

A kind of electronic fracturing pump system

Abstract

translated from Chinese

The utility model relates to an electric fracturing pump system, which includes a motor and a fracturing pump, the motor and the fracturing pump are connected in transmission, and also includes several groups of gas generator sets, control cabinets and voltage transformation control cabinets, and the control cabinet is connected with the fracturing pump. The motor is connected, the gas generating set is connected to the transformer control cabinet, and the transformer control cabinet is connected to the control cabinet; this patent changes the original engine into a motor, and the motor drives the fracturing pump to work, and is installed at the oil and gas field The power supply of the gas generator set greatly simplifies the structure of the fracturing pump system, reduces the cost of production, use and maintenance, and simplifies the operation. At the same time, the motor is controlled by frequency conversion technology, which can realize intelligent and remote operation, and the use of natural gas as fuel is clean and environmentally friendly. Its comprehensive economic and social benefits are obvious; it is convenient and flexible to use the skid-mounted gas generator set for power supply.

Landscapes

Structures Of Non-Positive Displacement Pumps

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Claims (5)

Hide Dependent ^ translated from Chinese

1. An electric fracturing pump system, comprising a motor (4) and a fracturing pump (6), the motor (4) and the fracturing pump (6) are connected by transmission, and it is characterized in that: it also includes several groups of gas generator sets (11), control cabinet (2) and transformer control cabinet (10), described control cabinet (2) is connected with electric motor (4), and described gas generator set (11) is connected with transformer control cabinet (10), The transformer control cabinet (10) is connected with the control cabinet (2). 2. An electric fracturing pump system according to claim 1, characterized in that: the variable pressure control cabinet (10) and the control cabinet (2) are provided with quick connectors (12), the variable pressure control A high-voltage cable (9) is arranged between the cabinet (10) and the control cabinet (2), and the high-voltage cable (9) is connected to the quick connector (12). 3. An electric fracturing pump system according to claim 1, characterized in that: a coupling (5) is arranged between the electric motor (4) and the fracturing pump (6), and the electric motor (4)) and the fracturing pump (6) are connected through a coupling (5). 4. An electric fracturing pump system according to any one of claims 1-3, characterized in that it further comprises a skid-mounted base (1), and a box (3) is arranged on the skid-mounted base (1)), the motor (4), the fracturing pump (6) and the control cabinet (2) are located on the skid-mounted base (1). 5. An electric fracturing pump system according to any one of claims 1-3, characterized in that: it also includes a vehicle chassis (8), the electric motor (4), the fracturing pump (6) and the control cabinet (2) is located on the vehicle chassis (8).

Description

translated from Chinese

An electric fracturing pump system

technical field

The utility model relates to a power transmission device, in particular to an electric fracturing pump system.

Background technique

The fracturing pump truck is the core equipment of the fracturing construction process in oil and natural gas exploitation. It belongs to the special vehicle equipment for oil and gas field drilling and production. Improve the permeability of oil and gas layers to enhance oil and gas recovery. Its main components are: truck chassis, engine, hydraulic gearbox, fracturing pump, control system and other auxiliary devices. With the development of oil field fracturing technology towards high pressure and large displacement, the fracturing pump truck is also forced to develop in the direction of large-scale pumps, high-power engines, and overloaded vehicles. horsepower, and the weight of the whole vehicle is also nearly 50 tons, and the space and weight that the engine occupies in the vehicle are all more than 50%. The increase of vehicle load and engine system seriously restricts the large-scale development of fracturing pump trucks.

Utility model content

The problem to be solved by the utility model is to provide a large-scale and intelligent electric fracturing pump system for the above problems.

CN204402781U

China

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Other languages: Chinese

Inventor: 于洪伟

Current Assignee : Individual

Worldwide applications

2015 [CN](#)

Application CN201520003826.3U events ⓘ

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2025-01-04 Anticipated expiration

Status Expired - Fee Related

Info: Cited by (7), Legal events, Similar documents, Priority and Related Applications

External links: Espacenet, Global Dossier, Discuss

In order to solve the above problems, the technical solution adopted by the utility model is: an electric fracturing pump system, including a motor and a fracturing pump, the motor and the fracturing pump are connected by transmission, and also include several groups of gas generator sets, control cabinets and a voltage transformation control cabinet, the control cabinet is connected to the motor, the gas generating set is connected to the voltage transformation control cabinet, and the voltage transformation control cabinet is connected to the control cabinet.

This patent changes the original engine into a motor, drives the fracturing pump to work through the motor, and supplies power through the gas generator set installed in the oil and gas field, which greatly simplifies the structure of the fracturing pump system, reduces production, use and maintenance costs, and simplifies operation. At the same time, the motor is controlled by frequency conversion technology, which can realize intelligent and remote control operation. Using natural gas as fuel is clean and environmentally friendly, and its comprehensive economic and social benefits are obvious; using skid-mounted gas generator sets for power supply is convenient and flexible.

A specific optimization solution, the transformer control cabinet and the control cabinet are provided with quick connectors, a high-voltage cable is provided between the transformer control cabinet and the control cabinet, and the high-voltage cable is connected to the quick connector.

In a specific optimization scheme, a coupling is provided between the motor and the fracturing pump, and the motor and the fracturing pump are connected through a coupling.

A specific optimization solution further includes a skid-mounted base, on which a box is arranged, and the motor, fracturing pump and control cabinet are located on the skid-mounted base.

The motor, fracturing pump and control cabinet are contained by the skid-mounted base and box. The skid-mounted fracturing pump system has low manufacturing cost, small footprint, long service life, large bearing capacity, and is convenient for hoisting and transportation.

Using natural gas as fuel is clean and environmentally friendly, and its comprehensive economic and social benefits are obvious

A specific optimization solution also includes a vehicle chassis, and the motor, fracturing pump and control cabinet are located on the vehicle chassis.

The utility model adopts the above technical scheme and has the following advantages:

This fracturing pump system solves the problem of increasing the vehicle load and engine system of the existing fracturing pump system, which seriously restricts the large-scale development of the fracturing pump truck. provides ample room for development.

Below in conjunction with accompanying drawing and embodiment the utility model is further described.

Description of drawings

Accompanying drawing 1 is the schematic structural diagram of an electric fracturing pump system in Embodiment 1 of the present utility model;

Accompanying drawing 2 is the structure diagram of an electric fracturing pump system in the utility model embodiment 2;

Accompanying drawing 3 is the structure diagram of an electric fracturing pump system in the embodiment of the utility model.

In the picture:

1-skid base; 2-control cabinet; 3-box; 4-motor; 5-coupling; 6-fracturing pump; 7-output assembly; 8-vehicle chassis; 9-high voltage cable; 10-transformer Pressure control cabinet; 11-natural gas generator set; 12-quick connector.

Detailed ways

Embodiment 1: As shown in accompanying drawings 1 and 3, an electric fracturing pump system includes an electric motor 4 and a fracturing pump 6, the electric motor 4 and the fracturing pump 6 are connected by transmission, and several groups of gas-fired power generators are also included. The unit 11, the control cabinet 2 and the transformer control cabinet 10, the control cabinet 2 is connected to the motor 4, the gas generator set 11 is connected to the transformer control cabinet 10, the transformer control cabinet 10 is connected to the control cabinet 2, The output end of the fracturing pump 6 is provided with an output assembly 7, and the motor 4 is a high-pressure engine, which is controlled by frequency conversion technology and can be remotely controlled.

The transformer control cabinet 10 and the control cabinet 2 are provided with a quick connector 12, and a high voltage cable 9 is provided between the transformer control cabinet 10 and the control cabinet 2, and the high voltage cable 9 is connected to the quick connector 12.

A coupling 5 is arranged between the motor 4 and the fracturing pump 6, and the motor 4 and the fracturing pump 6 are connected through the coupling 5.

It also includes a skid-mounted base 1, on which a box body 3 is arranged, and the motor 4, fracturing pump 6 and control cabinet 2 are located on the skid-mounted base 1, and the box body 3 is packaged to form a skid-mounted fracturing chamber. Split pump system.

Advantages of skid-mounted fracturing pump system compared with vehicle-mounted fracturing pump system:

1. With the trend of large-scale fracturing pump trucks, the vehicle capacity is limited, but the carrying capacity of the skid-mounted skid-mounted base 1 has enough room for development;
2. The super weight and the strong vibration during the operation of the equipment have serious damage to the chassis of the vehicle pump truck, and the skid-mounted type does not have this problem;
3. The on-board equipment must be limited by the characteristics of the vehicle, such as vehicle annual inspection, scrapping, environmental protection requirements, etc., and its service life is short, while the skid-mounted device is not subject to the above restrictions, and its service life is greatly extended;
4. Several pump trucks are required to run at the same time during the fracturing operation, and the footprint of the skid-mounted pump is much smaller than that of the vehicle-mounted pump;
5. During the fracturing operation, the pump device is in a relatively static state, and the vehicle function loses its effectiveness. The skid-mounted device is more suitable for this state. When the skid-mounted device needs to be moved, use a large crane to hoist the skid-mounted device as a whole to the container truck for convenient transportation;
6. In terms of manufacturing cost, the skid-mounted pump device is much lower than the pump truck.

Multiple sets of gas generating sets 11 are also placed in the skid-mounted base and the box body, adopting a skid-mounted structure, which is convenient and flexible, and can supply power to one or more electric fracturing pump truck systems at the same time.

The skid-mounted gas generator set 11 equipped according to the on-site electricity capacity can supply power to multiple fracturing pump systems and other equipment at the same time. The volume of the skid-mounted fracturing pump system is reduced. The engine clusters of the generating set 11 are concentrated in a closed skid-mounted device, and are fueled by clean energy natural gas, so that the on-site air pollution, noise pollution and environmental oil pollution are greatly reduced.

Embodiment 2: As shown in accompanying drawings 2 and 3, an electric fracturing pump system includes an electric motor 4 and a fracturing pump 6. The electric motor 4 and the fracturing pump 6 are connected by transmission, and several groups of gas-fired power generators are also included. The unit 11, the control cabinet 2 and the transformer control cabinet 10, the control cabinet 2 is connected to the motor 4, the gas generator set 11 is connected to the transformer control cabinet 10, the transformer control cabinet 10 is connected to the control cabinet 2, The output end of the fracturing pump 6 is provided with an output assembly 7, and the motor 4 is a high-pressure engine, which is controlled by frequency conversion technology and can be remotely controlled.

The transformer control cabinet 10 and the control cabinet 2 are provided with a quick connector 12 , and a high voltage cable 9 is provided between the transformer control cabinet 10 and the control cabinet 2 , and the high voltage cable 9 is connected to the quick connector 12 .

A coupling 5 is arranged between the motor 4 and the fracturing pump 6 , and the motor 4 and the fracturing pump 6 are connected through the coupling 5 .

It also includes a vehicle chassis 8 on which the motor 4 , the fracturing pump 6 and the control cabinet 2 are located.

Multiple sets of gas generating sets 11 are also placed in the skid-mounted base and the box body, adopting a skid-mounted structure, which is convenient and flexible, and can supply power to one or more electric fracturing pump truck systems at the same time.

The skid-mounted gas generator set 11 equipped according to the on-site electricity capacity can supply power to multiple fracturing pump systems and other equipment at the same time. The engine clusters of the generating set 11 are concentrated in a closed skid-mounted device, and are fueled by clean energy natural gas, so that the on-site air pollution, noise pollution and environmental oil pollution are greatly reduced.

Cited By (7)

Publication number	Priority date	Publication date	Assignee	Title
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WO2016207631A1 *	2015-06-24	2016-12-29	Rab Hydraulics Limited	Strata fracturing apparatus and method
CN110645159A *	2019-11-01	2020-01-03	三一石油智能装备有限公司	Electrically-driven fracturing driving system and electrically-driven fracturing device
WO2021056174A1 *	2019-09-24	2021-04-01	烟台杰瑞石油装备技术有限公司	Electrically-driven fracturing well site system
WO2023082249A1 *	2021-11-15	2023-05-19	烟台杰瑞石油装备技术有限公司	Electrically-driven fracturing device
CN116480547A *	2019-10-30	2023-07-25	烟台杰瑞石油装备技术有限公司	Piston pump and electric drive fracturing semi-trailer
US12312930B2	2019-06-13	2025-05-27	Yantai Jereh Petroleum Equipment & Technologies Co., Ltd.	Fracturing system
Family To Family Citations				

* Cited by examiner, † Cited by third party, ‡ Family to family citation

Similar Documents

Publication	Publication Date	Title
CN204402781U	2015-06-17	A kind of electronic fracturing pump system
US11725491B2	2023-08-15	Electrically driven fracturing system
CN110608030A	2019-12-24	An electric drive fracturing semi-trailer with frequency conversion integrated machine
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CN106972610A	2017-07-21	Net electric power workover rig energy storage control system and its control method
CN202455216U	2012-09-26	High-speed pump integrated device
CN203822197U	2014-09-10	Electric energy accumulator energy storage electric workover rig

Priority And Related Applications

Priority Applications (1)

Application	Priority date	Filing date	Title
CN201520003826.3U	2015-01-04	2015-01-04	A kind of electronic fracturing pump system

Applications Claiming Priority (1)

Application	Filing date	Title
CN201520003826.3U	2015-01-04	A kind of electronic fracturing pump system

Legal Events

Date	Code	Title	Description
2015-06-17	C14	Grant of patent or utility model	
2015-06-17	GR01	Patent grant	
2024-12-27	CF01	Termination of patent right due to non-payment of annual fee	
2024-12-27	CF01	Termination of patent right due to non-payment of annual fee	Granted publication date: 20150617

Concepts

machine-extracted

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Name		Image	Sections	Count	Query match
biological transmission	claims,abstract,description	6	0.000		
coupling process	claims,description	9	0.000		
coupling reaction	claims,description	9	0.000		
coupling	claims,description	8	0.000		
gas	abstract,description	19	0.000		
methane	abstract,description	12	0.000		
natural gas	abstract,description	7	0.000		
benefit	abstract,description	5	0.000		

■ engineering process	abstract,description	5	0.000
■ manufacturing process	abstract,description	5	0.000
■ chemical reaction	abstract,description	4	0.000
■ transformation	abstract,description	4	0.000
■ fuel	abstract,description	3	0.000
■ maintenance	abstract,description	2	0.000
Show all concepts from the description section			