



(11) **EP 2 145 698 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:  
**12.09.2012 Bulletin 2012/37**

(51) Int Cl.:  
**B08B 3/02 (2006.01)**

(21) Application number: **08012993.5**

(22) Date of filing: **18.07.2008**

(54) **Control panel for a high-pressure cleaner**

Steuertafel für Hochdruckreiniger

Panneau de commande pour nettoyeur haute pression

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR**

(43) Date of publication of application:  
**20.01.2010 Bulletin 2010/03**

(73) Proprietor: **Nilfisk-Advance A/S**  
**2605 Brøndby (DK)**

(72) Inventors:  
• **Bank Olesen, Hans Jørgen**  
**8900 Randers (DK)**

• **Glavind, Mads**  
**9500 Hobro (DK)**

(74) Representative: **Roerboel, Leif et al**  
**Budde Schou A/S**  
**Vester Søgade 10**  
**1601 Copenhagen V (DK)**

(56) References cited:  
**WO-A-03/071915 DE-U1- 9 403 745**  
**FR-A- 2 389 360 FR-A- 2 896 681**

**EP 2 145 698 B1**

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

## Description

### Field of the invention

**[0001]** The present invention generally relates to the placing of a control unit and the associated control panel on a pressure washer, and in particular to a technique facilitating an easier support or reparation of a high-pressure washer having a cover. More specifically, the present invention relates to a pressure washer that can be continuously operated even though the control unit and the associated control panel is not permanently fixed to another part of the high-pressure washer.

### Description of related art

**[0002]** There are high-pressure washers having a control unit mounted on either the frame or on the cover. In the former case, when the control unit is mounted on the frame, the cover has a cut-out or defines an opening where the control panel of the control unit protrudes. This way of mounting requires high tolerances for the control panel to fit in the cut-out or opening. In the latter case, the control unit is usually an integral part of, or permanently fixed, to the cover. When the control unit is a part of the cover, the control panel follows the cover when the cover is dismantled. This is also a disadvantage, since then the cover cannot be removed completely without disconnecting the electrical and/or the liquid conduits connected to the control unit. Naturally, an easily removable cover may be an advantage when servicing or repairing the high-pressure washer. When removing a cover with a permanently fixed control unit, this will demand electrical connectors that are waterproof, which increases the complexity and production cost of the high-pressure washer. Related art devices are disclosed in WO 03071915 and FR-A-2896681.

### Object of the invention

**[0003]** An object according to the present invention is to provide techniques that will allow a less complicated maintenance and reparation of high-pressure washers. It is an advantage of the present invention that it allows for a high-pressure washer that can be operated without the control unit and the associated control panel having a permanently fixed position in relation to rest of the high-pressure washer. A particular feature of the present invention is that it allows for a high-pressure washer that can be operated where the placing of the control unit and the associated control panel is primarily limited by the length of the conduits connecting the control unit with the rest of the high-pressure washer.

### Summary/Disclosure of invention

**[0004]** The above object, the above advantage and the above feature together with numerous other objects, ad-

vantages and features will be evident from the detailed descriptions given below of preferred embodiments according to the present invention. The objects, advantages and features are according to a first aspect of the present invention obtained by a high-pressure washer for delivering a liquid, said high-pressure washer comprising a frame, a delivery unit supported by said frame, such as a motor-driven pump or a heater, and a control unit for controlling said delivery unit and having a control panel, said high-pressure washer further comprising a cover for protecting said delivery unit, **characterized in that** said cover defines an opening for releaseably receiving said control unit with access to said control panel from the outside of said cover.

**[0005]** In a broad interpretation this means that the control unit may be supported by the cover, that it can be attached to and removed from the cover, and that when being attached to the cover the control panel can be accessed from the outside of the cover by way of the opening. The opening may correspond to a hole in the cover, i.e. the edge of the opening may correspond to a closed path completely defined by the cover. Alternatively, the opening may be a cut-out in the edge of the cover, i.e. the edge of the opening may only in part be defined by the cover.

**[0006]** Clearly, an advantage according to the first aspect of the present invention is that it enables the control unit to be removed from the cover without disconnecting it from the rest of the high-pressure washer, which may otherwise expose electrical connectors or the like. Another advantage may be that when servicing or repairing the high-pressure washer, it may be possible to establish an active delivery mode, i.e. to operate the high-pressure washer, even though the cover is removed completely.

**[0007]** A delivery mode of the high-pressure washer may be defined by properties of the liquid, such as pressure, volumetric flow rate, chemical composition, and/or temperature. The delivery unit may then enable a plurality of different delivery modes, from which an active delivery mode is established by the control unit. It is understood that the delivery unit may be able to change all of the properties of the liquid listed above, or that it may only be able to change some or only one of them. Similarly, the control unit may be able control all parameters that the delivery unit can change, or it may only be able to control some or one of the parameters that the delivery unit can change. This means that it may be necessary to have several control units in order to control all of the parameters that can be changed by the delivery unit.

**[0008]** In order to establish an active delivery mode, the control unit may comprise a valve, fluid regulator, and/or component with similar functions. Further, it may also comprise an electrical switch, relay, regulator and/or component with similar functions. In addition, the control unit may also comprise an electrical circuit, microprocessor, and/or component with similar functions. The control unit may also comprise a mechanical, pneumatic, or hydraulic switch or actuator, or the like. The control panel

of the control unit may comprise a push button, manual switch, lever, knob, handle, key, and/or a component with similar functions for manually setting the active delivery mode.

**[0009]** The cover of high-pressure washer, according to the first aspect of the present invention, may define a closed and an open position relative to the frame, where the closed position is for protecting the delivery unit, and the open position is for enabling the delivery unit to be reached by hand. The cover may, in its closed position, be supported by the frame by one or more locks, bolts, catches and/or the like. Alternatively or additionally, the cover may be supported by a hinge, a hook-and-hole arrangement, and/or the like that allows for a swiveling motion of the cover while still in contact with the frame and/or the delivery unit. In the open position, the cover may be supported by the same hinge, hook-and-hole arrangement, and/or the like. Alternatively, the cover may, in an open position, be completely detached from the frame and/or the delivery unit.

**[0010]** The high-pressure washer may further comprise one or more first fasteners for providing a first mounting for supporting the control unit by the cover, where the one or more first fasteners are manually releasable. A fastener may be defined as a device and/or features that mechanically joins or affixes two or more objects together. To give an example, a first fastener may comprise a hole on the control unit, a bolt with a head at one end and threads at the other end, and a threaded hole on the cover for receiving the threads of the bolt. When engaged, the two holes are placed centered on one another, and the bolt is first put through the hole of the control unit before it is attached to the cover, so that the head of the bolts locks the control unit in a position relative to the cover. An alternative to the threads and the hole on the cover would be to have a hock at the end of the bolt that is opposite from the head, and a pin on the cover to provide a fastening mechanism with a function similar to that of a bayonet mount. The first fastener may not have to involve a loose object, such as a bolt, but may be defined by features of the control unit and the cover alone. As an example, the fastener feature of the control unit and the fastener feature of the cover may together define a manually releasable catch. Another example of this kind would be to have a cover with one or more tracks, and one or more features of the control unit to make it fit in the slot defined by the one or more tracks. Other examples to first fasteners may involve a hook, loop, screw, clips, buckle, clamp, peg, pin, rubber band, strap, and/or a wedge. A first fastener may be of such a construction that no the component and/or feature involved is exposed to any significant wear when employed. Naturally, this would be an advantage if a fastener is employed repeatedly.

**[0011]** A fastener of the one or more first fasteners may further be employed in a second mounting of the control unit on the frame and/or on the delivery unit when the cover is in the open position, e.g. during servicing or re-

pairing. Hence, the fastener employed here may also be employed for providing the first mounting on the cover. This means that some or all of the features on the cover that enables the first mounting may also found on the frame and/or the delivery unit for enabling the second mounting.

**[0012]** The high-pressure washer may further comprise one or more second fasteners for enabling a third mounting for supporting the control unit by the frame and/or by the delivery unit when the cover is in the open position. This may be an advantage during service and repair, especially if the control panel of the control unit is easily accessible when the latter is supported by the third mounting. The one or more second fasteners may be of the same type and/or function as the one or more first fasteners described above. A second fastener may comprise a hook-and-holder arrangement, where the control unit has a fixed hook that can be inserted in a holder on the frame and/or the delivery unit when the control unit has an angle relative to the frame within a certain interval. If the angle is changed outside this interval after the hook has been inserted in the holder, the arrangement will lock the control unit to the frame and/or delivery unit, thereby providing a support of the control unit.

**[0013]** The high-pressure washer may further comprise a communication system coupled to the control unit and to the delivery unit, where the communication system enables a control communication of an active delivery mode from the control unit to the delivery unit. The communication system may further comprise one or more flexible conduits for continuously enabling the control communication when the control unit is supported by the first mounting, and when the open position is changed to the closed position, or when the closed position is changed to the open position. This may be an advantage in the servicing and repairing of the high-pressure washer, as it enables the high-pressure washer to be operated even though the cover is in an open position and the control unit is mounted on the cover.

**[0014]** The communication system may further comprise one or more flexible conduits for continuously providing the control communication when the position of the control unit is shifted relative to the frame and/or the delivery unit. This means that the flexible conduits may continuously provide the control communication when the first mounting is changed, e.g. to the second mounting or the third mounting; the second mounting is changed, e.g. to the first mounting or the third mounting; and the third mounting is changed, e.g. to the first mounting or the second mounting. Naturally, this demands a certain length of the flexible conduits. The high-pressure washer may, by these features, be continuously operated while the positions of the control unit is changed, which may be an advantage when servicing or repairing the high-pressure washer. They will also allow the high-pressure washer to be operated while the control unit is mounted in either of the first, second, or third mounting as described above.

[0015] The one or more flexible conduits may comprise an electrical wire, mechanical wire, hose, tube, optical wire, and/or the like. Further, a flexible conduit may also comprise rigid elements joined by a movable joint, hinge, and/or flexible element, e.g. rigid tubes coupled by a flexible hose.

[0016] The high-pressure may in a particular embodiment further comprise a piston pump driven by an electric motor for delivering the liquid under high pressure; a heater for heating of the liquid, where the heater further comprises a burner for providing the conditions of combustion for a fuel, a heater coil through which the liquid passes, and an electrically driven fan to drive the heat of the combustion over the heater coil; and a fuel tank for providing the heater with the fuel. Further, the high-pressure washer may comprise an electrical conduit for supplying the electric motor and the heater with electrical power from an external power source; a chemical container for storing a substance for being employed in defining a delivery mode involving the chemical composition of the liquid; and/or wheels mounted on the frame for lowering the friction when the high-pressure washer is transported along a surface.

[0017] The control panel of the control unit may further comprise one or more indicators for indicating the active delivery mode and/or the operational status of the delivery unit. An indicator may comprise a measuring device, e.g. a pressure gauge, a flow gauge, or a thermometer, for determining a measurement on the liquid to be delivered. Further, an indicator may comprise a mechanical moving-pointer type of meter, an electrical scale type of meter comprising light-emitting diodes, an electrical liquid crystal display type of meter, or the like. An indicator may also be integrated with a device for setting the active delivery mode, e.g. a push button, manual switch, lever, knob, handle, key, and/or a component with similar functions, where the position of the device indicates the active delivery mode, e.g. by having a scale or symbols located at the position of the device on the control panel. As an example, a handle may be placed in three positions pointing towards the printed numbers 1, 2, and 3, where the positions provides a low, a mediate, and a high volumetric flow rate, respectively, of the liquid to be delivered.

#### Brief description of the drawings

[0018] Additional objects and features according to the present invention will be more readily apparent from the following detailed description and appended claims, which are presented in conjunction with the drawing, where:

Fig. 1 illustrates a high-pressure washer with a cover in a close position,

Fig. 2 illustrates a high-pressure washer with the cover removed,

Fig. 3 illustrates a high-pressure washer in a moving state,

Fig. 4 illustrates the inside of the cover without a mounted control unit, and

Fig. 5 illustrates the inside of the cover with a mounted control unit.

#### 10 Detailed description of the invention

[0019] The exterior of a preferred embodiment of a high-pressure washer is shown in Fig. 1. The high-pressure washer 1 has a frame 2 providing support for its other components, and it is fitted with a cover 11 for protecting the delivery unit. A handle 14 is connected to the frame 2 for making the transport and handling of the high-pressure washer 1 easier. The cover has an opening 33 for receiving a control unit so that the control panel 10 of the unit is reachable by hand. The control panel comprises knobs 17 for manually setting an active operation mode of the high-pressure washer 1. As an example, a first knob may be for turning on and turning off the a heater of the liquid to be delivered, a second knob may be for setting the temperature of the liquid, and a third knob may be for setting the pressure and/or volumetric flow of the liquid. The high-pressure washer 1 has an air inlet-outlet 23 that allows air to reach the fan and heater behind the cover 11. The air inlet-outlet 23 will also enable cooling of the delivery unit by air convection. The cover 11 defines an opening 19 for the exhaust pipe 16 of the heater, where the opening 19 has such dimensions that the exhaust pipe 16 does not reach the cover 11 when it is in its closed position or changed from its closed position.

[0020] A preferred embodiment of a high-pressure washer 1 with its cover removed is shown in Fig. 2. The frame 2 supports the delivery unit 24 comprising a fan 5 driven by an electric motor 6, a pump 8 driven by another electric motor 18 for delivering the liquid under pressure, and a heater 20 for heating the liquid. The fan 24 establishes an airflow in the heater 20 leading out through the exhaust pipe 16. The heater comprises a burner and a heater coil (not shown in Fig. 2) contained within its exterior, where the fuel tank supplies the burner with fuel for combustion. The liquid passes through the heater coil, while the airflow drives the heat of the combustion over the heater coil, thereby providing heating of the liquid. The control unit 9 is supported by the heater 7 so that the high-pressure washer 1 can be easily operated by the control panel 10 even though the cover has been removed.

[0021] In Fig. 3 a side-view of the presently preferred embodiment of the high-pressure washer in Fig. 1 is illustrated. The cover 11 is attached to the frame by a set of screws 22 at the top of the cover and releasable joints at the front bottom 64 of the high-pressure washer. If the screws 22 are released, this means that the cover 11 can

be swung open with the turning point at the front bottom 64. In this motion the opening 19 for the exhaust pipe 16 will not reach the exhaust pipe 16, which otherwise could damage the cover 11 if the exhaust pipe 16 is hot. The fuel tank 4 is located at the back of the of the high-pressure washer 1, where the fuel tank is supplied with fuel through the fuel tank filler 15, which is sealed by a lid screwed in place.

**[0022]** A specific contact area 13 and the pair of wheels 12 will support the high-pressure washer 1 in its vertical position. Another specific contact area 21, which will support the high-pressure washer 1 at rest in its horizontal position, is provided by an element extruding from the fuel tank 4. This extruding element will also fill the function of a hook for supporting winded external hoses or cables, such as a high-pressure cable and an electric cable for supplying the high-pressure washer 1 with electric power. There is a cut-out 65 in the cover 11 that enables a fixedly mounted outlet 20 for the heated high-pressure liquid to be connected to an external high-pressure hose. There is also an inlet 63 for supplying the high-pressure washer 1 with the liquid to be pressurized and delivered by the high-pressure washer 1. The handle 14 connected to the frame 2 will allow the high-pressure washer 1 to be easily shifted from a vertical to a horizontal position, or to be transported by way of its wheels 12. The high-pressure washer 1 in Fig. 3 is in a moving state, in which it can be maneuvered by a person supporting the high-pressure washer by the handle 14.

**[0023]** A part of the inside of the cover 11 of a presently preferred embodiment is illustrated in Fig. 4, where the control unit has been detached and removed from the cover. The cover defines an opening 33 to which the control unit can be closely fitted and through which the control panel can be reached from the outside. There is a pair of hooks 34 below the opening 33 for receiving an arm. The hooks 34 are oriented so that an arm can be supported against the force of gravity when the cover is in a vertical position. There is also a pair of screw receivers 35 which, together with the pair of hooks 34, can be employed to support the control unit against a force in an arbitrary direction relative to the cover 11.

**[0024]** Fig. 5 illustrates the same part of the cover 11 as in Fig. 4, but with the control unit 9 closely fitted to the opening so that the control unit can be reached from the outside. The control unit 9 is attached by quarter-turn screws 31 locked to the screw receivers of the cover 11, and by a fixed arm 30 received by the hooks 34. The cover 11 is attached to the frame 2 by releasable joints 32 so that the cover can be removed completely from the frame 2. Communication means 28, e.g. hoses and electric cables, enables a control communication between the control unit 9 and the delivery units supported by the frame 2. The control unit is fitted with a pair of arms or fasteners 27, which can be received in corresponding holders located on the frame 2 or on a delivery unit, preferably on the heater as is shown in Fig. 2.

**[0025]** The term "supported" is to be understood as if

a second item is supported by a first item, and a third item is supported by the same first item, then the third item may be supported by the second item, which in turn is supported by the first item. Additionally or alternatively, the second item may be supported by the third item, which in turn is supported by the first item. As an example, if it is stated that the delivery unit and the control unit are supported by the frame; then the delivery unit and the control unit are individually supported by the frame, or the control unit is supported by the delivery unit, which in turn is supported by the frame; or the delivery unit is supported by the control unit, which in turn is supported by the frame.

## Claims

1. A high-pressure washer (1) for delivering a liquid, said high-pressure washer (1) comprising a frame (2), a delivery unit (24) supported by said frame (2), such as a motor-driven pump (8) and/or a heater (7), and a control unit (9) for controlling said delivery unit (24) and having a control panel (10), said high-pressure washer (1) further comprising a cover (11) for protecting said delivery unit (24), **characterized in that** said cover (11) defines an opening (33) for releasably receiving said control unit (9) with access to said control panel (10) from the outside of said cover (11).
2. A high-pressure washer (1) according to claim 1, wherein a delivery mode of said high-pressure washer (1) is defined by properties of said liquid, such as pressure, volumetric flow rate, chemical composition, and/or temperature, and where said delivery unit (24) enables a plurality of different delivery modes, from which an active delivery mode is established by said control unit (9).
3. A high-pressure washer (1) according to any of the claims 1 to 2 further comprising one or more first fasteners (30, 31, 34, 35) for providing a first mounting for supporting said control unit (9) by said cover (11), where said one or more first fasteners (30, 31, 34, 35) are manually releasable.
4. A high-pressure washer (1) according to any of the claims 1 to 3, wherein said cover (11) defines a closed and an open position relative to said frame (2), where said closed position is for protecting said delivery unit (24), and said open position is for enabling said delivery unit (24) to be reached by hand.
5. A high-pressure washer (1) according to any of the claims 1 to 4, wherein said one or more first fasteners (30, 31, 34, 35) further enables a second mounting for supporting said control unit (9) by said frame (2) and/or by said delivery unit (24) when said cover (11)

is in said open position.

6. A high-pressure washer (1) according to any of the claims 1 to 5 further comprising one or more second fasteners (27) enabling a third mounting for supporting said control unit (9) by said frame (2) and/or by said delivery unit (24) when said cover (11) is in said open position.
7. A high-pressure washer (1) according to any of the claims 1 to 6 further comprising a communication system (28) coupled to said control unit (9) and to said delivery unit (24), where said communication system (28) enables a control communication of an active delivery mode from said control unit (9) to said delivery unit (24).
8. A high-pressure washer (1) according to any of the claims 1 to 7, wherein said communication system (28) further comprising one or more flexible conduits (28) for continuously enabling said control communication when said control unit (9) is supported by said first mounting, and when said open position is changed to said closed position, or when said closed position is changed to said open position.
9. A high-pressure washer (1) according to any of the claims 1 to 8, wherein said communication system further comprising one or more flexible conduits (28) for continuously enabling said control communication when the position of said control unit (9) is shifted relative to said frame (2) and/or said delivery unit (24).
10. A high-pressure washer (1) according to any of the claims 1 to 9, wherein said communication system (28) further comprising one or more flexible conduits (28) for continuously enabling said control communication when said first mounting is changed to said second mounting or said third mounting, said second mounting is changed to said first mounting or said third mounting, and said third mounting is changed to said first mounting or said second mounting.
11. A high-pressure washer (1) according to any of the claims 1 to 10 further comprising a piston pump (8) driven by an electric motor (18) for delivering said liquid under high pressure; a heater (7) for heating of said liquid, where said heater further comprises a burner for providing the conditions of combustion for a fuel, a heater coil through which said liquid passes, and an electrically driven fan to drive the heat of the combustion over said heater coil; a fuel tank (4) for providing said heater with said fuel; an electrical conduit for supplying said electric motor and said heater with electrical power from an external power source; a chemical container for storing a substance for being employed in the defining a delivery mode involv-

ing said chemical composition of said liquid; and/or wheels (12) mounted on said frame (2) for lowering the friction when the high-pressure washer is transported on a surface.

12. A high-pressure washer according to any of the claims 1 to 11, wherein said control panel (10) further comprises one or more indicators (17) for indicating said active delivery mode and/or the operational status of said delivery unit.

#### Patentansprüche

1. Ein Hochdruckreiniger (1) zur Lieferung einer Flüssigkeit, wo der Hochdruckreiniger (1) ein Gehäuse (2), eine durch das Gehäuse (2) unterstützte Fördereinheit (24) wie eine motorisierte Pumpe (8) und/oder eine Heizvorrichtung (7), und eine Steuereinheit (9) für die Steuerung der Fördereinheit (24), die eine Steuertafel hat (10), umfasst, wo der Hochdruckreiniger (1) ausserdem eine Abdeckung (11) zum Schutz der Fördereinheit (24) umfasst, **dadurch gekennzeichnet, dass** die Abdeckung (11) eine Öffnung (33) definiert für eine lösbare Aufnahme der Steuereinheit (9) mit Zugang zur Steuertafel (10) von der Aussenseite der Abdeckung (11).
2. Ein Hochdruckreiniger (1) nach Anspruch 1, wo eine Lieferart der Hochdruckreiniger (1) durch Eigenschaften der Flüssigkeit wie Druck, Volumendurchsatz, chemische Zusammensetzung, und/oder Temperatur definiert ist, und wo die Fördereinheit (24) eine Mehrheit von verschiedenen Lieferarten ermöglicht, aus welchen eine aktive Lieferart durch die Steuereinheit (9) bestimmt wird.
3. Ein Hochdruckreiniger (1) nach einem der Ansprüche 1 bis 2, der ausserdem einen oder mehr ersten Befestiger (30, 31, 34, 35) für die Erbringung einer ersten Befestigung für die Unterstützung der Steuereinheit (9) durch die Abdeckung (11) umfasst, wo der eine oder mehr Befestiger (30, 31, 34, 35) von Hand lösbar sind.
4. Ein Hochdruckreiniger (1) nach einem der Ansprüche 1 bis 3, wo die Abdeckung (11) eine geschlossene und eine offene Position definiert relativ zum Gehäuse (2), wo die geschlossene Position dem Schutz der Fördereinheit (24) dient, und die offene Position die Erreichung der Fördereinheit (24) mit der Hand ermöglicht.
5. Ein Hochdruckreiniger (1) nach einem der Ansprüche 1 bis 4, wo der eine oder mehr Befestiger (30, 31, 34, 35) ausserdem eine zweite Befestigung ermöglicht für die Unterstützung der Steuereinheit (9) durch das Gehäuse (2) und/oder durch die Förder-

- einheit (24), wenn die Abdeckung (11) in der offenen Position ist.
6. Ein Hochdruckreiniger (1) nach einem der Ansprüche 1 bis 5, der ausserdem einen oder mehr zweiten Befestiger (27) umfasst um eine dritte Befestigung zu ermöglichen zur Unterstützung der Steuereinheit (9) durch das Gehäuse (2) und/oder durch die Fördereinheit (24), wenn die Abdeckung (11) in der offenen Position ist.
7. Ein Hochdruckreiniger (1) nach einem der Ansprüche 1 bis 6, der ausserdem ein Kommunikationssystem (28) umfasst, das mit der Steuereinheit (9) und der Fördereinheit (24) verbunden ist, wo das Kommunikationssystem (28) eine Steuerungskommunikation einer aktiven Lieferart ermöglicht von der Steuereinheit (9) an die Fördereinheit (24).
8. Ein Hochdruckreiniger (1) nach einem der Ansprüche 1 bis 7, wo das Kommunikationssystem (28) ausserdem eine oder mehr flexible Leitungen (28) zur Sicherung einer fortlaufenden Steuerungskommunikation umfasst, wenn die Steuereinheit (9) durch die erste Befestigung unterstützt ist, und wenn die offene Position auf die geschlossene Position geändert wird, oder wenn die geschlossene Position auf die offene Position geändert wird.
9. Ein Hochdruckreiniger (1) nach einem der Ansprüche 1 bis 8, wo das Kommunikationssystem ausserdem eine oder mehr flexible Leitungen (28) zur Sicherung einer fortlaufenden Steuerungskommunikation umfasst, wenn die Position der Steuereinheit (9) relativ zum Gehäuse (2) und/oder zur Fördereinheit (24) verändert wird.
10. Ein Hochdruckreiniger (1) nach einem der Ansprüche 1 bis 9, wo said Kommunikationssystem (28) ausserdem eine oder mehr flexible Leitungen (28) zur Sicherung einer fortlaufenden Steuerungskommunikation umfasst, wenn die erste Befestigung auf die zweite oder dritte Befestigung geändert wird, die zweite Befestigung auf die erste oder dritte Befestigung geändert wird, und die dritte Befestigung auf die erste oder zweite Befestigung geändert wird.
11. Ein Hochdruckreiniger (1) nach einem der Ansprüche 1 bis 10, der ausserdem Folgendes umfasst,
- eine durch einen Elektromotor (18) betriebene Kolbenpumpe (8) für Lieferung der Flüssigkeit unter hohem Druck,
  - eine Heizvorrichtung (7) für die Erwärmung der Flüssigkeit, wo die Heizvorrichtung ausserdem einen Brenner umfasst zur Versorgung der Brennbedingungen eines Brennstoffs, eine Heizspirale durch die die Flüssigkeit passiert,

und ein elektrisch betriebenes Gebläse, das die durch das Brennen erzielte Wärme über die Heizspirale treibt,

- einen Brennstofftank (4) für die Versorgung der Heizvorrichtung mit dem Brennstoff,
- eine elektrische Leitung für die Versorgung des Elektromotors und der Heizvorrichtung mit elektrischem Strom von einer externen Stromquelle,
- einen Chemikalienbehälter für die Aufbewahrung eines Stoffes zur Benutzung in der Festlegung einer Lieferart, die diese chemische Zusammensetzung der Flüssigkeit involviert,
- und/oder auf dem Gehäuse (2) angeordnete Räder (12) zur Minderung der Friktion, wenn der Hochdruckreiniger auf einer Oberfläche transportiert wird.

12. Ein Hochdruckreiniger nach einem der Ansprüche 1 bis 11, wo die Steuertafel (10) ausserdem einen oder mehr Anzeiger (17) umfasst für die Anzeige der aktiven Lieferart und/oder des Funktionsstands der Fördereinheit.

## Revendications

1. Nettoyeur haute pression (1) pour fournir un liquide, ledit nettoyeur haute pression (1) comprenant un châssis (2), une unité de fourniture (24) supportée par ledit châssis (2), telle qu'une motopompe (8) et/ou un appareil de chauffage (7), et une unité de commande (9) pour contrôler ladite unité de fourniture (24) et ayant un panneau de commande (10), ledit nettoyeur haute pression (1) comprenant en outre un couvercle (11) pour protéger ladite unité de fourniture (24), **caractérisé en ce que** ledit couvercle (11) définit une ouverture (33) pour recevoir de manière détachable ladite unité de commande (9) avec accès audit panneau de commande (10) de l'extérieur dudit couvercle (11).
2. Nettoyeur haute pression (1) selon la revendication 1, dans lequel un mode de fourniture dudit nettoyeur haute pression (1) est défini par des propriétés dudit liquide, telles que la pression, le débit volumétrique, la composition chimique, et/ou la température, et où ladite unité de fourniture (24) permet une pluralité de modes de fourniture différents, à partir desquels un mode de fourniture actif est établi par ladite unité de commande (9).
3. Nettoyeur haute pression (1) selon l'une quelconque des revendications 1 à 2 comprenant en outre une ou plusieurs attaches (30, 31, 34, 35) pour la fourniture d'un premier montage pour supporter ladite unité de commande (9) par ledit couvercle (11), où ladite une ou lesdites plusieurs attaches (30, 31, 34, 35) sont manuellement détachables.

4. Nettoyeur haute pression (1) selon l'une quelconque des revendications 1 à 3, dans lequel ledit couvercle (11) définit une position fermée et une position ouverte par rapport audit châssis (2), où ladite position fermée sert à protéger ladite unité de fourniture (24), et ladite position ouverte sert à permettre à ladite unité de fourniture (24) d'être à portée de main. 5
5. Nettoyeur haute pression (1) selon l'une quelconque des revendications 1 à 4, dans lequel lesdites une ou plusieurs attaches (30, 31, 34, 35) permettent en outre un deuxième montage pour supporter ladite unité de commande (9) par ledit châssis (2) et/ou par ladite unité de fourniture (24) lorsque ledit couvercle (11) se trouve dans ladite position ouverte. 10 15
6. Nettoyeur haute pression (1) selon l'une quelconque des revendications 1 à 5 comprenant en outre une ou plusieurs attaches (27) permettant un troisième montage pour supporter ladite unité de commande (9) par ledit châssis (2) et/ou par ladite unité de fourniture (24) lorsque ledit couvercle (11) se trouve dans ladite position ouverte. 20 25
7. Nettoyeur haute pression (1) selon l'une quelconque des revendications 1 à 6 comprenant en outre un système de communication (28) accouplé à ladite unité de commande (9) et à ladite unité de fourniture (24), où ledit système de communication (28) permet une communication de commande d'un mode de fourniture active de ladite unité de commande (9) à ladite unité de fourniture (24). 30 35
8. Nettoyeur haute pression (1) selon l'une quelconque des revendications 1 à 7, dans lequel ledit système de communication (28) comprend en outre un ou plusieurs conduits flexibles (28) pour permettre continuellement ladite communication de commande lorsque ladite unité de commande (9) est supportée par ledit premier montage, et lorsque ladite position ouverte est changée à ladite position fermée, ou lorsque ladite position fermée est changée à ladite position ouverte. 40 45
9. Nettoyeur haute pression (1) selon l'une quelconque des revendications 1 à 8, dans lequel ledit système de communication comprend en outre un ou plusieurs conduits flexibles (28) pour permettre continuellement ladite communication de commande lorsque la position de ladite unité de commande (9) est déplacée par rapport audit châssis (2) et/ou ladite unité de fourniture (24). 50 55
10. Nettoyeur haute pression (1) selon l'une quelconque des revendications 1 à 9, dans lequel ledit système de communication (28) comprend en outre un ou plusieurs conduits flexibles (28) pour permettre continuellement ladite communication de commande lorsque ledit premier montage est changé audit deuxième montage ou ledit troisième montage, ledit deuxième montage est changé audit premier montage ou ledit troisième montage, et ledit troisième montage est changé audit premier montage ou ledit deuxième montage.
11. Nettoyeur haute pression (1) selon l'une quelconque des revendications 1 à 10 comprenant en outre une pompe à piston (8) entraînée par un moteur électrique (18) pour fournir ledit liquide sous haute pression; un appareil de chauffage (7) pour chauffer ledit liquide, où ledit appareil de chauffage comprend en outre un brûleur pour fournir les conditions de combustion pour un combustible, un enroulement chauffant à travers lequel le liquide passe, et un ventilateur entraîné électriquement pour entraîner le chauffage de la combustion au dessus dudit enroulement chauffant; un réservoir à combustible (4) pour fournir ledit combustible audit appareil de chauffage; un conduit électrique pour alimenter de la puissance électrique venant d'une source de puissance externe audit moteur électrique et audit appareil de chauffage; un récipient chimique pour stocker une substance à être employée dans la définition d'un mode de fourniture impliquant ladite composition chimique dudit liquide; et/ou des roues (12) montées sur ledit châssis (2) pour réduire la friction lorsque ledit nettoyeur haute pression est transporté sur une surface.
12. Nettoyeur haute pression (1) selon l'une quelconque des revendications 1 à 11, dans lequel ledit panneau de commande (10) comprend en outre un ou plusieurs indicateurs (17) pour indiquer ledit mode de fourniture active et/ou le statut opérationnel de ladite unité de fourniture.

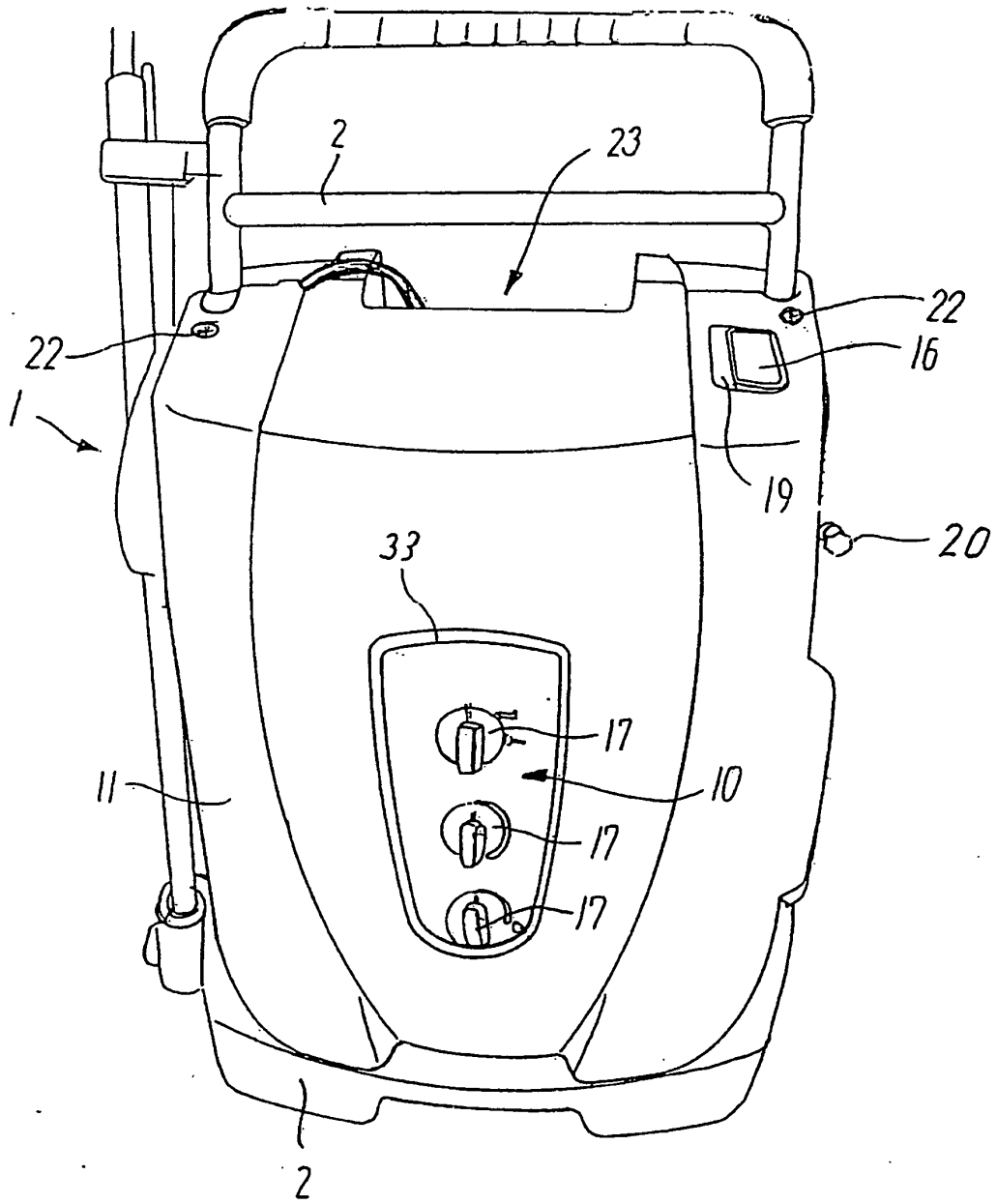


FIG. 1

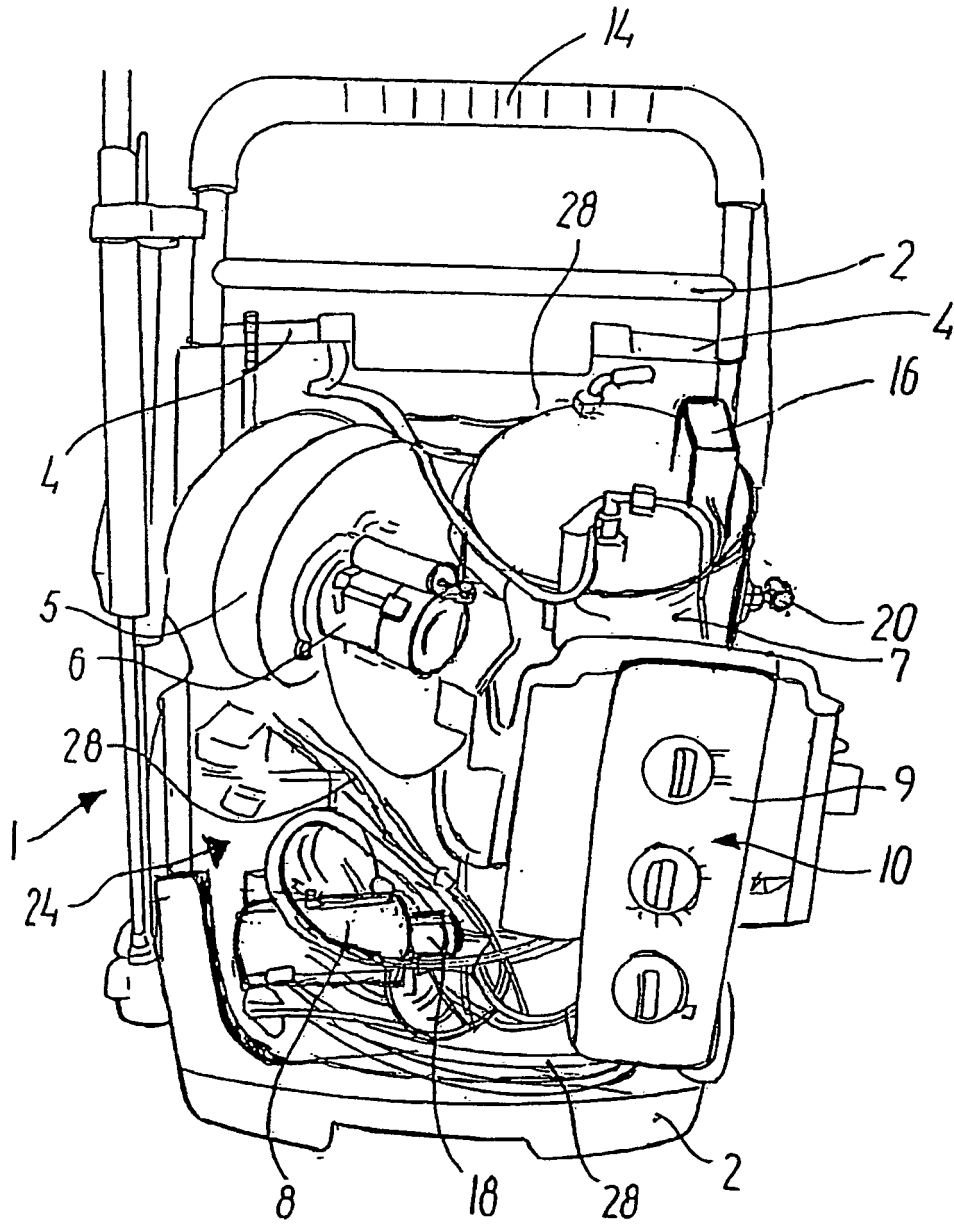


FIG. 2

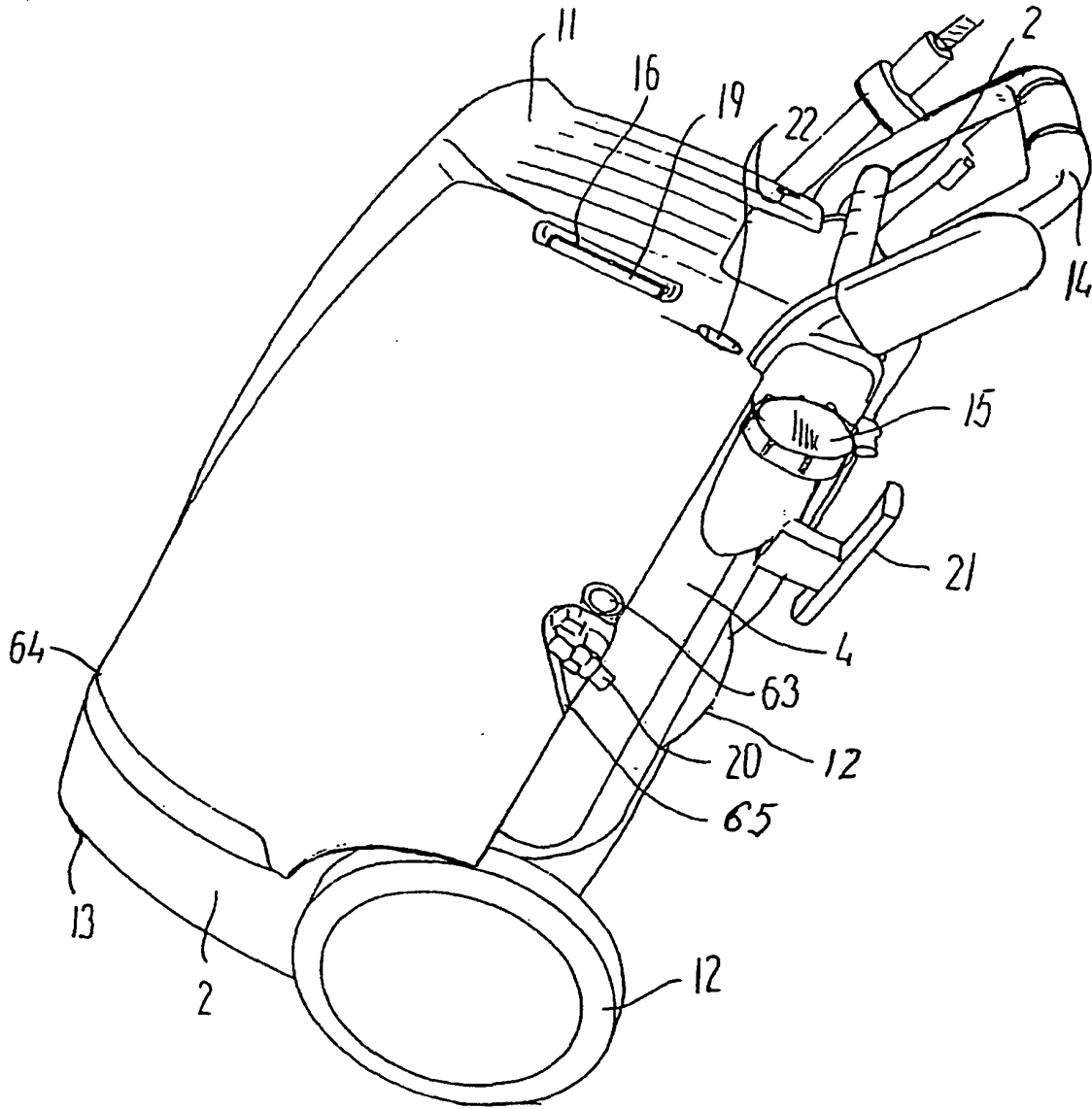


FIG. 3

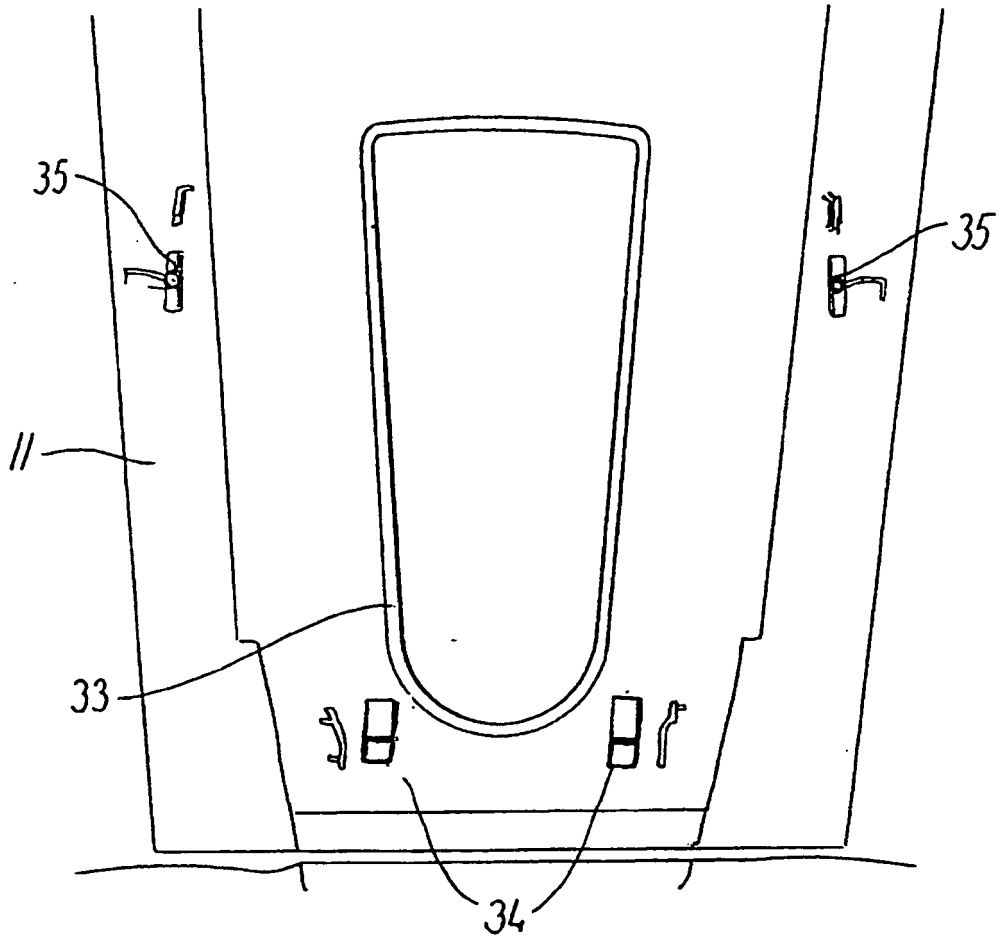


FIG.4

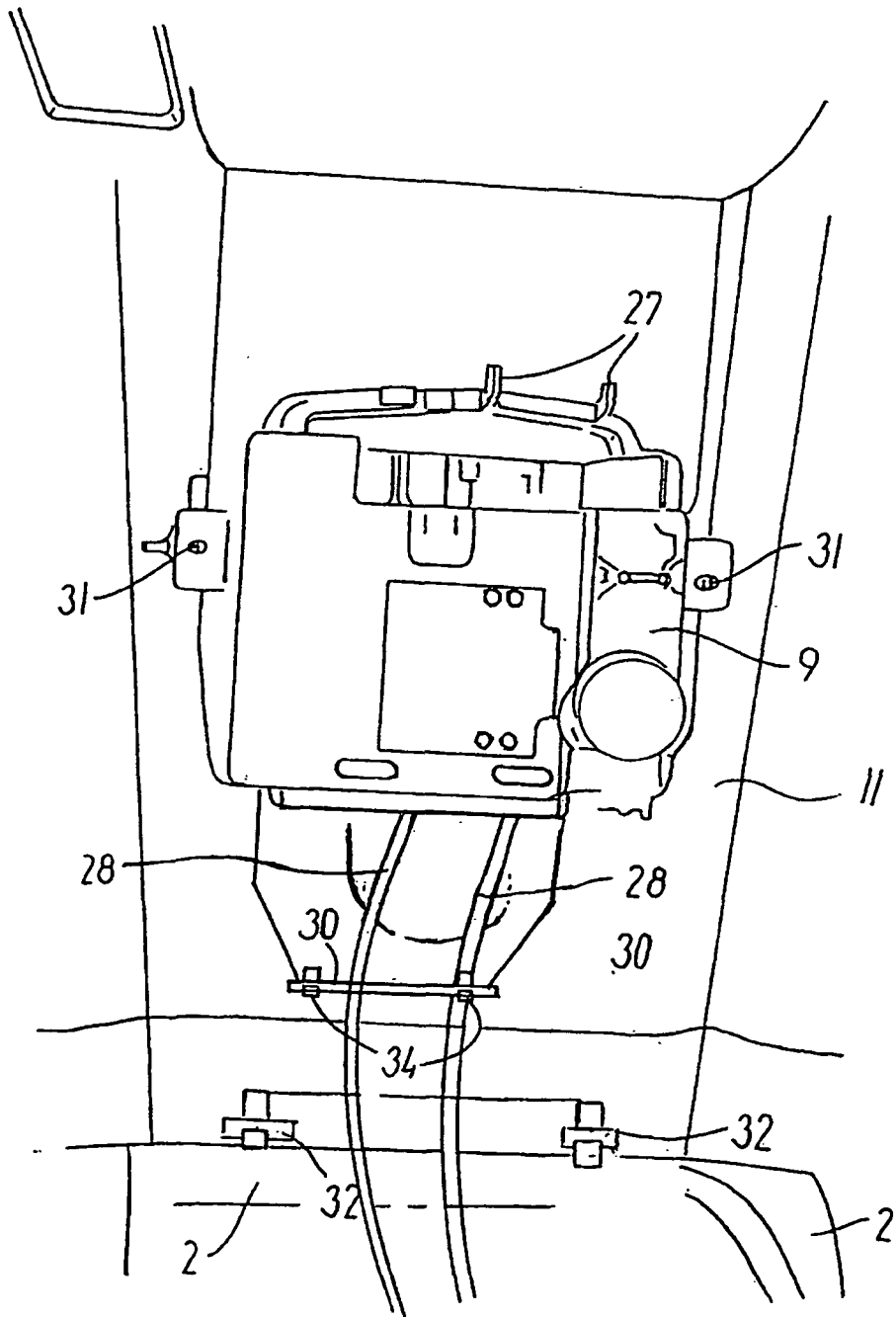


FIG.5

**REFERENCES CITED IN THE DESCRIPTION**

*This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.*

**Patent documents cited in the description**

- WO 03071915 A [0002]
- FR 2896681 A [0002]