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

(57) A device for handling a hose is provided. The device (1) allows the hose (3) to be pulled out from a hose storage space (5) and is adapted to return the hose (3) to the hose storage space (5), said device comprising a hose guiding means (7) having a carrier means (9) including a first roller (11) being rotatable around a first axis (13), and a second axis (17) connecting the hose guiding means (7) to said hose storage space (5), the hose guiding means (7) being vertically moveable in said hose storage space (5). The device (1) is **characterised in that** the second axis (17) is arranged at a fixed distance from the first axis (13) of the first roller (11); and that the hose guiding means (7) is pivotable around said second axis (17). A method for handling a hose and a fuel dispensing unit comprising a device for handling a hose are also provided.

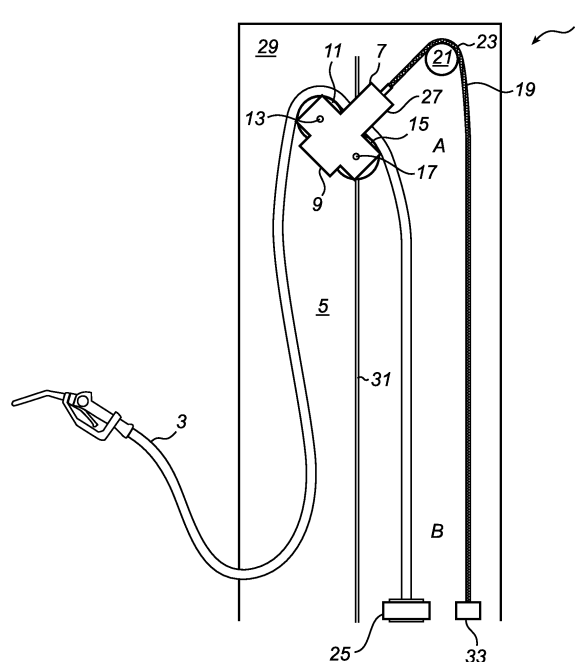


Fig. 2a

Description

Technical Field of the invention

[0001] The present invention relates to a device for handling a hose, which device allows the hose to be pulled out from a hose storage space and is adapted to return the hose to the hose storage space, said device comprising a hose guiding means having a carrier means including a first roller being rotatable around a first axis, and a second axis connecting the hose guiding means to said hose storage space, the hose guiding means being vertically moveable in said hose storage space. Further, the present invention relates to a fuel dispensing unit comprising a device for handling a hose. The present invention also relates to a method for handling a hose.

Background Art

[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] US6334457 discloses a hose management system according to which two pulleys are respectively mounted for rotation to at least one pair of telescoping members. A hose extends around the pulleys, so that movement of the hose causes the pulleys move relative to each other, and the telescoping member to extend and retract in response to the movement of the pulleys.

[0008] 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.

[0009] 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

[0010] 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.

[0011] 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 hose storage space and is adapted to return the hose to the hose storage space, said device comprising a hose guiding means having a carrier means including a first roller being rotatable around a first axis, and a second axis connecting the hose guiding means to said hose storage space, the hose guiding means being vertically moveable in said hose storage space. The device is **characterised in that** the second axis is arranged at a fixed distance from the first axis of the first roller, and that the hose guiding means is pivotable around said second axis. This is advantageous in that a robust and space-saving device is provided, which enables a smooth and flexible handling of the hose.

[0012] The carrier means may have a second roller. This is advantageous in that the bend of the hose is smoother and the risk of fracturing the hose is minimized.

[0013] The second roller may have a rotational axis that coincides with the second axis, which is advantageous in that the hose guiding means may be manufactured in a simpler and more cost-effective way.

[0014] The hose guiding means may further comprise a hose enclosing means. Thus, the hose is prevented from derailing from the hose guiding means thereby ensuring a more secure handling of the hose.

[0015] The hose guiding means may be moveable between an idle position at the upper portion of the device and an operating position below said idle position, which is advantageous in that a greater part of the hose length

is available to a user.

[0016] A spring element may be arranged to move the hose guiding means from the operating position to the idle position. Thus, a simple construction is utilized.

[0017] 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 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.

[0018] The guiding component may comprise a rotating means which is advantageous in that the spring element is guided in an efficient manner.

[0019] One end of the spring element may be attached to the upper portion of the device, and the second end of the spring element is attached to the hose guiding means. This is advantageous in that a simple construction is utilized.

[0020] The second end of the spring element may be attached to a centre position of the hose guiding means. Thus, the spring load is distributed uniformly over the hose guiding means. The device may further comprise a hose connecting means arranged at the lower portion of the device. This is advantageous in that a greater hose length is available to a user.

[0021] According to a second aspect of the invention, a method for handling a hose is provided. The method, in which the hose for use is pulled out from a hose storage space and after use is returned to said hose storage space, by moving a hose guiding means vertically in said hose storage space, said hose guiding means having a carrier means including a first roller being rotatable around a first axis, and a second axis connecting the hose guiding means to said hose storage space, is characterised in arranging the second axis at a fixed distance from the first axis of the first roller, and pivoting the hose guiding means around said second axis. The advantages of the first aspect are also applicable for this second aspect of the invention.

[0022] The hose guiding means may be moved between an idle position at the upper portion of the device and an operating position below said idle position.

[0023] According to a third 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. The fuel dispensing unit may comprise a bottom part, a top part and at least one column extending between the bottom part and the top part, wherein the column comprises the device for handling the hose. In that way, the device for handling the hose is efficiently incorporated in the fuel dispensing unit.

[0024] The column may comprise a first device for handling the hose arranged on one side of the column and a second device for handling the hose arranged on the opposite side of the column, which is advantageous in that two users simultaneously can use a device according

to the first aspect of the invention.

Brief Description of the Drawings

[0025] 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.

[0026] Fig. 1 is a perspective view of an embodiment of a fuel dispensing unit according to the third aspect of the present invention.

[0027] Fig. 2a, 2b and 2c show a device according to the first aspect of the invention.

[0028] Fig. 3 is an exploded perspective view of one embodiment of a hose guiding means.

[0029] Fig. 4 is a perspective view of the hose guiding means shown in fig. 3.

Detailed Description of Preferred Embodiments

[0030] Fig. 1 shows a fuel dispensing unit 100, having a bottom part 101, a top part 102 and two columns 103 extending between the bottom part 101 and the top part 102. The fuel dispensing unit 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 bottom part 101, and from there to one of the columns 103 and out to a nozzle 2 via a fuel hose 3. When filling-up does not take place, the fuel hose 3 is accommodated in a hose storage place 5 and the nozzle 2 is inserted in a nozzle boot. The hose 3 is handled by a hose handling device 1 according to the invention arranged at each column 103.

[0031] Except for the pump, the bottom part 101 also houses fuel dispensing means (not shown), e.g. fuel metering means, valves, vapour recovery system etc. Pump electronics are further located in the bottom part 101. Such electronics, 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 pump electronics can also include a payment terminal.

[0032] Fig. 2a, 2b and 2c show the device 1 for handling a petrol hose 3 in more detail. In fig. 2a, 2b and 2c, the device 1 has a hose storage space 5 which is formed by two opposite profiles 29, of which only one profile is shown, and the profiles 29 extends vertically along the column (not shown). The device 1 has a hose guiding means 7 which is attached to the profiles 29 in such way that an axis 17 of the hose guiding means 7 is fitted to two grooves 31, each groove 31 extending vertically in the profiles 29. The hose guiding means 7 is vertically slidable in the grooves 31 by means of the axis 17, and a spring element 19 is further provided in order to facilitate such sliding movement. One end of the spring element 19 is connected to the hose guiding means 7 and the

other end of the spring element 19 is fastened at a fastening means 33 arranged at the lower portion of the device. A hose 3 is connected to a hose connecting means 25 arranged at the lower portion of the device 1. The hose connecting means 25 is further connected to a fuel pump (not shown). The hose 3 extends upwardly from the hose connecting means 25, is guided by the hose guiding means 7, and changes direction to extend downwardly, thus forming an inverted U-shape.

[0033] Further, fig. 2a, 2b and 2c show the device 1 during operation, i.e. when handling a hose 3. Starting with fig. 2a, the hose guiding means 7 is in an idle position A. The hose guiding means 7 is maintained in the idle position A by means of the spring element 19, due to the fact the weight of the hose guiding means 7 together with the hose weight 3 is not sufficient enough to stretch the spring element 19. The hose guiding means 7 is pivotable around the axis 17, and when there is no external load on the hose 3, i.e. when the hose guiding means 7 is in the idle mode A, the hose guiding means 7 is tilted so that the first roller 11 is at a position which is vertically above the position of the second roller 15. The tilt angle is preferably between 10 and 60 degrees.

[0034] When a user pulls the hose 3, the pulling force will cause the hose guiding means 7 to move downward from the idle position A as shown in fig. 2b, thereby extending the spring element 19. The hose guiding means 7 slides in the grooves 31 in each profile 29. During the downwardly movement, the tilt angle of the hose guiding means will be reduced, as indicated in fig. 2b.

[0035] As shown in fig. 2c, the pulling force causes the spring element 19 to extend further so that the hose guiding means 7 will eventually be in an operating position B where maximum hose length is available to the user. When the hose guiding means 7 is in the operating position, the tilt angle is further reduced so that the hose guiding means is oriented substantially horizontal.

[0036] When the user releases the pulling force on the hose 3, the spring element 19 will be relaxed and consequently, the hose guiding means 7 will be allowed to move upwards towards the idle position A. During the upwardly movement of the hose guiding means 7, the tilt angle of the hose guiding means will gradually increase until the hose guiding means 7 reaches the idle position A.

[0037] When the hose guiding means 7 is arranged in the idle position A, the tilt of the hose guiding means 7 provides that the hose 3 is positioned inside the hose storage space 5. Further, the tilt angle of the hose guiding means 7 is preferable since it allows for storing more hose 3 inside the hose storage space 5.

[0038] A stopping means (not shown) can be arranged at the operating position B, so that the hose guiding means 7 is prevented from moving any further. Thus, the spring element 19 is protected from excessive load. Such stopping means may be a stop lug, or a termination of the grooves 31.

[0039] The guiding component 21 may be a rotating

means, such as a roller or any other suitable means known per se.

[0040] Again, with reference to fig. 2a, 2b, and 2c, the spring element 19 can be arranged without the need of the guiding component 21. In such case, one end of the spring element is connected to the hose guiding means 7, and the other end is connected to a connecting means (not shown) in the upper part of the device 1.

[0041] 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.

[0042] The hose guiding means will now be further described. As shown in fig 3, the hose guiding means 7 has a carrier means 9 and a hose enclosing means 27 formed as a single body. The hose enclosing means 27 allows the hose to be fixedly arranged to the hose guiding means 7. The first roller 11 is mounted to the carrier means 9 by means of a rotational through axis 13 which is fastened to the carrier means 9 by bolts or rivets (not shown). The second roller 15 is correspondingly mounted to the carrier means 9 by means of a rotational through axis 17 which extends through the carrier means 9 so that the ends of the axis 17 are attachable to the grooves 29 as shown in fig. 2a, 2b and 2c. The hose guiding means 7 further comprises a pin 37 arranged at the upper part of the hose guiding means 7, for attaching the spring element 19 to it.

[0043] In order to achieve a compact hose guiding means that only occupies a small storage space, it is preferred that the rollers of the hose guiding means are small. Thus, it is preferred that the edge diameter (i.e. the outer or maximum diameter of the concavely shaped roller) of the first and second rollers 11, 15 is less than 50 mm, and it is particularly preferred that it is about 25-30 mm, such as 28 mm. Correspondingly, the distance between the rollers should preferably be as small as possible, and it is particularly preferred that the closest distance between the edges of the two rollers (the edge distance) is less than 5 mm, especially about 1 mm. Such compact dimensions of the hose guiding means makes it possible to accommodate it in a thin and shallow hose storage space.

[0044] Fig. 4 shows the assembled hose guiding means 7 of fig. 3.

Claims

1. A device (1) for handling a hose (3), which device allows the hose (3) to be pulled out from a hose storage space (5) and is adapted to return the hose (3) to the hose storage space (5), said device comprising a hose guiding means (7) having a carrier means (9) including a first roller (11) being rotatable around a first axis (13), and a second axis (17) connecting the hose guiding means (7) to said hose storage space (5), the hose guiding means (7) being vertically moveable in said hose storage space (5),

characterised in that

the second axis (17) is arranged at a fixed distance from the first axis (13) of the first roller (11); and that the hose guiding means (7) is pivotable around said second axis (17).

2. A device according to claim 1, wherein the carrier means (9) has a second roller (15). 5
3. A device according to claim 2, wherein the second roller (15) has a rotational axis that coincides with the second axis (17). 10
4. A device according to any one of claims 1-2, wherein the hose guiding means (7) further comprises a hose enclosing means (27). 15
5. A device according to any one of claims 1-4, wherein the hose guiding means (7) is moveable between an idle position (A) at the upper portion of the device (1) and an operating position (B) below said idle position (A). 20
6. A device according to claim 5, wherein a spring element (19) is arranged to move the hose guiding means (7) from the operating position (B) to the idle position (A). 25
7. A device according to claim 6, wherein one end of the spring element (19) is attached to the lower portion of the device (1), the second end of the spring element (19) is attached to the hose guiding means (7), and the spring element (19) is guided by a guiding component (21) arranged at the upper portion of the device (1). 30
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8. A device according to claim 7, wherein the guiding component (21) comprises a rotating means (23).
9. A device according to claim 6, wherein one end of the spring element (19) is attached to the upper portion of the device (1), and the second end of the spring element (19) is attached to the hose guiding means (7). 40
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10. A device according to any one of claims 7-9, wherein the second end of the spring element (19) is attached to a centre position of the hose guiding means (7).
11. A device according to any of the preceding claims, further comprising a hose connecting means (25) arranged at the lower portion of the device (1). 50
12. A method for handling a hose, in which the hose for use is pulled out from a hose storage space (5) and after use is returned to said hose storage space, by moving a hose guiding means (7) vertically in said hose storage space, said hose guiding means hav-

ing a carrier means (9) including a first roller (11) being rotatable around a first axis (13), and a second axis (17) connecting the hose guiding means (7) to said hose storage space (5),

characterised in

arranging the second axis (17) at a fixed distance from the first axis (13) of the first roller (11), and; pivoting the hose guiding means (7) around said second axis (17).

13. A method according to claim 12, wherein the hose guiding means (7) is moved between an idle position (A) at the upper portion of the device (1) and an operating position (B) below said idle position (A).
14. A fuel dispensing unit (100), such as a petrol pump, **characterised in that** it comprises a device (1) for handling a hose (3) as claimed in any one of claims 1-11.
15. A fuel dispensing unit according to claim 14, comprising a bottom part (101), a top part (102) and at least one column (103) extending between the bottom part (101) and the top part (102), wherein the column (103) comprises the device (1) for handling the hose (3).
16. A fuel dispensing unit according to claim 15, wherein the column (103) comprises a first device (1) for handling the hose (3) arranged on one side of the column (103) and a second device (1) for handling the hose (3) arranged on the opposite side of the column (103).

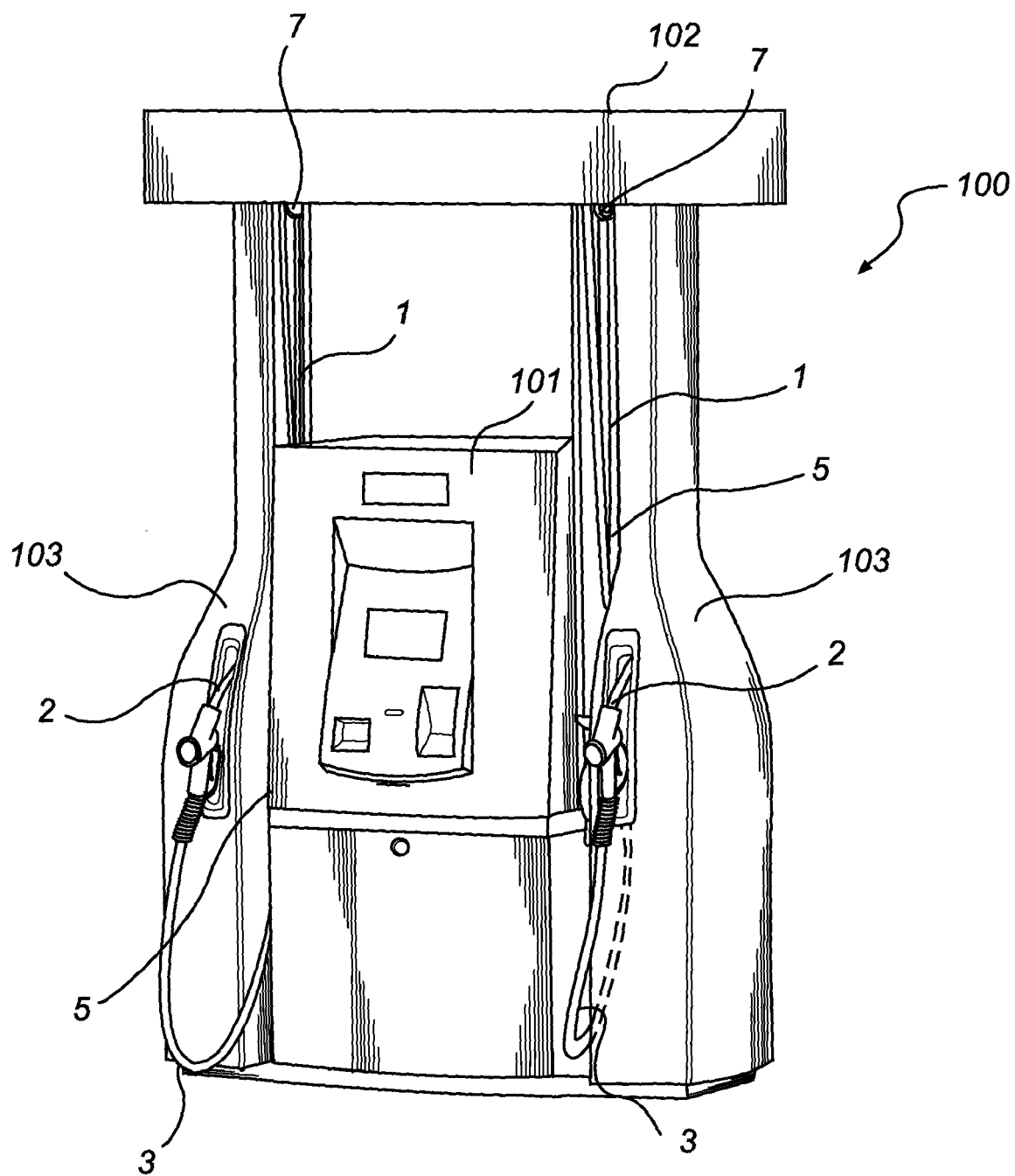


Fig. 1

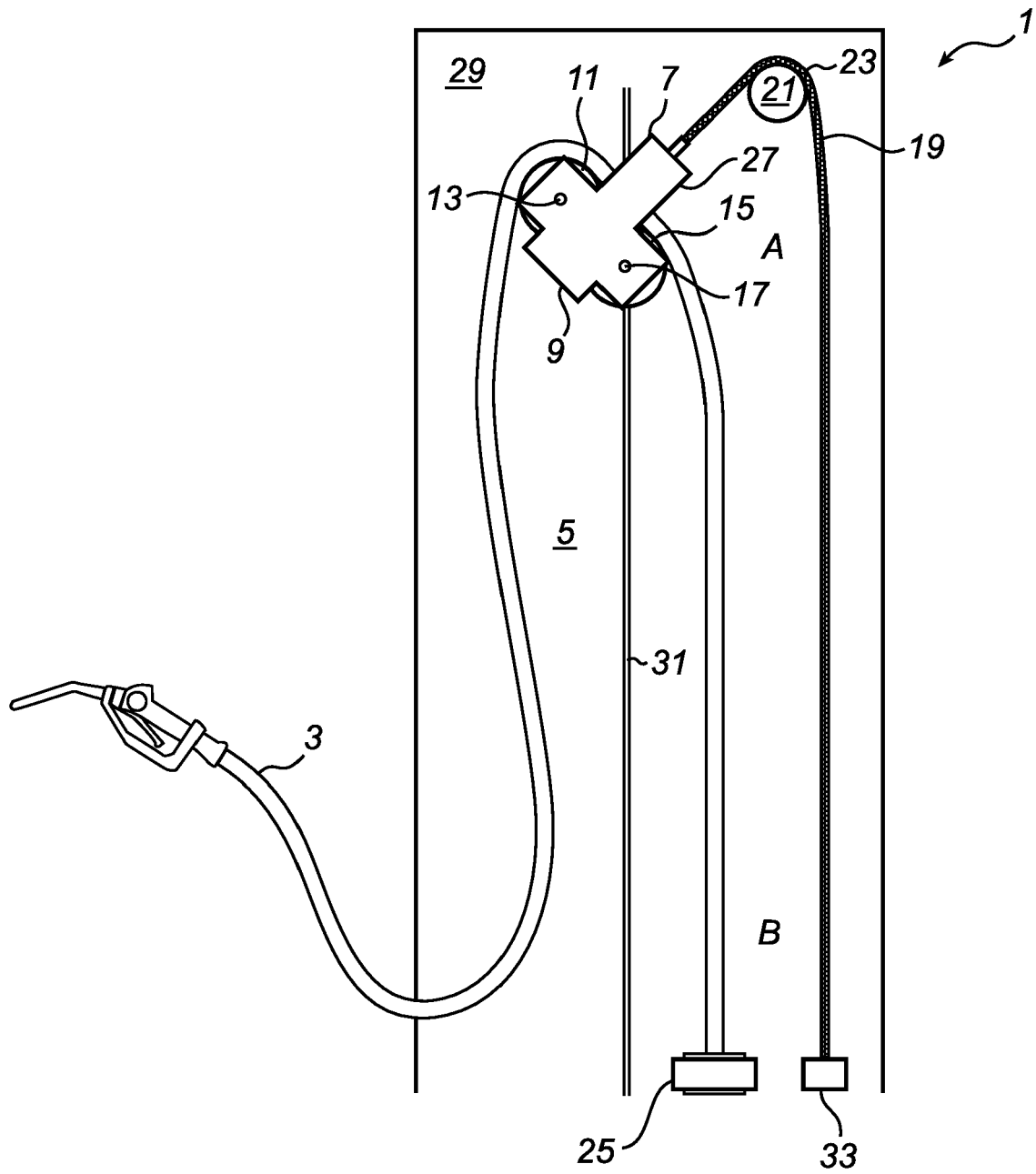


Fig. 2a

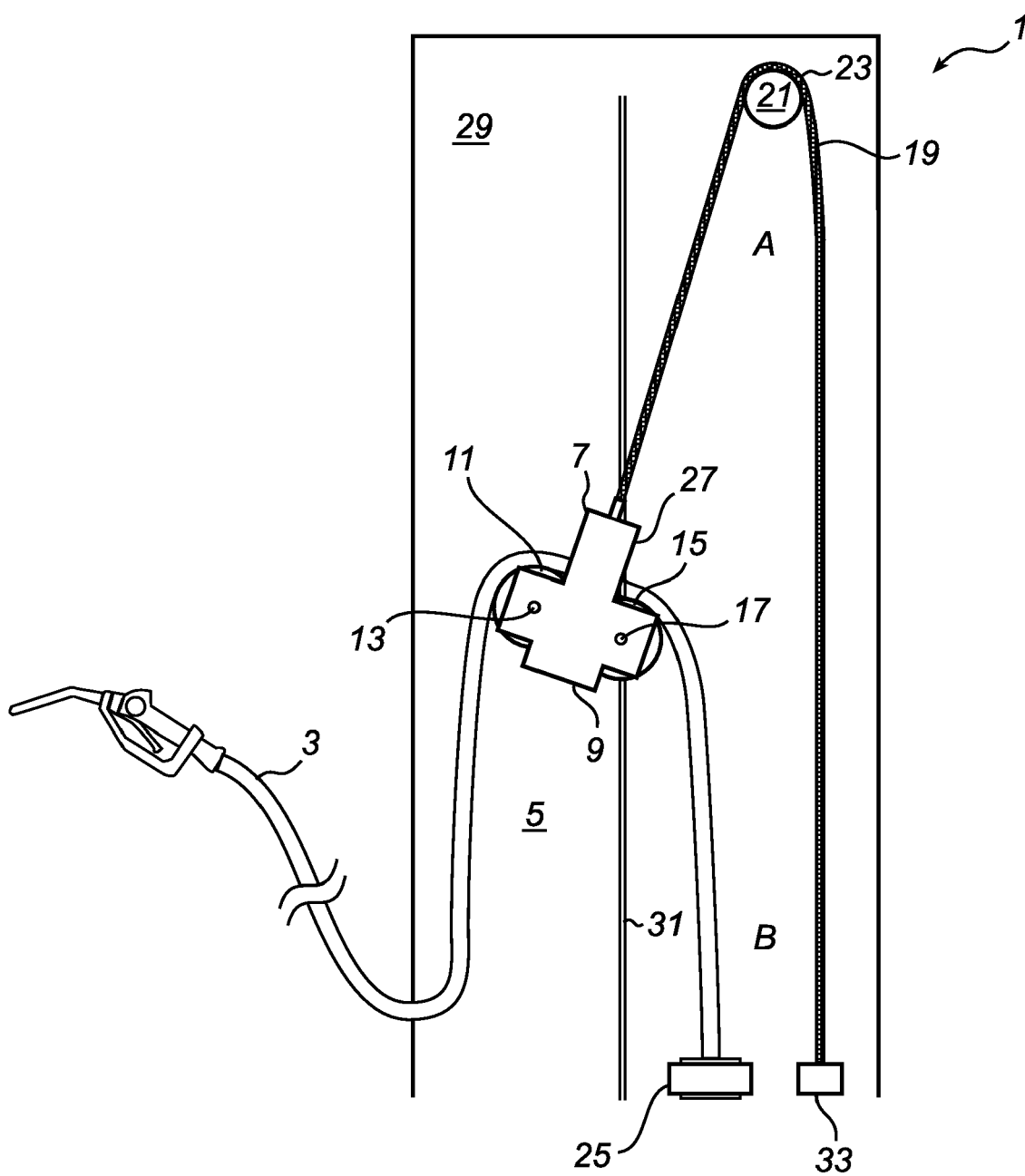


Fig. 2b

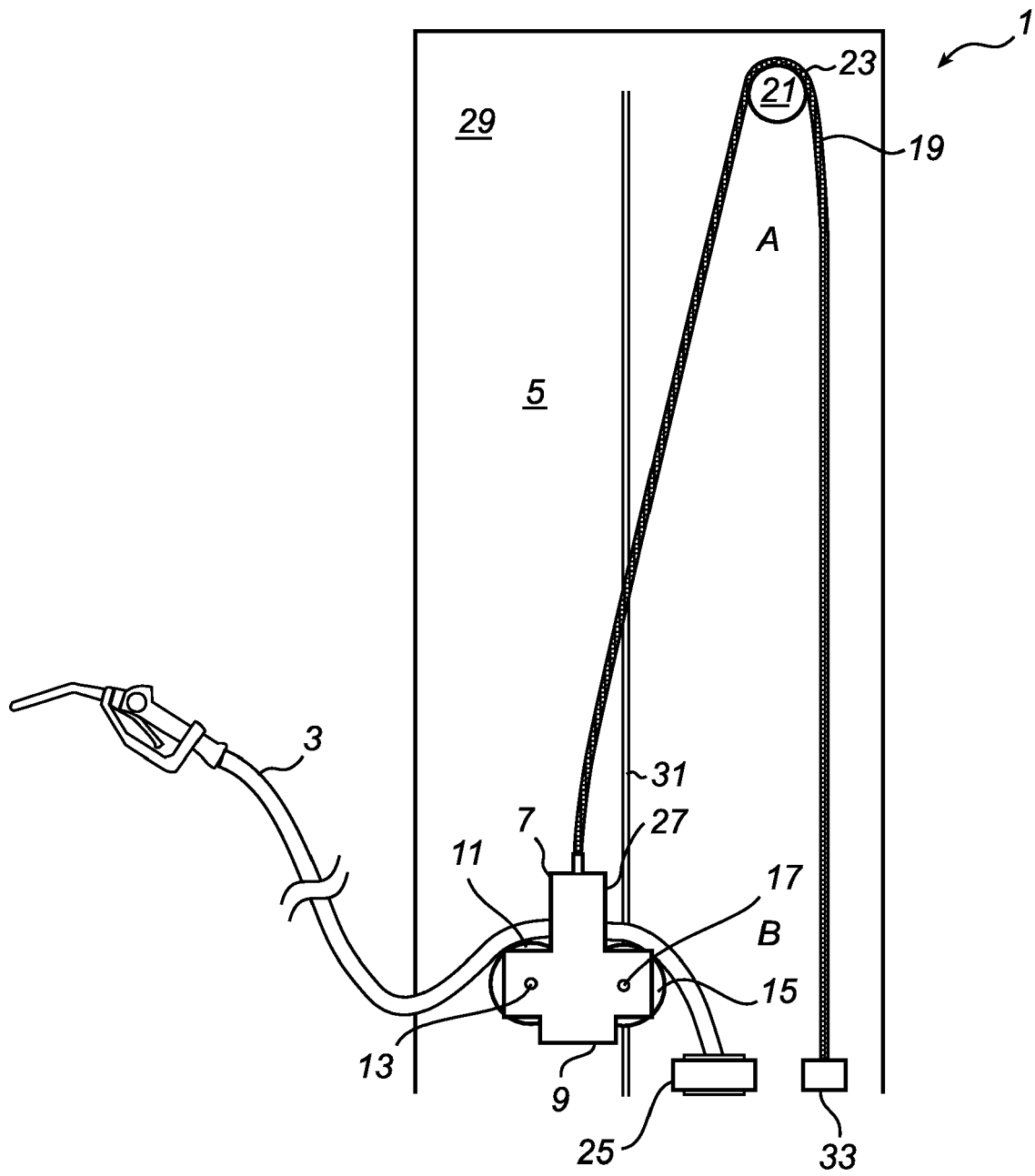
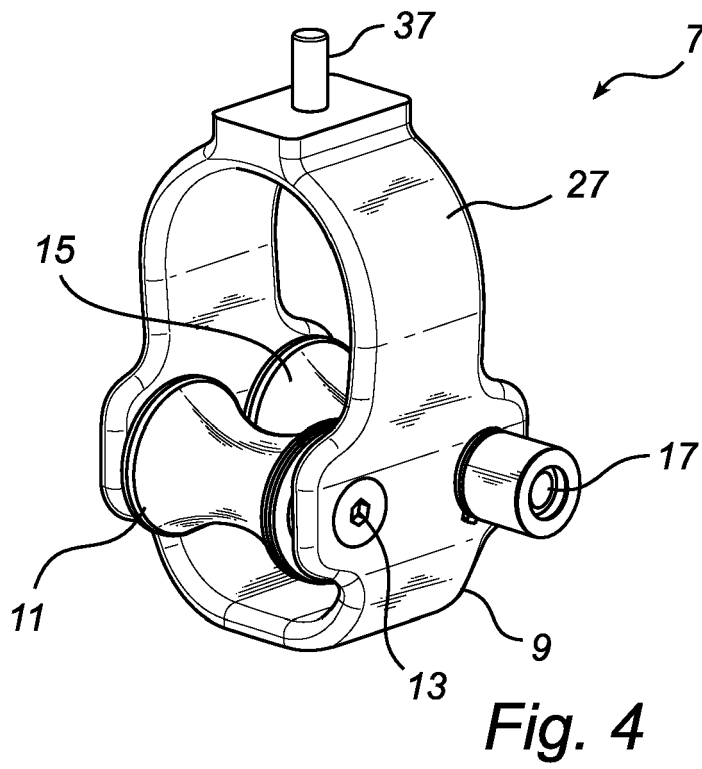
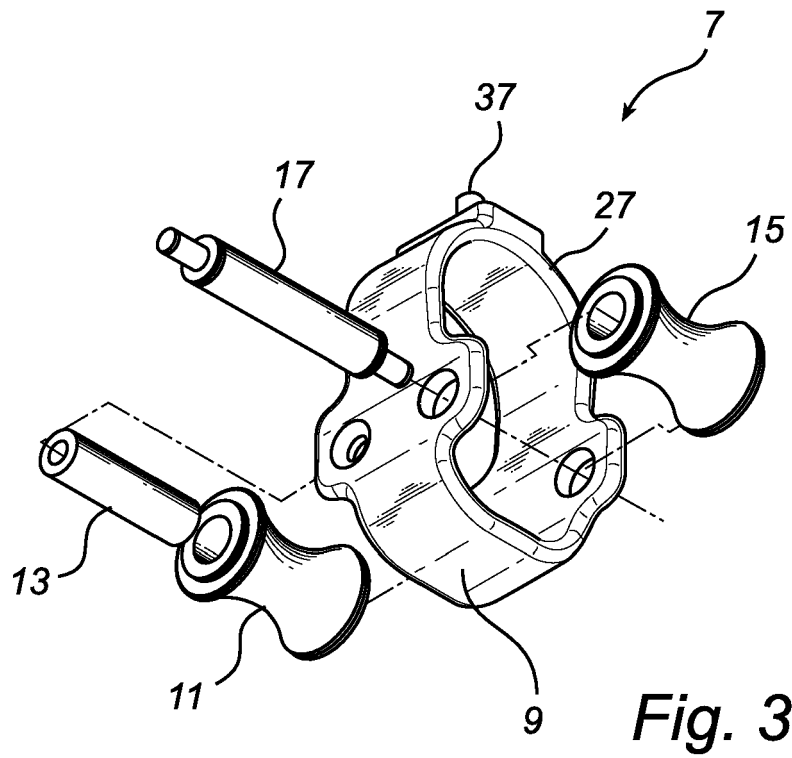


Fig. 2c





EUROPEAN SEARCH REPORT

Application Number
EP 08 15 9436

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 6 334 457 B1 (BAKER IV FRANK A [US]) 1 January 2002 (2002-01-01) * column 3, line 60 - column 4, line 49; figure 6 *	1-14	INV. B67D5/365
X	EP 1 845 057 A (DRESSER WAYNE AB [SE]) 17 October 2007 (2007-10-17) * figures 1,2 *	1,12,14, 15	
E	EP 2 006 245 A (DRESSER WAYNE AKTIEBOLAG [SE]) 24 December 2008 (2008-12-24) * abstract * * claims 15,16; figures 1-9 *	1,4,12, 14-16	
			TECHNICAL FIELDS SEARCHED (IPC)
			B67D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 17 February 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
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 15 9436

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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17-02-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6334457	B1	01-01-2002	NONE
EP 1845057	A	17-10-2007	AT 405521 T 15-09-2008 ES 2311267 T3 01-02-2009 US 2008000528 A1 03-01-2008
EP 2006245	A	24-12-2008	NONE

REFERENCES CITED IN THE DESCRIPTION

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- US 6334457 B [0007]
- WO 0015542 A [0008]