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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
62/713,393	08/01/2018	Jeffrey G. Morris	1693-0020PUS (P204US00)

CONFIRMATION NO. 9146

IMPROPER CFR REQUEST



29855
Blank Rome LLP - Houston General
717 Texas Avenue, Suite 1400
Houston, TX 77002

Date Mailed: 03/23/2022

RESPONSE TO REQUEST FOR CORRECTED FILING RECEIPT

Power of Attorney, Claims, Fees, System Limitations, and Miscellaneous

In response to your request for a corrected Filing Receipt, the Office is unable to comply with your request because:

- Any request to correct or update the name of the applicant must include an application data sheet (ADS) in compliance with 37 CFR 1.76 specifying the correct or updated name of the applicant in the applicant information section. Any request to change the applicant after an original applicant has been specified under 37 CFR 1.46(b) must include a new ADS in compliance with 37 CFR 1.76 specifying the applicant in the applicant information section and comply with 37 CFR 3.71 and 3.73. See 37 CFR 1.46(c).

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.

/kgebremichael/



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62/713,393	08/01/2018	Jeffrey G. Morris	1693-0020PUS (P204US00)

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IMPROPER CPOA LETTER

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717 Texas Avenue, Suite 1400
Houston, TX 77002



Date Mailed: 03/23/2022

NOTICE REGARDING POWER OF ATTORNEY

This is in response to the power of attorney filed 03/21/2022. The power of attorney in this application is not accepted for the reason(s) listed below:

- The power of attorney has not been accepted because the party who is giving power has not been identified. Power of attorney may only be signed by the applicant for patent (37 CFR 1.42) or the patent owner. A party who is not the applicant must become the applicant in accordance with 37 CFR 1.46(c) and appoint any power of attorney in compliance with 37 CFR 3.71 and 3.73. For a reissue application, reexamination proceeding, or supplemental examination proceeding, a patent owner who was not the applicant under 37 CFR 1.46 must appoint any power of attorney in compliance with 37 CFR 3.71 and 3.73. See 37 CFR 1.32(b)(4).

/kgebremichael/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

00758
FENWICK & WEST LLP
SILICON VALLEY CENTER
801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041
UNITED STATES

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA/82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	62/713,393
Filing Date	August 1, 2018
First Named Inventor	Jeffrey G. Morris
Title	Switch Gear Transport that Distributes Electric Power for Fracturing Operations
Art Unit	Not Assigned
Examiner Name	Not Assigned
Attorney Docket Number	39517-51925/US-PR

SIGNATURE of Applicant or Patent Practitioner

Signature	/Robert A. Hulse/	Date (Optional)	March 21, 2022
Name	Robert A. Hulse	Registration Number	48,473
Title (if Applicant is a juristic entity)	Attorney for Applicant		
Applicant Name (if Applicant is a juristic entity)	Typhon Technology Solutions, LLC		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.



*Total of ONE forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. 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 3 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.**

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number

Filing Date

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I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above.

00758

OR



I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:



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The address associated with Customer Number:

OR



Firm or
Individual Name

Address

City

State

Zip

Country

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Email

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box).

Typhon Technology Solutions, LLC



Inventor or Joint Inventor (title not required below)



Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)



Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)



Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature

Date (Optional)

3/8/22

Name

Gregory V. Brown

Title

Secretary and General Counsel

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 27 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.



Total of **ONE** forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. 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 3 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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Electronic Acknowledgement Receipt

EFS ID:	45281721
Application Number:	62713393
International Application Number:	
Confirmation Number:	9146
Title of Invention:	SWITCH GEAR TRANSPORT THAT DISTRIBUTES ELECTRIC POWER FOR FRACTURING OPERATIONS
First Named Inventor/Applicant Name:	Jeffrey G. Morris
Customer Number:	29855
Filer:	Robert Andrew Hulse
Filer Authorized By:	
Attorney Docket Number:	1693-0020PUS (P204US00)
Receipt Date:	21-MAR-2022
Filing Date:	01-AUG-2018
Time Stamp:	22:28:19
Application Type:	Provisional

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	51925_US_PR_POA.pdf	1499706	no	2
			5d389ddf38d92b335bdb86569591b595499f fecae2		

Warnings:

Information:	
Total Files Size (in bytes):	1499706
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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
62/713,393	08/01/2018		280	1501-0020PUS (204US00)		

29855
Blank Rome LLP - Houston General
717 Texas Avenue, Suite 1400
Houston, TX 77002

CONFIRMATION NO. 9146
FILING RECEIPT



Date Mailed: 08/07/2018

Receipt is acknowledged of this provisional patent application. It will not be examined for patentability and will become abandoned not later than twelve months after its filing date. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, 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 Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections 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**

Inventor(s)

Jeffrey G. Morris, The Woodlands, TX;
Adrian Benjamin Bodishbaugh, Fayetteville, AK;

Applicant(s)

Evolution Well Services, LLC, The Woodlands, TX

Power of Attorney:

Rayhao Chung--63247

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: 08/06/2018

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 62/713,393**

Projected Publication Date: None, application is not eligible for pre-grant publication

Non-Publication Request: No

Early Publication Request: No

Title

SWITCH GEAR TRANSPORT THAT DISTRIBUTES ELECTRIC POWER FOR FRACTURING OPERATIONS

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

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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>.

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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ABSTRACT

A system and a method for producing fracturing fluid, comprising: a plurality of circuit breakers, wherein each circuit breaker includes a first circuit breaker connector and a second circuit breaker connector, wherein the first circuit breaker and the second generates electric power at a first voltage level; a power source connector that receives electric power from a power source of electricity at the first voltage level; and a black start generator that generates electric power at a second voltage level to start the power source of electricity.

CLAIMS

What is claimed is:

1. An electric fracturing system comprising:
 - a switch gear transport electrically connected to a power source of electricity to provide electric power at a first voltage level;
 - a circuit breaker connector that supplies electric power at the first voltage level; and
 - a fracturing pump transport electrically connected to the circuit breaker connector via an electrical cable,wherein the fracturing pump transport comprises a transformer that steps down the electric power received at the first voltage level to at least one lower voltage level.
2. The electric fracturing system of claim 1, wherein the first voltage level is a medium voltage level.
3. The electric fracturing system of claim 1, wherein the at least one lower voltage level is a medium voltage level.
4. The electric fracturing system of claim 1, further comprising a circuit breaker that includes the circuit breaker connector and a second circuit breaker connector.
5. The electric fracturing system of claim 1, wherein a second circuit breaker connector is able to supply electric power at the first voltage level to a second fracturing pump transport.
6. The electric fracturing system of claim 1, wherein the switch gear transport further comprises a black start generator.
7. The electric fracturing system of claim 6, wherein the switch gear transport couples the black start generator to the power source of electricity.
8. The electric fracturing system of claim 1, further comprising:

a first power source connector to connect to the power source of electricity; and
a second power source connector to connect to a second power source of electricity.

9. The electric fracturing system of claim 8, wherein the first power source connector and the second power source connector receives electric power from one or more power source of electricity.

10. A switch gear transport comprising:

a plurality of circuit breakers, wherein each circuit breaker includes a first circuit breaker connector and a second circuit breaker connector, wherein the first circuit breaker connector and the second circuit breaker connector output electric power at a first voltage level;

a power source connector that receives electric power from a power source of electricity at the first voltage level; and

a black start generator that generates electric power at a second voltage level to start the power source of electricity.

11. The switch gear transport of claim 10, wherein the first voltage level is a target output voltage level of about 13.8 kilovolts.

12. The switch gear transport of claim 10, wherein the power source connector is configured to receive up to 40 megawatts of electric power.

13. The switch gear transport of claim 10, wherein the first circuit breaker connector allows a single cable connection between first circuit breaker connector and a second transport.

14. The switch gear transport of claim 10, further comprising a transformer that steps down electric power from the first voltage level to a low voltage level.

15. The switch gear transport of claim 14, wherein each circuit breaker is rated to handle a maximum current that equals to or exceeds a total maximum current generated from two fracturing pump transports.

16. The switch gear transport of claim 10, wherein the power source of electricity is located off a well site, at the well site, or both. .

17. A method for electric power distribution for fracturing operations, comprising:
receiving, at a transport, electric power from a mobile source of electricity at a first voltage level, wherein the first voltage level falls within a range of 1,000 V to 35 kilovolts;
supplying, from the transport, the electric power to a fracturing pump transport at the first voltage level using only a first, single cable connection; and
supplying, from the transport, the electric power to a second transport at the first voltage level using only a second, single cable connection.

18. The method of claim 17, further comprising:
receiving, at the transport, electric power from an auxiliary power transport at the first voltage level at a first auxiliary power source connector; and
receiving, at the transport, electric power from a second auxiliary power transport at the first voltage level at a second auxiliary power source connector.

19. The method of claim 18, further comprising stepping down, at the transport, the electric power from the auxiliary power transport from the first voltage level to at least one lower voltage level.

20. The method of claim 19, further comprising supplying, from the transport, the electric power at the lower voltage level to the mobile source of electricity.

SWITCH GEAR TRANSPORT THAT DISTRIBUTES POWER FOR FRACTURING OPERATIONS

BACKGROUND

[0001] Hydraulic fracturing has been commonly used by the oil and gas industry to stimulate production of hydrocarbon producing wells, such as oil and/or gas wells. Hydraulic fracturing, sometimes called “fracing” or “fracking” is the process of injecting fracturing fluid into a wellbore to fracture the subsurface geological formations and release hydrocarbons. The fracturing fluid is pumped into a wellbore at a pressure sufficient to cause fissures within the underground geological formations. Once inside the wellbore, the fracturing fluid fractures the underground formation. The fracturing fluid may include water, various chemical additives, and proppants that promote the extraction of the hydrocarbon reserves, such as oil and/or gas. Proppants, such as fracturing sand, prevent fissures and fractures in the underground formation from closing; thereby, allowing the formation to remain open so that hydrocarbons flow through the hydrocarbon wells.

[0002] Implementing fracturing operations at well sites requires extensive investment in equipment, labor, and fuel. A typical fracturing operation uses fracturing equipment, personnel to operate and maintain the fracturing equipment, large amounts of fuel to power the fracturing operations, and relatively large volumes of fracturing fluids. As such, planning for fracturing operations is complex and encompasses a variety of logistical challenges that include minimizing the on-site area or “footprint” of the fracturing operations, providing adequate power and/or fuel to continuously power the fracturing operations, increasing the efficiency of the hydraulic fracturing equipment, and reducing the environmental impact resulting from fracturing operations. Thus, numerous innovations and improvements of existing fracturing technology are needed to address the variety of complex and logistical challenges faced in today’s fracturing operations.

SUMMARY

[0003] The following presents a simplified summary of the disclosed subject matter in order to provide a basic understanding of some aspects of the subject matter disclosed herein. This summary is not an exhaustive overview of the technology disclosed herein, and it is not intended to identify key or critical elements of the invention or to delineate the scope of the invention. Its sole purpose is

to present concepts in a simplified form as a prelude to the more detailed description that is discussed later.

[0004] In one embodiment, a switch gear transport comprising a plurality of circuit breakers, wherein each circuit breaker includes a first circuit breaker connector and a second circuit breaker connector, wherein the first circuit breaker and the second circuit breaker outputs electric power at a first voltage level; a power source connector that receives electric power from a power source of electricity at the first voltage level; and a black start generator that generates electric power at a second voltage level to start the power source of electricity.

[0005] In another embodiment, an electric fracturing system comprising: a switch gear transport electrically connected to a power source of electricity to provide electric power at a first voltage level; a circuit breaker connector that supplies electric power at the first voltage level; and a fracturing pump transport electrically connected to the circuit breaker connector via an electrical cable, wherein the fracturing pump transport comprises a transformer that steps down the electric power received at the first voltage level to at least one lower voltage level.

[0006] In yet another embodiment, a method comprising receiving, at a transport, electric power from a power source of electricity at a first voltage level, wherein the first voltage level falls within a range of 1,000 V to 35 kilovolts; supplying, from the transport, the electric power to a fracturing pump transport at the first voltage level using only a first, single cable connection; and supplying, from the transport, the electric power to an additional transport at the first voltage level using only a second, single cable connection.

[0007] In yet another embodiment, each of the above described embodiments and variations thereof, may be implemented as a method, apparatus, and/or system.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] For a more complete understanding of this disclosure, reference is now made to the following brief description, taken in connection with the accompanying drawings and detailed description, wherein like reference numerals represent like parts.

[0009] FIG. 1 is a schematic diagram of an embodiment of a medium voltage power distribution system for a fracturing fleet located at well site.

[0010] FIG. 2 is a schematic diagram of an embodiment of a switch gear transport.

[0011] FIG. 3 is a schematic diagram of another embodiment of a switch gear transport.

[0012] FIG. 4 is a block diagram of an embodiment of the power system for a switch gear transport.

[0013] FIG. 5 is a flow chart of an embodiment of a method to manage and distribute electric power for a switch gear transport.

[0014] While certain embodiments will be described in connection with the illustrative embodiments shown herein, the invention is not limited to those embodiments. On the contrary, all alternatives, modifications, and equivalents are included within the spirit and scope of the invention as defined by the claims. In the drawing figures, which are not to scale, the same reference numerals are used throughout the description and in the drawing figures for components and elements having the same structure, and primed reference numerals are used for components and elements having a similar function and construction to those components and elements having the same unprimed reference numerals.

DETAILED DESCRIPTION

[0015] As used herein, the term “transport” refers to any transportation assembly, including, but not limited to, a trailer, truck, skid, rail car, and/or barge used to transport relatively heavy structures and/or other types of articles, such as fracturing equipment and fracturing sand. A transport could be independently movable from another transport. For example, a first transport can be mounted or connected to a motorized vehicle that independently moves the first transport while an unconnected second transport remains stationary.

[0016] As used herein, the term “trailer” refers to a transportation assembly used to transport relatively heavy structures and/or other types of articles (such as fracturing equipment and fracturing sand) that can be attached and/or detached from a transportation vehicle used to pull or tow the trailer. As an example, the transportation vehicle is able to independently move and tow a first trailer while an unconnected second trailer remains stationary. In one or more embodiments, the trailer includes mounts and manifold systems to connect the trailer to other fracturing equipment within a fracturing fleet or fleet. The term “lay-down trailer” refers to a specific embodiment of a trailer that includes two sections with different vertical heights. One of the sections or the upper section is positioned at or above the trailer axles and another section or the lower section is positioned at or below the trailer axles. In one embodiment, the main trailer beams of the lay-down trailer may be

resting on the ground when in operational mode and/or when uncoupled from a transportation vehicle, such as a tractor.

[0017] As used herein, the term “low voltage” refers to a voltage range from about 50 volts (V) to 1,000 V for alternating current (AC) electric power. The term “medium voltage” refers to a voltage range from about 1,000 V to about 35 kilovolts (kV) for AC electric power, and the term “high voltage” refers to a voltage range greater than 35 kV for AC electric power. Although the terms “low voltage,” “medium voltage,” and “high voltage” generally refer to voltage ranges in AC electric power, the disclosure is not limited to AC electric power and could also utilize current (DC) voltage.

[0018] Unless otherwise specified within the disclosure, the term “electrical connection” refers to connecting one transport to another transport using one or more electrical cables. The term “electrical cable” can be interchanged throughout this disclosure with the term “power cable” “power cable connection,” “cable connection,” or “electrical cable connection.” The terms “electrical cable,” “power cable” “power cable connection,” “cable connection,” and “electrical cable connection” refer to a single cable assembly that bundles together one or more wires (e.g., copper wires) that carry AC or DC electric current to provide electric power. In one or more embodiments, the single cable assembly also includes other wire types, such as fiber optic wires that perform other functions besides providing electric power. For example, the fiber optic wires are able to carry light for the purposes of transferring communication signals.

[0019] Various example embodiments are disclosed herein that distribute electric power using a switch gear transport to power one or more fracturing fleets. The switch gear transport may include a black start generator that provides electric power to initiate and start one or more power sources of electricity. Once the power sources of electricity are operational, the switch gear transport receives electric power from the power sources of electricity at a designated input voltage level. In one or more embodiments, the designated input voltage level is a relatively high medium voltage level, such as 13.8 kilovolts (kV). The switch gear transport maintains the input voltage level when outputting electric power to one or more transports, such as fracturing pump transports and a hydration-blender transport. To output and provide electric power, each circuit breaker includes a circuit breaker connector that connects to a transport (e.g., fracturing pump transport) using a single electrical cable. For example, a circuit breaker connector may connect to a fracturing pump transport using a single electrical cable that supplies electric power at a target output voltage level of about 13.8 kV. To provide additional redundancy and/or to power additional fracturing fleets, each circuit breaker could

include more than one circuit breaker connector. When the transports receive the electric power at the target output voltage level, each of the transports include one or more transformers that step down the target output voltage level (e.g., 13.8 kV). The transformers are able step down the target output voltage level to one or more lower voltage levels that fracturing equipment (e.g., electric prime movers) mounted on the transports may utilize. As an example, a transformer mounted on the fracturing pump transport is able to step down electric power received at the target output voltage level (e.g., 13.8 kV) to lower voltage levels (e.g., 4.2 kV, 2.1 kV, 600 volts (V), 480 V, 240 V, and 120 V).

[0020] FIG. 1 is a schematic diagram of an embodiment of a medium voltage power distribution system for a fracturing fleet 103 located at well site 100. Although the voltage and current levels referenced in FIG. 1 generally refer to AC electric power, other embodiments could have the fracturing fleet 103 adapted to be powered using DC electric power. As shown in FIG. 1, the power source of electricity 102 provides power by connecting to the switch gear transport 108 using six medium voltage (e.g., 13.8 kV) cable connections. In one or more embodiments, the power source of electricity 102 includes one or more turbine-electric generator transports that compress and mix combustion air with hydrocarbon fuel to spin and generate mechanical energy and then converts the mechanical energy to electricity. The power source of electricity 102 could also include an inlet and exhaust transport that provides ventilation and combustion air to the turbine-electric generator transport when generating electricity. Configuring and utilizing a turbine-electric generator transport and an inlet and exhaust transport are discussed and shown in more detail in U.S. Patent 9,534,473, filed December 16, 2015 by Jeffrey G. Morris et al. and entitled “Mobile Electric Power Generation for Hydration Fracturing of Subsurface Geological Formations,” which is hereby incorporated by reference as if reproduced in its entirety. In other embodiments, the power source of electricity 102 could include other transport configurations to employ a centralized source of electricity that powers fracturing equipment.

[0021] FIG. 1 illustrates that the switch gear transport 108 also connects to an auxiliary power transport 120 with one medium voltage (e.g., 13.8 kV) cable connection. The auxiliary power transport 120 provides ancillary power for situations where the power source of electricity 102 is out of service or where peak electric power demand exceeds the electric power output of the power source of electricity 102. The switch gear transport 108 also includes a transformer 112 that steps down electric power received at a medium voltage level (e.g., 13.8 kV) from the auxiliary power

transport 120 and/or power source of electricity 102 to a low voltage level (e.g., 480 V, 240 V and 110 V). In one or more embodiments, the low voltage level (e.g., 480 V) connection may provide electric power to ignite or start the power source of electricity 102 and/or provide power to other fracturing equipment. In one or more embodiments, the switch gear transport 108 may house a black start generator to initiate and start the power source of electricity 102. Using FIG. 1 as an example, the black start generator may provide electric power at 480 V. When the black start generator generates electric power, the switch gear transport 108 supplies the electric power directly to the power source of electricity 102 using the low voltage level connection. In other examples, the black start generator may provide electric power could provide electric power at voltage levels that exceed 480 V (e.g., 600 V, 2.1 kV, and 4.2 kV). In this situation, the switch gear transport 108 could include other transformers to step down voltage from the black start generator to a voltage level to start the power source of electricity 102.

[0022] As shown in FIG. 1, the switch gear transport 108 outputs and supplies medium voltage (e.g., 13.8 kV) cable connections directly to the hydration-blender transport 106 and the fracturing pump transport 104 without connecting to any intermediate transports. FIG. 1 depicts that the switch gear transport 108 generates a total of seven medium voltage (e.g., 13.8 kV) cable connections, where each fracturing pump transport 104 is directly connected to the switch gear transport 108 with a single medium voltage (e.g., 13.8 kV) cable connection. The switch gear transport 108 also directly connects to the hydration-blender transport 106 using a single medium voltage (e.g., 13.8 kV) cable connection. Additional transports can be connected to the switch gear transport 108 with a single medium voltage (e.g., 13.8 kV) cable connection, for example, up to a total of 24 for a single switch gear transport 108.

[0023] The medium voltage power distribution system shown in FIG. 1 is able to reduce the number of electrical cables used to supply electric power to the fracturing pump transport 104 and hydration-blender transport 106 when compared to other power distribution systems that provide power to the different transports at lower voltage levels (e.g., 4.2 kV, 600 V, and 480 V). As shown in FIG. 1, the fracturing fleet 103 reduces the number of electrical cables to one electrical cable for each fracturing pump transport 104. A further reduction of electrical cables is shown by supplying one electrical cable to the hydration-blender transport 106 instead of multiple electrical cables used to power a blender transport and a hydration transport. One reason the medium voltage power distribution system is able to utilize less electrical cables is that each electrical cable does not need

to supply a relatively high current (e.g., equal to or more than 600 A) to each fracturing pump transport 104 and hydration-blender transport 106. Supplying electric power at relatively lower current levels avoids the safety concerns and/or connection/disconnection issues associated with using a single electrical cable that supplies relatively high current (e.g., at 600 A); thereby, reducing the risk of harm and physical injuries to operators.

[0024] Each fracturing pump transport 104 may include one or more transformers to step down the voltage received from the switch gear transport 108 to different voltage levels. Using FIG. 1 as an example, each fracturing pump transport 104 may include two separate and independent transformers, a first transformer 110 to step down to a voltage level of 4.2 kV or 2.1 kV and a second transformer 312 to step down to a voltage level of 480 V, 240 V and 110 V. In other examples, each fracturing pump transport 104 could include a single transformer that produces multiple voltages levels. For example, the fracturing pump transport 104 may mount a three phase or three winding transformer to step down the voltage to two different voltage levels. The 4.2 kV or 2.1 kV voltage level supplies electric power to one or more electric prime movers that drive one or more pumps and the 480 V, 240 V and 110 V supplies electric power to the drives and/or other control instrumentation mounted on the fracturing pump transport 104. Transformers 110 and 112 are able to supply enough electric current to power the prime movers, drivers, and/or other control instrumentation.

[0025] FIG. 1 also illustrates that the hydration-blender transport 106 includes a transformer that steps down the voltage levels to 480 V, 240 V and 110 V. The hydration-blender transport 106 can use the stepped down voltages levels to provide electric power to the electric prime movers, drives, and/or other control instrumentation mounted on the hydration-blender transport 106. The hydration-blender transport 106 may also be configured to provide electric power at the 480 V, 240 V and 110 V voltage levels to other downstream fracturing equipment, such as the sand conveyor. The medium voltage power distribution system may utilize one or more electrical connections to provide electric power to the sand conveyor, data van 114 and/or other fracturing equipment that utilize electric power. Although FIG. 1 illustrates that switch gear transport 108 provides electric power to a hydration-blender transport 106, other embodiments could have the switch gear transport 108 separately connect to a hydration transport and a blender transport. In such an embodiment, the switch gear transport 108 may connect to the hydration transport using a single medium voltage (e.g., 13.8 kV) cable connection and another single medium voltage (e.g., 13.8 kV) cable connection to connect to the blender transport.

[0026] By mounting the drives and transformers 110 and/or 112 onto the fracturing pump transport 104 and hydration-blender transport 106, the transports become individually autonomous by removing the need for other separate support-based trailers, such as the auxiliary unit transport and drive power transports that provide power conversion and/or drive control. Having autonomous trailers allows the fracturing fleet 103 to become scalable and flexible, where each fracturing pump transport may be interchangeable with each other and allow for a reduced physical foot print of the fracturing fleet 103. For example, if the well is relatively small, the fracturing fleet 103 may have a reduced number of fracturing pump transports 104 (e.g., four transports instead of six transports). Conversely, if the well is large, more fracturing pump transports 104 can be stacked to increase pumping capacity without utilizing additional support-based transports.

[0027] In FIG. 1, the switch gear transport 108 receives electricity generated from the power source of electricity 102 at an input voltage level (e.g., 13.8 kV). After receiving the electric power, the switch gear transport 108 utilizes multiple circuit breakers to distribute the electric power to one or more transports, such as fracturing pump transport 104 and hydration-blender transport 106. Each circuit breaker could include electrical disconnects, switches, fuses, and/or circuit protectors to protect other fracturing equipment with fracturing fleet 103. In one embodiment, the circuit breakers are constructed to produce a target output voltage level that is about the same as the input voltage level. Each circuit breaker may have a maximum current rating that is about equal to or exceeds a maximum current rated for powering one or more transports at the target output voltage level. For example, a circuit breaker that provides electric power to two fracturing pump transport can have a maximum current rating of about 500 A when each fracturing pump transport is expected to utilize a maximum current of 250 A. In other words, the circuit breaker can implement a 2:1 ratio regarding the number of fracturing pump transports 104 that receive electric power from the circuit breaker. Other embodiments could have different ratios where the circuit breaker provides electric power to a single transport (e.g., 1:1 ratio) or more than two transports (e.g., 3:1 or 4:1 ratio). The switch gear transport 108 is discussed in more detail with reference to FIGS. 2 and 3.

[0028] The switch gear transport 108 could also be setup to act as a hub for receiving control and monitoring information for fracturing fleet 103. Recall that cable connections could include fiber optics wires that allows the switch gear transport 108 to communicate, monitor, and provide control signals to other transports, such as fracturing pump transport 104 and hydration-blender transport 106. Specifically, the switch gear transport 108 could house control and monitoring equipment to

communicate with other transports and fracturing equipment. For example, the switch gear transport 108 could include fiber optics, network translation tables, power measurements (e.g., voltage and current) and power management equipment (e.g., safety circuits and safety logic). The switch gear transport 108 could also provide data received from transports and fracturing equipment to data van 114. The data van 114 remotely controls the switch gear transport 108.

[0029] Although FIG. 1 illustrates a specific embodiment of a fracturing fleet 103 that utilizes electric power for operations, the disclosure is not limited to these particular embodiments. For instance, with reference to FIG. 1, the disclosure describes a switch gear transport 108 receiving electric power from a centralized power source of electricity 102 located at the well site 100. However, other embodiments could have the switch gear transport 108 receive electric power from other types of power sources, such as a power grid or a stationary power source. Additionally or alternatively, the fracturing fleet 103 shown in FIG. 1 may utilize a separate hydration transport and blender transport instead of a combined hydration-blender transport 106. Although not explicitly shown in FIG. 1, the switch gear transport 108 may also be able to power a second fracturing fleet located at an adjacent well site or for the purposes of fracturing multiple well heads 101. The use and discussion of FIG. 1 is only an example to facilitate ease of description and explanation.

[0030] FIG. 2 is a schematic diagram of an embodiment of a switch gear transport 200. With reference to FIG. 1, switch gear transport 200 corresponds to switch gear transport 108 shown in FIG. 1. FIG. 2 illustrates a side-profile view of the switch gear transport 200, which includes circuit breakers 202A-L, power source connections 204A and 204B, auxiliary power source connections 206A and 206B, power system 208, and black start generator 210. Within each of the circuit breakers 202A-L are circuit breaker connectors 212A-X that output and provide electric power to transports, such as a fracturing pump transport. Each circuit breaker 202 may include multiple circuit breaker connectors 212 (e.g., two circuit breaker connectors 212). Using FIG. 2 as an example, circuit breaker 202A includes circuit breaker connectors 212A and 212B; circuit breaker 202B includes circuit breaker connectors 212C and 212D; circuit breaker 202C includes circuit breaker connectors 212E and 212F and so forth. Having each circuit breaker 202 include multiple connectors provides additional redundancy and/or the capability for the switch gear transport to distribute electric power to multiple fracturing fleets.

[0031] In one or more embodiments, the circuit breakers 202A-L are each rated to supply a maximum current rating that exceeds the sum of the maximum currents for two transports before

tripping. For example, a circuit breaker that provides electric power to two fracturing pump transport can have a maximum current rating of about 500 A. In this situation, each fracturing pump transport could be expected to utilize a maximum current of 250 A. In other words, the circuit breaker can implement a 2:1 ratio regarding the number of fracturing pump transports 104 that receive electric power from the circuit breaker. Other embodiments could have different ratios where the circuit breaker provides electric power to a single transport (e.g., 1:1 ratio) or more than two transports (e.g., 3:1 or 4:1 ratio).

[0032] Power source connections 204A and 204B represent input electrical connections that supply electric power for switch gear transport 200 to distribute to one or more fracturing fleets. In one example, each power source connection 204A and 204B may be a single cable connection that connects to a power source of electricity capable of providing power to a single fracturing fleet. For example, the power source of electricity may generate electric power in the ranges of about 15-40 megawatts (MW) at a voltage of about 13.8 kV. Typically, 30-40 MW of electric power is needed to power a fracturing fleet that includes about eight fracturing pump transports and an electric blender transport. Alternatively, each power source connection 204A and 204B may be implemented using multiple cable connections. Using FIG. 1 as an example, power source connection 204A represents the six medium voltage (e.g., 13.8 kV) cable connections between the power source of electricity 102 and switch gear transport 108. Having two power source connections 204A and 204B provides the switch gear transport 200 additional electric power to power two or more fracturing fleets (e.g., about 16 fracturing pump transport and two or more electric blender transports).

[0033] To provide electric power to two fracturing fleets, the switch gear transport 200 could also include auxiliary power source connections 206A and 206B. Each auxiliary power source connection 206A and 206B represents an input electrical connection to an auxiliary power transport (e.g., auxiliary power transport 120 shown in FIG. 1). Generally, an auxiliary power transport includes a power source that produces less or a fraction of the electric power generated from the main power source of electricity (e.g., power source of electricity 102). Stated another way, the auxiliary power transport is unable to generate enough electric power for an entire fracturing fleet. As an example, an auxiliary power transport is able to generate a total of about 1-8 MW of electric power). Recall that one of the functions for an auxiliary power transport is to provide ancillary power for situations where the power source is out of service or where peak electric power demand temporarily exceeds the electric power output of the power source of electricity. Having two

auxiliary power source connections 206A and 206B provides the switch gear transport 200 enough electric power to temporarily manage these electric power demands for at least two fracturing fleets.

[0034] FIG. 2 also illustrates that switch gear transport 200 utilizes a lay-down trailer to enhance mobility, improved safety, and enhance ergonomics for crew members when performing routine maintenance and connecting transports to circuit breaker connectors 212. The lay-down trailer positions the circuit breakers 202 closer to the ground as the main trailer beams are resting on the ground in operational mode. With the lay-down trailer design, the switch gear transport 200 has an upper section above the trailer axles that could hold or have mounted the black start generator 210. The black start generator 210 may include a diesel generator or some other type of generator (turbine) powered by a hydrocarbon fuel (e.g., natural gas) to generate electric power to start or initiate the power source of electricity. For example, the black start generator 210 can generate electric power at a low voltage level (e.g., 480 V) to start the power source of electricity 102 shown in FIG. 1. In other examples, the black start generator 210 could generate electric power at a medium voltage level, which could be stepped down to a lower voltage level by a transformer housed within power system 208.

[0035] As shown in FIG. 2, the switch gear transport 200 includes a power system 208 that includes one or more transformers to step one or more input voltages (e.g., 13.8 kV) to one or more lower voltages (e.g., 4.2 kV, 2.1 kV, 600 V, 480 V, 240 V, and 120 V). Using FIG. 1 as an example, the power system 208 contains transformer 112 that steps down electric power from 13.8 kV to 480 V. Additionally or alternatively, the power system 208 could have transformers that step down electric power to different voltage levels. In one example, if the black start generator 210 generates a voltage level that the power source of electricity is unable to utilize, the power system 208 could have a transformer that converts electric power from the black start generator 210 to a proper voltage level. In another example, the power system 208 could also include transformers that step down electric power to a relatively low voltage levels (e.g., 240 V and/or 120 V) that power electronic device (e.g., transport lights) operating on the switch gear transport 200.

[0036] FIG. 3 is a schematic diagram of another embodiment of a switch gear transport 300. Switch gear transport 300 is substantially similar to switch gear transport 200 except that the power source connections 204A and 204B and auxiliary power source connections 206A and 206B have been moved towards the rear of the switch gear transport 300. For purposes of the disclosure, the rear of the switch gear transport references the section that is nearest to the trailer axles and the

front of the switch gear transport references the section where a motorized vehicle could couple to the switch gear transport during transportation. In FIG. 3, by moving the power source connections 204A and 204B and auxiliary power source connections 206A and 206B toward the rear, the switch gear transport 300 may have some difficulties managing and/or distributing the electric power to each of the circuit breakers 202A-L when compared to the switch gear transport 200. Specifically, circuit breaker 202A is physically located farther away from the power source connections 204A and 204B and auxiliary power source connections 206A and 206B, and thus, may be susceptible to a relatively high parasitic resistance and/or noise that dissipates electric power. Physically locating the power source connections 204A and 204B and auxiliary power source connections 206A and 206B in between circuit breakers 202A-F and 202G-L as shown in FIG. 2, decreases the parasitic resistance and/or noise seen at circuit breaker 202A when compared to switch gear transport 300.

[0037] FIG. 4 is a block diagram of an embodiment of the power system 400 for a switch gear transport. In FIG. 4, the power source connection 204A and power source connection 204B supply electric power to a main power bus 402. The main power bus 402 is capable of providing at least 60-80 MW of electric power to the circuit breakers 202A-L. In one or more embodiments, the main power bus 402 may include a positive voltage bus, a negative voltage bus, and a ground voltage bus (not shown in FIG. 4). The three different buses that form the main power bus 402 each couples to the circuit breakers 202A-L. Each circuit breaker 202A-L may be set to one of three states: an ON state, an OFF state, or a tripped state. When the circuit breakers 202A-L are in the ON state, the circuit breakers 202A-L are able to provide electric power to circuit breaker connectors 212A-X. When the circuit breakers 202A-L are in the OFF state, the circuit breakers 202A-L are disconnected from the main power bus 402 and does not to provide electric power to circuit breaker connectors 212A-X. The tripped state acts as a neutral state that prevents supplying electric power circuit breaker connectors 212A-X and also informs operators that an error has occurred within the switch gear transport.

[0038] FIG. 5 is a flow chart of an embodiment of a method 500 to manage and distribute electric power for a switch gear transport. Method 500 may correspond to distributing electric power received from one or more power sources of electricity to one or more fracturing fleets. In particular, method 500 may implemented using switch gear transports 200 and 300 as shown in FIGS. 2 and 3. The use and discussion of FIG. 5 is only an example to facilitate explanation and is not intended to limit the disclosure to this specific example.

[0039] Method 500 may start at block 502 and generate electric power to start one or more power sources of electricity. In one embodiment, the power source of electricity can be a mobile power source that utilizes a gas turbine generator to generate electric power. To implement block 502, method 500 may utilize black start generator as referenced in FIG. 2. Method 500 may then move to block 504 and receive electric power from the power sources of electricity after starting the power sources of electricity. Using FIGS. 2 and 3 as an example, method 500 may receive electric power from power source connections 204A and 204B at an input voltage level of about 13.8 kV.

[0040] Method 500 continues to block 506 and distributes power to one or more circuit breakers. With reference to FIG. 4, method 500 may distribute electric power using main power bus 402. Afterwards, method 500 moves to block 508 outputs electric power to multiple transport such that one of the circuit breakers provide electric power to at least two transports. Using FIG. 1 as an example, method 500 may have one of the circuit breakers in switch gear transport 108 supply electric power to two fracturing pump transport 104. In one or more embodiments, method 500 is able to provide electric power to both fracturing pump transports 104 using a single cable connection at a medium voltage level (e.g., 13.8 kV).

[0041] At least one embodiment is disclosed and variations, combinations, and/or modifications of the embodiment(s) and/or features of the embodiment(s) made by a person having ordinary skill in the art are within the scope of the disclosure. Alternative embodiments that result from combining, integrating, and/or omitting features of the embodiment(s) are also within the scope of the disclosure. Where numerical ranges or limitations are expressly stated, such express ranges or limitations may be understood to include iterative ranges or limitations of like magnitude falling within the expressly stated ranges or limitations (e.g., from about 1 to about 10 includes, 2, 3, 4, etc.; greater than 0.10 includes 0.11, 0.12, 0.13, etc.). The use of the term “about” means $\pm 10\%$ of the subsequent number, unless otherwise stated.

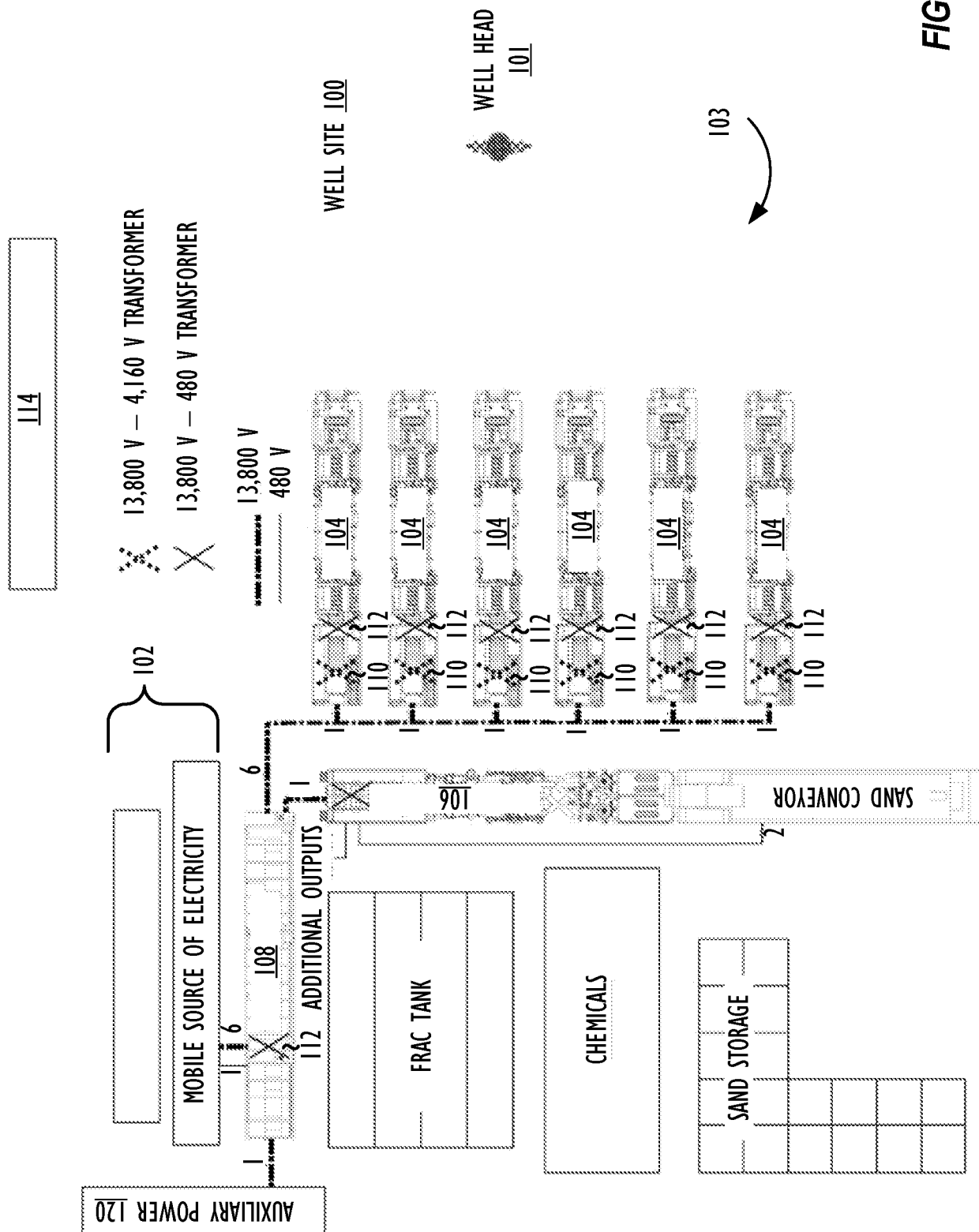
[0042] Use of the term “optionally” with respect to any element of a claim means that the element is required, or alternatively, the element is not required, both alternatives being within the scope of the claim. Use of broader terms such as comprises, includes, and having may be understood to provide support for narrower terms such as consisting of, consisting essentially of, and comprised substantially of. Accordingly, the scope of protection is not limited by the description set out above but is defined by the claims that follow, that scope including all

equivalents of the subject matter of the claims. Each and every claim is incorporated as further disclosure into the specification and the claims are embodiment(s) of the present disclosure.

[0043] While several embodiments have been provided in the present disclosure, it should be understood that the disclosed systems and methods might be embodied in many other specific forms without departing from the spirit or scope of the present disclosure. The present examples are to be considered as illustrative and not restrictive, and the intention is not to be limited to the details given herein. For example, the various elements or components may be combined or integrated in another system or certain features may be omitted, or not implemented.

[0044] In addition, techniques, systems, subsystems, and methods described and illustrated in the various embodiments as discrete or separate may be combined or integrated with other systems, modules, techniques, or methods without departing from the scope of the present disclosure. Other items shown or discussed as coupled or directly coupled or communicating with each other may be indirectly coupled or communicating through some interface, device, or intermediate component whether electrically, mechanically, or otherwise.

FIG. 1



L

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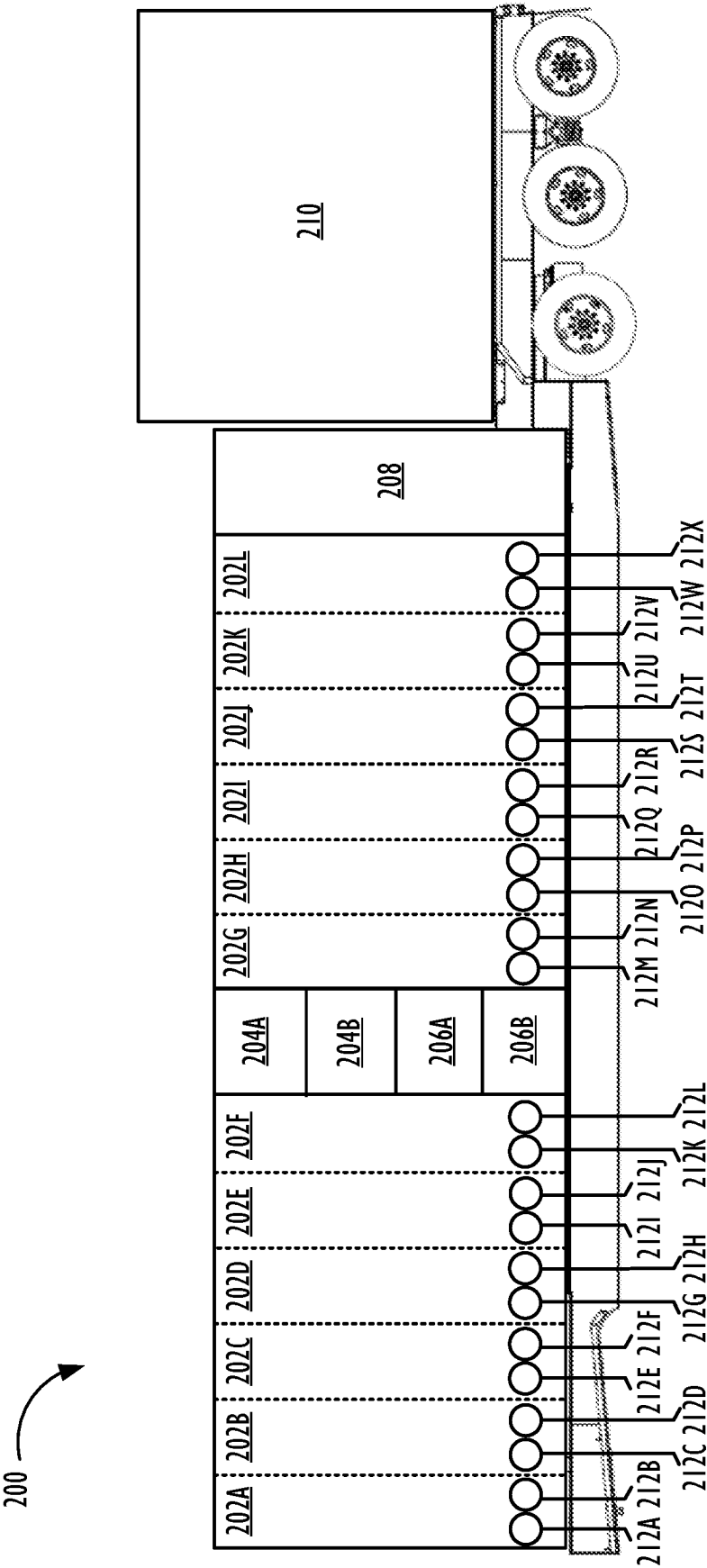


FIG. 2

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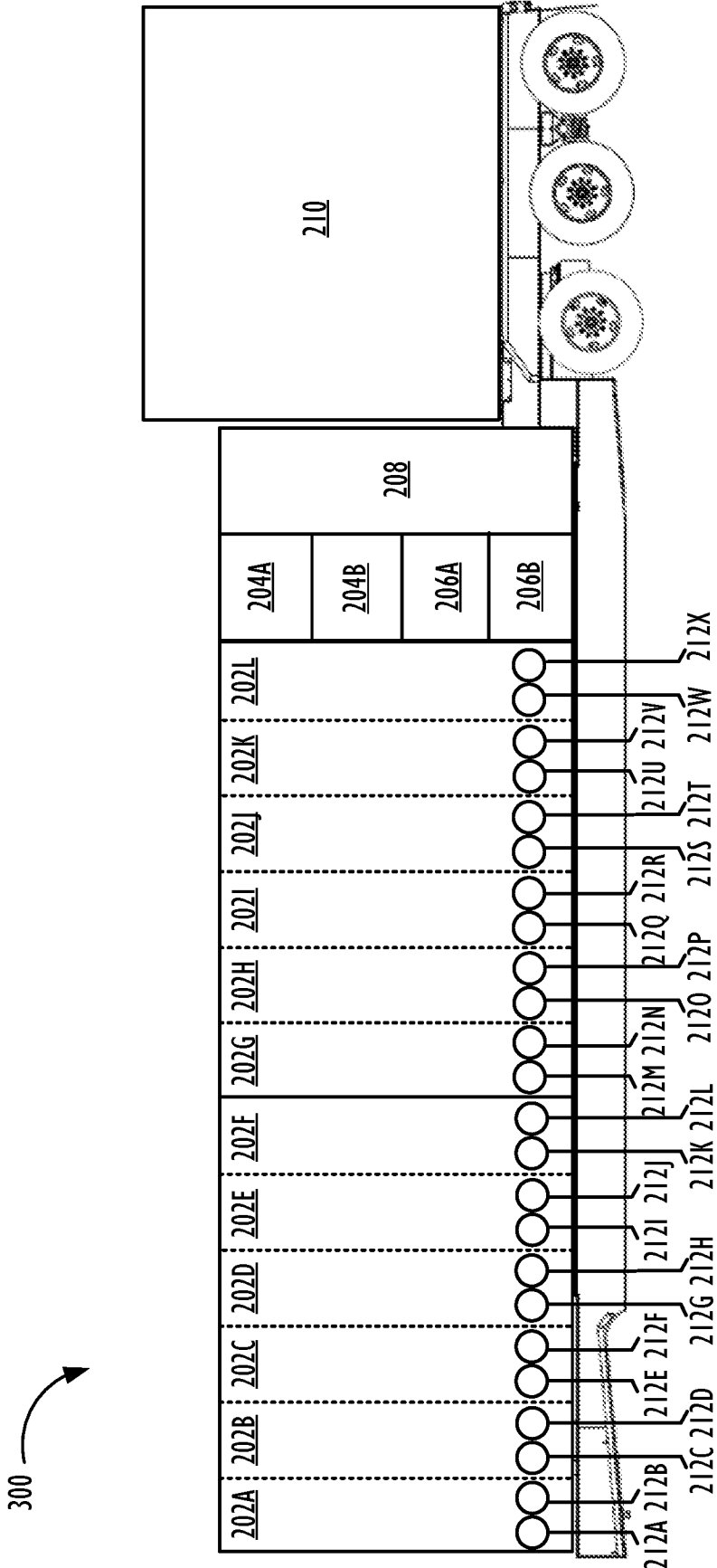


FIG. 3

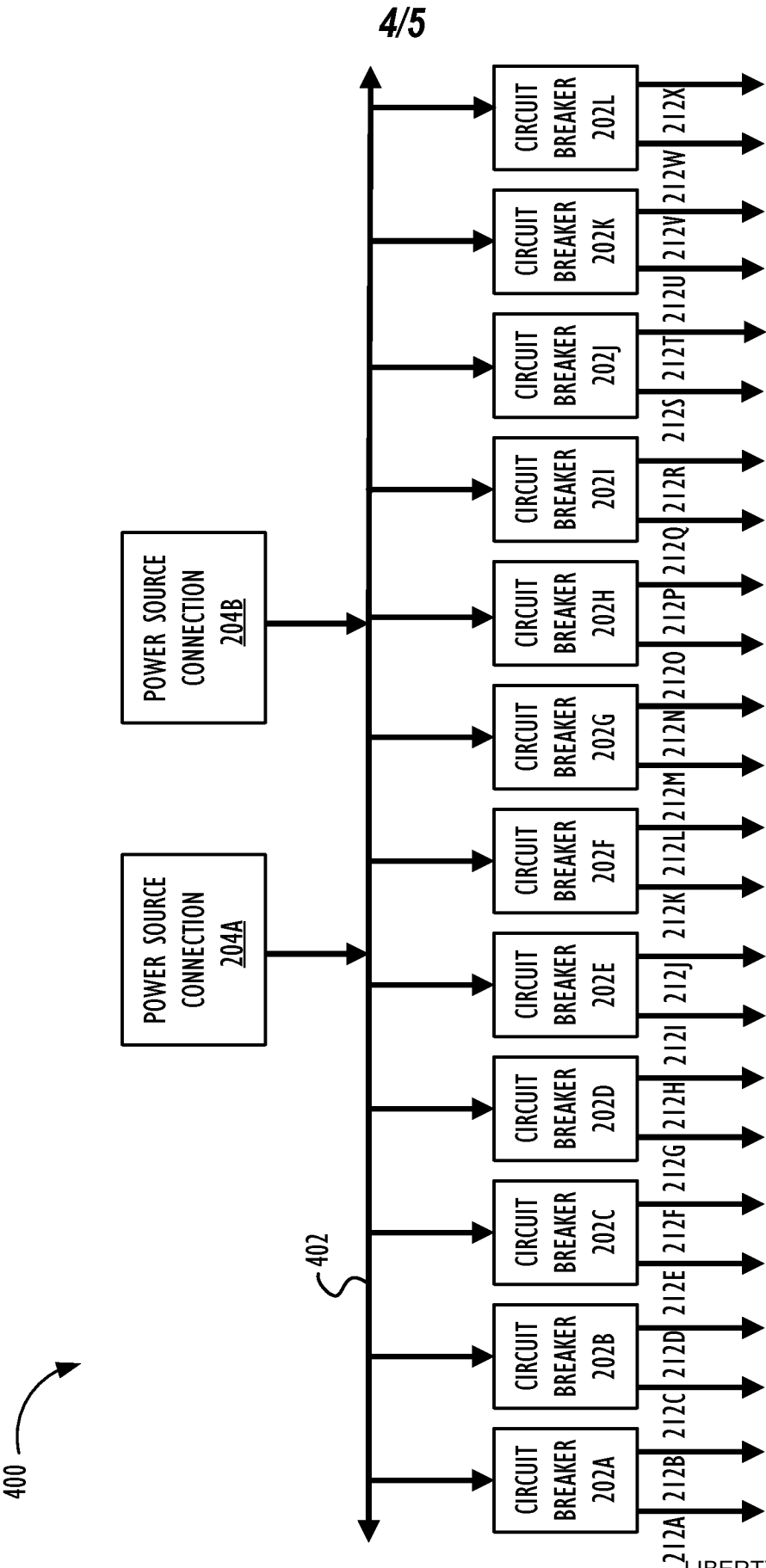


FIG. 4

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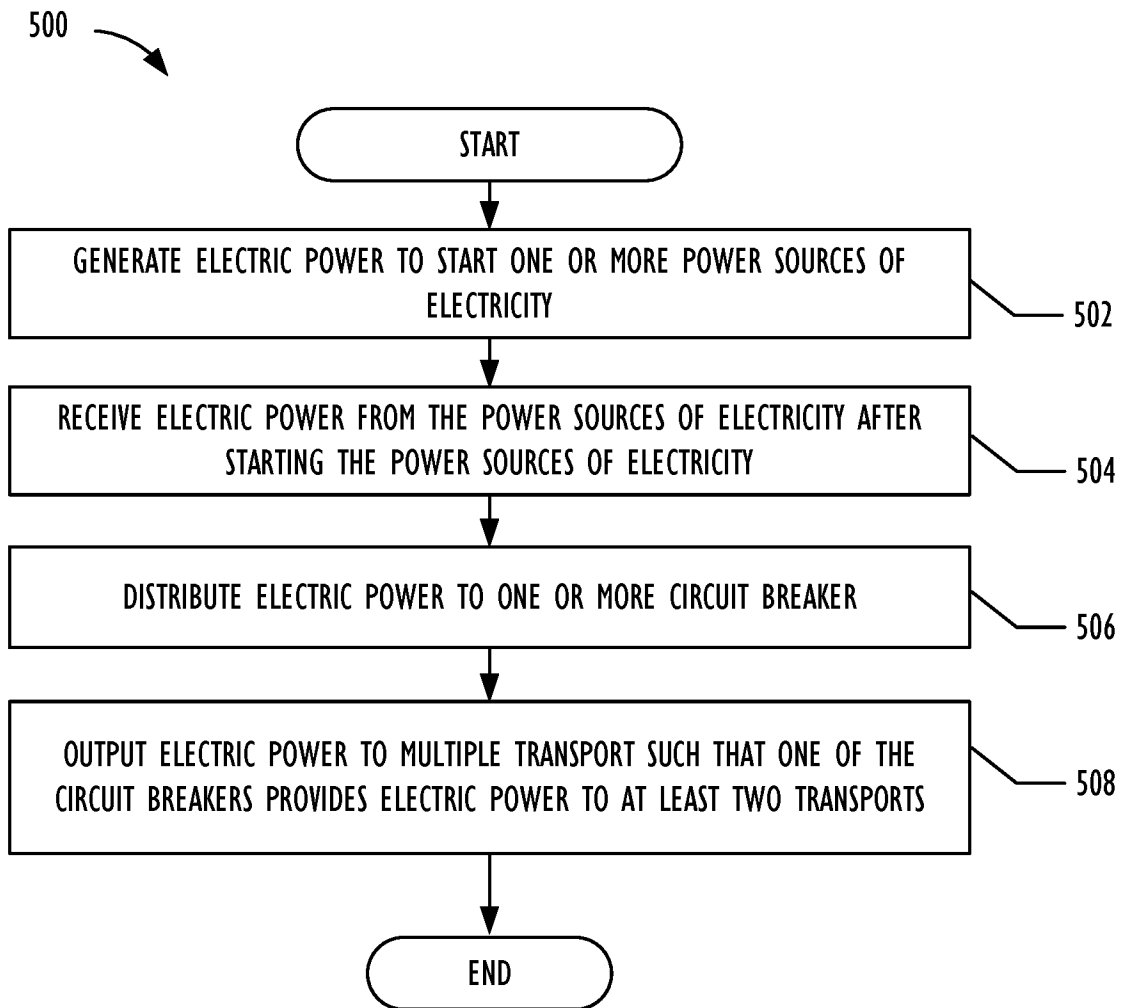


FIG. 5

Provisional Application for Patent Cover Sheet

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c)

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

Add

Title of Invention

SWITCH GEAR TRANSPORT THAT DISTRIBUTES ELECTRIC POWER FOR FRACTURING OPERATIONS

Attorney Docket Number (if applicable)

1501-0020PUS (204US00)

Correspondence Address

Direct all correspondence to (select one):

☒ The address corresponding to Customer Number

☐ Firm or Individual Name

Customer Number

29855

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are:

Entity Status

Applicant claims small entity status under 37 CFR 1.27

- ☐ Yes, applicant qualifies for small entity status under 37 CFR 1.27
- ☒ No

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Signature

Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/Rayhao Chung/		Date (YYYY-MM-DD)	2018-08-01
First Name	Rayhao	Last Name	Chung	Registration Number (If appropriate)
				63247

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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 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.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1501-0020PUS (204US00)
		Application Number	
Title of Invention	SWITCH GEAR TRANSPORT THAT DISTRIBUTES ELECTRIC POWER FOR FRACTURING OPERATIONS		
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	
	Jeffrey	G.	Morris		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	The Woodlands	State/Province	TX	Country of Residence	US

Mailing Address of Inventor:

Address 1	3 Hughes Landing				
Address 2	1780 Hughes Landing Boulevard, Ste 125				
City	The Woodlands	State/Province	TX		
Postal Code	77380	Country	US		

Inventor	2				Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Adrian	Benjamin	Bodishbaugh		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Fayetteville	State/Province	AK	Country of Residence	US

Mailing Address of Inventor:

Address 1	3 Hughes Landing				
Address 2	1780 Hughes Landing Boulevard, Ste 125				
City	The Woodlands	State/Province	TX		
Postal Code	77380	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).

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1501-0020PUS (204US00)
		Application Number	
Title of Invention	SWITCH GEAR TRANSPORT THAT DISTRIBUTES ELECTRIC POWER FOR FRACTURING OPERATIONS		

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

Customer Number	29855		
Email Address	houstonpatents@blankrome.com	Add Email	Remove Email

Application Information:

Title of the Invention	SWITCH GEAR TRANSPORT THAT DISTRIBUTES ELECTRIC POWER FOR FRACTURING OPERATIONS		
Attorney Docket Number	1501-0020PUS (204US00)	Small Entity Status Claimed	☐
Application Type	Provisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	5	Suggested Figure for Publication (if any)	

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	29855		

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1501-0020PUS (204US00)
		Application Number	
Title of Invention	SWITCH GEAR TRANSPORT THAT DISTRIBUTES ELECTRIC POWER FOR FRACTURING OPERATIONS		

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		Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			Add

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.			Add

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	1501-0020PUS (204US00)
	Application Number	
Title of Invention	SWITCH GEAR TRANSPORT THAT DISTRIBUTES ELECTRIC POWER FOR FRACTURING OPERATIONS	

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.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1501-0020PUS (204US00)
		Application Number	
Title of Invention	SWITCH GEAR TRANSPORT THAT DISTRIBUTES ELECTRIC POWER FOR FRACTURING OPERATIONS		

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	Remove
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	Evolution Well Services, LLC	
Mailing Address Information For Applicant:		
Address 1	3 Hughes Landing	
Address 2	1780 Hughes Landing Boulevard, Ste 125	
City	The Woodlands	State/Province TX
Country	US	Postal Code 77380
Phone Number		Fax Number
Email Address		
Additional Applicant Data may be generated within this form by selecting the Add button. Add		

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.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1501-0020PUS (204US00)
		Application Number	
Title of Invention	SWITCH GEAR TRANSPORT THAT DISTRIBUTES ELECTRIC POWER FOR FRACTURING OPERATIONS		

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.				
				Remove
If the Assignee or Non-Applicant Assignee is an Organization check here.				☐
Prefix	Given Name	Middle Name	Family Name	Suffix
Mailing Address Information For Assignee including Non-Applicant Assignee:				
Address 1				
Address 2				
City		State/Province		
Country ⁱ		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.				Add

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	/Rayhao Chung/		Date (YYYY-MM-DD)	2018-08-01
First Name	Rayhao	Last Name	Chung	Registration Number
				63247
Additional Signature may be generated within this form by selecting the Add button.				Add

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	1501-0020PUS (204US00)
		Application Number	
Title of Invention	SWITCH GEAR TRANSPORT THAT DISTRIBUTES ELECTRIC POWER FOR FRACTURING OPERATIONS		

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 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.

Electronic Patent Application Fee Transmittal

Application Number:				
Filing Date:				
Title of Invention:	SWITCH GEAR TRANSPORT THAT DISTRIBUTES POWER FOR FRACTURING			
First Named Inventor/Applicant Name:	Jeffrey G. Morris			
Filer:	Rayhao Chung/Amber Collins			
Attorney Docket Number:	1501-0020PUS (204US00)			
Filed as Large Entity				
Filing Fees for Provisional				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
PROVISIONAL APPLICATION FILING	1005	1	280	280
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				280

Electronic Acknowledgement Receipt

EFS ID:	33349675
Application Number:	62713393
International Application Number:	
Confirmation Number:	9146
Title of Invention:	SWITCH GEAR TRANSPORT THAT DISTRIBUTES POWER FOR FRACTURING
First Named Inventor/Applicant Name:	Jeffrey G. Morris
Customer Number:	29855
Filer:	Rayhao Chung/Amber Collins
Filer Authorized By:	Rayhao Chung
Attorney Docket Number:	1501-0020PUS (204US00)
Receipt Date:	01-AUG-2018
Filing Date:	
Time Stamp:	18:40:24
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$280
RAM confirmation Number	080218INTEFSW18412200
Deposit Account	501922
Authorized User	Amber Collins

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

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 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		1501-0020PUS_Patent_Application_v4.pdf	281225	yes	18
			c38cc9e793a7dba89a3018bd5a048709f70d767		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Abstract		18	18	
	Claims		15	17	
	Specification		1	14	
Warnings:					
Information:					
2	Drawings-only black and white line drawings	1501-0020PUS_Drawings_v1.pdf	275834	no	5
			5052d364dd145e370f3e7fad05578aa6c5816c0b		
Warnings:					
Information:					
3	Provisional Cover Sheet (SB16)	1501-0020PUS_ProvisionalSB.pdf	2071544	no	3
			303a79cdfaf86386ba4fd532af2cd8ea626ea0ed7		
Warnings:					
Information:					
4	Application Data Sheet	1501-0020PUS_ADS.pdf	1822973	no	8
			e6192a1ff9a19bf20a0b392ddb916e964e4dca96		
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	30172	no	2
			22b2033df67aed4d9ef47e1f63a3938dd103f6f8		

LIBERTY EXHIBIT 1005 Page 47

Warnings:	
Information:	
Total Files Size (in bytes):	4481748
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. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a 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. <u>National Stage of an International Application under 35 U.S.C. 371</u> 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. <u>New International Application Filed with the USPTO as a Receiving Office</u> 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.	