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(54) Title: A DEVICE PREFERABLY FOR PERFORMING OF A DRILLING IN EARTH-LAYER AND ROCK

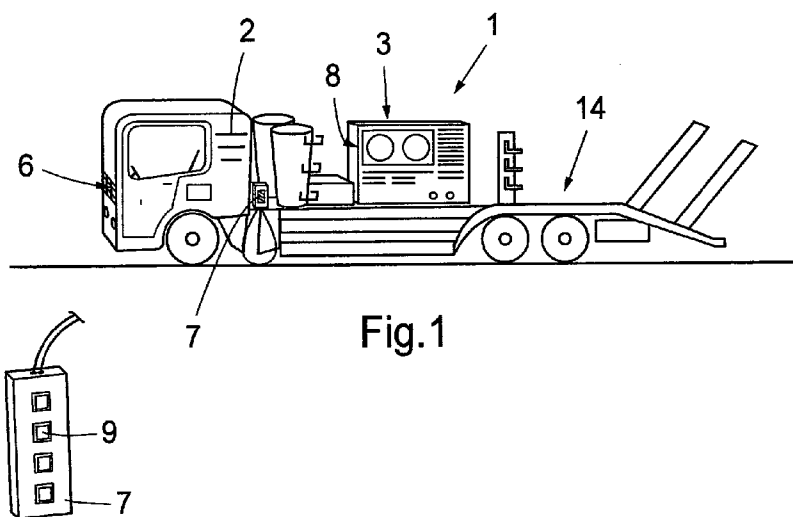


Fig.1

(57) Abstract: The invention refers to a device especially for performing of a drilling in earth layer and rocks whereby a first unit is used comprising a counter sink hammer, which by its strokes acts towards a bore crown for drilling a bore hole at the same time as a driving downwards can be done of a casing pipe into the bore hole made together with the bore crown used and a second unit for feeding pressure air at first hand needed for the operation of the first unit. The second unit (1) comprises a high pressure compressor (3) mounted on a load vehicle (2), which is connected to and is driven by a power take off (4) of that gear box (5) belonging to existing motor (6) of the load vehicle (2) at the same time as a control unit (7) is connected to the motor (6) of the load vehicle (2) for adjusting of its motor speed and hence that pressure which the high pressure compressor (3) is delivering and pressure sensors (8) are provided to maintain predetermined working pressures.



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A device preferably for performing of a drilling in earth-layer and rock

The present invention refers to a device in the first place for performing of a drilling in earth-layers and rocks, whereby a first unit is used comprising a countersink hammer, which by aid of its strokes acts towards a bore crown for drilling of a bore hole at the same time as a driving downwards can be provided by a casing pipe in the bore hole made together with the bore crown used and a second unit for feeding pressurized air to in the first place to the first unit for its operation.

Existing drilling devices of today usually are built up around a counter sink hammer and are used i.a. for drilling of a well. This machine requires a separate unit in the form of a high pressure compressor assembly, which delivers compressed air and which is driven by a diesel motor connected directly to the same. During transport up to and from different working places therefore you usually must use a lorry with the capability to lift up and support the high pressure compressor assembly with its integrated motor and thereafter connect the drilling aggregate itself together with the countersink machine as a trailer after the lorry. This requires a lot of work on the respective working place before all units have placed in order before the drilling work. Further it has been shown to be relatively expensive what concerns the fuel consumption to drill, since for each drilled meter it is needed about 2,2 – 2,5 litre diesel oil.

One object of the present invention is to eliminate those drawbacks existing with known drilling devices of the type i.a. mentioned above by providing a new thinking and a new device in the first place in connection with drilling in earth-layers and rocks. The characterizing features of the present invention are set forth in the claims enclosed.

Thanks to the invention a concept has now been provided, which in an excellent way fulfils its purpose at the same time as it furthermore is both cheap and easy to realize. According to the invention you now use a high pressure compressor without having a motor which has been integrated with a loading vehicle in the form of a lorry, the ordinary or existing motor of which having its gear box is used both for the operation of the lorry and in a change-over condition also for the operation of the high compressor, which is adjustable by the help of a separate control unit. The fuel consumption has been

able to be lowered by the device according to the invention to about 1,5 litre/drilled meter from that consumption usual today mentioned above using known devices, which is about 2,2-2,5 litre/meter, which is by an environment point of view of a great importance.

Thanks to this fact the energy consumption has been able to be lowered to about. 20.000 – 30.000 litres of oil and year. According to the invention you will obtain with other words the same result as by using known devices but by use of only one driving source instead of two, and also an arrangement which has an essentially lower weight than before, which is a great advantage what concerns the handling and transporting weight. The high pressure compressor integrated with the load vehicle can of course also be used for other purposes such as i.e. transporting bulk material in pipe lines when i.e. emptying of ships and cleaning and regenerating of pipes in oil refineries.

The invention will be described closer below with help of a preferred embodiment example with reference to the accompanying drawings, in which

Fig. 1 shows a schematic perspective view of a device according to the invention comprising a load vehicle with an integrated high pressure compressor,

Fig. 2 shows a schematic perspective view of the high pressure compressor itself illustrated in fig. 1,

Fig. 3 shows a schematic side view of the power transmission between the power take off from the gear box of the load vehicle and the primary shaft to the high pressure compressor, and

Fig. 4 shows a perspective view in a greater scale of the operating unit according to the invention.

According to a preferred embodiment example of the invention the same consists of a device for performing of a drilling in earth layer and rocks. Here is used on one hand a first unit comprising a counter sink hammer, which by its strokes acts towards a bore crown for drilling a bore hole at the same time as a driving downwards can be done of a

casing pipe into the bore hole made together with the bore crown used. A second unit is on the other especially intended to feed that pressure air needed for the operation of the first unit.

The second unit 1 comprises a high pressure compressor 3 mounted on a load vehicle 2, which is connected to and is driven by a power take off 4 of that gear box 5 belonging to existing motor 6 of the load vehicle 2. A control unit 7 is connected to the motor 6 of the load vehicle 2 for adjusting of its motor speed and hence that pressure which the high pressure compressor is delivering. Pressure sensors 8 are further used in order to sense and maintain predetermined working pressures.

The control unit 7 comprises at least three function buttons 9, of which the first one is provided by an electric signal or radio signal with a predetermined frequency to start the load vehicle 2 and the high pressure compressor 3 in different steps or gradually by at least two depressions, whereupon the pressure sensors 8 in the form of a last-pressure sensor and a control pressure sensor in a way known per se are provided to sense the correct working pressure, of which function buttons 9 the second one is provided to shut off or unload the operation in steps and of which the third function button is provided by an electric signal or a predetermined radio frequency signal to give an impulse to the motor 6 for increasing the pressure or decreasing the pressure of the high pressure compressor 3 to manually determined values. The function buttons of the control unit 7 also can be distance controlled via a cable or predetermined radio frequency signals by a portable distance control unit, so that the second unit is adjustable in distance from the same i.e. from the first unit. Instead of using the function buttons in the control unit these can of course be replaced by icons belonging to a menu of a computer.

The power take off 4 of the gear box 5 is via an universal joint 10 and belt pulleys 11 completed with driving belts 12 connected to the primary shaft 13 of the high pressure compressor 3 in order to bridge over a vertical height difference between the two. This height difference can be varied upwards to about 800 mm between the power take off 4 of the gear box 5 and the primary shaft 13 of the high pressure compressor 3, which is connectable by aid of a splined coupling or creep wedge coupling.

The actual rotation speed of the primary shaft 13 of the high pressure compressor 3 is about 1100 – 1500 r/min and preferably about 1350 r/min during normal drilling by the first unit and the actual working pressure then amounts to maximum about 30 bar.

The load vehicle 2 and the high pressure compressor 3 mounted on the same are integrated connected to each other at the same time as the load vehicle 2 having a loading space 14 after or just behind the high pressure compressor 3, which admits space for the first unit in one and the same equipage.

Claims

1. A device especially for performing of a drilling in earth layer and rocks whereby a first unit is used comprising a counter sink hammer, which by its strokes acts towards a bore crown for drilling a bore hole at the same time as a driving downwards can be done of a casing pipe into the bore hole made together with the bore crown used and a second unit for feeding pressured air at first hand needed for the operation of the first unit, said second unit (1) comprising a high pressure compressor (3) without a motor, **characterized in** that the high pressure compressor (3) is integrated with the load vehicle (2) and connected to and driven by a power take off (4) of that gear box (5) belonging to existing motor (6) of the load vehicle (2) at the same time as a control unit (7) is connected to the motor (6) of the load vehicle (2) for adjusting of its motor speed and hence that pressure, which the high pressure compressor (3) can deliver and pressure sensors (8) are provided to sense and maintain predetermined working pressures.

2. A device according to claim 1, **characterized in** that the control unit (7) comprises at least three function buttons(9), of which the first one is provided by an electric signal or radio signal with a predetermined frequency to start the load vehicle (2) and the high pressure compressor (3) in different steps or gradually by at least two depressions , whereupon the pressure sensors (8) in the form of a last-pressure sensor and a control pressure sensor in a way known per se are provided to sense the correct working pressure, of which function buttons (9) the second one is provided to shut off or unload the operation in steps and of which the third function button is provided by an electric signal or a predetermined radio frequency signal to give an impulse to the motor (6) for adjusting its motor speed for increasing or decreasing the pressure of the high pressure compressor (3).

3. A device according to claim 2, **characterized in** that the function buttons (9) of the control unit (7) are distance controlled via a cable or predetermined radio frequency signals by a portable distance control unit, so that the second unit (1) is adjustable in distance from the same i.e. from the first unit.

4. A device according to claim 1, **characterized in** that the power take off (4) of the gear box (5) is via an universal joint (10) and belt pulleys (11) completed with driving belts (12) connected to the primary shaft (13) of the high pressure compressor (3) in order to bridge over a vertical height difference between the two.
5. A device according to claim 4, **characterized in** that height difference can be varied upwards to about 800 mm between the power take off (4) of the gear box (5) and the primary shaft (13) of the high pressure compressor (3), which is connectable by aid of a splined coupling or creep wedge coupling.
6. A device according to claim 1, **characterized in** that the actual rotation speed of the primary shaft (13) of the high pressure compressor (3) is about 1100 – 1500 r/min and preferably about 1350 r/min during normal drilling by the first unit and the actual working pressure then amounts to maximum about 30 bar.
7. A device according to claim 1, **characterized in** that the load vehicle (2) and the high pressure compressor (3) mounted on the same are integrated connected to each other at the same time as the load vehicle (2) having a loading space (14) after or just behind the high pressure compressor (3), which admits space for the first unit in one and the same equipage.

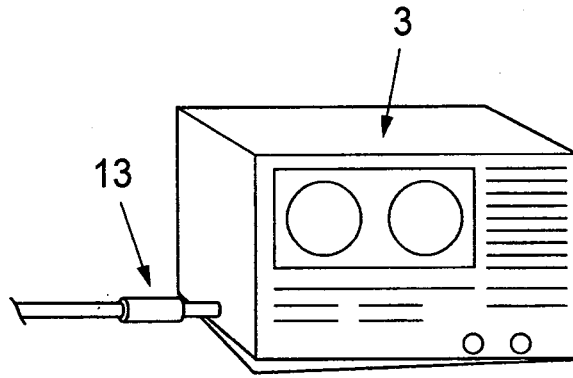
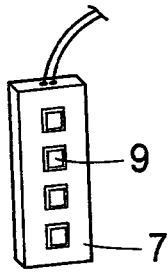
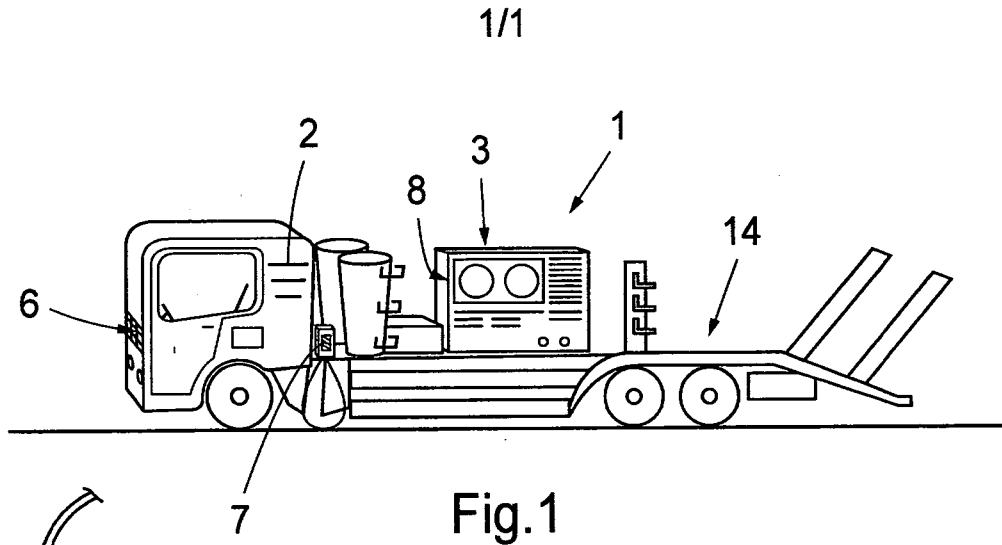


Fig. 2

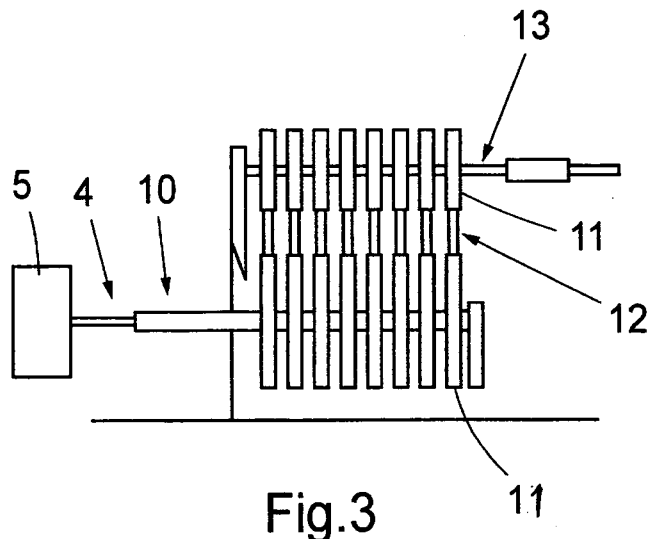


Fig. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2008/000500

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: E21B, B60K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2783971 A (G.F. CARLE ET AL), 5 March 1957 (05.03.1957) --	1-7
A	FR 2849413 A1 (RENTFORCE S.A.), 2 July 2004 (02.07.2004) --	1-7
A	US 20040060717 A1 (J. LEPPANEN), 1 April 2004 (01.04.2004) --	1-7
A	EP 1731708 A1 (GEOMECHANIK WASSER- UND UMWELTTECHNIK GMBH), 13 December 2006 (13.12.2006) -- -----	1-7

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International patent classification (IPC)

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B60K 25/06 (2006.01)

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Cited literature, if any, will be enclosed in paper form.

INTERNATIONAL SEARCH REPORT

Information on patent family members

01/11/2008

International application No.

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