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PROVISIONAL APPLICATION FOR PATENT COVER SHEET – Page 1 of 2

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

Express Mail Label No. _____

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Given Name (first and middle (if any))	Family Name or Surname	Residence (City and either State or Foreign Country)
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Jared	Oehring	Houston, Texas
Additional inventors are being named on the <u>ONE</u> separately numbered sheets attached hereto.		
TITLE OF THE INVENTION (500 characters max):		
SINGLE POINT REMOTE OPERATION METHOD AND APPARATUS FOR CONTROLLING DISTRIBUTED AC MOTORS USED IN THE STIMULATION OF OIL AND GAS WELLS		
Direct all correspondence to: CORRESPONDENCE ADDRESS		
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ENCLOSED APPLICATION PARTS (check all that apply)		
☐ Application Data Sheet. See 37 CFR 1.76.		
☐ Drawing(s) <i>Number of Sheets</i> _____		
☒ Specification (e.g., description of the invention) <i>Number of Pages</i> <u>9</u>		
☐ CD(s), Number of CDs _____		
☐ Other (specify) _____		
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METHOD OF PAYMENT OF THE FILING FEE AND APPLICATION SIZE FEE FOR THIS PROVISIONAL APPLICATION FOR PATENT		
☐ Applicant asserts small entity status. See 37 CFR 1.27.		
☐ Applicant certifies micro entity status. See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.		
☐ A check or money order made payable to the <i>Director of the United States Patent and Trademark Office</i> is enclosed to cover the filing fee and application size fee (if applicable).		
☐ Payment by credit card. Form PTO-2038 is attached.		
☒ The Director is hereby authorized to charge the filing fee and application size fee (if applicable) or credit any overpayment to Deposit Account Number: <u>50-3013</u> .		
\$260 TOTAL FEE AMOUNT (\$)		

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PROVISIONAL APPLICATION FOR PATENT COVER SHEET – Page 2 of 2

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 invention was made by an agency of the U.S. Government. The U.S. Government agency name is: _____

☐

Yes, the invention was made under a contract with an agency of the U.S. Government. The name of the U.S. Government agency and Government contract number are: _____

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SIGNATURE /Peter G. Thurlow/ DATE March 4, 2015

TYPED OR PRINTED NAME Peter G. Thurlow REGISTRATION NO. 47,138
(if appropriate)

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Invention Disclosure Form for Patent Application

Name of Invention:

Single point remote operation method and apparatus for controlling distributed AC motors used in the stimulation of oil and gas wells

Brief Description

An apparatus and method enabling a single operator to remotely monitor and control, wired and/or wirelessly, single and/or multiple alternating current motors as prime movers in oil and gas well stimulation hydraulic fracturing applications.

Hydraulic fracturing is the process of injecting treatment fluids at high pressures into existing oil or gas wells in order to stimulate oil or gas production. A typical stimulation treatment often requires twenty or more high pressure fracturing pumps operating simultaneously to meet pumping rate requirements. While diesel engines have been used as the fracturing pumps' prime movers in the past, this invention describes an apparatus and method of controlling multiple AC motors, each of which is mechanically coupled to a high pressure, fixed displacement pump, from a single location, for the purpose of stimulating oil and gas production.

Details of the Invention:

An apparatus and method enabling a single point operator to remotely monitor and control, wired and/or wirelessly, single and/or multiple alternating current motors as prime movers in oil and gas well stimulation hydraulic fracturing applications.

Hydraulic fracturing is the process of injecting treatment fluids at high pressures into existing oil or gas wells in order to stimulate oil or gas production. A typical stimulation treatment often requires twenty or more high pressure fracturing pumps operating simultaneously to meet pumping rate requirements. While diesel engines have been used as the fracturing pumps' prime movers in the past, this invention describes an apparatus and method of controlling multiple AC motors, each of which is mechanically coupled to a high pressure, fixed displacement pump, from a single location, for the purpose of stimulating oil and gas production.

Diesel engines have been used as the fracturing pumps' prime movers in the past. The diesel-driven apparatus suffers from three disadvantages compared to this invention. The relative inefficiency of the internal combustion engine is more costly to operate than AC motor propulsion; off-road diesel engines of the types used for hydraulic fracturing are noisy

while pumping, which limits the areas in which they may be used; diesel engines have more moving parts and require more monitoring, maintenance and diagnosis than do AC motors.

This invention also describes a method to control and monitor from a single remote location the previously described AC motors. A wired or wireless data channel can be established that connects the hydraulic fracturing equipment to a single remote monitoring and control station. The remote monitoring and control station consists of a human machine interface (HMI) that allows the AC motors' speed set points to be entered and transmitted such that the speed of the AC motors can be individually controlled. The fracturing pumps' individual pumping rates and combined manifold pressure can therefore be regulated by a single remote controller operating from a distance.

Hydraulic Fracturing Pump Unit Control

The hydraulic fracturing pump unit contains one (1) or more electric motor-driven fracturing pumps that can be operated independently from either a local control panel or from a single remote location.

Pump Motor Control

The pump-motor is controlled by the variable-frequency drive ("VFD"). The control system provides a RUN/STOP signal (2 wire digital contact closure, normally open, closed to RUN) to the VFD to control the status of the pump-motor. The control system provides a speed request signal to the VFD to control the speed of the motor. The motor speed is displayed and can be controlled locally and remotely.

- A normal stop (RUN/STOP) will control each pump independently (e.g. pump 1 and pump 2 are controlled independently)
- An e-stop will be supplied to stop an entire Hydraulic Fracturing Pump Unit (i.e. the VFD and all motors on the trailer are shut down)
- A master e-stop will be supplied to shut down all deployed Hydraulic Fracturing Pump Units (i.e. all VFD and all motors on all FT-3502TE trailers are shut down)

Included in the single remote control method of this invention is an automated alarm management system, such that if any operating parameter exceeds its normal range, an indicator will be overlaid on the HMI to alert the operator. The operator can then choose what action to take, for example, bringing the affect unit offline. The alarm management system can be extended to suggest to the operator the appropriate response(s) to the alarm event, and what options exist. One benefit of the automated alarm management system is that multiple processes and subsystems on each pumping unit can be monitored autonomously, thus enabling a single operator to focus on primary objectives, that is, pumping rates and pressures, while ensuring safe operation across multiple pumping units.

The VFD provides a VFD FAULT contact to the control system to indicate if a fault condition is present, and the control system provides local/remote alarm indication of the VFD FAULT (contact switch, open = in the fault, closed = no fault). In the case a VFD FAULT occurs, the data van will display a generic fault warning. However the VFD FAULT can only be reset from the VFD.

The pump-motor contains a space heater to help ensure that the motor windings are dry before operation. Typical practice is to have the space heaters energized for at least 24-hours before running the motor. The space heater has 2 operating modes: AUTO and OFF. In AUTO mode the heater is turned on when the control system is energized and the pump-motor is OFF. The heater is turned off whenever the pump-motor is commanded to RUN.

The heater is turned on again anytime the pump-motor is stopped (Normal Stop). If an Emergency Stop occurs, the heat is turned off immediately.

Pump Motor Beacon

The hydraulic fracturing pump unit is supplied with a red/amber/green 3-color light tower for each pump. The beacon lights illuminate (steady) based on the following:

- Green: Pump-motor is not running and is not enabled to run.
- Amber: Pump-motor is running OR has been enabled to run.
- Red: The pump discharge pressure is greater than a pre-defined psig setpoint

Pump Motor Bearing Temperature

This implementation includes the mounting of five resistance temperature detectors (RTDs) onto each AC motor; one on each of three phase windings, one on the front motor bearing, and one on the rear motor bearing. In the case where twenty or more pumping units are used simultaneously, the AC motor temperatures alone represent 100+ operational values, an otherwise overwhelming quantity that the automated alarm management system renders workable.

The pump-motor has 2 bearings, each with a temperature sensor. The bearing closest to the pump is labeled as the “Drive End” (DE) bearing and the other is the “Non-Drive End” (NDE) bearing. The bearing temperatures are displayed locally and remotely.

- If either bearing temperature reaches 210°F, the control system should indicate an alarm. The alarm is latched until the Alarm Reset switch is operated.
- If either bearing temperature reaches 235°F, the control system should activate/indicate a shutdown. The shutdown is latched until the Alarm Reset switch is operated.

Pump Motor Winding Temperature

The pump-motor has 3 windings (one for each AC phase) each with a temperature sensor. The windings are labeled A, B and C corresponding to the AC phases. The winding temperatures are displayed locally and remotely.

- If any winding temperature reaches 330°F, the control system should indicate an alarm. The alarm is latched until the Alarm Reset switch is operated.
- If any winding temperature reaches 350°F, the control system should activate/indicate a shutdown. The shutdown is latched until the Alarm Reset switch is operated.

Pump Motor Blower Control

The pump-motor has an electric motor-driven blower for cooling the pump-motor. The blower motor has multiple operating modes: AUTO, MANUAL and OFF. In AUTO mode the blower motor is started any time the pump-motor is running and remains on for a “cool down” period of at least 5 minutes after the pump-motor is stopped (Normal Stop). If an Emergency Stop occurs, the blower motor stops immediately and there is not a “cool down” period.

In MANUAL mode the blower motor runs continuously, regardless of the pump-motor’s status. In OFF mode the blower motor does not run, regardless of the pump-motor’s status.

The blower includes a pressure switch that senses the blower outlet pressure to confirm that the blower is operating satisfactorily. Any time that the blower is running, the pressure switch should be activated.

If the blower is running and the pressure switch is NOT activated, then the control system should indicate an alarm. The alarm is latched until the Alarm Reset switch is operated.

Pump Discharge Pressure Control

A pressure transmitter provides a signal for the pump discharge pressure. The pump discharge pressure is displayed locally and remotely.

An Overpressure setpoint can be adjusted on the control system that is triggered by the pump discharge pressure.

If the pump discharge pressure exceeds the Overpressure setpoint, the control system stops the pump-motor via the RUN/STOP control to the VFD. The control system should activate/indicate a shutdown. The Overpressure shutdown is latched until the Alarm Reset switch is operated.

Pump Lubrication Control

The pump has a lubrication system that includes an electric motor-driven pump, a cooling fan, pressure transmitter and temperature transmitter. Any time the control system commands the VFD to RUN it first turns on the lube pump, confirms lube oil pressure is greater than a predefined PSIG setpoint, then enables the VFD to start the pump-motor. Whenever the control system commands the VFD to STOP, it also turns off the lube pump following the same “cool down” period that was discussed for the Motor Blower control. Any time the control system commands the VFD to RUN, the lube system cooling fan is enabled to run. Once the lube temperature reaches a predefined temperature maximum threshold, the control system turns on the cooling fan. Whenever the lube temperature is below a predefined temperature midrange minimum threshold, the control system turns the cooling fan off. The fan is also turned off whenever the lube pump is turned off.

If an Emergency Stop occurs, the lube pump and fan motor are stopped immediately and there is not a “cool down” period.

When enabled to run, if the lube temperature exceeds a predefined threshold or lube pressure falls below a predefined PSIG setpoint, the control system should indicate an alarm. The alarm is latched until the Alarm Reset switch is operated.

When enabled to run, if the lube pressure is below a minimum predefined PSIG setpoint for more than 5 seconds, the control system should activate/indicate a shutdown. The shutdown is latched until the Alarm Reset switch is operated.

The lube system pressure and temperature are both displayed locally and remotely.

The shutdowns listed for the hydraulic fracturing pump unit can be enabled/disabled via a master override setting at the local or remote control station. When shutdowns are disabled the control system still provides a visual indicator advising the operator to manually shut the unit down. When shutdowns are enabled, the unit is shut down automatically without operator intervention.

Hydraulic Fracturing Blender Unit Control

The hydraulic fracturing blender unit contains two (2) or more electric motor-drives that can be operated independently from a local control panel mounted on the unit. One (1) motor drives a Hydraulic Power Unit and the other a Slurry Power Unit. The following is a description of the basic control system operation for the unit:

Slurry Power Unit Control

The Slurry Power Unit (SPU) motor is controlled by the VFD. The control system provides a RUN/STOP signal to the VFD to control the status of the SPU motor. The control system provides a speed request signal to the VFD that allows the speed of the motor to be varied across the entire speed range. The motor speed is displayed and can be controlled locally.

The VFD provides a VFD FAULT contact to the control system to indicate if a fault condition is present, and the control system provides local/remote alarm indication of the VFD FAULT.

The SPU motor contains a space heater to help ensure that the motor windings are dry before operation. Typical practice is to have the space heaters energized at least for 24-hours before running the motor. The space heater has multiple operating modes: AUTO and OFF. In AUTO mode the heater is turned on the control system is energized and the SPU motor is OFF. The heater is turned off whenever the SPU motor is commanded to RUN.

The heater is turned on again anytime the SPU motor is stopped (Normal Stop). If an Emergency Stop occurs, the heat is turned off immediately.

Slurry Power Unit Motor Bearing Temperature

The SPU motor has 2 bearings, each with a temperature sensor. The bearing closest to the pump is labeled as the “Drive End” (DE) bearing and the other is the “Non-Drive End” (NDE) bearing. The bearing temperatures are displayed locally and remotely.

If either bearing temperature reaches XXX°F, the control system should indicate an alarm. The alarm is latched until the Alarm Reset switch is operated.

If either bearing temperature reaches XXX°F, the control system should activate/indicate a shutdown. The shutdown is latched until the Alarm Reset switch is operated.

Slurry Power Unit Motor Winding Temperature

The SPU motor has 3 windings (one for each AC phase) each with a temperature sensor. The windings are labeled A, B and C corresponding to the AC phases. The winding temperatures are displayed locally and remotely.

If any winding temperature reaches XXX°F, the control system should indicate an alarm. The alarm is latched until the Alarm Reset switch is operated.

If any winding temperature reaches XXX°F, the control system should activate/indicate a shutdown. The shutdown is latched until the Alarm Reset switch is operated.

Slurry Power Unit Blower Control

The SPU motor has an electric motor-driven blower for cooling the pump-motor. The blower motor has 3 operating modes: AUTO, MANUAL and OFF. In AUTO mode the blower motor is started any time the SPU motor is running and remains on for a “cool down” period of at least 5 minutes after the SPU motor is stopped (Normal Stop). If an Emergency Stop occurs, the blower motor stops immediately and there is not a “cool down” period.

In MANUAL mode the blower motor runs continuously, regardless of the SPU motor’s status. In OFF mode the blower motor does not run, regardless of the SPU motor’s status.

The blower includes a pressure switch that senses the blower outlet pressure to confirm that the blower is operating satisfactorily. Any time that the blower is running, the pressure switch should be activated.

If the blower is running and the pressure switch is NOT activated, then the control system should indicate an alarm. The alarm is latched until the Alarm Reset switch is operated.

Hydraulic Power Unit Control

The Hydraulic Power Unit (HPU) motor is operated at a fixed speed. The control system provides a RUN/STOP signal to the MCC to control the status of the HPU motor. The motor speed is fixed; the motor can be controlled On/Off locally.

The HPU motor contains a space heater to help ensure that the motor windings are dry before operation. Typical practice is to have the space heaters energized at least for 24-hours before running the motor. The space heater has 2 operating modes: AUTO and OFF. In AUTO mode the heater is turned on the control system is energized and the HPU motor is OFF. The heater is turned off whenever the HPU motor is commanded to RUN.

The heater is turned on again anytime the HPU motor is stopped (Normal Stop). If an Emergency Stop occurs, the heat is turned off immediately.

Hydraulic Power Unit Motor Bearing Temperature

The HPU motor has 2 bearings, each with a temperature sensor. The bearing closest to the pump is labeled as the “Drive End” (DE) bearing and the other is the “Non-Drive End” (NDE) bearing. The bearing temperatures are displayed locally and remotely.

If either bearing temperature reaches XXX°F, the control system should indicate an alarm. The alarm is latched until the Alarm Reset switch is operated.

If either bearing temperature reaches XXX°F, the control system should activate/indicate a shutdown. The shutdown is latched until the Alarm Reset switch is operated.

Hydraulic Power Unit Motor Winding Temperature

The HPU motor has 3 windings (one for each AC phase) each with a temperature sensor. The windings are labeled A, B and C corresponding to the AC phases. The winding temperatures are displayed locally and remotely.

If any winding temperature reaches XXX°F, the control system should indicate an alarm. The alarm is latched until the Alarm Reset switch is operated.

If any winding temperature reaches XXX°F, the control system should activate/indicate a shutdown. The shutdown is latched until the Alarm Reset switch is operated.

Hydraulic Power Unit Motor Blower Control

The HPU motor has an electric motor-driven blower for cooling the pump-motor. The blower motor has 3 operating modes: AUTO, MANUAL and OFF. In AUTO mode the blower motor is started any time the SPU motor is running and remains on for a “cool down” period of at least 5 minutes after the SPU motor is stopped (Normal Stop). If an Emergency Stop occurs, the blower motor stops immediately and there is not a “cool down” period.

In MANUAL mode the blower motor runs continuously, regardless of the SPU motor’s status. In OFF mode the blower motor does not run, regardless of the SPU motor’s status.

The blower includes a pressure switch that senses the blower outlet pressure to confirm that the blower is operating satisfactorily. Any time that the blower is running, the pressure switch should be activated.

If the blower is running and the pressure switch is NOT activated, then the control system should indicate an alarm. The alarm is latched until the Alarm Reset switch is operated.

Hydraulic Fracturing Blender Unit Shutdown Override Control

The shutdowns listed in this document can be enabled/disabled via a master override setting at the local or remote control station. When shutdowns are disabled the control system still provides a visual indicator advising the operator to manually shut the unit down. When shutdowns are enabled, the unit is shut down automatically without operator intervention.

Hydraulic Fracturing Hydration Unit Control

The hydraulic fracturing hydration unit contains one (1) electric motor-drives that can be operated from a local control panel. The motor drives a Hydraulic Power Unit (HPU). The following is a description of the basic control system operation for the unit:

Hydrator Hydraulic Power Unit Motor Blower Control

The HPU motor has an electric motor-driven blower for cooling the pump-motor. The blower motor has 3 operating modes: AUTO, MANUAL and OFF. In AUTO mode the blower motor is started any time the HPU motor is running and remains on for a “cool down” period of at least 5 minutes after the HPU motor is stopped (Normal Stop). If an Emergency Stop occurs, the blower motor stops immediately and there is not a “cool down” period.

In MANUAL mode the blower motor runs continuously, regardless of the HPU motor’s status. In OFF mode the blower motor does not run, regardless of the HPU motor’s status.

The blower includes a pressure switch that senses the blower outlet pressure to confirm that the blower is operating satisfactorily. Any time that the blower is running, the pressure switch should be activated.

If the blower is running and the pressure switch is NOT activated, then the control system should indicate an alarm. The alarm is latched until the Alarm Reset switch is operated.

The HPU motor contains a space heater to help ensure that the motor windings are dry before operation. Typical practice is to have the space heaters energized at least for 24-hours before running the motor. The space heater has 2 operating modes: AUTO and OFF. In AUTO mode the heater is turned on the control system is energized and the HPU motor is OFF. The heater is turned off whenever the HPU motor is commanded to RUN.

The heater is turned on again anytime the HPU motor is stopped (Normal Stop). If an Emergency Stop occurs, the heat is turned off immediately.

Hydrator Hydraulic Power Unit Motor Bearing Temperature

The HPU motor has 2 bearings, each with a temperature sensor. The bearing closest to the pump is labeled as the “Drive End” (DE) bearing and the other is the “Non-Drive End” (NDE) bearing. The bearing temperatures are displayed locally and remotely.

If either bearing temperature reaches XXX°F, the control system should indicate an alarm. The alarm is latched until the Alarm Reset switch is operated.

If either bearing temperature reaches XXX°F, the control system should activate/indicate a shutdown. The shutdown is latched until the Alarm Reset switch is operated.

Hydrator Hydraulic Power Unit Motor Winding Temperature

The HPU motor has 3 windings (one for each AC phase) each with a temperature sensor. The windings are labeled A, B and C corresponding to the AC phases. The winding temperatures are displayed locally and remotely.

If any winding temperature reaches XXX°F, the control system should indicate an alarm. The alarm is latched until the Alarm Reset switch is operated.

If any winding temperature reaches XXX°F, the control system should activate/indicate a shutdown. The shutdown is latched until the Alarm Reset switch is operated.

Hydrator Hydraulic Power Unit Shutdown Override Control

The shutdowns listed in this document can be enabled/disabled via a master override setting at the local or remote control station. When shutdowns are disabled the control system still provides a visual indicator advising the operator to manually shut the unit down. When shutdowns are enabled, the unit is shut down automatically without operator intervention.

In this implementation, the invention's HMI consists of a desktop computer, monitor, and keyboard, but the invention can be extended to other HMI devices, such as touch enabled tablet computers and mobile phones. The HMI is connected via a data channel to a distributed programmable automation controller (PAC) on each hydraulic fracturing unit. The PAC relays the speed set point from the operator at the HMI to a variable frequency drive (VFD). The VFD provides ac current which turns the mechanically coupled motor and fracturing pump. In this implementation, the PAC also acts a safety device. If an unsafe condition is detected, for example, an over pressure event, the PAC can independently override the remote operator's command and take whatever action is appropriate, for example, shutting off the VFD,

In addition to the prime movers, additional AC motors provide the means for powering ancillary subsystems, such as lubrication pumps and cooling fans, which in the prior art were driven hydraulically. This invention can easily be extended to control, either manually or automatically, any ancillary subsystem electric motors over the same data channel used to control the prime mover.

The single point supervisory control described in this invention can be extended by adding a higher level automation layer that synchronizes the AC motors' operation. Using this method, an operator could enter a single target pressure and pump rate limit, or alternatively, a single target rate and a pump pressure limit, whereby an algorithm on the HMI device could automatically adjust the AC motors' speed set points to collectively reach the target quantity, while not collectively exceeding the limit quantity. This high level automation layer could operate in either open loop or closed loop control modes.

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		Single Point Remote Operation Method And Apparatus For Controlling Distributed AC Motors Used In The Stimulation Of Oil and Gas Wells		
First Named Inventor/Applicant Name:		Mark Payne		
Filer:		George Nader Phillips/Darlene Morgan		
Attorney Docket Number:		011779-0069-888		
Filed as Large Entity				
Filing Fees for Provisional				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Provisional Application Filing	1005	1	260	260
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 (\$)				260

Electronic Acknowledgement Receipt

EFS ID:	21677416
Application Number:	62128291
International Application Number:	
Confirmation Number:	4114
Title of Invention:	Single Point Remote Operation Method And Apparatus For Controlling Distributed AC Motors Used In The Stimulation Of Oil and Gas Wells
First Named Inventor/Applicant Name:	Mark Payne
Customer Number:	20583
Filer:	George Nader Phillips/Darlene Morgan
Filer Authorized By:	George Nader Phillips
Attorney Docket Number:	011779-0069-888
Receipt Date:	04-MAR-2015
Filing Date:	
Time Stamp:	17:01:18
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$ 260
RAM confirmation Number	4161
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1	Provisional Cover Sheet (SB16)	03_04_15_Povisional_Cover.pdf	302624	no	4
			a883869e69ad479f32861d6dda5cfa619494bccf		
Warnings:					
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2	Specification	03_04_15_Provisional_Application.pdf	130299	no	9
			b897e0e6e8b038af15371674252650cf9b3d5cad		
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30263	no	2
			856bf05cef3f107d39a2266c680d64348ac0decd		
Warnings:					
Information:					
Total Files Size (in bytes):			463186		
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*Application*Address to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	62/128,291
Filing Date	March 4, 2015
First Named Inventor	Mark Payne
Art Unit	Not assigned.
Examiner Name	Not assigned.
Attorney Docket Number	011779-0069-888

Please change the Correspondence Address for the above-identified patent application to:

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Customer Number:

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I am the:



Applicant

Attorney or agent of record. Registration Number 47,138.

Registered practitioner named in the application transmittal papers who acts in a representative capacity under 37 CFR 1.34. See 37 CFR 1.33(a)(1). Registration Number _____.

Signature /Peter G. Thurlow/

Typed or Printed
Name Peter G. Thurlow

Date March 6, 2015

Telephone (212) 326-3694

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

Electronic Acknowledgement Receipt	
EFS ID:	21699002
Application Number:	62128291
International Application Number:	
Confirmation Number:	4114
Title of Invention:	Single Point Remote Operation Method And Apparatus For Controlling Distributed AC Motors Used In The Stimulation Of Oil and Gas Wells
First Named Inventor/Applicant Name:	Mark Payne
Customer Number:	20583
Filer:	George Nader Phillips/Darlene Morgan
Filer Authorized By:	George Nader Phillips
Attorney Docket Number:	011779-0069-888
Receipt Date:	06-MAR-2015
Filing Date:	
Time Stamp:	15:47:06
Application Type:	Provisional

Payment information:					
Submitted with Payment			no		
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Change of Address	Change_of_Address_Form.pdf	183404 f6345dae01d7f091cf3647ebef1739c3ee9c8916	no	2
Warnings:					
Information:					

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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 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.

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
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
62/128,291	03/04/2015		260	011779-0069-8888		

CONFIRMATION NO. 4114

20583
JONES DAY
222 EAST 41ST ST
NEW YORK, NY 10017

FILING RECEIPT



OC00000074076386

Date Mailed: 03/19/2015

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)

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Power of Attorney:

Peter Thurlow--47138

If Required, Foreign Filing License Granted: 03/18/2015

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 62/128,291**

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

Non-Publication Request: No

Early Publication Request: No

Title

Single Point Remote Operation Method And Apparatus For Controlling Distributed AC Motors Used In The Stimulation Of Oil and Gas Wells

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

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