(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 248 761 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
10.11.2010 Bulletin 2010/45

(51) Int Cl.:
B67D 7/40 *(2010.01)*

(21) Application number: **09159334.3**

(22) Date of filing: **04.05.2009**

(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 MK MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA RS

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

(57) The invention relates to a device (8) for handling at least one hose (7), which device (8) allows the hose (7) to be pulled out from a hose storage space (2) and is adapted to return the hose (7) to the hose storage space (2), said device (8) comprising at least a hose guiding means (9) and a guiding component (12), said guiding component (12) being arranged in the device (8) and adapted to receive a retractable element (14). The device (8) is **characterized in that** said guiding component (12) is adapted to extend laterally to said hose guiding means (9), and that said retractable element (14) is adapted to extend through the guiding component (12) and said hose guiding means (9), thereby connecting said hose guiding means (9) resiliently to said hose storage space (2). The invention also relates to a method for handling at least one hose (7) and a fuel dispensing unit (1) comprising a device (8) according to the above described features.

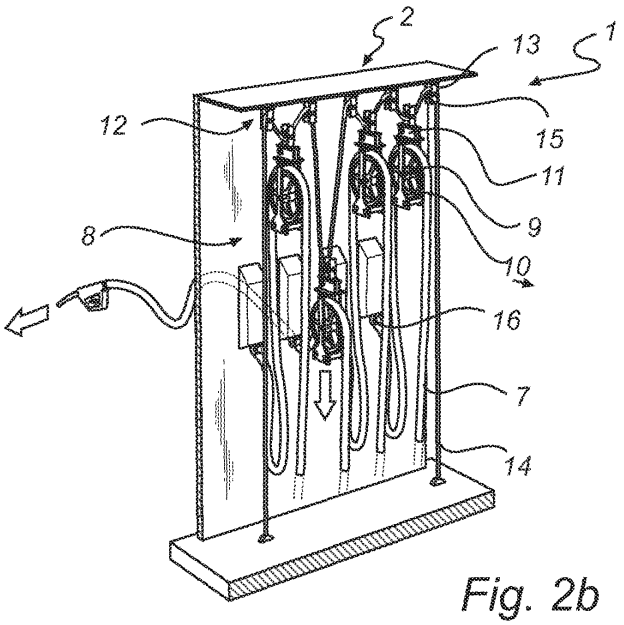

Fig. 2b

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Description

Technical field

[0001] The invention relates to a device for handling at least one hose and a fuel dispensing unit comprising such a device.The present invention also relates to a method for handling at least one hose.

Background art

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

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

[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 fuel 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 fuel 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 fuel 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 fuel pump since the hose does not reach all the way round the vehicle.

[0005] Therefore, the hose is normally longer than the height of the column which means that the hose has to be folded inside the column to avoid it from lying on the ground outside the fuel dispensing unit. The problem of keeping a folded hose inside the column while still presenting the possibility for a user to extend the hose in an easy manner can be solved in a number of different ways. However, fuel dispensing units available on the market today normally comprise several hoses to be able to dispense several types of fuel. Accordingly, a slimmer and more space efficient device for handling a hose in a fuel dispensing unit is required.

[0006] EP 1 113 979 shows a hose storing device for a fuel dispensing unit where each hose is folded around rollers when the hose is stored. When a user wants to extend a hose, one or several rollers move along. The main movement is due to the movement of a roller mounted in the ceiling of the column fastened in a resilient device providing a counter force. When the outward force on the hose, created by the user, is released, the counter force will retract the hose into the column again.

[0007] EP 1 845 057 A1 shows a hose storing device where the hose is folded inside the column over two rollers. When the hose is extended from the column, a lever that is fastened in an axis is rotated to allow more hose to be extended. A resilient element fastened to the lever will provide a counter force to retract the hose when the user releases it.

[0008] A problem common for the hose handling devices described above and other prior art devices is their size, or their extension within respective hose housings, which results in bulky and complicated structures. Accordingly, the fuel dispensing units comprising such a device will be time consuming to manufacture and thus expensive both in regard to labor and material costs.

Summary of the invention

[0009] It is an object of the present invention to provide an improvement of the prior art. More particularly, it is an object of the present invention to provide a simple and overall cheaper device for handling at least one hose within a fuel dispensing unit in a space efficient manner. Further, it is an object of the present invention to provide a fuel dispensing unit comprising such a device and method handling at least one hose within the fuel dispensing unit.

[0010] These and other objects as well as advantages that will be apparent from the following description of the present invention are achieved by a device for handling at least one hose and a fuel dispensing unit comprising such a device, as well as a method for handling at least one hose according to the independent claims.

[0011] Thus, a device is provided for handling at least one 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 at least a hose guiding means and a guiding component, said guiding component being arranged in the device and adapted to receive a retractable element. The device is **characterized in that** said guiding component is adapted to extend laterally to said hose guiding means, and that said retractable element is adapted to extend through the guiding component and said hose guiding means, thereby connecting said hose guiding means resiliently to said hose storage space. This is advantageous in that the number of components used in the device is minimized which results in a simplified manufacturing process and lower material costs and thus an overall cheaper device. Further, since the retractable element will extend laterally to the device through the guiding component, the risk of entangling with the hose is eliminated. The device is also very space efficient due to the small number of components and their strategic locations.

[0012] The device may comprise several hoses arranged side by side, each hose having a hose guiding means resiliently connected to said hose storage space

by means of said retractable element and said guiding component. In this way, the number of components are further decreased since only one retractable element is used for all of the hose guiding members at one side of the fuel dispensing unit. Normally, according to the prior art, one retractable element is used for each of the hose guiding means which results in eight retracable elements for a fuel dispensing unit carrying eight hoses. With a device according to the present invention, however, the number of retractable elements will be decreased to only two for a fuel dispensing unit carrying eight hoses (four on each side). As a consequence, the risk of retractable elements entangling with each other or with the hoses is practically eliminated.

[0013] The guiding component may be divided into several guiding units spaced apart from each other in a lateral direction, which is advantageous in that a bigger space for the hose guiding means is created.

[0014] The device may comprise several hoses arranged side by side, each hose having a hose guiding means, guiding units being arranged on each side of the hose guiding means, and the retractable element extending through the guiding units and the hose guiding means, thereby connecting said hose guiding means resiliently to said hose storage space. As mentioned above, normally according to the prior art, one retractable element is used for each of the hose guiding means which results in eight retractable elements for a fuel dispensing unit carrying eight hoses. With a device according to the invention the number of retractable elements will be decreased to only two for a fuel dispensing unit carrying eight hoses. As a consequence, the risk of retractable elements entangling with each other of with the hoses is practically eliminated.

[0015] The retractable element may be chosen from the group consisting of a rubber band, a wire connected to a spring, a roll of spring-loaded coiled wire or an unelastic wire connected to a weight. Accordingly, the device may be adapted to different types of fuel dispensing units. Depending on the shape and size of the hose guiding means in the fuel dispensing unit, different types of retractable elements may be used.

[0016] The retractable element may be attached to the hose storage space in the lower portion of the device. With an overall longer retractable element, the resiliency will be increased, and thus the vertical movement of the hose guiding means when pulling out a hose from the hose storage space is facilitated.

[0017] The hose guiding means may comprise a wheel arranged in a carrier means and may run in a guide rail. This is advantageous in that the risk of the hose guiding means entangling with each other will be eliminated.

[0018] The guiding component may comprise a rotating means, thereby simplifying the feeding of the retractable element through said guiding member.

[0019] The device may further comprise additional hose guiding means arranged in the lower portion of the device guiding the hose out from the hose storage space, which is advantageous in that a proper extraction of the hose is provided during use.

[0020] According to a second aspect of the present invention, the invention relates to a method for handling at least one hose, in which said at least one 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, comprising arranging a guiding component in the hose storage space. The method is characterised by extending said guiding component laterally to said hose guiding means, and extending said retractable element through the guiding component and said hose guiding means, thereby connecting said hose guiding means resiliently to said hose storage space. This is advantageous in that the number of components used in a fuel dispensing unit implementing the method is minimized which results in a simplified manufacturing process and lower material costs and thus an overall cheaper fuel dispensing unit. Further, since the retractable element will extend laterally to the hose storage space through the guiding component, the risk of entangling with the hose is eliminated. The fuel dispensing unit using the method will also be very space efficient due to the small number of components and their strategic locations.

[0021] According to a third aspect of the present invention, the invention relates to a fuel dispensing unit comprising a device according to the above described features.

[0022] Generally, all terms used in the claims are to be interpreted according to their ordinary meaning in the technical field, unless explicitly defined otherwise herein. All references to "a/an/the [element, device, component, means, unit, etc]" are to be interpreted openly as referring to at least one instance of said element, device, component, means, unit, etc., unless explicitly stated otherwise. The steps of any method disclosed herein do not have to be performed in the exact order disclosed, unless explicitly stated.

Brief description of the drawings

[0023] The above, as well as additional objects, features and advantages of the present invention, will be better understood through the following illustrative and non-limiting detailed description of preferred embodiments of the present invention, with reference to the appended drawings, where the same reference numerals will be used for similar elements, wherein:

Fig. 1 is a schematic view of an exemplary fuel dispensing unit according to the third aspect of the invention,

Fig. 2a and 2b are perspective views of the device according to the first aspect of the invention when arranged in a fuel dispensing unit carrying four hoses on each pump side,

Fig. 3 is a perspective view of an embodiment of the

device, wherein each hose guiding means runs in guide rail,

Fig. 4 is a top view of two devices arranged in a fuel dispensing unit carrying four hoses on each pump side,

Fig. 5 is a perspective view of an exemplary guiding component.

Detailed description of preferred embodiments of the invention

[0024] Fig. 1 illustrates an exemplary fuel dispensing unit 1, having a hose storage space 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 reservoir (not shown) containing fuel. When filling up the tank of a motor vehicle, the fuel is pumped from the underground reservoir 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 hose 7.

[0025] In Fig. 2a and 2b a preferred embodiment of the device 8 according to the first aspect of the invention is illustrated when arranged in a fuel dispensing unit 1 carrying four hoses on each pump side (only one pump side is illustrated). In total, the fuel dispensing unit 1 carries eight hoses 7, four on each pump side, by means of two devices 8 located in the hose storage space 2. The device 8 comprises four hose guiding means 9 arranged side by side, each one carrying a hose 7. Each hose guiding means 9 comprises a wheel 10 and a carrier means 11. In the upper portion of the device 8, a guiding component 12 is arranged and extends laterally in relation to the hose guiding means 9. The guiding component 12 is divided into five guiding units 13 which are spaced apart from each other and adapted to receive a retractable element 14. Each guiding unit 13 comprises a rotating means 15. The retractable element 14 extends through the guiding units 13 and the hose guiding means 9, thereby connecting the four hose guiding means 9 resiliently to said hose storage space 2. The guiding units 13 are arranged on each side of the hose guiding means 9. The retractable element 14 extends from the bottom of the hose storage space 2 at one side, upwardly and through a first guding unit 13, via a first hose guiding means 9 and on through the second guiding unit 13, via a second hose guiding means 9 and on through the third guiding unit 13, via a third hose guiding means 9 and on through the fourth guiding unit 13, via a fourth hose guiding means 9 and on through the fifth and last guiding unit 13, downwards back to the bottom of the hose storage space 2 at the other side. In other words, only one retractable element 14, extending laterally in relation to the hose guiding means 9, is used to handle all four hose guiding means 9 of the device 8. The caracteristic feature of a common retractable element 14 for all the hose guiding means 9 of the device 8 means that less parts are necesarry for the hose handling device 8 and that the costs are reduced. In order to guide the hoses 7 properly out from the hose storage space 2 during use, four additional hose guiding means 16 (one for each hose 7) are preferably arranged in the lower part of the hose storage space 2. These additional hose guiding means 16 may preferably be selected from guding rails, guiding rollers and guiding wheels.

[0026] Fig. 3 illustrates an embodiment of the device 8, wherein each hose guiding means 9 runs in a guide rail 17. The guide rails 17 extend in a vertically in the hose storage space 2 and guides the hose guding means 9 when moving in the hose storage space 2. In this way, the risk of the hose guiding means 9 entangling with each other will be eliminated. The guide rails 17 can of course have different sizes and shapes. In one embodiment the guide rails 16 are replaced by side walls within the hose storage space 2, e.g. made of metal sheets.

[0027] In Fig. 4, a hose storage space 2 of a fuel dispensing unit 1 carrying eight hoses 7 of two devices 8 is illustrated. The two devices 8 are laterally displaced in relation to each other in order to create a better space for the hose guiding means 9. Accordingly, the fuel dispensing unit 1 can be made very space efficient.

[0028] Fig. 5 illustrates an embodiment of a guiding component 12 comprising five guiding units 13 integrated into one unitary element. Each guiding unit 13 comprises a rotating means 15 (illustrated as a roller).

[0029] When a user of the fuel dispensing unit pulls the hose 7, the pulling force will cause the hose guiding means 9 to move downwards in a vertical direction of the hose storage space 2 from its idle position, thereby extending the retractable element 14 as shown in Fig. 2b. The pulling force causes the retractable element 14 to extend further so that the hose guiding means 9 will eventually be in an operating position where maximum length of the hose 7 is available to the user.

[0030] When the user releases the pulling force on the hose 7, the spring element will be relaxed and consequently, the hose guiding means 9 will be allowed to move uppwards in a vertical direction of the hose storage space 2 back to its idle position.

[0031] The retractable element 14 may of course be of any size and shape, but is preferably constituted by a rubber band, a wire connected to a spring, a roll of spring-loades coiled wire or an unelastic wire connected to a weight. Further, the ends of the retractable element 14 may be connected to a portion located anywhere within the hose storage space 2. The guiding component 12 may also be of any suitable size and shape. Also, the guiding component 12 may be arranged anywhere within the hose storage space 2, but is preferably arranged in the upper portion of the device 8 and adapted to extend above the hose guiding means 9.

[0032] According to a second aspect of the invention a method for handling at least one hose is provided, in which said at least one 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, comprising arranging a guiding component in the hose storage space. The method is characterised by extending said guiding component laterally to said hose guiding means, and extending said retractable element through the guiding component and said hose guiding means, thereby connecting said hose guiding means resiliently to said hose storage space.

[0033] According to a third aspect of the invetion a fuel dispensing unit is provided comprising a device according to the above described features.

[0034] The invention has mainly been described above with reference to a few embodiments. However, as is readily appreciated by a person skilled in the art, other embodiments than the ones disclosed above are equally possible within the scope of the inventions, as defined by the appended claims.

Claims

1. A device (1) for handling at least one hose (7), which device (8) allows the hose (7) to be pulled out from a hose storage space (2) and is adapted to return the hose (7) to the hose storage space (2), said device (8) comprising at least a hose guiding means (9) and a guiding component (12), said guiding component (12) being arranged in the device (8) and adapted to receive a retractable element (14), **characterized in that** said guiding component (12) is adapted to extend laterally to said hose guiding means (9), and that said retractable element (14) is adapted to extend through the guiding component (12) and said hose guiding means (9), thereby connecting said hose guiding means (9) resiliently to said hose storage space (2).

2. A device (8) according to claim 1, wherein the device (8) comprises several hoses (7) arranged side by side, each hose (7) having a hose guiding means (9) resiliently connected to said hose storage space (2) by means of said retractable element (14) and said guiding component (12).

3. A device (8) according to claims 1 or 2, wherein said guiding component (12) is divided into several guiding units (13) spaced apart from each other in a lateral direction.

4. A device (8) according to claim 3, wherein the device (8) comprises several hoses (7) arranged side by side, each hose (7) having a hose guiding means (9), guiding units (13) being arranged on each side of the hose guiding means (9), and the retractable element (14) extending through the guiding units (13) and the hose guiding means (9), thereby connecting said hose guiding means (9) resiliently to said hose storage space (2).

5. A device (8) according to any of the preceding claims, wherein said retractable element (14) is chosen from the group consisting of a rubber band, a wire connected to a spring, a roll of spring-loaded coiled wire or an unelastic wire connected to a weight.

6. A device (8) according to any of the preceding claims, wherein the ends of the retractable element (14) are attached to the hose storage space (2) in the lower portion of the device (8).

7. A device according to any of the preceding claims, wherein said hose guiding means (9) comprises a wheel (10) arranged in a carrier means (11).

8. A device according to any one of the preceding claims, wherein said hose guiding means (9) runs in a guide rail (17).

9. A device according to any of the preceding claims, wherein said guiding component (12) comprises a rotating means (15).

10. A device according to any one of the preceding claims, further comprising additional hose guiding means (9) arranged in the lower portion of the device (8) guiding the hose (7) out from the hose storage space (9).

11. A method for handling at least one hose, in which said at least one hose (7) for use is pulled out from a hose storage space (2) and after use is returned to said hose storage space (2), by moving a hose guiding means (9) vertically in said hose storage space (2), comprising
arranging a guiding component (12) in the hose storage space (2), **characterised by**
extending said guiding component (12) laterally to said hose guiding means (9), and
extending said retractable element (14) through the guiding component (12) and said hose guiding means (9), thereby connecting said hose guiding means (9) resiliently to said hose storage space (2).

12. A fuel dispensing unit (1), such as a fuel pump, **characterised in that** it comprises a device (8) for handling a hose (7) as claimed in any one of claims 1-10.

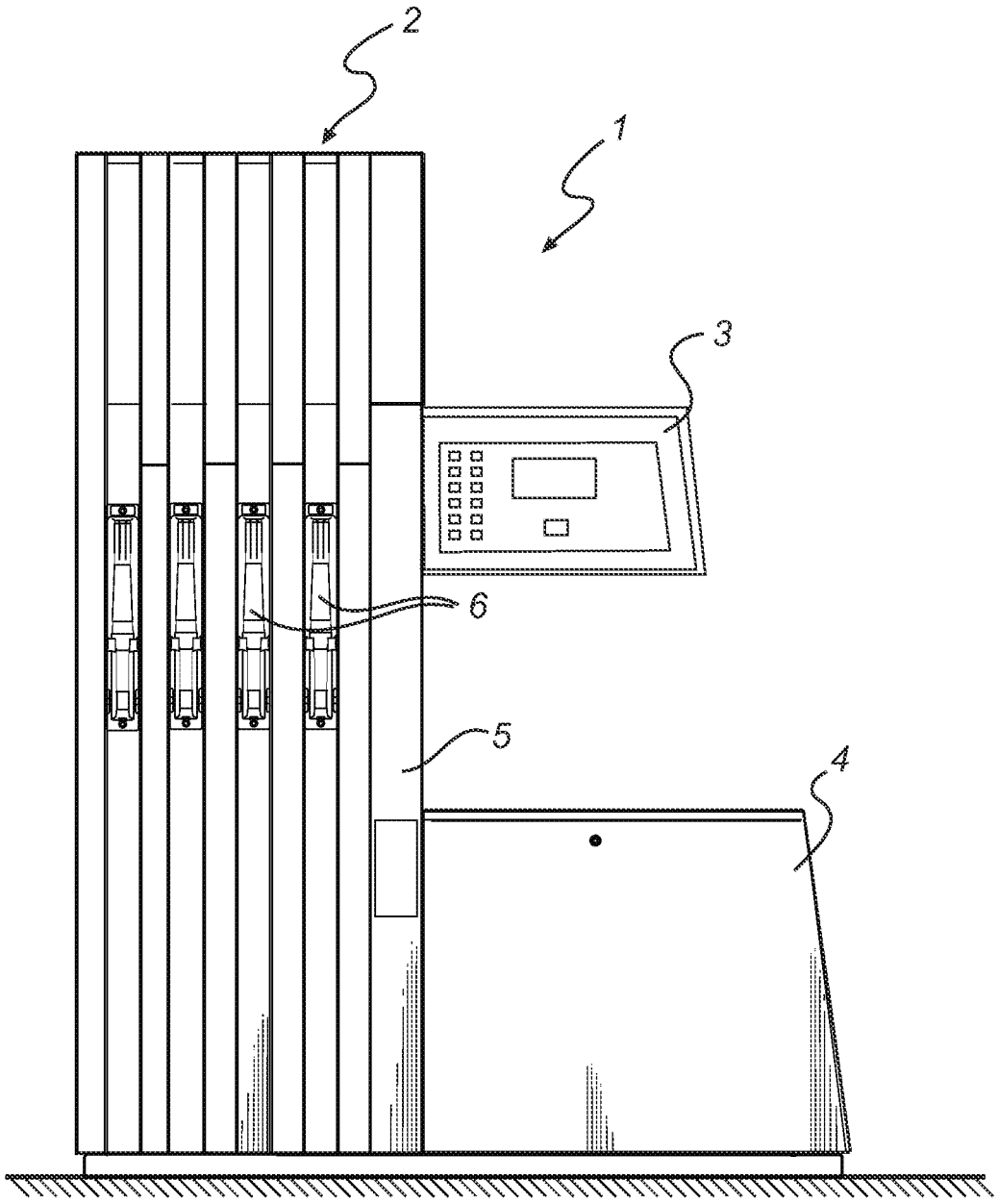

Fig. 1

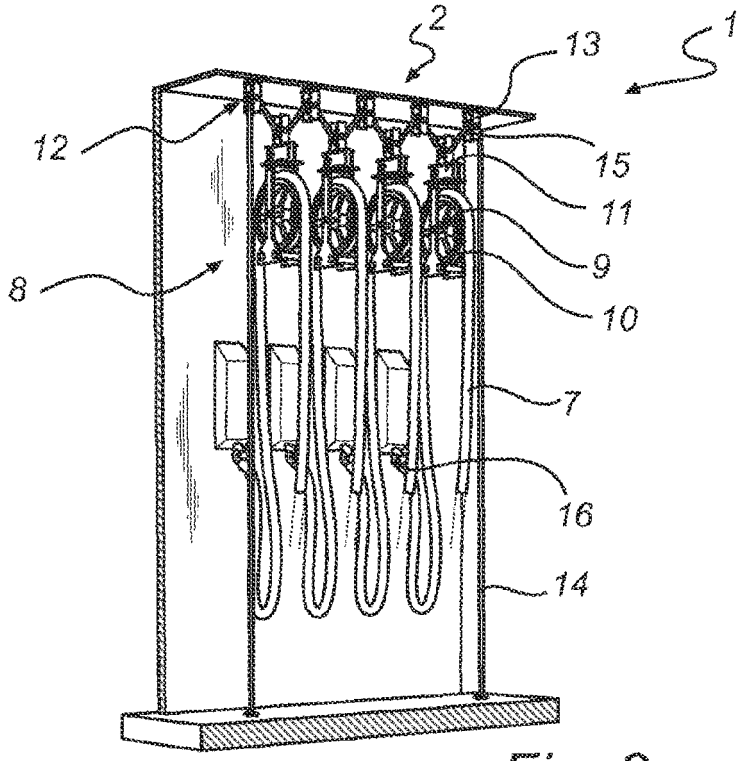

Fig. 2a

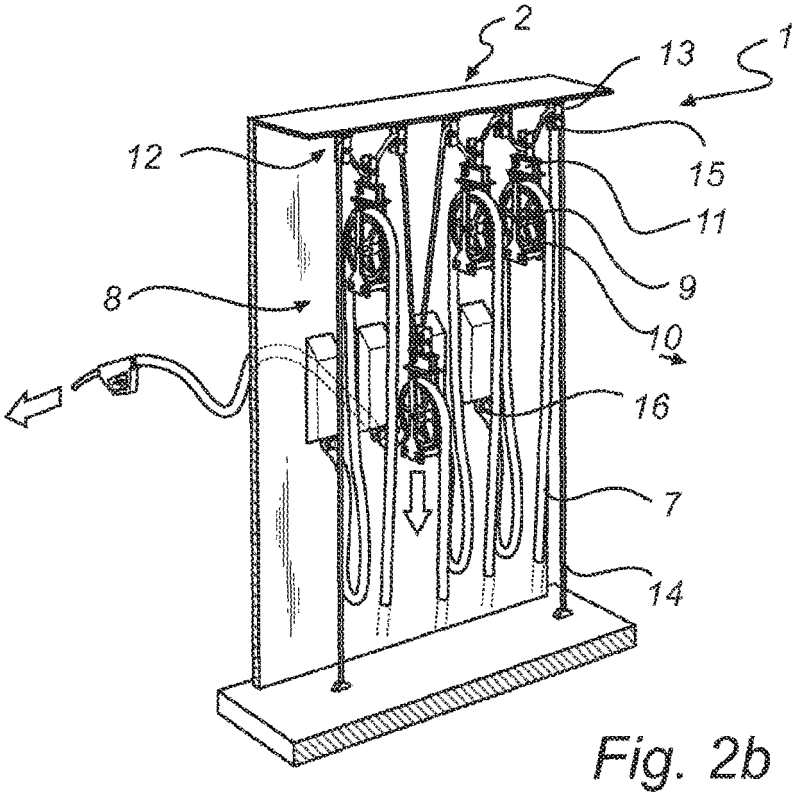

Fig. 2b

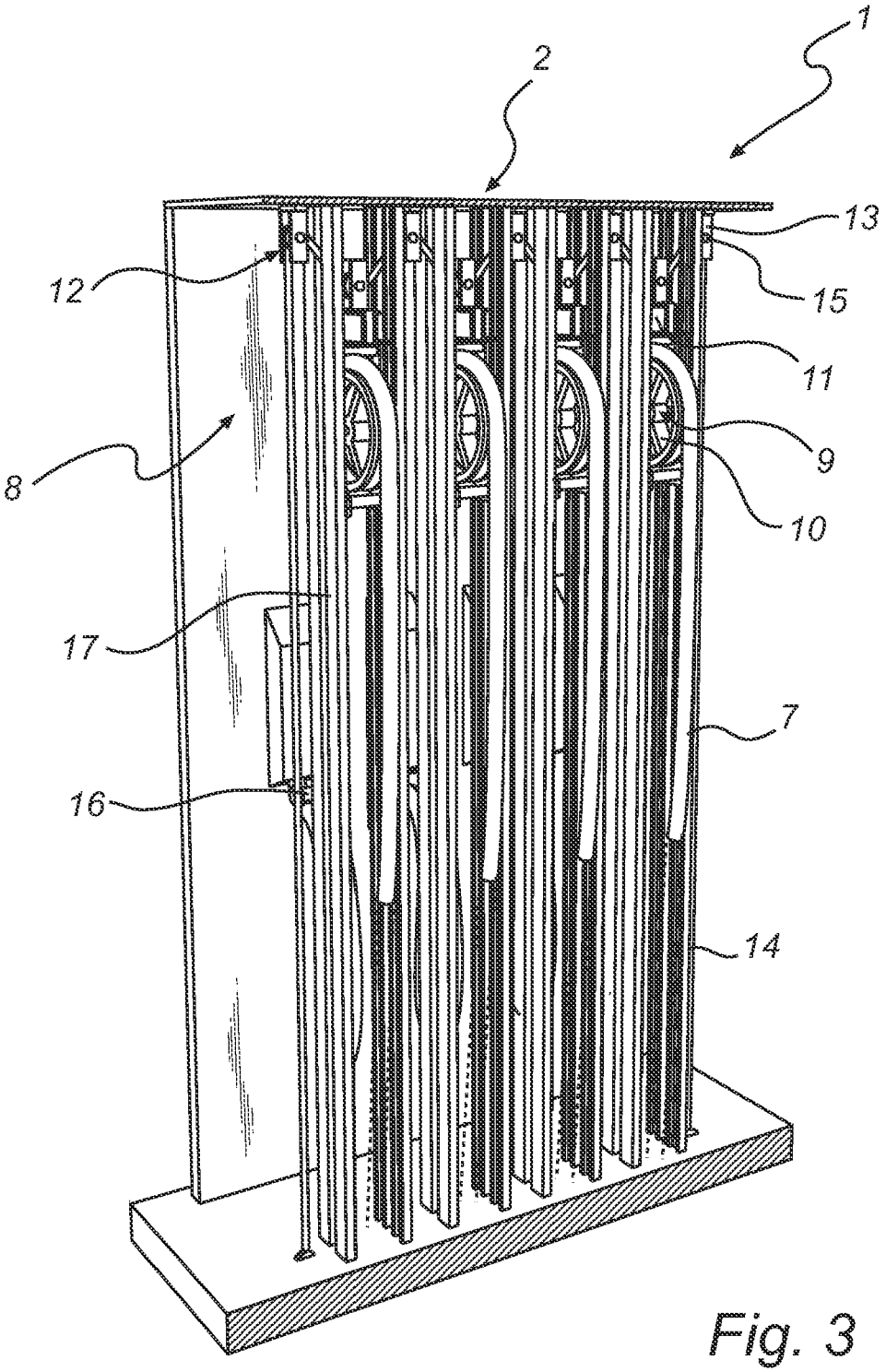

Fig. 3

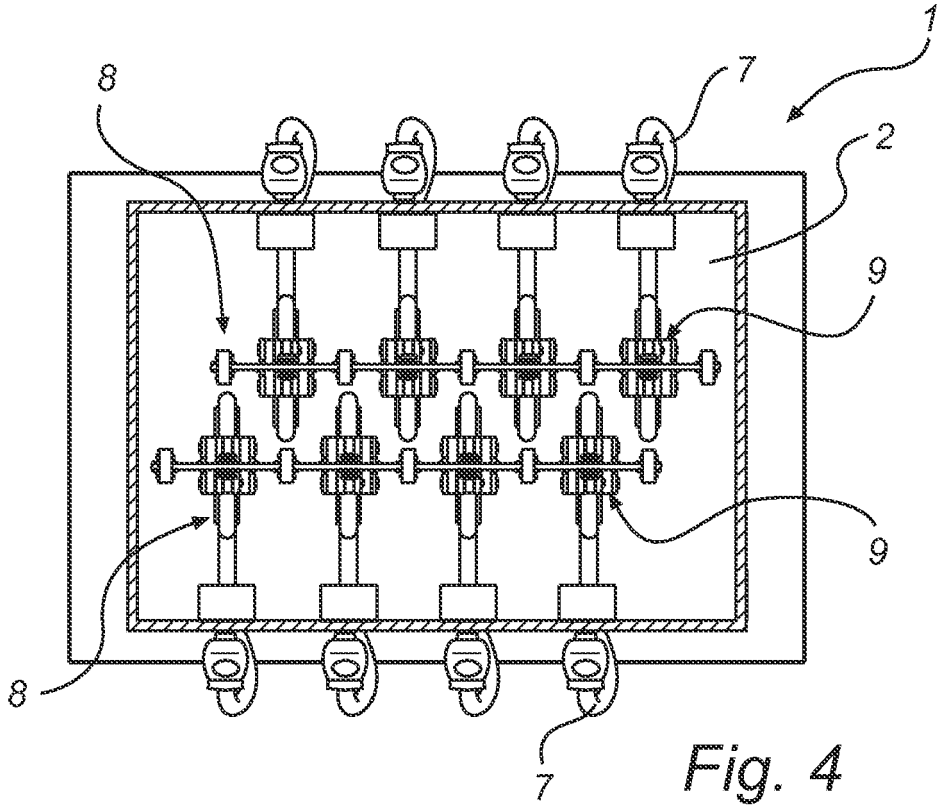

Fig. 4

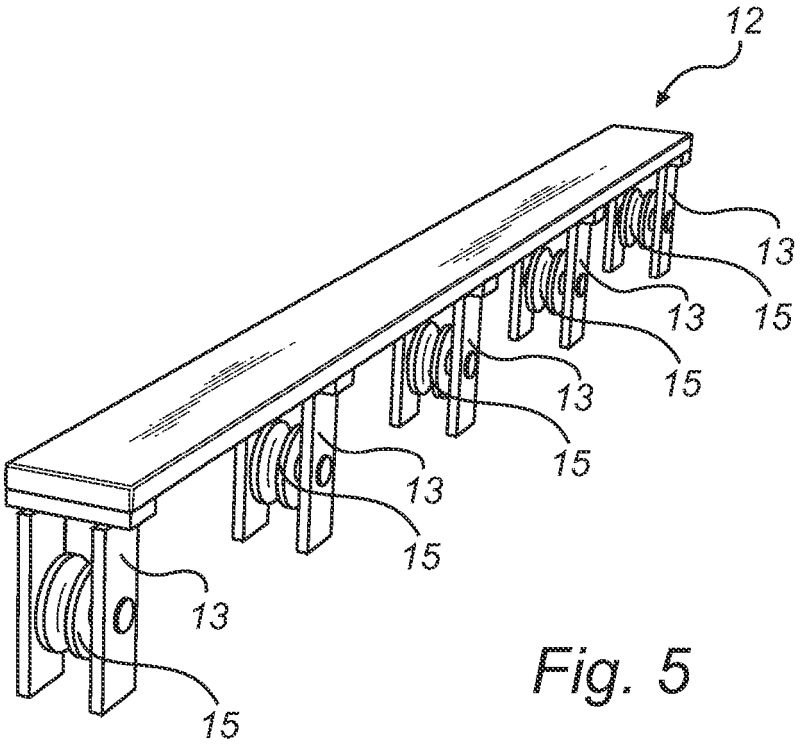

Fig. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 09 15 9334

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)

B67D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	19 March 2010	Müller, Claus

CATEGORY OF CITED DOCUMENTS

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REFERENCES CITED IN THE DESCRIPTION

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