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- **Sassner, Linda**
246 36 Löddeköpinge (SE)
- **Larsson, John**
212 12 Malmö (SE)
- **Bogert, Pontus**
215 62 Malmö (SE)
- **Sjöberg, Klas**
214 20 Malmö (SE)

(71) Applicant: **Dresser Wayne Aktiebolag**
200 61 Malmö (SE)

(74) Representative: **Henriksson, Dan Ragnar Mikael**
Awapatent AB
P.O. Box 5117
200 71 Malmö (SE)

(72) Inventors:
• **Larsson, Bengt I.**
274 53 Skivarp (SE)

(54) **Device for handling a hose, and a fuel dispensing unit comprising such device**

(57) A device (8) for handling a hose (7) is provided. The device (8) allows the hose (7) to be pulled out from a front opening of a hose storage space (2) and which device (8) is adapted to return the hose (7) to the hose storage space (2), said device (8) comprising a first hose guiding means (9) that is movably arranged in the hose storage space (2) and is adapted to move in a substantially vertical direction between an idle position in the upper portion of the hose storage space (2) and an operating position in the lower portion of the hose storage space (2). The device (8) is characterised by a second hose guiding means (10) that is fixedly arranged in the lower portion of the hose storage space (2). A fuel dispensing unit (1) comprising a device (8) for handling a hose is also provided.

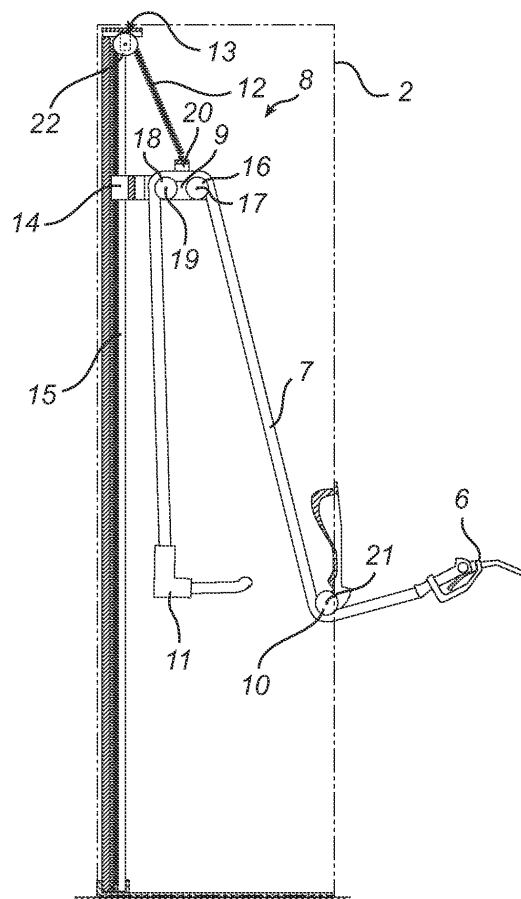


Fig. 3a

Description

Technical field

[0001] The present invention relates to a device for handling a hose, which device allows the hose to be pulled out from a front opening of a hose storage space and which device is adapted to return the hose to the hose storage space, said device comprising a first hose guiding means that is movably arranged in the hose storage space and is adapted to move in a substantially vertical direction between an idle position in the upper portion of the hose storage space and an operating position in the lower portion of the hose storage space. Further, the present invention relates to a fuel dispensing unit comprising a device for handling a hose.

Technical background

[0002] A fuel dispensing unit, such as a petrol pump typically comprises a pump part standing on the ground, a display part positioned above the pump part and showing the chosen type of petrol, cash readout, volume readout etc., and a column to which one or more petrol hoses are connected.

[0003] When the tank of a vehicle is to be filled up, the driver parks the vehicle beside the petrol pump and opens the cover or cap of the petrol tank. The driver then selects the desired type of petrol and places the pump nozzle in the inlet of the vehicle's petrol tank and puts in the desired volume of petrol.

[0004] A difficulty that may arise in connection with filling-up is that the hose does not reach to the vehicle if parked a distance from the petrol pump. The reason why the vehicle has not been parked sufficiently close to the pump may be difficulty in manoeuvring owing to a limited space round the petrol pump. To allow the hose to reach the vehicle, it is usually necessary for the driver to park his vehicle so that the side of the vehicle where the filler cap is positioned faces the petrol pump. It is not always known to a driver of an unfamiliar vehicle whether the filler cap is positioned on the left or right side. This may result in the driver by mistake parking the vehicle on the wrong side of the pump and thus not being able to fill up the tank without moving the vehicle to the other side of the petrol pump since the hose does not reach all the way round the vehicle.

[0005] One way of facilitating access to the petrol pump is to provide it with a longer hose. This may, however, cause problems since a longer hose may tend to land on the ground when not used and thus get stuck in or be damaged by passing cars or other vehicles. To prevent this, the column may be provided with some kind of returning mechanism for the hose.

[0006] US4131218 discloses hose returning means for a fuel dispensing unit.

According to the embodiment shown in Fig. 11 the hose is connected to a fuel supply connection arranged inside

the housing and passes a floatingly suspended roller which is connected to a wire reel. When the hose is pulled, the roller is lowered in order to make more hose available for the user.

[0007] WO00/15542 discloses a hose storing device in which a flexible hose is passed over a roller which is accommodated in a housing in such manner as to be movable against a return force in substantially vertical direction.

[0008] A problem common for the hose returning devices described above is their size, or their extension within respective hose housings, which results in bulky and complicated structures.

Summary of the Invention

[0009] In view of the foregoing, it is an object of the present invention to provide a more efficient and space effective way for handling a hose.

[0010] This and other objects and advantages that will be apparent from the following description of the present invention are achieved according to a first aspect of the invention by a device for handling a hose, which device allows the hose to be pulled out from a front opening of a hose storage space and which device is adapted to return the hose to the hose storage space, said device comprising a first hose guiding means that is movably arranged in the hose storage space and is adapted to move in a substantially vertical direction between an idle position in the upper portion of the hose storage space and an operating position in the lower portion of the hose storage space. The device is characterised by a second hose guiding means that is fixedly arranged in the lower portion of the hose storage space. This is advantageous in that a robust and space-saving device is provided, which enables a smooth and flexible handling of the hose.

[0011] The first hose guiding means may have a shaft connecting it to said hose storage space by means of grooves on either side of the first hose guiding means, whereby the first hose guiding means is pivotable and movable in said grooves. This is advantageous in that the hose is prevented from moving in a lateral direction in the hose storage space. Thus, problems regarding hoses and cables getting entangled with each other within the hose storage space are eliminated.

[0012] A spring element may be arranged to move the first hose guiding means from the operating position to the idle position, which is advantageous in that a simple construction is utilized.

[0013] One end of the spring element may be attached to the lower portion of the device, the second end of the spring element is attached to the first hose guiding means, and the spring element is guided by a guiding component arranged at the upper portion of the device. This is advantageous in that a relatively long spring element is used, thereby enabling a relatively long extension of the spring element.

[0014] The second end of the spring element may be

connected to the first guiding means at a predetermined distance from a side wall of the hose storage space in a forward direction in relation to a hose extraction direction. This is advantageous in that a greater width of the hose storage space is used.

[0015] The spring element may be a rubber band, which is advantageous in that it comprises suitable elastic characteristics.

[0016] The first hose guiding means may comprise a roller, which is advantageous in that the first hose guiding means may be manufactured in a simpler and more cost-effective way.

[0017] The second hose guiding means may comprise a roller, which is advantageous in that the second hose guiding means may be manufactured in a simpler and more cost-effective way.

[0018] The roller of the second hose guiding means may be rotatable about a hollow shaft, and the hollow shaft is adapted to receive pipes or electrical cables, which is advantageous in that said pipes and electrical cables will not risk getting entangled with each other or with other elements within the hose storage space.

[0019] The hose connection may be arranged in the lower portion of the hose storage space, which is advantageous in that nearly the entire hose can be pulled out of the hose storage space, giving the customer a possibility to use a greater part of the hose length.

[0020] The guiding component may comprise a rotating means which is advantageous in that the spring element is guided in an efficient manner.

[0021] The first hose guiding means may comprise a first roller being rotatable around a first shaft, a second roller being rotatable around a second shaft and a sleeve located between said first and second roller and adapted to enclose the hose. This is advantageous in that the hose is prevented from derailing from the hose guiding means thereby ensuring a more secure handling of the hose.

[0022] The first hose guiding means may comprise a foldable arm, which is advantageous in that the hose will be prevented from moving in a lateral direction.

[0023] The second hose guiding means may comprise a guide bar, which is advantageous in that the second hose guiding means may be manufactured in a simpler and more cost-effective way.

[0024] A guiding sleeve may be arranged at the second hose guiding means to enclose the hose and guide it into engagement with the second hose guiding means. This is advantageous in that the hose is prevented from derailing from the second hose guiding means thereby ensuring a more secure handling of the hose.

[0025] The second hose guiding means may be arranged forward of the first hose guiding means in the hose storage space, which is advantageous in that the hose is kept within the hose storage space before it exits from the second hose guiding means.

[0026] According to a second aspect of the invention, a fuel dispensing unit comprising a device for handling a

hose according to the first aspect of the invention is provided.

Brief description of the drawings

[0027] The invention will now be described in more detail with reference to the accompanying schematic drawings, which shows examples of presently preferred embodiments of the invention.

Fig. 1 is a front view of one embodiment of a fuel dispensing unit according to the second aspect of the present invention.

Fig. 2 is a perspective view of a first embodiment of a device for handling a hose according to the first aspect of the invention.

Fig. 3a and 3b shows the device for handling a hose in Fig. 2.

Fig. 4 shows the device for handling a hose according to the first aspect of the invention with an alternative embodiment of the second hose guiding means.

Fig. 5 shows another embodiment of the device for handling a hose according to the first aspect of the invention.

Fig. 6a-6c shows yet another embodiment of the device for handling a hose according to the first aspect of the invention.

Detailed description of preferred embodiments

[0028] Fig. 1 shows a fuel dispensing unit 1, having eight hose storage spaces 2, an electrical cabinet 3 containing all the electronics for the fuel dispensing unit 1, a hydraulic cabinet 4 containing fuel dispensing means (not shown), e.g. fuel metering means, valves, vapour recovery system etc, and a column 5 extending vertically between and separating the electrical cabinet 3 and the hydraulic cabinet 4 from the hose storage spaces 2. The fuel dispensing unit 1 is connected to an underground fuel container (not shown). When filling up the tank of a vehicle, the fuel is pumped from the underground container by means of a pump (not shown) which is located in the hydraulic cabinet 4, and from there to the column 5 and out to a nozzle 6 via a fuel hose 7. When filling-up does not take place, the fuel hose 7 is accommodated in a hose storage place 2 and the nozzle 6 is inserted in a nozzle boot. The hose 7 is handled by a hose handling device 8 according to the invention, which is arranged in every hose storage space 2. The electronics located in the electrical cabinet 3, such as means for choosing the desired type of fuel and display means for showing the chosen type of fuel, the volume of dispensed fuel etc, are securely isolated in order to encapsulate electronic components from possible presence of flammable gases. The electronics can also include a payment terminal.

[0029] Fig 2 shows a device 8 for handling a hose 7 according to a first embodiment of the first aspect of the

invention.

[0030] In Fig. 3a, a device 8 for handling a hose 7 is shown, when said hose 7 is in a retracted position. The device 8 which is located in a storage space 2 comprises a first hose guiding means 9, a second hose guiding means 10, a hose connection 11, a spring element 12 and a guiding component 13. The first hose guiding means 9 has a shaft 14 connecting it to said hose storage space 2 by means of grooves 15 on either side of the first hose guiding means 9, whereby the first hose guiding means 9 is pivotable and movable in a substantial vertical direction. The first hose guiding means 9 comprises a first roller 16 being rotatable around a first shaft 17, a second roller 18 being rotatable around a second shaft 19 and a sleeve 20 located between said first and second roller 16, 18 and adapted to enclose the hose 7. When the hose 7 is in its retracted position the first hose guiding means 9 is located in the upper portion of the hose storage space 2. The second hose guiding means 10 comprises a roller and is fixedly arranged in the lower portion of the hose storage space 2. The roller of the second hose guiding means 10 is rotatable about a hollow shaft 21, and the hollow shaft 21 is adapted to receive pipes or electrical cables. The second hose guiding means 10 is arranged forward of the first hose guiding means 9 in the hose storage space 2. The hose connection 11 is arranged in the lower portion of the hose storage space. The spring element 12 is arranged to move the first hose guiding means 9 from the operating position to the idle position. One end of the spring element 12 is attached to the lower portion of the hose storage space 2 and the second end of the spring element 12 attached to the first hose guiding means 9. The spring element 12 is guided by the guiding component 13 which is arranged at the upper portion of the hose storage space 2. The guiding component 13 comprises a rotating means 22, such as a roller.

[0031] Fig. 3b shows the device 8 for handling a hose 7, when said hose 7 is in an extracted position. The first hose guiding means 9 is located in the lower part of the hose storage space 2 below the second hose guiding means 10 when the hose 7 is fully extracted. The spring element 12 is extended and applies a force upwards in a vertical direction on the first hose guiding means 9 and thus also on the hose 7.

[0032] In Fig. 4, an alternative embodiment of the second hose guiding means 10 is shown. In this embodiment, the second hose guiding means 10 comprises a guide bar.

[0033] Fig. 5 shows another embodiment of the device 8 for handling a hose 7 according to the first aspect of the invention. In this embodiment, the first guiding means 9 comprises a roller. A line drawn from the shaft 14 connecting the roller to the hose storage space 2 and the shaft carrying the roller creates an angle α together with the adjacent wall of the hose storage space 2. When the first hose guiding means 9 is in the idle position, the angle α preferably lies in a range between 45 and 120 degrees

and is more preferably about 90 degrees. However, when the first hose guiding means 9 move downward from the idle position towards the operating position, the angle α decreases rapidly. Accordingly, when the angle α has decreased a certain amount, the hose 7 will abut against the adjacent side wall of the hose storage space 2 and be pressed between said side wall and the first hose guiding means 9. Thus, the hose 7 helps preventing the first guiding means 9 from lateral movement. As shown in Fig. 5, the second hose guiding means 10 may be attached to the lower end of the nozzle boot. Also, the second hose guiding means 10 may be integral with the nozzle boot.

[0034] The first hose guiding means 9 is maintained in the idle position by means of the spring element 12, due to the fact that the weight of the first hose guiding means 9 together with the weight of the hose 7 is not sufficient enough to stretch the spring element 12. Accordingly, when the first hose guiding means 9 is in its idle position, the hose 7 is in a retracted position. In the retracted position, the hose 7 extends upwards from the hose connection 11, over the first hose guiding means 9, and downwards under the second hose guiding means 10.

[0035] When a user pulls the hose 7, the pulling force will cause the first hose guiding means 9 to move downward from the idle position as shown in Fig. 3b, thereby extending the spring element 12. The first hose guiding means 9 slides vertically in a downward direction in the grooves 15 in the hose storage space 2. When the hose 7 is in its extracted position, the first hose guiding means 9 is in its operating position and the hose 7 extends from the hose connection 11, over the first hose guiding means 9, and under the second hose guiding means 10.

[0036] When the user releases the pulling force on the hose 7, the spring element 12 will contract and consequently, the first hose guiding means 9 will be allowed to slide vertically in an upward direction in the grooves 15 in the hose storage space 2 to the idle position.

[0037] The components in the device 8 for handling a hose 7 and in the fuel dispensing unit 1 comprising such device 8 may vary in many different ways regarding size and shape.

[0038] The spring element may be of any type known per se, such as a rubber band, a coil spring or a gas spring. Moreover, the spring element may be a line reel or a rotating wheel connected to a spring. In one embodiment, one end of the spring element 12 may be attached to the upper portion of the hose storage space 2 and the other end directly to the first hose guiding means 9.

[0039] The spring element 12 may also be attached to other places within the hose storage space 2. In one embodiment the spring element 12 is connected to the hose storage space 2 next to the second hose guiding means 10 or at the bottom of the hose storage space 2. The spring element 12 then runs in a vertical direction to a first upper corner of the hose storage space 2 and over a first guiding component located in this first upper corner, along the top of the hose storage space 2 to a second

upper corner of the hose storage space 2 and over a second guiding component located in this second upper corner, in order to connect with the first hose guiding means 9. Also, one end of the spring element 12 may be attached to the upper portion of the hose storage space 2 and the other end of the spring element 12 to the first hose guiding means 9.

[0040] The first hose guiding means 9 may be a roller and the second hose guiding means 10 may be a roller or a guide bar. In one embodiment, a guiding sleeve is arranged at the second hose guiding means 10 to enclose the hose 7 and guide it into engagement with the second hose guiding means 10.

[0041] In Fig. 6a-6c, yet another embodiment of the device 8 for handling a hose 7 according to the first aspect of the invention is shown. In this embodiment, the first hose guiding means 9 is a foldable arm which is connected to the hose 7 by means of a sleeve. A spring element 12 is attached between the sleeve and the hose storage space 2. When a user pulls the hose 7, the pulling force will at first cause the foldable arm to fold and then to follow the hose 7 in a substantially vertical direction towards the second hose guiding means 10, thereby extending the spring element 12. When the user releases the pulling force on the hose 7, the spring element 12 will contract and consequently, the foldable arm will return to its idle position. The fuel dispensing unit 1 can be equipped with a various number of storage spaces 2 comprising the device 8 for handling a hose 7. However, in the preferred embodiment of the present invention the fuel dispensing unit 1 comprises eight hose storage spaces 2, four on each opposing side, and thus eight devices 8 for handling eight hoses 7, four on each opposing side.

[0042] The skilled person realises that a number of modifications of the embodiments described herein are possible without departing from the scope of the invention, which is defined in the appended claims.

Claims

1. A device (8) for handling a hose (7), which device (8) allows the hose (7) to be pulled out from a front opening of a hose storage space (2) and which device (8) is adapted to return the hose (7) to the hose storage space (2), said device (8) comprising a first hose guiding means (9) that is movably arranged in the hose storage space (2) and is adapted to move in a substantially vertical direction between an idle position in the upper portion of the hose storage space (2) and an operating position in the lower portion of the hose storage space (2), **characterised by** a second hose guiding means (10) that is fixedly arranged in the lower portion of the hose storage space (2).
2. A device (8) according to claim 1, wherein the first hose guiding means (9) has a shaft (14) connecting it to said hose storage space (2) by means of grooves (15) on either side of the first hose guiding means (9), whereby the first hose guiding means (9) is pivotable and movable in said grooves (15).
3. A device (8) according to any one of the claims 1 or 2, wherein a spring element (12) is arranged to move the first hose guiding means (9) from the operating position to the idle position.
4. A device (8) according to claim 3, wherein one end of the spring element (12) is attached to the lower portion of the hose storage space (2), the second end of the spring element (12) is attached to the first hose guiding means (9), and the spring element (12) is guided by a guiding component (13) arranged at the upper portion of the hose storage space (2).
5. A device (8) according to any one of the claims 3 or 4, wherein the second end of the spring element (12) is connected to the first guiding means (9) at a predetermined distance from a side wall of the hose storage space (2) in a forward direction in relation to a hose extraction direction.
6. A device (8) according to any one of the claims 3-5, wherein the spring element (12) is a rubber band.
7. A device (8) according to any one of the preceding claims, wherein the first hose guiding means (9) comprises a roller.
8. A device (8) according to any one of the preceding claims, wherein the second hose guiding means (10) comprises a roller.
9. A device (8) according to claim 8, wherein the roller of the second hose guiding means (10) is rotatable about a hollow shaft (21), and the hollow shaft (21) is adapted to receive pipes or electrical cables.
10. A device (8) according to any one of the preceding claims, wherein a hose connection (11) is arranged in the lower portion of the hose storage space (2).
11. A device (8) according to any one of the claims 4-10, wherein the guiding component comprises a rotating means (22).
12. A device (8) according to any one of the claims 1-6, wherein the first hose guiding means (9) comprises a first roller (16) being rotatable around a first shaft (17), a second roller (18) being rotatable around a second shaft (19) and a sleeve (20) located between said first and second roller (16, 18) and adapted to enclose the hose (7).
13. A device (8) according to any one of the claims 1-6,

wherein the first hose guiding means (9) is a foldable arm.

14. A device (8) according to any one of claims 1-7,
wherein the second hose guiding means (10) comprises a guide bar. 5
15. A device (8) according to any one of the preceding
claims, wherein a guiding sleeve is arranged at the
second hose guiding means (10) to enclose the hose 10
(7) and guide it into engagement with the second
hose guiding means (10).
16. A device (8) according to any one of the preceding
claims, wherein the second hose guiding means (10) 15
is arranged forward of the first hose guiding means
(9) in the hose storage space (2).
17. A fuel dispensing unit, such as a petrol pump, **characterised in that** it comprises a device (8) for handling a hose (7) as claimed in any one of claims 1-16. 20

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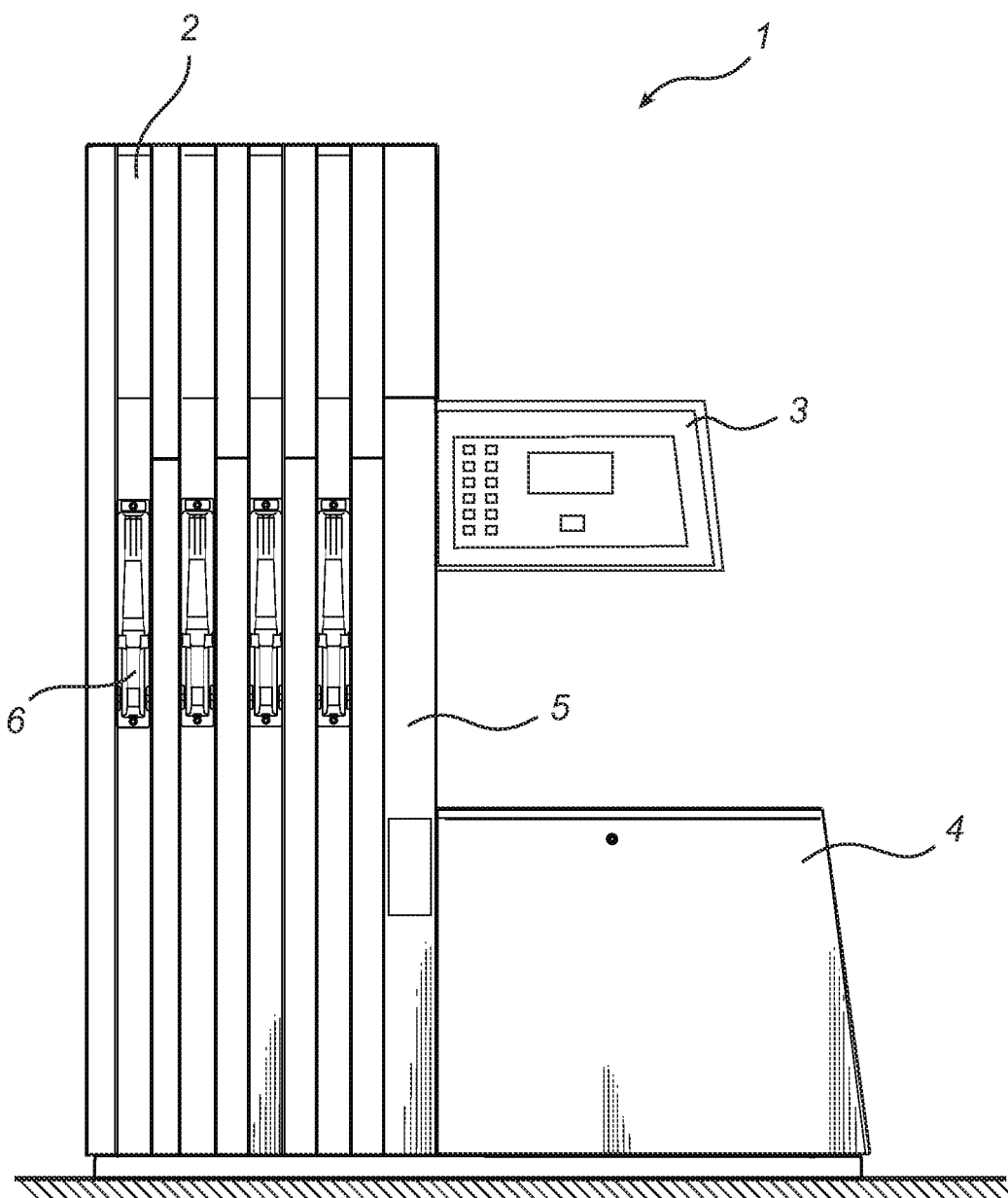
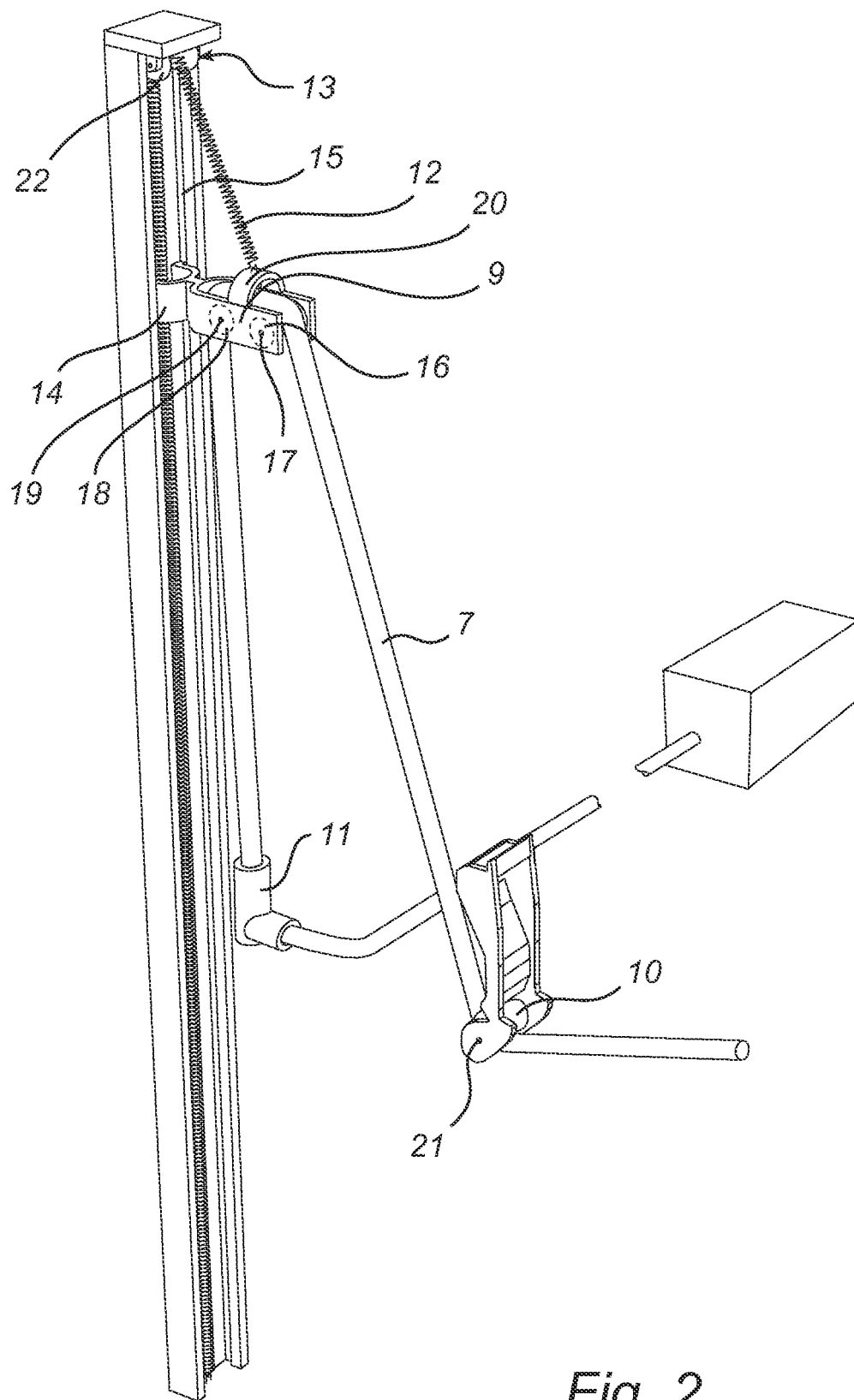
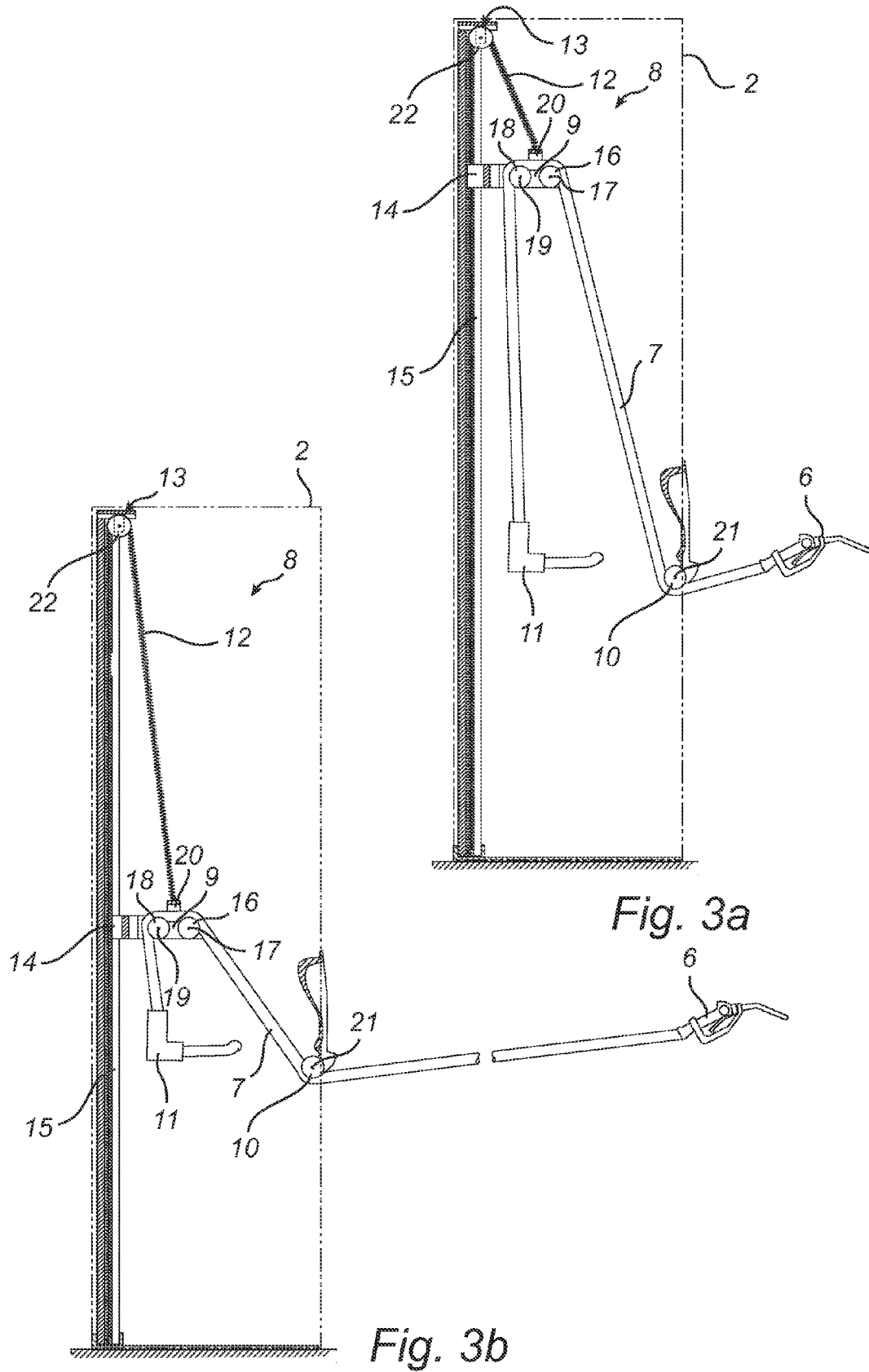


Fig. 1





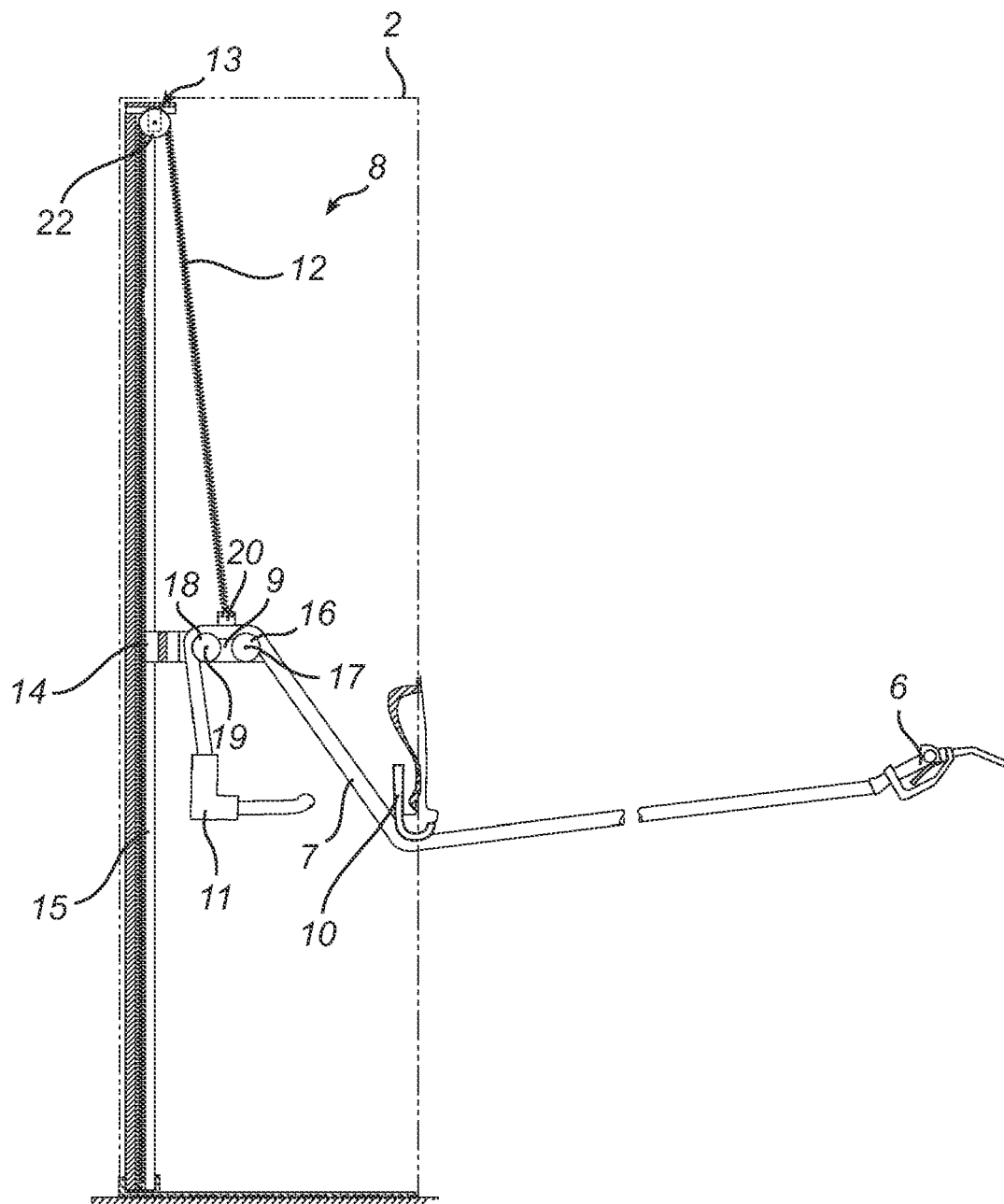


Fig. 4

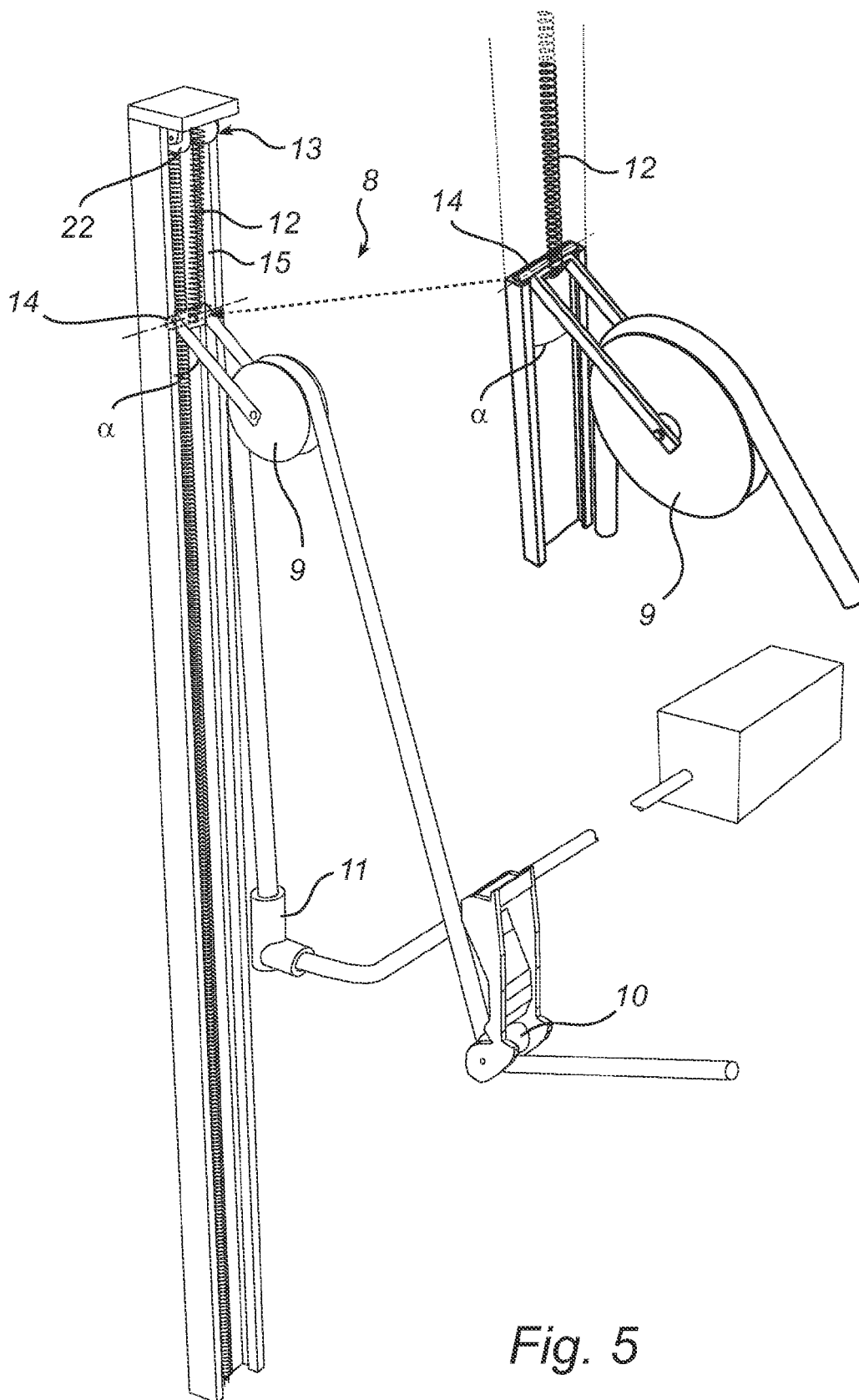
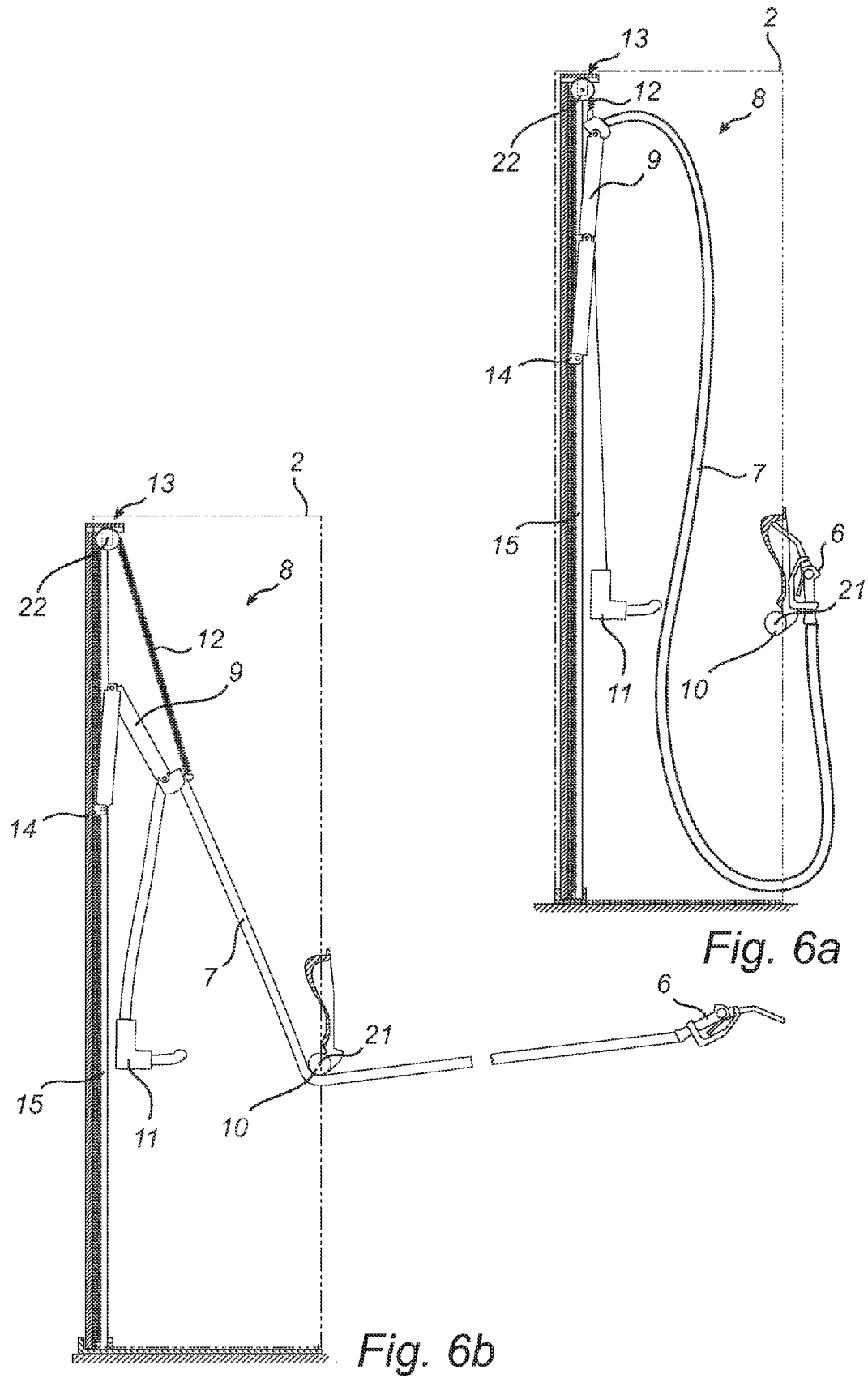


Fig. 5



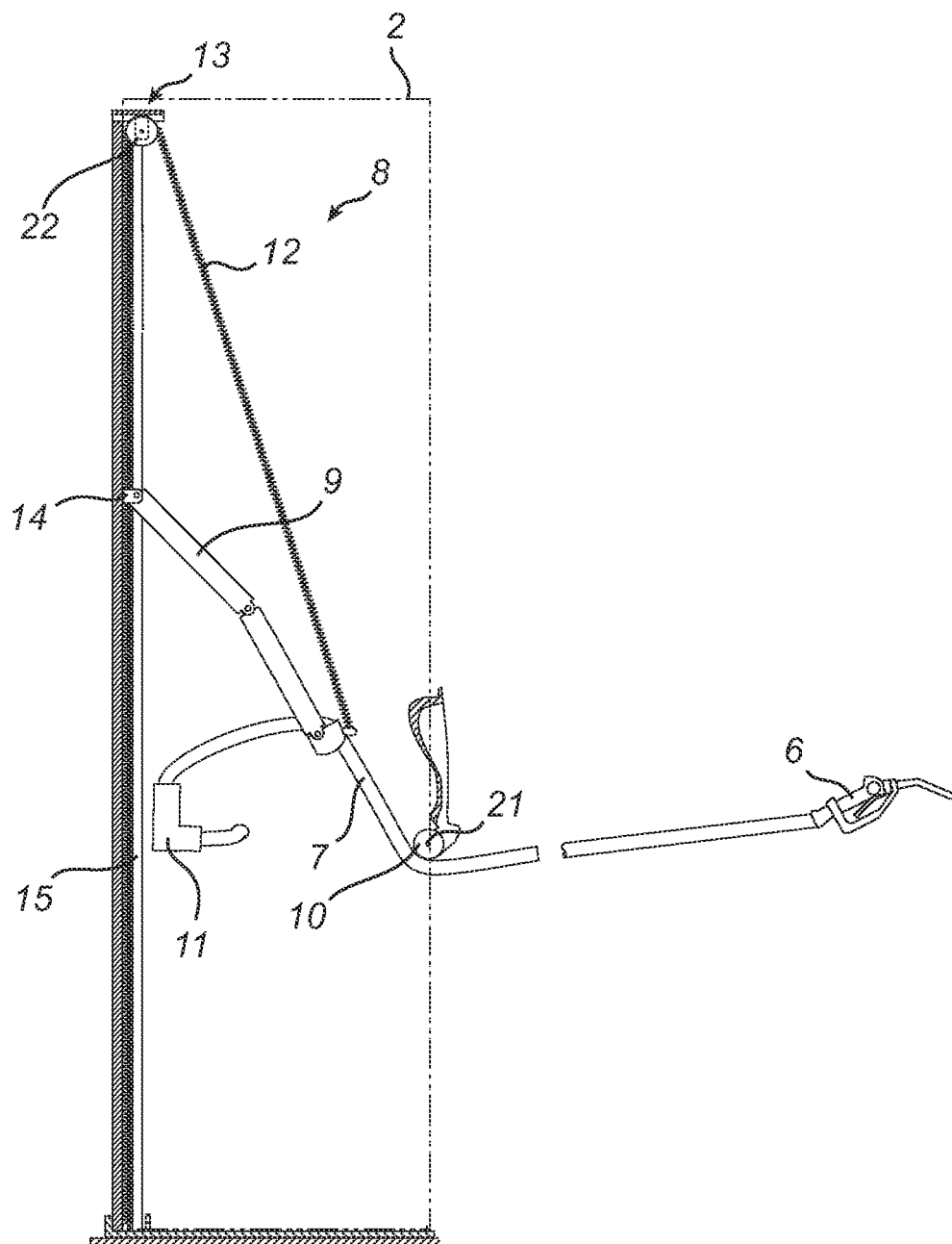


Fig. 6c



EUROPEAN SEARCH REPORT

Application Number
EP 08 16 3885

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 13 July 2009	Examiner Desittere, Michiel
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 08 16 3885

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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