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(54) **ORDER PICKER TRUCK**

(57) Oder picker truck having a vertically moveable platform (2) and a gate that is opened in order to get access to the platform (2). The gate comprises an upper bar (3) having a bow form. Means are arranged allowing the bow of the upper bar (3) to be turned from a vertical position to a horizontal position and vice versa.

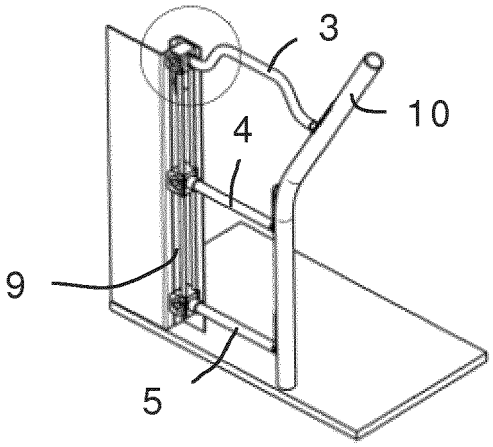

Fig. 5a

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Description

Technical Field

[0001] The present invention concerns an order picker truck and more precisely means to extend the range of a picker.

Background

[0002] By means of an order picker truck a driver is picking items from a rack at an elevated level. The driver is standing on a platform, which platform can be raised and lowered to desired heights. The truck may also be driven along the rack in order to pick items at different positions in a rack.

[0003] In order to be able to enter the platform some kind of gate is provided. The gate is normally also a safety device hindering the driver from falling off the platform. However, in some cases the gate may make it hard to reach items placed far into the rack. A solution to this according to prior art is to arrange the gate so that it can be tilted outwards and thereby increase the reach for the driver standing on the platform. One example of such a solution is shown in EP 2 514 708 B1, wherein an upper lateral barrier and a central lateral barrier are arranged on a carrier component. The carrier component holds one end of the upper and middle lateral barriers, respectively. The carrier component holder can be folded outwards to a limited degree.

Summary

[0004] One object of the present invention is to solve the above problem of how to reach further into a rack in a simple, economical and safe way.

[0005] According to one aspect of the invention an order picker truck is arranged with a vertically moveable platform and a gate. The gate comprises an upper bar having a bow form. Means are arranged allowing the bow of the upper bar to be turned from a vertical position to a horizontal position and vice versa. The bow is directed away from the platform in the horizontal position.

[0006] According to a further aspect of the invention the upper bar is held at both ends. It is thereby safer than prior art solutions in which corresponding bars are only held at one end.

[0007] Further objects and advantages of the invention will be obvious to a person skilled in the art when reading the detailed description below of different embodiments.

Brief Description of the Drawings

[0008] The invention will be described further below by way of example and with reference to the enclosed drawings. In the drawings:

Fig. 1 is a perspective view of an order picker truck according to prior art,

Fig. 2 is an exploded view of a gate of an order picker truck according to the present invention,

Fig. 3a is a side view, with parts removed for illustrative purpose, of the gate of Fig. 2 in an open position,

Fig. 3b is a detailed view of the encircled parts of the gate in the position of Fig. 3a,

Fig. 4a is a side view corresponding with Fig. 3a but with the gate in a closed position,

Fig. 4b is a detailed view corresponding with Fig. 3b but with the gate in a closed position,

Figs. 5a, 6a, 7a and 8a are perspective views, with parts removed, of the gate illustrating different positions of an upper bar of the gate,

Figs. 5b, 6b, 7b and 8b are detailed views of the encircled parts of the gate in the position of Figs. 5a, 6a, 7a and 8a, respectively,

Fig. 9a is a cross section view of a part of the gate with the upper bar in a first end position, and

Fig. 9b is a cross section view corresponding to Fig. 9a but with the upper bar in a second end position.

Detailed Description

[0009] In Fig. 1 an example of a general order picker truck 1 is shown, which order picker truck 1 can be furnished with a gate according to the present invention. The order picker truck 1 has a platform 2, which can be raised and lowered such as along a mast for example. A person is to stand on the platform 2 and pick items at all levels. The platform 2 has a gate that is opened for allowing a person to go onto the platform 2. The gate is also a safety device that serves the purpose to hinder the person on the platform 2 from falling out. According to the present invention the gate has an upper bar 3, a middle bar 4 and a lower bar 5. Each bar 3-5 is received with one first end in a housing 6, which housing 6 can be turned upwards to open the gate. The bars 3-5 and corresponding housings 6 are interconnected in such a way that they will be turned as one unit upwards and downwards. The housings 6 are placed on a frame 7, parts of which are removed in Figs. 3a-9b for illustrative purpose. The exact design of the frame 7 is of no importance for the present invention and will not be described further here. The bars 3-5 together with the housings 6 are turned upwards and downwards around studs 8, placed on opposite sides of the housing 6.

[0010] The housings 6, each receiving an end of one of the bars 3-5 of the gate, are placed in a common column 9. The opposite end of respective bar 3-5 is received in an opening of a further column 10. A plastic seat 11 is normally placed in the openings of the further column 10. In the fully open position of the gate, the bars 3-5 are along the column 9 holding the housings 6.

[0011] Different ways for the gate, including the upper, middle and lower bars, to be opened and closed and held at the opened and closed positions are well known for a

person skilled in the art and will not be described extensively here.

[0012] A first end 12 of the upper bar 3 goes through a socket 13 on one side of the housing 6 and into a through opening of the housing 6. The upper bar 3 is received moveable in a longitudinal direction. A compression spring 14 is placed at said first end 12 of the upper bar 3 between a cover 16 at the end of the upper bar 3 and an inner wall of the opening of the housing 6. The cover 16 is held at the upper bar by means of a locking pin 15 going through the upper bar 3. The upper bar 3 has a pin 17 going through the upper bar 3 at a distance from the outer end. Said pin 17 is to cooperate with the socket 13 of the housing 6. The socket 13 has grooves 18 for receiving the pin 17 of the upper bar 3 in one end position of the upper bar 3. Adjacent each groove 18 the socket 13 forms a curve 19 which curve 19 is directed away from the housing 6. In the shown embodiment there is a recess 20 at the outer end of the curve 19. In other embodiments there is no recess. The socket 12 has a straight side 21adjacent the groove 18, which straight side 21 is parallel with the first end 12 of the upper bar 3.

[0013] In other embodiments the pin 17 going through the upper bar 3 and cooperating with the socket 13 is replaced with one or more pins arranged protruding from the outer surface of the upper bar 3. The number of grooves 18 and curves 19 of the socket 13 is adapted to the number of pins 17 of the upper bar 3.

[0014] Outside the housing 6 of the upper bar 3 a gas damper (spring) 22 and a sensor 23 are placed. The gas damper 22 acts to hold the gate, including the upper bar 3, in either a completely open position, as shown in Fig. 3b, or in a completely closed position, as shown in Fig. 4b. The gate is normally opened and closed by hand but it is also possible to provide an actuator for opening and closing of the gate. The sensor 23 senses the position of the housing 6 and is used to hinder movement of the truck 1 if the gate is not closed and to permit movement when the gate is completely closed. The studs 8 of the housing 6 are placed off-centre in such a way that the housing 6 has a part adjacent the sensor 23 in the closed position for the gate and that no part of the housing 6 is adjacent to the sensor 23 in the open position for the gate. When the sensor 23 has registered that the gate is open movement of the truck 1 is hindered.

[0015] The upper bar 3 has a bent form, forming a kind of bow. The first and second ends 12, 24 of the upper bar 3 are received in respective column 9, 10 in such a way that the upper bar 3 is free to be rotated at the same time as the upper bar 3 is locked from lateral movement. The extent of the rotation of the upper bar 3 is only restricted by the cooperation between the pin 17 of the upper bar 3 and the socket 13. The upper bar 3 is free to rotate 90° between a vertical position and a horizontal position of the bow of the upper bar 3. In said horizontal position the bow is placed laterally outside the platform 2. The bow starts a short distance from the first end 12 and a second end 24, respectively, of the upper bar 3. A straight part at each end 12, 24 of the upper bar 3 goes via a curve 25 over in a middle part 26. In the shown embodiment the middle part 26 is straight but in other embodiments the middle part 26 has a curved form. A distance by which the middle part 26 is displaced from the ends of the upper bar is about 100 mm. The exact distance may vary depending on the intended use and available space. In the horizontal position the bow of the upper bar 3 is directed away from the platform 2. By placing the bow of the upper bar 3 in a horizontal position the person standing on the platform 2 can lean further into a rack or the like compared to if the upper bar would be straight.

[0016] In the closed position of the gate, the pin 17 at the first end 12 of the upper bar 3 is received in the grooves 18 of the socket 13. With the pin 17 placed in the grooves 18 the bow of the upper bar 3 has a vertical position, in which the bow is parallel with the columns 9, 10 of the gate. By pulling the upper bar 3 in a direction away from the housing 6, against the force of the spring 14, the pin 17 will leave the grooves 18. The bow may then be turned towards a horizontal position either by hand or by leaning against the bow of the upper part 3. In the horizontal position of the bow, the pin 17 will be received in the recesses 20 of the curves 19 of the socket 13. As the upper bar 3 is pulled in a direction away from the housing 6, the end of the upper bar will no longer be in position adjacent the sensor 23. When the sensor 23 has registered that the end of the upper bar 3 has been pulled away moving of the truck 1 is hindered. If one lets the upper bar 3 go, for instance by not leaning against it any more, the bow of the upper bar 3 will be brought to the vertical position by means of the spring 14, whereby the pin 17 will follow the curves 19 of the socket 13 and go into the grooves 18. In that position the sensor 23 will register that the upper bar 3 is back in the original position allowing movement for the truck 1.

[0017] In Figs. 5a and 5b the upper bar 3 is shown in the position where the bow is in a vertical position. In said position the pin 17 of the upper bar 3 is received in the grooves 18 of the socket 13. Figs. 6a and 6b shows the position of the upper bar 3 after pulling in direction away from the housing 6 and with the pin 17 just outside the grooves 18. In this position the bow of the upper bar 3 is still in a vertical position. Figs. 7a and 7b shows a position for the bow of the upper bar 3 somewhere between a vertical and a horizontal position. In this position the pin 17 is somewhere along the curves 19 of the socket 13 between the groove 18 and the recess 20 of the curve 19. Finally, Figs. 8a and 8b shows the position of the upper bar 3 when the bow is in a horizontal position. In said position the pin 17 of the upper bar 3 are placed in the recesses 20 of the curves 19 of the socket 13, if there are any recesses. The vertical and horizontal positions of the bow of the upper bar 3 are respective end positions for turning movement of the upper bar 3.

[0018] In an alternative embodiment the socket has no grooves 18, whereby there is no need to pull the upper

bar 3 away from the housing 6 in order to turn the bow of the upper bar 3 away from the vertical position. Thus, it is enough to lean against the bow of the upper bar 3 in order for it to leave the vertical position. Except for the grooves 18 the socket of the alternative embodiment corresponds with the previously described socket 9. When the person is no longer leaning on the bow of the upper bar 3, or if it is not held by hand, the bow of the upper bar 3 will return to the vertical position by means of the spring 14. In the same way as described above the pin 17 will follow the curves 19 of the socket until they hit the straight sides 21 of the socket, until the bow of the upper bar 3 is returned to the vertical position.

[0019] In a further embodiment the compression spring 14 is replaced by a torsion spring.

Claims

1. An order picker truck having a vertically moveable platform (2) and a gate, **characterized in that** the gate comprises an upper bar (3) having a bow form and that means are arranged allowing the bow of the upper bar (3) to be rotated 90° from a vertical position to a horizontal position and vice versa, whereby said bow is placed laterally outside the platform (2) in the horizontal position.

2. The order picker truck of claim 1, wherein the bow of upper bar (3) is formed by a middle part (26) going over by means of curves (25) into a first end (12) of the upper bar (3) and a second end (24) of the upper bar (3), respectively, and wherein the middle part (26) is displaced in relation to the first and second ends (12, 24), respectively, of the upper bar (3).

3. The order picker truck of claim 2, wherein the middle part (26) of the upper bar (3) is straight or curved.

4. The order picker truck of claim 2 or 3, wherein the displacement of the straight middle part (26) is about 100 mm.

5. The order picker truck of any of the claims 1 to 4, wherein the gate further comprises a middle bar (4) and a lower bar (5), wherein a first end of the upper, middle and lower bars (3-5), respectively, are received in a housing (6) each of a column (9), wherein the gate is moveable between an open position and a closed position, in which closed position a second end of each of the upper, middle and lower bars (3-5) is received in an opening of a further column (10), wherein each of the upper, middle and lower bars (3-5) has an approximately vertical position in the open position of the gate and wherein each of the upper, middle and lower bars (3-5) has an approximately horizontal position in the closed position of the gate.

6. The order picker truck of claim 5, wherein the housing (6) receiving the upper bar (3) comprises a socket (13), receiving the first end (12) of the upper bar (3), and studs (8), received in a frame (7) in such a way that the housing (6) can be turned in relation to the frame (7).

7. The order picker truck of claim 6, wherein the studs (8) are placed off-centre on the housing (6).

8. The order picker truck of claim 6 or 7, wherein the first end (12) of the upper bar (3) is received in an opening of the housing (6) and wherein a spring (14) is placed on the bar (3) between a cover (16) at the outer end of the upper bar (3) and a wall in the opening of the housing (6), wherein the upper bar (3) is received moveable in a longitudinal direction away from the housing (6) against the action of the spring (14), and wherein the upper bar (3) is arranged pre-tensioned in direction towards the housing (6) by means of the spring (14).

9. The order picker truck of claim 8, wherein the upper bar (3) has one or more pins (17) protruding from the upper bar (3), which one or more pins (17) are to cooperate with one or more grooves (18) and curves (19) of the socket (13), wherein the one or more pins (17) of the upper bar (3) are received in the grooves (18) of the socket (13) in the pre-tensioned position of the upper bar (3) and wherein the upper bar (3) is received rotatable in the housing (6) and in the further column (10).

10. The order picker truck of claim 9, wherein the upper bar (3) is hindered from rotating when the one or more pins (17) of the upper bar (3) are inside the one or more grooves (18) of the socket (13).

11. The order picker truck of claim 10, wherein the upper bar (3) can be pulled in longitudinal direction until the one or more pins (17) have left the one or more grooves (18), whereby the upper bar (3) is free to be rotated moving the bow of the upper bar (3) from the vertical position to the horizontal position.

12. The order picker truck of claim 11, wherein the spring (14) acts to bring back the upper bar (3) to the position where the bow is in the vertical position, whereby the one or more pins (17) of the upper bar (3) will follow the one or more curves (19) of the socket (13) back into the one or more grooves (18) of the socket (13).

13. The order picker truck of any of the claims 8 to 12, wherein a sensor (23) is arranged to register whether the gate is open and whether the upper bar (3) has been pulled in longitudinal direction, in which case movement of the order picker truck is hindered.

14. The order picker truck of any of the claims 5 to 13, wherein there are means to hold the gate in the fully open position and in the closed position, respectively.

15. The order picker truck of claim 14, wherein said means is a gas damper (22) acting on the housing (6) receiving the upper bar (3).

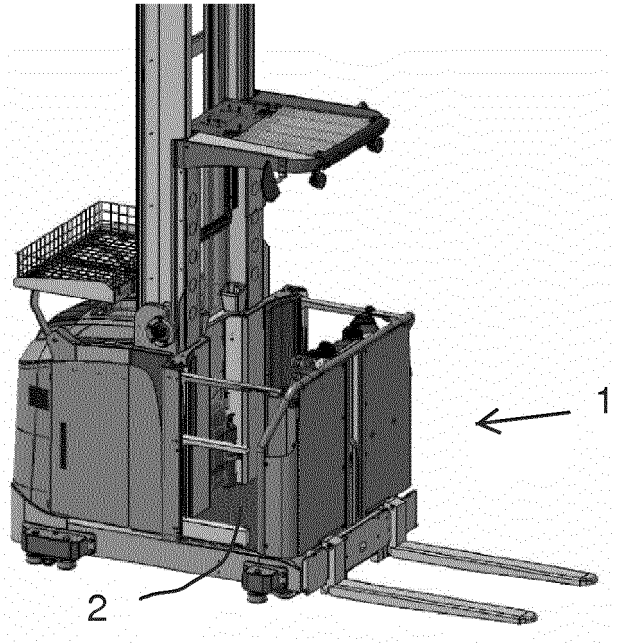

Fig. 1

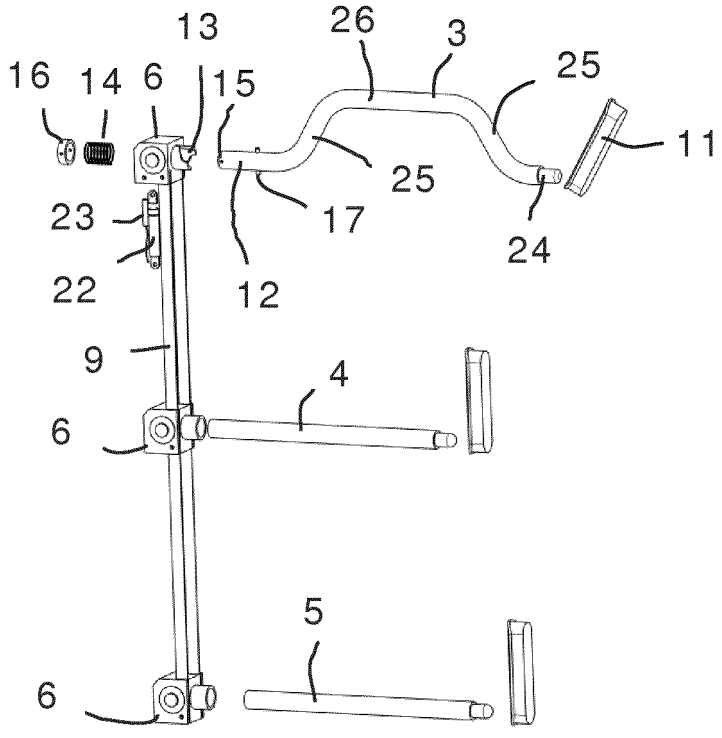

Fig. 2

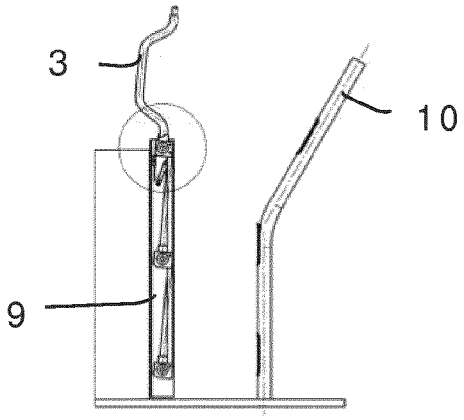

Fig. 3a

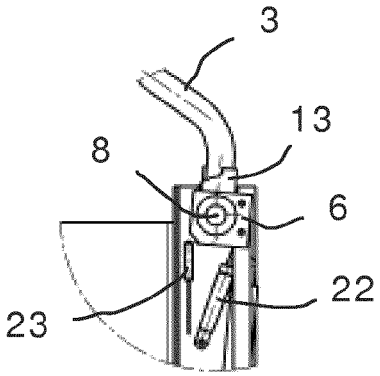

Fig. 3b

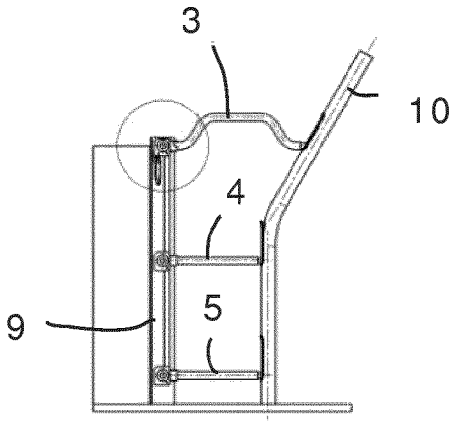

Fig. 4a

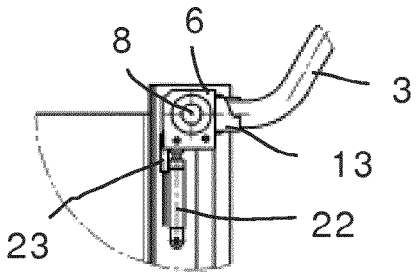

Fig. 4b

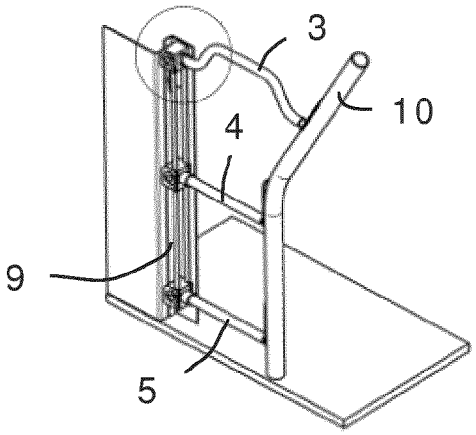

Fig. 5a

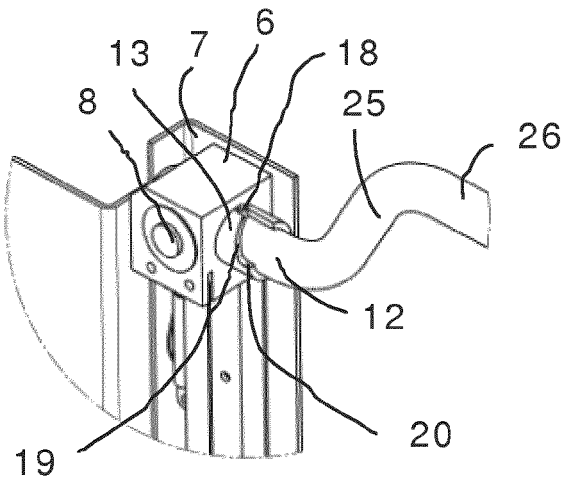

Fig. 5b

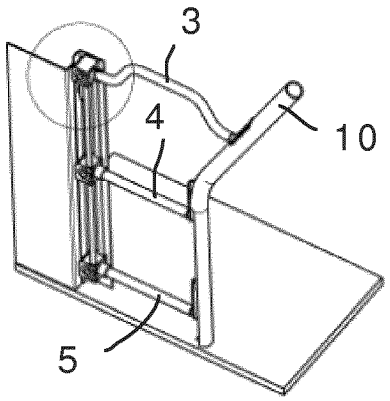

Fig. 6a

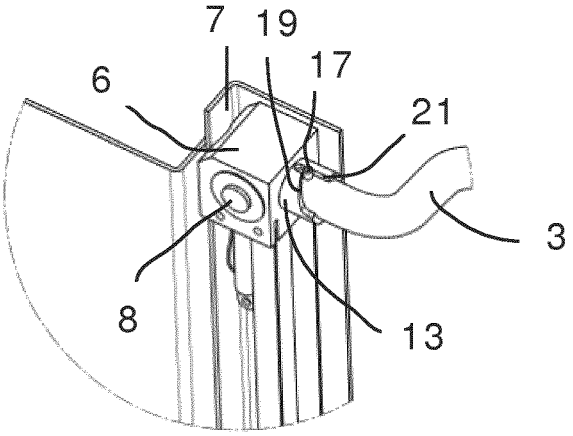

Fig. 6b

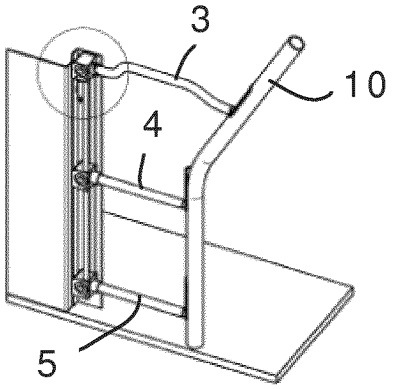

Fig. 7a

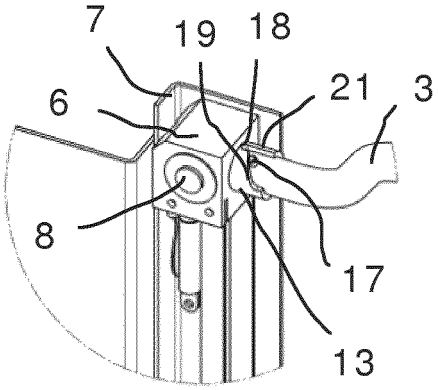

Fig. 7b

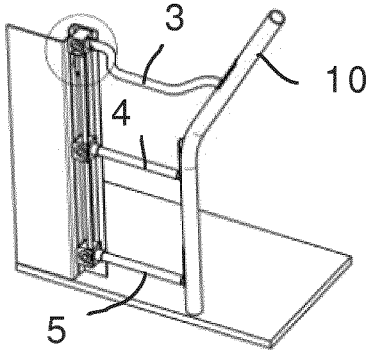

Fig. 8a

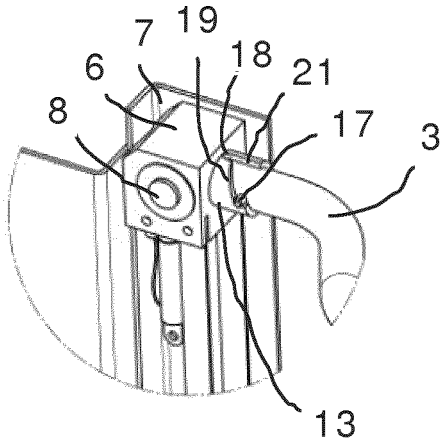

Fig. 8b

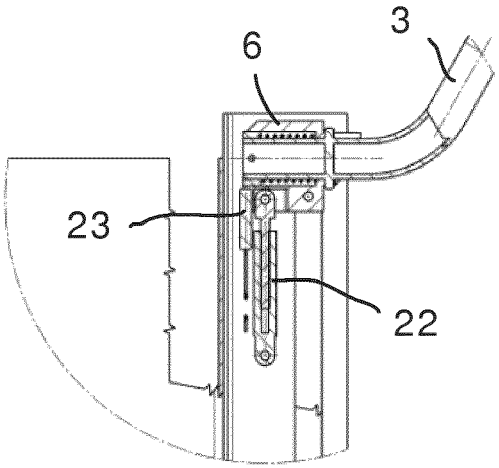

Fig. 9a

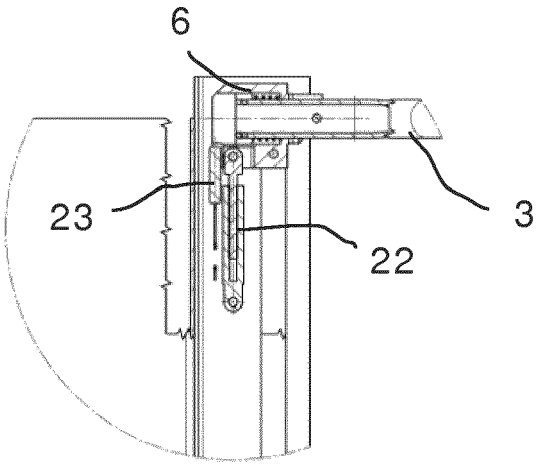

Fig. 9b

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EUROPEAN SEARCH REPORT

Application Number
EP 16 17 7202

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 195 18 116 A1 (LINDE AG [DE]) 23 November 1995 (1995-11-23) * abstract; figures 1,11-13 *	1	INV. B66F9/075 B66F9/12
A	DE 198 17 565 A1 (STILL WAGNER GMBH & CO KG [DE]) 21 October 1999 (1999-10-21) * abstract; figures *	1	
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TECHNICAL FIELDS SEARCHED (IPC)

B66F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	12 December 2016	Verheul, Omiros

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 16 17 7202

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12-12-2016

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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