	1st Gear	1500	368.8	5.85	2nd Gear	1500	368.8	2.92	3rd Gear	1500	368.8	2.21	4th Gear	1500	368.8	1.97	5th Gear	1500	368.8	1.84	6th Gear	1500	368.8	1.50	7th Gear	1500	368.8	1.40	8th Gear	1500	368.8	1.13	9th Gear	1500	368.8	0.83
		1550	381.1	6.04		1550	381.1	3.02		1550	381.1	2.28		1550	381.1	2.04		1550	381.1	1.90		1550	381.1	1.55		1550	381.1	1.45		1550	381.1	1.17		1550	381.1	0.86
		1600	393.5	6.24		1600	393.5	3.12		1600	393.5	2.36		1600	393.5	2.10		1600	393.5	1.96		1600	393.5	1.60		1600	393.5	1.50		1600	393.5	1.21		1600	393.5	0.89
		1650	405.8	6.43		1650	405.8	3.22		1650	405.8	2.43		1650	405.8	2.17		1650	405.8	2.02		1650	405.8	1.65		1650	405.8	1.55		1650	405.8	1.25		1650	405.8	0.92
		1700	418.1	6.63		1700	418.1	3.32		1700	418.1	2.50		1700	418.1	2.23		1700	418.1	2.08		1700	418.1	1.70		1700	418.1	1.59		1700	418.1	1.29		1700	418.1	0.95
		1750	430.4	6.82		1750	430.4	3.41		1750	430.4	2.57		1750	430.4	2.30		1750	430.4	2.14		1750	430.4	1.75		1750	430.4	1.64		1750	430.4	1.33		1750	430.4	0.98
		1800	442.7	7.02		1800	442.7	3.51		1800	442.7	2.65		1800	442.7	2.37		1800	442.7	2.21		1800	442.7	1.80		1800	442.7	1.69		1800	442.7	1.37		1800	442.7	1.01
		1850	455.1	7.21		1850	455.1	3.61		1850	455.1	2.72		1850	455.1	2.44		1850	455.1	2.27		1850	455.1	1.85		1850	455.1	1.74		1850	455.1	1.41		1850	455.1	1.04
		1900	467.4	7.41		1900	467.4	3.71		1900	467.4	2.79		1900	467.4	2.50		1900	467.4	2.33		1900	467.4	1.90		1900	467.4	1.79		1900	467.4	1.45		1900	467.4	1.07
		1950	479.8	7.60		1950	479.8	3.80		1950	479.8	2.86		1950	479.8	2.57		1950	479.8	2.39		1950	479.8	1.95		1950	479.8	1.84		1950	479.8	1.49		1950	479.8	1.10
5.0" Fluid End	1st Gear	1500	368.8	5.08	2nd Gear	1500	368.8	2.54	3rd Gear	1500	368.8	1.92	4th Gear	1500	368.8	1.72	5th Gear	1500	368.8	1.60	6th Gear	1500	368.8	1.30	7th Gear	1500	368.8	1.22	8th Gear	1500	368.8	0.98	9th Gear	1500	368.8	0.72
		1550	381.1	5.25		1550	381.1	2.62		1550	381.1	1.98		1550	381.1	1.77		1550	381.1	1.65		1550	381.1	1.35		1550	381.1	1.26		1550	381.1	1.01		1550	381.1	0.75
		1600	393.5	5.42		1600	393.5	2.71		1600	393.5	2.05		1600	393.5	1.83		1600	393.5	1.70		1600	393.5	1.39		1600	393.5	1.30		1600	393.5	1.05		1600	393.5	0.77
		1650	405.8	5.59		1650	405.8	2.79		1650	405.8	2.11		1650	405.8	1.88		1650	405.8	1.75		1650	405.8	1.43		1650	405.8	1.34		1650	405.8	1.08		1650	405.8	0.80
		1700	418.1	5.76		1700	418.1	2.88		1700	418.1	2.17		1700	418.1	1.94		1700	418.1	1.80		1700	418.1	1.48		1700	418.1	1.38		1700	418.1	1.12		1700	418.1	0.82
		1750	430.4	5.93		1750	430.4	2.96		1750	430.4	2.23		1750	430.4	2.00		1750	430.4	1.86		1750	430.4	1.52		1750	430.4	1.43		1750	430.4	1.15		1750	430.4	0.85
		1800	442.7	6.10		1800	442.7	3.05		1800	442.7	2.30		1800	442.7	2.06		1800	442.7	1.91		1800	442.7	1.56		1800	442.7	1.47		1800	442.7	1.19		1800	442.7	0.88
		1850	455.1	6.27		1850	455.1	3.13		1850	455.1	2.36		1850	455.1	2.12		1850	455.1	1.97		1850	455.1	1.61		1850	455.1	1.51		1850	455.1	1.22		1850	455.1	0.90
		1900	467.4	6.44		1900	467.4	3.22		1900	467.4	2.42		1900	467.4	2.17		1900	467.4	2.02		1900	467.4	1.65		1900	467.4	1.55		1900	467.4	1.25		1900	467.4	0.93
		1950	479.8	6.61		1950	479.8	3.30		1950	479.8	2.49		1950	479.8	2.23		1950	479.8	2.07		1950	479.8	1.69		1950	479.8	1.59		1950	479.8	1.29		1950	479.8	0.95

FIG. 5

Transmission	
Allison 9800 Ratios	
1st Gear	3.75
2nd Gear	2.69
3rd Gear	2.20
4th Gear	1.77
5th Gear	1.58
6th Gear	1.27
7th Gear	1.00

Frac Pump	
Fluid End Bore	Triplex Bbl/rev
4.0"	0.03107
4.5"	0.03933
5.0"	0.04855

Allison 9800 Transmission, Triplex Pumps

	7.00 OD 4.5"	Engine rpm	Pump Crank rpm	Pump BPM	8.00 OD 4.5"	Engine rpm	Pump Crank rpm	Pump BPM	9.00 OD 4.5"	Engine rpm	Pump Crank rpm	Pump BPM	10.00 OD 4.5"	Engine rpm	Pump Crank rpm	Pump BPM
Allison 9800 Transmission	1st Gear	1500	90.0	3.06	2nd Gear	1500	97.8	3.32	3rd Gear	1500	107.5	3.65	4th Gear	1500	135.4	4.59
		1550	92.9	3.16		1550	101.0	3.43		1550	110.9	3.77		1550	137.8	4.68
		1600	95.9	3.26		1600	104.3	3.54		1600	114.5	3.89		1600	142.3	4.82
		1650	98.9	3.36		1650	107.6	3.65		1650	118.1	4.01		1650	146.7	4.96
		1700	101.8	3.46		1700	110.8	3.76		1700	121.6	4.13		1700	151.2	5.13
		1750	104.8	3.56		1750	114.1	3.87		1750	125.2	4.25		1750	155.6	5.27
		1800	107.8	3.66		1800	117.3	3.98		1800	128.8	4.37		1800	160.1	5.41
		1850	110.7	3.76		1850	120.5	4.09		1850	132.4	4.49		1850	164.5	5.55
		1900	113.7	3.86		1900	123.8	4.20		1900	135.9	4.61		1900	169.0	5.70
		1950	116.7	3.96		1950	127.1	4.31		1950	139.5	4.73		1950	173.4	5.84

	7.00 OD 4.5"	Engine rpm	Pump Crank rpm	Pump BPM	8.00 OD 4.5"	Engine rpm	Pump Crank rpm	Pump BPM	9.00 OD 4.5"	Engine rpm	Pump Crank rpm	Pump BPM	10.00 OD 4.5"	Engine rpm	Pump Crank rpm	Pump BPM
Allison 9800 Transmission	1st Gear	1500	88.0	2.98	2nd Gear	1500	95.8	3.25	3rd Gear	1500	105.3	3.57	4th Gear	1500	133.4	5.25
		1550	90.9	3.08		1550	99.0	3.36		1550	108.8	3.69		1550	137.8	5.42
		1600	93.9	3.18		1600	102.3	3.47		1600	112.4	3.81		1600	142.3	5.60
		1650	96.8	3.28		1650	105.5	3.58		1650	116.1	3.94		1650	146.7	5.77
		1700	99.8	3.38		1700	108.7	3.69		1700	119.6	4.06		1700	151.2	5.95
		1750	102.8	3.49		1750	112.0	3.80		1750	123.2	4.18		1750	155.6	6.12
		1800	105.8	3.59		1800	115.2	3.91		1800	126.8	4.30		1800	160.1	6.30
		1850	108.7	3.69		1850	118.4	4.02		1850	130.3	4.42		1850	164.5	6.47
		1900	111.7	3.79		1900	121.6	4.13		1900	133.9	4.54		1900	169.0	6.65
		1950	114.7	3.89		1950	124.9	4.24		1950	137.5	4.66		1950	173.4	6.82

	7.00 OD 4.5"	Engine rpm	Pump Crank rpm	Pump BPM	8.00 OD 4.5"	Engine rpm	Pump Crank rpm	Pump BPM	9.00 OD 4.5"	Engine rpm	Pump Crank rpm	Pump BPM	10.00 OD 4.5"	Engine rpm	Pump Crank rpm	Pump BPM
Allison 9800 Transmission	1st Gear	1500	88.0	3.06	2nd Gear	1500	97.8	3.38	3rd Gear	1500	107.5	3.71	4th Gear	1500	133.4	6.48
		1550	90.9	3.16		1550	101.0	3.49		1550	110.9	3.84		1550	137.8	6.69
		1600	93.9	3.26		1600	104.3	3.61		1600	114.5	3.96		1600	142.3	6.91
		1650	96.8	3.36		1650	107.6	3.73		1650	118.1	4.09		1650	146.7	7.12
		1700	99.8	3.46		1700	110.8	3.84		1700	121.6	4.21		1700	151.2	7.34
		1750	102.8	3.57		1750	114.1	3.96		1750	125.2	4.34		1750	155.6	7.55
		1800	105.8	3.67		1800	117.3	4.07		1800	128.8	4.46		1800	160.1	7.77
		1850	108.7	3.77		1850	120.5	4.18		1850	132.4	4.59		1850	164.5	7.98
		1900	111.7	3.87		1900	123.8	4.30		1900	135.9	4.71		1900	169.0	8.20
		1950	114.7	3.97		1950	127.1	4.41		1950	139.5	4.83		1950	173.4	8.41

FIG. 6

Transmission	
Allison 9800 Ratios	
1st Gear	3.75
2nd Gear	2.08
3rd Gear	1.20
4th Gear	0.77
5th Gear	0.58
6th Gear	0.47
7th Gear	0.00

Frac Pump	
Fluid End Bore	Quint BBL/rev
4.0"	0.05167
4.5"	0.06546
5.0"	0.08085

Allison 9800 Transmission, Quint Pumps

	Quint 4.0"	Engine rpm	Pump Crank rpm	Pump BPM	Quint 4.0"	Engine rpm	Pump Crank rpm	Pump BPM	Quint 4.0"	Engine rpm	Pump Crank rpm	Pump BPM	Quint 4.0"	Engine rpm	Pump Crank rpm	Pump BPM
Allison 9800 Transmission	1st Gear	1500	69.0	5.35	2nd Gear	1500	97.8	4.84	3rd Gear	1500	107.3	9.65	4th Gear	1500	133.4	6.88
		1550	69.3	5.36		1550	98.0	4.85		1550	109.9	9.75		1550	137.8	7.12
		1600	67.2	5.49		1600	95.6	4.74		1600	114.5	9.85		1600	142.3	7.35
		1650	68.1	5.55		1650	96.6	4.89		1650	118.1	9.39		1650	146.7	7.58
		1700	72.4	5.69		1700	98.5	5.18		1700	121.6	9.23		1700		
		1750	73.5	5.86		1750	103.4	5.29		1750	125.2	9.47		1750		
		1800	75.6	5.96		1800	106.2	5.44		1800	128.8	9.63		1800		
		1850	77.7	6.01		1850	109.0	5.59		1850	132.4	9.84		1850		
		1900	78.8	6.15		1900	111.2	5.74		1900	135.9	7.01		1900		
		1950	80.6	6.25		1950	114.1	5.90		1950	138.5	7.21		1950		

	Quint 4.5"	Engine rpm	Pump Crank rpm	Pump BPM	Quint 4.5"	Engine rpm	Pump Crank rpm	Pump BPM	Quint 4.5"	Engine rpm	Pump Crank rpm	Pump BPM	Quint 4.5"	Engine rpm	Pump Crank rpm	Pump BPM
Allison 9800 Transmission	1st Gear	1500	69.0	4.62	2nd Gear	1500	97.8	4.45	3rd Gear	1500	107.3	7.03	4th Gear	1500	133.4	8.73
		1550	69.3	4.76		1550	98.0	4.94		1550	109.9	7.26		1550	137.8	9.03
		1600	67.2	4.96		1600	95.6	4.83		1600	114.5	7.50		1600	142.3	9.32
		1650	68.1	5.03		1650	96.6	4.932		1650	118.1	7.73		1650	146.7	9.61
		1700	72.4	5.07		1700	98.5	4.91		1700	121.6	7.96		1700		
		1750	73.5	5.01		1750	103.4	5.71		1750	125.2	8.20		1750		
		1800	75.6	5.05		1800	106.2	5.80		1800	128.8	8.43		1800		
		1850	77.7	5.06		1850	109.0	7.09		1850	132.4	8.67		1850		
		1900	78.8	5.22		1900	111.2	7.23		1900	135.9	8.90		1900		
		1950	80.6	5.26		1950	114.1	7.41		1950	138.5	9.14		1950		

	Quint 5.0"	Engine rpm	Pump Crank rpm	Pump BPM	Quint 5.0"	Engine rpm	Pump Crank rpm	Pump BPM	Quint 5.0"	Engine rpm	Pump Crank rpm	Pump BPM	Quint 5.0"	Engine rpm	Pump Crank rpm	Pump BPM
Allison 9800 Transmission	1st Gear	1500	69.0	5.10	2nd Gear	1500	97.8	7.10	3rd Gear	1500	107.3	9.62	4th Gear	1500	133.4	10.80
		1550	69.3	5.27		1550	98.0	7.34		1550	109.9	9.96		1550	137.8	11.16
		1600	67.2	5.48		1600	95.6	7.58		1600	114.5	9.27		1600	142.3	11.52
		1650	68.1	5.61		1650	96.6	7.62		1650	118.1	9.56		1650	146.7	11.88
		1700	72.4	5.79		1700	98.5	9.65		1700	121.6	9.85		1700		
		1750	73.5	5.86		1750	103.4	8.23		1750	125.2	10.14		1750		
		1800	75.6	5.92		1800	106.2	8.53		1800	128.8	10.43		1800		
		1850	77.7	6.28		1850	109.0	8.78		1850	132.4	10.71		1850		
		1900	78.8	6.46		1900	111.2	9.00		1900	135.9	11.00		1900		
		1950	80.6	6.60		1950	114.1	9.24		1950	138.5	11.29		1950		

FIG. 7

Transmission	
CAT TH55-E70 Switch	
1st Gear	6.25
2nd Gear	4.09
3rd Gear	2.68
4th Gear	1.78
5th Gear	1.00
6th Gear	0.76
7th Gear	1.00

Fan Pump	
Hydraulic Fan	Tractor
Gpm	cubic inch
4.0"	0.052407
4.5"	0.066338
5.0"	0.081955

CAT TH55-E70 Transmission, Triplex Pumps

TH55-E70 Switch	Engine rpm	Pump Clutch rpm	Pump GPM
	1501	90.1	3.60
	1550	93.0	3.72
	1600	96.0	3.84
	1650	99.0	3.96
1st Gear	1700	102.0	4.08
	1750	105.0	4.20
	1800	108.0	4.32
	1850	111.0	4.44
	1900	114.0	4.56
	1950	117.0	4.68

TH55-E70 Switch	Engine rpm	Pump Clutch rpm	Pump GPM
	1501	90.1	3.60
	1550	93.0	3.72
	1600	96.0	3.84
	1650	99.0	3.96
2nd Gear	1700	102.0	4.08
	1750	105.0	4.20
	1800	108.0	4.32
	1850	111.0	4.44
	1900	114.0	4.56
	1950	117.0	4.68

TH55-E70 Switch	Engine rpm	Pump Clutch rpm	Pump GPM
	1501	90.1	3.60
	1550	93.0	3.72
	1600	96.0	3.84
	1650	99.0	3.96
3rd Gear	1700	102.0	4.08
	1750	105.0	4.20
	1800	108.0	4.32
	1850	111.0	4.44
	1900	114.0	4.56
	1950	117.0	4.68

TH55-E70 Switch	Engine rpm	Pump Clutch rpm	Pump GPM
	1501	90.1	3.60
	1550	93.0	3.72
	1600	96.0	3.84
	1650	99.0	3.96
4th Gear	1700	102.0	4.08
	1750	105.0	4.20
	1800	108.0	4.32
	1850	111.0	4.44
	1900	114.0	4.56
	1950	117.0	4.68

TH55-E70 Switch	Engine rpm	Pump Clutch rpm	Pump GPM
	1501	90.1	3.60
	1550	93.0	3.72
	1600	96.0	3.84
	1650	99.0	3.96
5th Gear	1700	102.0	4.08
	1750	105.0	4.20
	1800	108.0	4.32
	1850	111.0	4.44
	1900	114.0	4.56
	1950	117.0	4.68

TH55-E70 Switch	Engine rpm	Pump Clutch rpm	Pump GPM
	1501	90.1	3.60
	1550	93.0	3.72
	1600	96.0	3.84
	1650	99.0	3.96
6th Gear	1700	102.0	4.08
	1750	105.0	4.20
	1800	108.0	4.32
	1850	111.0	4.44
	1900	114.0	4.56
	1950	117.0	4.68

TH55-E70 Switch	Engine rpm	Pump Clutch rpm	Pump GPM
	1501	90.1	3.60
	1550	93.0	3.72
	1600	96.0	3.84
	1650	99.0	3.96
7th Gear	1700	102.0	4.08
	1750	105.0	4.20
	1800	108.0	4.32
	1850	111.0	4.44
	1900	114.0	4.56
	1950	117.0	4.68

FIG. 8

Transmission	
CAT TH55-E70 Ratios	
1st Gear	4.25
2nd Gear	2.58
3rd Gear	1.48
4th Gear	1.00
5th Gear	0.73
6th Gear	1.34
7th Gear	3.00

Stat Pump	
Fluid Out	Quint
Bore	BBI/rev
4.0"	0.005150
4.5"	0.006646
5.0"	0.008205

CAT TH55-E70 Transmission, Quint Pumps

Pump Set	Engine rpm	Pump Crank rpm	Pump SPM	Pump Set	Engine rpm	Pump Crank rpm	Pump SPM	Pump Set	Engine rpm	Pump Crank rpm	Pump SPM	Pump Set	Engine rpm	Pump Crank rpm	Pump SPM	Pump Set	Engine rpm	Pump Crank rpm	Pump SPM
CAT TH55-E70 Transmission	1st Gear	1850	43.8	5.84	2nd Gear	1850	80.4	10.72	3rd Gear	1850	109.9	14.65	4th Gear	1850	154.2	20.56	5th Gear	1850	201.9	26.92
		1800	42.6	5.68		1800	78.2	10.43		1800	106.9	14.26		1800	150.0	20.00		1800	196.4	26.19
		1750	41.4	5.52		1750	76.0	10.14		1750	103.9	13.86		1750	145.9	19.45		1750	191.0	25.47
		1700	40.3	5.37		1700	73.9	9.85		1700	101.0	13.47		1700	141.7	18.90		1700	185.5	24.74
		1650	39.1	5.21		1650	71.7	9.56		1650	98.0	13.07		1650	137.6	18.34		1650	180.1	24.02
		1600	37.9	5.05		1600	69.5	9.27		1600	95.0	12.67		1600	133.4	17.79		1600	174.6	23.29
		1550	36.7	4.90		1550	67.4	8.98		1550	92.1	12.28		1550	129.3	17.24		1550	169.2	22.57

Pump Set	Engine rpm	Pump Crank rpm	Pump SPM	Pump Set	Engine rpm	Pump Crank rpm	Pump SPM	Pump Set	Engine rpm	Pump Crank rpm	Pump SPM	Pump Set	Engine rpm	Pump Crank rpm	Pump SPM	Pump Set	Engine rpm	Pump Crank rpm	Pump SPM
CAT TH55-E70 Transmission	1st Gear	1850	43.8	5.84	2nd Gear	1850	80.4	10.72	3rd Gear	1850	109.9	14.65	4th Gear	1850	154.2	20.56	5th Gear	1850	201.9	26.92
		1800	42.6	5.68		1800	78.2	10.43		1800	106.9	14.26		1800	150.0	20.00		1800	196.4	26.19
		1750	41.4	5.52		1750	76.0	10.14		1750	103.9	13.86		1750	145.9	19.45		1750	191.0	25.47
		1700	40.3	5.37		1700	73.9	9.85		1700	101.0	13.47		1700	141.7	18.90		1700	185.5	24.74
		1650	39.1	5.21		1650	71.7	9.56		1650	98.0	13.07		1650	137.6	18.34		1650	180.1	24.02
		1600	37.9	5.05		1600	69.5	9.27		1600	95.0	12.67		1600	133.4	17.79		1600	174.6	23.29
		1550	36.7	4.90		1550	67.4	8.98		1550	92.1	12.28		1550	129.3	17.24		1550	169.2	22.57

Pump Set	Engine rpm	Pump Crank rpm	Pump SPM	Pump Set	Engine rpm	Pump Crank rpm	Pump SPM	Pump Set	Engine rpm	Pump Crank rpm	Pump SPM	Pump Set	Engine rpm	Pump Crank rpm	Pump SPM	Pump Set	Engine rpm	Pump Crank rpm	Pump SPM
CAT TH55-E70 Transmission	1st Gear	1850	43.8	5.84	2nd Gear	1850	80.4	10.72	3rd Gear	1850	109.9	14.65	4th Gear	1850	154.2	20.56	5th Gear	1850	201.9	26.92
		1800	42.6	5.68		1800	78.2	10.43		1800	106.9	14.26		1800	150.0	20.00		1800	196.4	26.19
		1750	41.4	5.52		1750	76.0	10.14		1750	103.9	13.86		1750	145.9	19.45		1750	191.0	25.47
		1700	40.3	5.37		1700	73.9	9.85		1700	101.0	13.47		1700	141.7	18.90		1700	185.5	24.74
		1650	39.1	5.21		1650	71.7	9.56		1650	98.0	13.07		1650	137.6	18.34		1650	180.1	24.02
		1600	37.9	5.05		1600	69.5	9.27		1600	95.0	12.67		1600	133.4	17.79		1600	174.6	23.29
		1550	36.7	4.90		1550	67.4	8.98		1550	92.1	12.28		1550	129.3	17.24		1550	169.2	22.57

FIG. 9

Transmission	
TA90-8501 Ratios	
1st Gear	4.47
2nd Gear	3.57
3rd Gear	2.85
4th Gear	2.41
5th Gear	1.92
6th Gear	1.54
7th Gear	1.25
8th Gear	1.00
9th Gear	0.80

Rec. Pump	
Fluid End Bore	Quint BBL/rev
4.0"	0.095167
4.5"	0.096548
5.0"	0.08086

Twin Disc TA90-8501 Transmission - Quint Pumps

4.0" Fluid End

1st Gear				2nd Gear				3rd Gear				4th Gear				5th Gear			
Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM	
1500	52.8	3.66		1500	66.3	4.43		1500	82.8	5.28		1500	98.0	6.06		1500	123.0	6.35	
1550	54.6	3.82		1550	68.5	4.63		1550	85.6	5.42		1550	101.3	6.22		1550	127.1	6.57	
1600	56.3	3.98		1600	70.6	4.85		1600	88.4	5.67		1600	104.5	6.40		1600	131.2	6.78	
1650	58.1	4.00	2nd	1650	72.8	4.76	3rd	1650	91.1	5.73	4th	1650	107.8	6.57	5th	1650	135.3	6.99	
1700	59.9	3.90	Gear	1700	75.0	4.83	Gear	1700	93.9	4.85	Gear	1700	111.0	5.78	Gear	1700	139.4	7.20	
1750	61.6	3.78		1750	77.2	4.89		1750	96.7	4.89		1750	114.3	5.91		1750	143.5	7.41	
1800	63.4	3.78		1800	79.4	4.10		1800	99.5	5.14		1800	117.6	6.07		1800	147.6	7.62	
1850	65.2	3.77		1850	81.6	4.25		1850	102.2	5.26		1850	120.8	6.24		1850	151.7	7.83	
1900	66.9	3.66		1900	83.8	4.33		1900	104.9	5.42		1900	124.1	6.41		1900	155.8	8.05	
1950	68.7	3.55		1950	86.0	4.44		1950	107.7	5.56		1950	127.4	6.58		1950	159.9	8.26	

4.5" Fluid End

1st Gear				2nd Gear				3rd Gear				4th Gear				5th Gear			
Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM	
1500	52.8	3.46		1500	66.4	4.33		1500	82.8	5.42		1500	98.0	6.42		1500	123.0	8.05	
1550	54.6	3.57		1550	68.7	4.48		1550	85.6	5.61		1550	101.3	6.63		1550	127.1	8.32	
1600	56.3	3.68		1600	70.9	4.62		1600	88.4	5.78		1600	104.5	6.84		1600	131.2	8.6	
1650	58.1	3.80	2nd	1650	72.8	4.76	3rd	1650	91.1	5.97	4th	1650	107.8	7.06	5th	1650	135.3	8.9	
1700	59.9	3.90	Gear	1700	75.0	4.91	Gear	1700	93.9	6.15	Gear	1700	111.0	7.27	Gear	1700	139.4	9.1	
1750	61.6	4.04		1750	77.2	5.05		1750	96.7	6.33		1750	114.3	7.48		1750	143.5	9.39	
1800	63.4	4.15		1800	79.4	5.20		1800	99.5	6.51		1800	117.6	7.70		1800	147.6	9.66	
1850	65.2	4.27		1850	81.6	5.34		1850	102.2	6.68		1850	120.8	7.91		1850	151.7	9.93	
1900	66.9	4.38		1900	83.8	5.48		1900	104.9	6.87		1900	124.1	8.13		1900	155.8	10.2	
1950	68.7	4.50		1950	86.0	5.63		1950	107.7	7.05		1950	127.4	8.34		1950	159.9	10.47	

5.0" Fluid End

1st Gear				2nd Gear				3rd Gear				4th Gear				5th Gear			
Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM		Engine rpm	Pump Crank rpm	Pump BPM	
1500	52.8	4.02		1500	66.4	5.05		1500	82.8	6.29		1500	98.0	7.45		1500	123.0	9.35	
1550	54.6	4.15		1550	68.7	5.23		1550	85.6	6.51		1550	101.3	7.70		1550	127.1	10.29	
1600	56.3	4.28		1600	70.9	5.39		1600	88.4	6.72		1600	104.5	7.94		1600	131.2	10.62	
1650	58.1	4.42	2nd	1650	72.8	5.53	3rd	1650	91.1	6.93	4th	1650	107.8	8.20	5th	1650	135.3	10.95	
1700	59.9	4.53	Gear	1700	75.0	5.70	Gear	1700	93.9	7.14	Gear	1700	111.0	8.44	Gear	1700	139.4	11.28	
1750	61.6	4.69		1750	77.2	5.87		1750	96.7	7.35		1750	114.3	8.69		1750	143.5	11.61	
1800	63.4	4.82		1800	79.4	6.03		1800	99.5	7.57		1800	117.6	8.93		1800	147.6	11.95	
1850	65.2	4.96		1850	81.6	6.20		1850	102.2	7.77		1850	120.8	9.18		1850	151.7	12.28	
1900	66.9	5.09		1900	83.8	6.37		1900	104.9	7.98		1900	124.1	10.03		1900	155.8	12.61	
1950	68.7	5.22		1950	86.0	6.54		1950	107.7	8.19		1950	127.4	10.31		1950	159.9	12.95	

FIG. 10

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	MULTI-PLUNGER PUMPS AND ASSOCIATED DRIVE SYSTEMS

As the below named inventor, I hereby declare that:

This declaration is directed to:

- [x] The attached application, or
- [ ] United States application or PCT international application number _____ filed on _____.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

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LEGAL NAME OF INVENTOR

Inventor: Alexander James Christinzio Date (Optional): 12/5/18

Signature: Alexander James Christinzio

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	MULTI-PLUNGER PUMPS AND ASSOCIATED DRIVE SYSTEMS

As the below named inventor, I hereby declare that:

This declaration is directed to:

- [x] The attached application, or
- [ ] United States application or PCT international application number _____ filed on _____.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

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LEGAL NAME OF INVENTOR

Inventor: Brandon N. Hinderliter Date (Optional): 12/5/18

Signature: _____

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	MULTI-PLUNGER PUMPS AND ASSOCIATED DRIVE SYSTEMS

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 16/210,807

filed on December 5, 2018

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

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LEGAL NAME OF INVENTOR

Inventor: Jared Oehring Date (Optional) :

Signature:

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	MULTI-PLUNGER PUMPS AND ASSOCIATED DRIVE SYSTEMS

As the below named inventor, I hereby declare that:

This declaration is directed to:

- [■] The attached application, or
- [ ] United States application or PCT international application number _____ filed on _____.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

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LEGAL NAME OF INVENTOR

Inventor: Lon Robinson Date (Optional): 5-Dec-2018

Signature: _____

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	U.S. Well Services, LLC	Art Unit	:	Not yet assigned
Serial No.	:	Not yet assigned	Examiner	:	Not yet assigned
Filed	:	Hereinwith	Conf. No.	:	Not yet assigned
Title	:	MULTI-PLUNGER PUMPS AND ASSOCIATED DRIVE SYSTEMS			

Mail Stop AMENDMENT
Commissioner for Patents
P.O. Box 1450
Arlington, VA 22313-1450

PRELIMINARY AMENDMENT

Before examination, please amend this application as follows:

AMENDMENTS TO THE SPECIFICATION

Please replace paragraph [0001] with the following amended paragraph:

[0001] This application is a continuation of U.S. Patent Application No. 16/827,166, entitled "Multi-plunger Pumps and Associated Drive Systems," filed March 23, 2020, which is a continuation of U.S. Patent Application No. 16/210,807, entitled "Multi-plunger Pumps and Associated Drive Systems," filed December 5, 2018, which claims priority to and the benefit of U.S. Provisional Patent Application No. 62/594,912, filed December 5, 2017. The disclosures of the above-referenced priority applications are ~~, the full disclosure of which is~~ hereby incorporated herein by reference ~~herein for all purposes~~.

AMENDMENTS TO THE CLAIMS

Before examination, please amend the claims as follows:

1.-20. (Canceled)

21. (New) A hydraulic fracturing system for fracturing a subterranean formation, the hydraulic fracturing system comprising:

a multi-plunger hydraulic fracturing pump configured to pump fluid to a wellbore associated with the subterranean formation, the multi-plunger hydraulic fracturing pump comprising a pump crankshaft;

a plurality of motors positioned to power the multi-plunger hydraulic fracturing pump; and

a planetary gear train positioned to translate power from the plurality of motors to the pump crankshaft of the multi-plunger hydraulic fracturing pump, the planetary gear train comprising:

a plurality of input pinion gears connected to the plurality of motors; and

a final drive gear connected to the pump crankshaft of the multi-plunger hydraulic fracturing pump.

22. (New) The hydraulic fracturing system of claim 21, wherein the plurality of motors comprises a plurality of electric motors, and each of the plurality of input pinion gears is connected to a respective one of the plurality of electric motors.

23. (New) The hydraulic fracturing system of claim 21, wherein the multi-plunger hydraulic fracturing pump has three plungers.

24. (New) The hydraulic fracturing system of claim 21, wherein the multi-plunger hydraulic fracturing pump has five plungers.

25. (New) The hydraulic fracturing system of claim 21, wherein the multi-plunger hydraulic fracturing pump has seven plungers.

26. (New) The hydraulic fracturing system of claim 21, wherein the multi-plunger hydraulic fracturing pump has nine plungers.

27. (New) The hydraulic fracturing system of claim 21, further comprising a variable frequency drive (VFD) associated with the plurality of motors and configured to control a pump rotational speed of the multi-plunger hydraulic fracturing pump.

28. (New) The hydraulic fracturing system of claim 21, wherein the planetary gear train comprises a main gear that contacts each of the plurality of input pinion gears, wherein the main gear comprises external gear teeth that mate with external gear teeth of the plurality of input pinion gears.

29. (New) The hydraulic fracturing system of claim 28, wherein the planetary gear train comprises:

a sun gear connected to the main gear by a shaft extending from the main gear; and

a plurality of planetary gears that each contact the sun gear and the final drive gear, wherein each of the plurality of planetary gears comprises external gear teeth that mate with external gear teeth of the sun gear and with internal gear teeth of the final drive gear.

30. (New) The hydraulic fracturing system of claim 29, wherein a final drive gear is connected to the pump crankshaft by a plurality of arms extending from the final drive gear.

31. (New) A hydraulic fracturing method comprising:

by operation of a multi-plunger hydraulic fracturing pump of a hydraulic fracturing system, pumping fluid to a wellbore associated with a subterranean formation, the multi-plunger hydraulic fracturing pump comprising a pump crankshaft;

powering the multi-plunger hydraulic fracturing pump with a plurality of motors; and

translating power from the plurality of motors to the multi-plunger hydraulic fracturing pump through a planetary gear train, wherein translating power through the planetary gear train comprises translating power through:

a plurality of input pinion gears that are driven by the plurality of motors;

and

a final drive gear that drives the pump crankshaft.

32. (New) The hydraulic fracturing method of claim 31, wherein the plurality of motors comprises a plurality of electric motors, and each of the plurality of input pinion gears is driven by a respective one of the plurality of electric motors.

33. (New) The hydraulic fracturing method of claim 31, wherein the multi-plunger hydraulic fracturing pump has three plungers.

34. (New) The hydraulic fracturing method of claim 31, wherein the multi-plunger hydraulic fracturing pump has five plungers.

35. (New) The hydraulic fracturing method of claim 31, wherein the multi-plunger hydraulic fracturing pump has seven plungers.

36. (New) The hydraulic fracturing method of claim 31, wherein the multi-plunger hydraulic fracturing pump has nine plungers.

37. (New) The hydraulic fracturing method of claim 31, comprising, by operation of a variable frequency drive (VFD), controlling a pump rotational speed of the multi-plunger hydraulic fracturing pump.

38. (New) The hydraulic fracturing method of claim 31, wherein translating power through the planetary gear train comprises translating power through a main gear that contacts each of the plurality of input pinion gears, wherein the main gear comprises external gear teeth that mate with external gear teeth of the plurality of input pinion gears.

39. (New) The hydraulic fracturing method of claim 38, wherein translating power through the planetary gear train comprises translating power through:

a sun gear connected to the main gear by a shaft extending from the main gear; and

a plurality of planetary gears that contact the sun gear and the final drive gear, wherein each of the plurality of planetary gears comprises external gear teeth that mate with external gear teeth of the sun gear and with internal gear teeth of the final drive gear.

40. (New) The hydraulic fracturing method of claim 31, comprising limiting a maximum pump speed of the multi-plunger hydraulic fracturing pump, wherein the maximum pump speed is limited by a selection of a gear ratio of the planetary gear train and a speed at which the plurality of motors operate.

41. (New) The hydraulic fracturing method of claim 31, wherein the maximum pump speed correlates with a critical plunger speed of the multi-plunger hydraulic fracturing pump.

42. (New) The hydraulic fracturing method of claim 31, wherein the maximum pump speed is 5% over a critical plunger speed of the multi-plunger hydraulic fracturing pump.

43. (New) A hydraulic fracturing system for fracturing a subterranean formation, the hydraulic fracturing system comprising:

a plurality of electric motors;

a planetary gear train connected to the plurality electric motors, the planetary gear train comprising:

a plurality of input pinion gears, each driven by a respective one of the plurality of electric motors;

a main gear driven by the plurality of input pinion gears, the main gear comprising external gear teeth that mate with external gear teeth of the plurality of input pinion gears;

a sun gear driven by the main gear and connected to the main gear by a shaft;

planetary gears driven by the sun gear, the planetary gears each comprising external gear teeth that mate with external gear teeth of the sun gear; and

a final drive gear driven by the planetary gears, the final drive gear comprising internal gear teeth that mate with the external gear teeth of the planetary gears; and

a multi-plunger hydraulic fracturing pump that pumps fluid to a wellbore and comprises a pump crankshaft that is driven by the final drive gear of the planetary gear train.

44. (New) The hydraulic fracturing system of claim 43, further comprising a variable frequency drive (VFD) associated with the plurality of motors and configured to control a pump rotational speed of the multi-plunger hydraulic fracturing pump.

45. (New) The hydraulic fracturing system of claim 44, wherein the multi-plunger hydraulic fracturing pump comprises seven plungers.

46. (New) The hydraulic fracturing system of claim 44, wherein the multi-plunger hydraulic fracturing pump comprises nine plungers.

47. (New) A hydraulic fracturing system for fracturing a subterranean formation, the hydraulic fracturing system comprising:

a multi-plunger hydraulic fracturing pump that pumps fluid to a wellbore associated with the subterranean formation;

a plurality of motors that operate in parallel to power the multi-plunger hydraulic fracturing pump; and

means for transferring power from the plurality of motors to the multi-plunger hydraulic fracturing pump, the means for transferring power comprising a planetary gear train.

48. (New) The hydraulic fracturing system of claim 47, wherein the planetary gear train comprises a plurality of input pinion gears, a main gear, a sun gear, a plurality of planetary gears, and a final drive gear.

49. (New) The hydraulic fracturing system of claim 47, wherein the multi-plunger hydraulic fracturing pump comprises seven plungers.

50. (New) The hydraulic fracturing system of claim 47, wherein the multi-plunger hydraulic fracturing pump comprises nine plungers.

REMARKS

Before examination, please amend the Application as set forth above.

Claims 1-20 are currently a canceled; and claims 21-50 are newly added. Thus, claims 21-50 are currently pending in the application. It is submitted that no new matter has been added to the Application by the present amendments.

The Commissioner is hereby authorized to charge any necessary fees or credit any overpayments to deposit account 506816, referencing the attorney docket number shown above.

Respectfully submitted,

Date: July 24, 2023

/KE SUN/
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