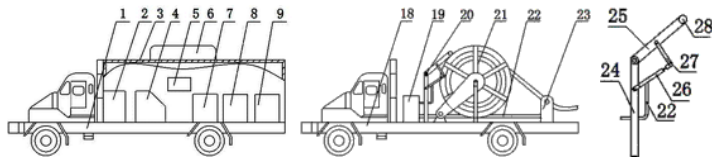


## Fracturing unit for oil field exploitation

### Abstract

The invention relates to a fracturing unit for oil field exploitation. The unit comprises a signal collection system, a measuring truck, a fracturing pump truck, a manifold truck and a fracturing blender truck. The measuring truck comprises a data collection and analysis system (4), a communication system (6), a controlling system (7) of the pump truck, a controlling system (8) of the fracturing blender truck and a controlling system (9) of the manifold truck. The fracturing pump truck comprises a controlling system, a motor driven device, a data sending and receiving device and a plurality of sets of fracturing pumps. The manifold truck comprises a hydraulic controlling system, a roller assembly and an automatic coiler device. The unit has the advantages that the centralized control of the fracturing pump truck, the manifold truck and the fracturing blender truck on the measuring truck is achieved through the data sharing of a local area network, and the unit improves the controlling precision and the construction safety of the equipment and the operation is convenient and simple. The unit reduces the cable connection between the trucks, and updates the controlling technique, thereby lowering the breakdown rate of the equipment and reducing the maintaining cost drastically.

### Images (3)



### Landscapes

#### Sampling And Sample Adjustment

#### Measuring Fluid Pressure

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### Claims (3)

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1. oilfield exploitation Frac unit, it is characterized in that: it comprises signal acquiring system, measuring truck, pressure break pump truck, manifold truck and fracturing blender truck, and signal acquiring system is connected with measuring truck, measuring truck is connected with many pressure break pump trucks, manifold truck and fracturing blender trucks respectively:

described measuring truck comprises measuring truck chassis (1), operating room (3), power-supply system (2), data acquisition and analysis system (4), communication system (6), pump truck control system (7), fracturing blender truck control system (8) and manifold truck control system (9), operating room (3) are placed in top, measuring truck chassis (1), power-supply system (2), data acquisition and analysis system (4), pump truck control system (7), fracturing blender truck control system (8) and manifold truck control system (9) are arranged on operating room (3) inside successively, are provided with communication system (6) at the top of operating room (3), power-supply system (2) respectively with data acquisition and analysis system (4), pump truck control system (7), fracturing blender truck control system (8), manifold truck control system (9) is connected by cable with communication system (6), data acquisition and analysis system (4) respectively with pump truck control system (7), fracturing blender truck control system (8) is connected by rigid line with manifold truck control system (9), and data acquisition and analysis system (4) is connected with communication system (6),

described pressure break pump truck comprises fracturing pump chassis (10), electric-controlled house (12), control system (11), motor driver (13), data input and data output device (14), motor (15), reduction box (16) and many group fracturing pumps (17), electric-controlled house (12) is arranged on a side of fracturing pump chassis (10) top, electric-controlled house (12) inside is provided with control system (11) and motor driver (13), motor (15) is arranged at the opposite side of fracturing pump chassis (10) top, the output of motor (15) is connected with the input of reductor (16), the output of reductor (16) is connected with the input of fracturing pump (17), fracturing pump chassis (10) top also is provided with data send and receive device (14),

Described manifold truck comprises manifold truck chassis (18), hydraulic control system (19), roller assembly (21) and pipe automatic coil device (23), top, manifold truck chassis (18) is disposed with hydraulic control system (19), roller assembly (21) and pipe automatic coil device (23), and hydraulic control system (19) is connected by high-pressure rubber pipe (22) with pipe automatic coil device (23).

2. a kind of oilfield exploitation Frac unit according to claim 1 is characterized in that: described operating room (3) inside also is provided with cooling/warming system (5).

3. a kind of oilfield exploitation Frac unit according to claim 1, it is characterized in that: a side of described roller assembly (21) also is provided with hold down gag (20), hold down gag (20) comprises column (24), pivoted arm (25), hydraulic cylinder (26), pull bar (27) and pressure head (28), the bottom of column (24) is fixed on manifold truck chassis (18), the top of column (24) and pivoted arm (25) are hinged, the other end of pivoted arm (25) is provided with pressure head (28), the middle part of

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**Inventor:** 王江阳, 赵崇胜, 韩淳, 张成举

**Current Assignee :** SICHUAN HONGHUA ELECTRIC Co.,Ltd.

### Worldwide applications

2013 [CN](#)

### Application CN2013100267018A events ②

**2013-01-24** Application filed by CHENGDU HONGTIAN ELECTRIC DRIVE ENGINEERING Co Ltd

**2013-01-24** Priority to CN201310026701.8A

**2013-05-08** Publication of CN103089226A

**2016-04-20** Application granted

**2016-04-20** Publication of CN103089226B

**Status** Active

**2033-01-24** Anticipated expiration

**Info:** [Patent citations \(8\)](#), [Non-patent citations \(3\)](#), [Cited by \(13\)](#), [Legal events](#), [Similar documents](#), [Priority and Related Applications](#)

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pivoted arm (25) is hinged with pull bar (27), be connected with hydraulic cylinder (26) between pull bar (27) and column (24), hydraulic cylinder (26) is connected by high-pressure rubber pipe (22) with hydraulic control system (19).

## Description

A kind of oilfield exploitation Frac unit

Technical field

The present invention relates to shale gas mining equipment field, particularly a kind of oilfield exploitation Frac unit.

Background technology

Shale gas is the natural gas that is retained in the oil generation rock stratum, is a kind of "unconventional natural gas", belongs to a class together with "coal bed gas", "tight gas", and global shale petroleum resources is very abundant. U.S.'s "oil gas" magazine prediction, approximately 11,000,000,000,000 tons ~ 13,000,000,000,000 tons of whole world shale oil savings are considerably beyond world's conventional oil reserves of more than 4,000 hundred million tons. The exploitation of shale oil gas becomes the important subject that solves energy crisis. Estimate according to PetroChina Company Ltd., the shale gas resource of China may reach 45 tcms, and wherein recoverable reserves is 38 tcms, occupies the first in the world. Fracturing unit is the capital equipment of exploiting coal bed methane and natural gas, and is same, and the exploitation of shale gas also mainly depends on fracturing unit.

China is since the complete Frac unit of the Introduced From Abroad eighties in last century, and the introduction of these equipment makes the fracturing unit of China that qualitative leap arranged, and reaches the international level of synchronization same period. Along with exploitation and development that the sky is arranged, be that the fracturing work of coal bed gas and the natural gas well is had higher requirement to discharge capacity and the pressure of pressing crack construction on the one hand, be to adopt contracting system on the other hand, pressing crack construction technique and pressure break precision are had higher requirement. The external Frac unit of introducing is in the overage military service stage mostly, its effective power descends, the unit failure rate increases, particularly control technology falls behind, every pressure break pump truck in construction will control by multicore cable and display is transferred to measuring truck, start and control each pressure break pump truck by the centralized control panel that arranges in measuring truck, this control and the required stub cable of display transmission means are many, and system needs often to safeguard. In addition, do not realize data sharing between each pressure break pump truck, can't control and observe all key operation parameters of all the other pressure break pump trucks by the guidance panel of any pressure break pump truck, increased the coordination difficulty between each pressure break pump truck.

Summary of the invention

The object of the invention is to overcome the shortcoming of prior art, a kind of easy to operate simple and low oilfield exploitation Frac unit of maintenance cost is provided, realize data sharing by LAN, each car all is furnished with a wireless local communication network, centralized Control pressure break pump truck, fracturing blender truck and manifold truck on measuring truck, realize "unmanned" operation of pressure break pump truck and fracturing blender truck, improved control accuracy and the working security of equipment.

Purpose of the present invention is achieved through the following technical solutions: a kind of oilfield exploitation Frac unit, it comprises signal acquiring system, measuring truck, pressure break pump truck, manifold truck and fracturing blender truck, signal acquiring system is connected with measuring truck, and measuring truck is connected with many pressure break pump trucks, manifold truck and fracturing blender trucks respectively:

described measuring truck comprises the measuring truck chassis, operating room, power-supply system, data acquisition and analysis system, communication system, the pump truck control system, fracturing blender truck control system and manifold truck control system, operating room is placed in top, measuring truck chassis, power-supply system, data acquisition and analysis system, the pump truck control system, fracturing blender truck control system and manifold truck control system are arranged on operating room inside successively, top at operating room is provided with communication system, power-supply system respectively with data acquisition and analysis system, the pump truck control system, the fracturing blender truck control system, the manifold truck control system is connected by cable with communication system, data acquisition and analysis system respectively with the pump truck control system, the fracturing blender truck control system is connected by rigid line with the manifold truck control system, data acquisition and analysis system is connected with communication system,

Described pressure break pump truck comprises fracturing pump chassis, electric-controlled house, control system, motor driver, data input and data output device, motor, reduction box and organizes fracturing pump more, electric-controlled house is arranged on a side of fracturing pump chassis top, electric-controlled house inside is provided with control system and motor driver, motor is arranged at the opposite side of fracturing pump chassis top, the output of motor is connected with the input of reductor, and the output of reductor is connected with the input of fracturing pump; Fracturing pump chassis top also is provided with data send and receive device;

Described manifold truck comprises manifold truck chassis, hydraulic control system, roller assembly and pipe automatic coil device, top, manifold truck chassis is disposed with hydraulic control system, roller assembly and pipe automatic coil device, and hydraulic control system is connected by high-pressure rubber pipe with the pipe automatic coil device.

Described operating room inside also is provided with cooling/warming system.

One side of described roller assembly also is provided with hold down gag, hold down gag comprises column, pivoted arm, hydraulic cylinder, pull bar and pressure head, the bottom of column is fixed on the manifold truck chassis, top and the pivoted arm of column are hinged, the other end of pivoted arm is provided with pressure head, the middle part of pivoted arm is hinged with pull bar, is connected with hydraulic cylinder between pull bar and column, and hydraulic cylinder is connected by high-pressure rubber pipe with hydraulic control system.

The present invention has the following advantages:

- 1, by the LAN communication system, centralized Control pressure break pump truck, manifold truck, fracturing blender truck and other auxiliary equipment on measuring truck are easy to operate simple.
- 2, the cable that has reduced between each car connects, and has upgraded control technology, makes equipment failure rate reduce, and has reduced significantly maintenance cost.
- 3, realize data sharing by LAN, each car all is furnished with a wireless local communication network, centralized Control pressure break pump truck, fracturing blender truck and manifold truck on measuring truck are realized "unmanned" operation of pressure break pump truck and fracturing blender truck, have improved control accuracy and the working security of equipment.

Description of drawings

Fig. 1 is the structural representation of measuring truck;

Fig. 2 is the structural representation of pressure break pump truck;

Fig. 3 is the structural representation of manifold truck;

Fig. 4 is the structural representation of hold down gag;

in figure: 1-measuring truck chassis, the 2-power-supply system, the 3-operating room, the 4-data acquisition and analysis system, the 5-cooling/warming system, the 6-communication system, 7-pump truck control system, 8-fracturing blender truck control system, 9-manifold truck control system, 10-fracturing pump chassis, the 11-control system, the 12-electric-controlled house, the 13-motor driver, 14-data input and data output device, the 15-motor, the 16-reduction box, the 17-fracturing pump, 18-manifold truck chassis, the 19-hydraulic control system, the 20-hold down gag, the 21-roller assembly, the 22-high-pressure rubber pipe, 23-pipe automatic coil device, the 24-column, the 25-pivoted arm, the 26-hydraulic cylinder, the 27-pull bar, the 28-pressure head.

The specific embodiment

The present invention will be further described below in conjunction with accompanying drawing, but protection scope of the present invention is not limited to the following stated.

A kind of oilfield exploitation Frac unit, it comprises signal acquiring system, measuring truck, pressure break pump truck, manifold truck and fracturing blender truck, and signal acquiring system is connected with measuring truck, and measuring truck is connected with many pressure break pump trucks, manifold truck and fracturing blender trucks respectively:

as shown in Figure 1, measuring truck comprises measuring truck chassis 1, operating room 3, power-supply system 2, data acquisition and analysis system 4, communication system 6, pump truck control system 7, fracturing blender truck control system 8 and manifold truck control system 9, operating room 3 is placed in 1 top, measuring truck chassis, power-supply system 2, data acquisition and analysis system 4, pump truck control system 7, fracturing blender truck control system 8 and manifold truck control system 9 are arranged on operating room 3 inside successively, be provided with communication system 6 at the top of operating room 3, power-supply system 2 respectively with data acquisition and analysis system 4, pump truck control system 7, fracturing blender truck control system 8, manifold truck control system 9 is connected by cable with communication system 6, data acquisition and analysis system 4 respectively with pump truck control system 7, fracturing blender truck control system 8 is connected by rigid line with manifold truck control system 9, data acquisition and analysis system 4 is connected with communication system 6, operating room 3 inside also are provided with cooling/warming system 5.

As shown in Figure 2, the pressure break pump truck comprises fracturing pump chassis 10, electric-controlled house 12, control system 11, motor driver 13, data input and data output device 14, motor 15, reduction box 16 and organizes fracturing pump 17 more, electric-controlled house 12 is arranged on a side of fracturing pump chassis 10 tops, electric-controlled house 12 inside are provided with control system 11 and motor driver 13, motor 15 is arranged at the opposite side of fracturing pump chassis 10 tops, the output of motor 15 is connected with the input of reductor 16, and the output of reductor 16 is connected with the input of fracturing pump 17; Fracturing pump chassis 10 tops also are provided with data send and receive device 14;

As shown in Figure 3, manifold truck comprises manifold truck chassis 18, hydraulic control system 19, roller assembly 21 and pipe automatic coil device 23,18 tops, manifold truck chassis are disposed with hydraulic control system 19, roller assembly 21 and pipe automatic coil device 23, and hydraulic control system 19 is connected by high-pressure rubber pipe 22 with pipe automatic coil device 23.

One side of roller assembly 21 also is provided with hold down gag 20, as shown in Figure 4, hold down gag 20 comprises column 24, pivoted arm 25, hydraulic cylinder 26, pull bar 27 and pressure head 28, the bottom of column 24 is fixed on manifold truck chassis 18, the top of column 24 and pivoted arm 25 are hinged, and the other end of pivoted arm 25 is provided with pressure head 28, and the middle part of pivoted arm 25 is hinged with pull bar 27, be connected with hydraulic cylinder 26 between pull bar 27 and column 24, hydraulic cylinder 26 is connected by high-pressure rubber pipe 22 with hydraulic control system 19.

The course of work of the present invention is as follows: measuring truck is the control centre of a whole set of unit, it is accepted from the working state signal of each executing agency and pressure break pump truck, manifold truck and fracturing blender truck is controlled by LAN, communication system 6 on measuring truck is hinges of reception and transmitted signal, be respectively arranged with pump truck control system 7, fracturing blender truck control system 8, manifold truck control system 9 and data acquisition and analysis system 4 on fracturing blender truck, can realize pressure break pump truck, fracturing blender truck and manifold truck " unmanned " operation.Manual and automatic two options are set on the pressure break pump truck, wherein manually control and have the highest weight limit, select manually to control, control at the enterprising line operate of pressure break pump truck, can control and observe simultaneously all key operation parameters of other any pressure break pump truck by the guidance panel of a pressure break pump truck wherein, the coordination difficulty between each pressure break pump truck is reduced.

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Family To Family Citations

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Priority And Related Applications

Priority Applications (1)

| Application       | Priority date | Filing date | Title                                     |
|-------------------|---------------|-------------|-------------------------------------------|
| CN201310026701.8A | 2013-01-24    | 2013-01-24  | A kind of oilfield exploitation Frac unit |

Applications Claiming Priority (1)

| Application       | Filing date | Title                                     |
|-------------------|-------------|-------------------------------------------|
| CN201310026701.8A | 2013-01-24  | A kind of oilfield exploitation Frac unit |

Legal Events

| Date       | Code | Title                                                   | Description                                                                                                                                                                                                                                                                                                                            |
|------------|------|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2013-05-08 | C06  | Publication                                             |                                                                                                                                                                                                                                                                                                                                        |
| 2013-05-08 | PB01 | Publication                                             |                                                                                                                                                                                                                                                                                                                                        |
| 2013-06-12 | C10  | Entry into substantive examination                      |                                                                                                                                                                                                                                                                                                                                        |
| 2013-06-12 | SE01 | Entry into force of request for substantive examination |                                                                                                                                                                                                                                                                                                                                        |
| 2016-04-20 | C14  | Grant of patent or utility model                        |                                                                                                                                                                                                                                                                                                                                        |
| 2016-04-20 | GR01 | Patent grant                                            |                                                                                                                                                                                                                                                                                                                                        |
| 2021-01-01 | CP01 | Change in the name or title of a patent holder          | <b>Address after:</b> 610036 No. 99, East Road, Yingbin Road, Jinniu District, Sichuan, Chengdu<br><b>Patentee after:</b> SICHUAN HONGHUA ELECTRIC Co.,Ltd.<br><b>Address before:</b> 610036 No. 99, East Road, Yingbin Road, Jinniu District, Sichuan, Chengdu<br><b>Patentee before:</b> CHENGDU HONGTIAN TELEX ENGINEERING Co.,Ltd. |
| 2021-01-01 | CP01 | Change in the name or title of a patent holder          |                                                                                                                                                                                                                                                                                                                                        |

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| ■ warming                                                      | claims,description   | 4 | 0.000 |
| ■ construction                                                 | abstract,description | 4 | 0.000 |
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