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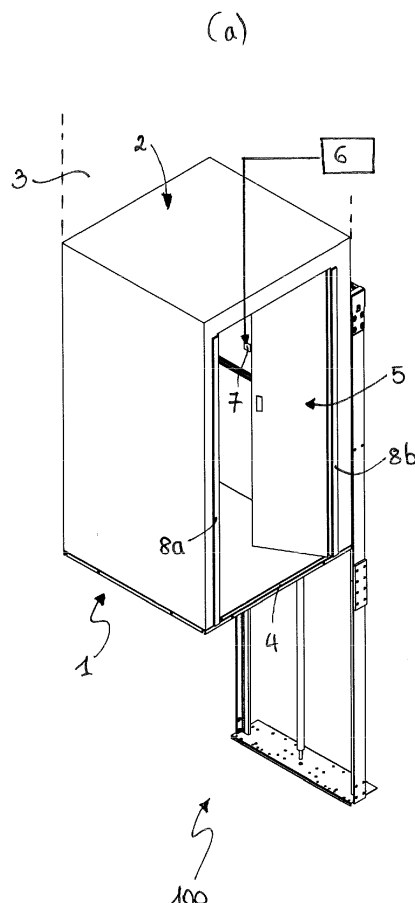
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(54) LIFT PLATFORM AND HOME LIFT COMPRISING THE LIFT PLATFORM

(57) Lift platform (1) comprising:
a cabin (2) slidable in a lift shaft (3) and provided with a door (5) that may be manually opened/closed;
a selector (7) for selecting the sliding of the cabin (2) in the lift shaft (3),
the selector (7) being configurable by a user in a first mode in which it enables the automatic sliding of the cabin (2) in the lift shaft (3), and in a second mode in which it enables the manual sliding of the cabin (2) in the lift shaft (3);
a control unit (6) configured in such a way that:
- in response to the detection of the closed condition of the door (5), the control unit (6) allows to configure the selector (7) in the first mode;
- in response to the detection of the open condition of the door (5), the control unit (6) allows to configure the selector (7) only in the second mode.

FIG. 4



Description

[0001] The present invention relates to a lift platform and a home lift comprising the lift platform.

[0002] Lift platforms are machines intended for lifting people or loads in lift shafts for exclusive use, typically closed and accessible through safety landing doors.

[0003] In this context, the focus is on screw-driven lift platforms. An example of such a lift platform, according to the state of the art, is shown in figure 1, in which the following are recognised:

- a lifting table 20, driven by an electric motor 21;
- an endless screw 22 fixed in the lift shaft;
- a rotating nut screw 23 mounted on the lifting table 20.

[0004] The rotation of the nut screw 23 causes the lifting table 20 to rise or fall as a function of the direction of rotation. The sliding of the lifting table 20 in the lift shaft is guided by a pair of substantially vertical guides, which are indicated in figure 1 with the identification numbers 24a, 24b.

[0005] As is known, a screw-driven lift platform has several advantages over other known solutions, including:

- the inherent safety of the lifting system, obtainable with simple and inexpensive mechanical devices, which prevents uncontrolled movements of the lifting table;
- the absence of additional machine spaces separated from the lift shaft, unlike hydraulically-driven platforms;
- the absence of mechanical devices that add bulk to the pit and/or the head in the lift shaft (unlike platforms driven by an electric hoist), which allows fully exploiting the vertical space available and installation even

in very small spaces in height.

[0006] Two types of screw-driven lift platforms drives are known, which differ in terms of the lifting table used and the platform control methodology.

[0007] The first known type, illustrated in figure 2, is a lift platform with an open lifting table 20, i.e. not equipped with perimeter walls. The lifting table 20 is provided with sensitive edges along the entire perimeter to ensure user safety. In fact, a small gap is defined between the lifting table and the walls of the lift shaft in order to avoid the "shearing" of the users, that is, the trapping of the same between the mobile table and the fixed walls of the lift shaft.

[0008] Safety regulations require a manual manoeuvre (called a "dead man's switch" in technical jargon): the user must continuously push the command (for example button 25) to move the lifting table 20. If the pressure on the control 25 ceases, the lifting table 20 stops.

[0009] The lift platform with an open lifting table is, however, disadvantageous for users with motor deficits.

[0010] In addition, the presence of sensitive edges required by safety regulations introduces mechanical elements subject to wear and breakdowns.

[0011] In addition, having a direct visual or tactile relationship with the lift shaft during the sliding of the lifting table, without separation elements, is not pleasant for the user.

[0012] The second known type, illustrated in figures 3a-3b, is a lift platform with a closed lifting table or "cabin".

[0013] The lifting table 20 is completely delimited by perimeter walls and a roof, collectively defining a cabin 2, which avoids the direct contact of the passengers with the lift shaft. The access to the cabin 2 is closed by an automatic sliding or folding door, indicated with the number 5.

[0014] In this second type, the manoeuvre is therefore automatic: the user activates the movement of the lifting table by pushing the control once, without maintaining the pressure.

[0015] This type of lift platform also has intrinsic limits.

[0016] First of all, the sliding automatic door implies the presence of an operator mechanism of considerable mass, which subtracts useful capacity from the lifting table and adds bulk at the head in the lift shaft (above the roof of the cabin) and also lateral bulk, for the folding up of the doors in the open configuration. The automatic folding door also has a bulk that reduces the useful load of the table.

[0017] A lift platform according to the preamble of claim 1 is further known from the document EP2848570.

[0018] In this context, the technical task that is the basis of the present invention is to propose a lift platform and a home lift that overcome the drawbacks of the cited prior art.

[0019] In particular, the object of the present invention is to propose a lift platform and a home lift that can be used by any user in compliance with safety regulations.

[0020] Another object of the present invention is to provide a lift platform with reduced dimensions with respect to lift platforms with a cabin and, at the same time, also usable in contexts where automatic manoeuvring is not possible for safety reasons.

[0021] The stated technical task and specified objects are substantially achieved by a lift platform comprising:

- a cabin slidable in a lift shaft, the cabin having an entrance at which a door is mounted that may be manually opened/closed;
- means for detecting an open/closed condition of the door;
- a selector for selecting the sliding of the cabin in the lift shaft, the selector being configurable by a user in a first mode in which it enables the automatic sliding of the cabin in the lift shaft, and in a second mode in which it enables the manual sliding off the cabin in the lift shaft;

- a control unit configured in such a way that:
 - in response to the detection of the closed condition of the door by the detecting means, the control unit allows to configure the selector in the first mode;
 - in response to the detection of the open condition of the door by the detecting means, the control unit allows to configure the selector only in the second mode.

[0022] Preferably, the lift platform also comprises a safety barrier operatively active on the entrance to detect the presence of obstacles.

[0023] In particular, the safety barrier is a photoelectric safety barrier comprising a first device configured to emit electromagnetic radiations and a second device configured to receive the electromagnetic radiations coming from the first device.

[0024] In accordance with one embodiment, the first device and the second photoelectric safety barrier device are installed on opposite sides of the door.

[0025] Preferably, the control unit is also configured to disable the sliding of the cabin in response to the detection of the open condition of the door by said detecting means and the detection of obstacles near the entrance by the safety barrier.

[0026] In accordance with one embodiment, the selector is a button for which:

- the configuration of the first mode by the user is obtained by pushing the button only once;
- the configuration of the second mode by the user is obtained by continuously pushing this button.

[0027] In accordance with one embodiment, the door is a double-leaf door.

[0028] In accordance with another embodiment, the door is a folding door. Preferably, the lift platform also comprises an emergency stop device arranged near the selector and manually activatable by the user to stop the sliding of the cabin.

[0029] The stated technical task and specified aims are substantially achieved by a home lift, comprising:

- a lift platform in accordance with the present invention;
- an endless screw sliding apparatus, which is operatively active on the cabin of the lift platform for activating the sliding thereof in the lift shaft.

[0030] Further characteristics and advantages of the present invention will become more apparent from the indicative and thus non-limiting description of a preferred, but not exclusive, embodiment of a lift platform and a home lift comprising the lift platform, as illustrated in the appended drawings, in which:

- figures 1, 2, 3a, 3b illustrate home lifts of known type;
- figures 4a and 4b illustrate a home lift comprising a lift platform, in accordance with the present invention, respectively in a perspective view from above and in a perspective view from below;
- figure 5 illustrates the home lift of figures 4a-4b, in a sectional transverse view;
- figure 6 illustrates a different embodiment of the home lift of figures 4a-4b, in a sectional transverse view.

[0031] With reference to the accompanying figures, a lift platform, which is an object of the present invention, is indicated with the reference number 1. This lift platform 1 comprises a cabin 2 slidable in a lift shaft 3. The cabin 2 has at least one entrance 4 at which a door 5 is mounted that may be manually opened/closed.

[0032] In a first embodiment, illustrated in figure 5, the door 5 is a double-leaf door, in particular with two panels 5a, 5b with manual opening towards the interior of the cabin 2.

[0033] In a second embodiment, illustrated in figure 6, the door 5 is a folding door.

[0034] Both types of doors are of the known type and will not be described further.

[0035] Advantageously, the lift platform 1 is provided with means (not illustrated) to detect an open/closed condition of the door 5.

[0036] The lift platform 1 further comprises a selector 7 for selecting the sliding of the cabin 2 in the lift shaft 3. Originally, the selector 7 is configurable by a user in a first mode in which it enables the automatic sliding of the cabin 2 in the lift shaft 3, and in a second mode in which it enables the manual sliding of the cabin 2 in the lift shaft 3.

[0037] In this context, "automatic sliding" means that, once the sliding of the cabin 2 in the lift shaft 3 has been activated by the user, the cabin 2 slides without further intervention by the user.

[0038] "Manual sliding", on the other hand, means that the cabin 2 can only slide in the lift shaft 3 through the continuous intervention by the user.

[0039] For example, in the embodiments described and illustrated herein, the selector 7 is a key or a button for which:

- the configuration of the first mode by the user is obtained by pushing the button 7 only once;
- the configuration of the second mode by the user is instead obtained by continuously pushing the button 7. In other words, the user must press the button 7 for the entire duration of the sliding of the cabin 2 in the lift shaft 3.

[0040] Preferably, near the entrance 4 a safety barrier 8a, 8b is installed which is operatively active on the entrance 4 to detect the presence of obstacles.

[0041] In particular, the safety barrier 8a, 8b is a photoelectric safety barrier.

toelectric barrier comprising a first device 8a (also called "emitter") and a second device 8b (also called "receiver").

[0042] The emitter 8a is configured to emit electromagnetic radiations, while the receiver 8b is configured to receive the radiations from the emitter 8a.

[0043] In the embodiments described and illustrated herein, the emitter 8a and the receiver 8b are installed on opposite sides of the door 5, outside the cabin 2, so as to detect the presence of obstacles near the entrance 4. Advantageously, the lift platform 1 further comprises a control unit 6 configured in such a way that:

- in response to the detection of the closed condition of the door 5, the control unit 6 allows to configure the selector 7 in the first mode;
- in response to the detection of the open condition of the door 5, the control unit 6 allows to configure the selector 7 only in the second mode.

[0044] In particular, in response to the detection of the open condition of the door 5 and the detection of obstacles near the entrance 4 by the safety barrier 8, the control unit 6 is configured to disable the sliding of the cabin 2. This takes place regardless of whether the user configures the selector 7 in the second mode.

[0045] In addition, an emergency stop device (not shown) is provided, located near the selector 7. In particular, the emergency stop device is a stop button manually activatable by the user to stop the sliding of the cabin 2. The number 100 indicates a home lift comprising:

- the lift platform 1;
- an endless screw sliding apparatus 101 operably active on the cabin 2 of the lift platform 1 for activating the sliding thereof in the lift shaft 3.

[0046] The endless screw sliding apparatus 101 is of a known type, similar to that illustrated in figure 1, and will not be further described.

[0047] The functioning of the lift platform, according to the present invention, is briefly described below.

[0048] When a user must enter the cabin 2, he manually opens the door 5, for example by pushing the doors 5a, 5b towards the inside of the cabin 2 (see figure 5).

[0049] The door 5 then passes from the closed condition, in which entry into the cabin 2 is prevented, to the open condition, in which the user is allowed to enter the cabin 2.

[0050] Once the user has entered the cabin 2, he closes the door 5 again, for example by pushing the doors 5a, 5b towards the outside of the cabin 2.

[0051] In response to the detection of the closed door condition by the detecting means, the control unit 6 allows the user to activate the automatic sliding of the cabin 2 through a single push of the button 7 (first mode).

[0052] In fact, since the door 5 is closed, the automatic sliding can be safely activated.

[0053] If it is not possible to close the door 5, for ex-

ample due to people or loads standing in the space necessary to open/close the door 5, the automatic sliding (first mode) is not allowed for safety reasons.

[0054] There are two possibilities:

- if the safety barrier 8 does not detect obstacles near the entrance 4, the control unit 6 allows the user to activate the manual sliding of the cabin 2 (second mode) by continuously pushing the button 7. If the pressure fails at any moment of the sliding, the control unit 6 stops the cabin 2;
- if the safety barrier 8 detects obstacles near the entrance 4, the control unit 6 does not in any way allow the user to activate the sliding of the cabin 2 (neither automatically nor manually).

[0055] In the embodiments described and illustrated herein, the cabin 2 has a single entrance. In variant embodiments of the invention, multiple entrances are provided.

[0056] The lift platform 1 can be installed either by creating a basic containment pit or without a pit. In the first case the lower access is flush with the floor, in the second case a small fixed access ramp can be used.

[0057] The characteristics of the lift platform and the home lift comprising the lift platform according to the present invention emerge clearly from the above description, as do the advantages.

[0058] In particular, the proposed lift platform has the typical advantages of platforms with cabins (safety and visual pleasantness), combined with the benefits generally associated with an open table, such as the use of a manually opening door that guarantees compactness, lightness and reliability.

[0059] In particular, the proposed lift platform is versatile thanks to the possibility of switching from automatic to manual sliding according to needs. The coexistence of the double manoeuvre (automatic and manual) in the same lift platform allows safe use in a range of circumstances and conditions, greater than that of known solutions.

[0060] In addition, the presence of the safety barrier and the emergency stop device make it possible to comply with the safety criteria required by law. The use of an endless screw sliding apparatus contributes to the simplicity of construction and the compactness of the home lift.

Claims

1. Lift platform (1) comprising:

a cabin (2) slidable in a lift shaft (3), said cabin (2) having an entrance (4) where it is mounted a door (5) that may be manually opened/closed; means for detecting an open/close condition of the door (5);

a selector (7) for selecting the sliding of the cabin (2) in the lift shaft (3),
 said selector (7) being configurable by a user in a first mode in which it enables the automatic sliding of the cabin (2) in the lift shaft (3), and in a second mode in which it enables the manual sliding of the cabin (2) in the lift shaft (3);
 a safety barrier (8a, 8b) operatively active on said entrance (4) for detecting obstacles;
 a control unit (6) configured in such a way that:

- in response to the detection of the close condition of the door (5) by said means for detecting, the control unit (6) allows to configure the selector (7) in the first mode,

characterised in that said control unit (6) is configured

- in such a way that in response to the detection of the open condition of the door (5) by said means for detecting, the control unit (6) allows to configure the selector (7) only in the second mode;

- to disable the sliding of the cabin (2) in response to the detection of the open condition of the door (5) by said means for detecting and to the detection of obstacles in proximity of the entrance (4) by said safety barrier (8a, 8b)

2. Lift platform (1) according to claim 1, wherein said safety barrier (8a, 8b) is a photoelectric barrier comprising a first device (8a) configured to emit electromagnetic radiations and a second device (8b) configured to receive the electromagnetic radiation coming from the first device (8a).

3. Lift platform (1) according to claim 2, wherein said first device (8a) and said second device (8b) are installed on opposed sides of the door (5).

4. Lift platform (1) according to any of the preceding claims, wherein said selector (7) is a button wherein:

- the configuration of the first mode by the user is obtained by pushing said button (7) once;
 - the configuration of the second mode by the user is obtained by pushing continuously said button (7).

5. Lift platform (1) according to any of the previous claims, wherein said door (5) is a double-leaf door.

6. Lift platform (1) according to any of the claims 1 to 4, wherein said door (5) is a folding door.

7. Lift platform (1) according to any of the previous

claims, further comprising an emergency stop device arranged near said selector (7) and manually activatable by the user to stop the sliding of said cabin (2).

8. Home lift (100) comprising:

a lift platform (1) according to any of the previous claims;
 an endless screw sliding apparatus (101) operatively active on the cabin (2) of said lift platform (1) for activating the sliding thereof in the lift shaft (3).

FIG. 1

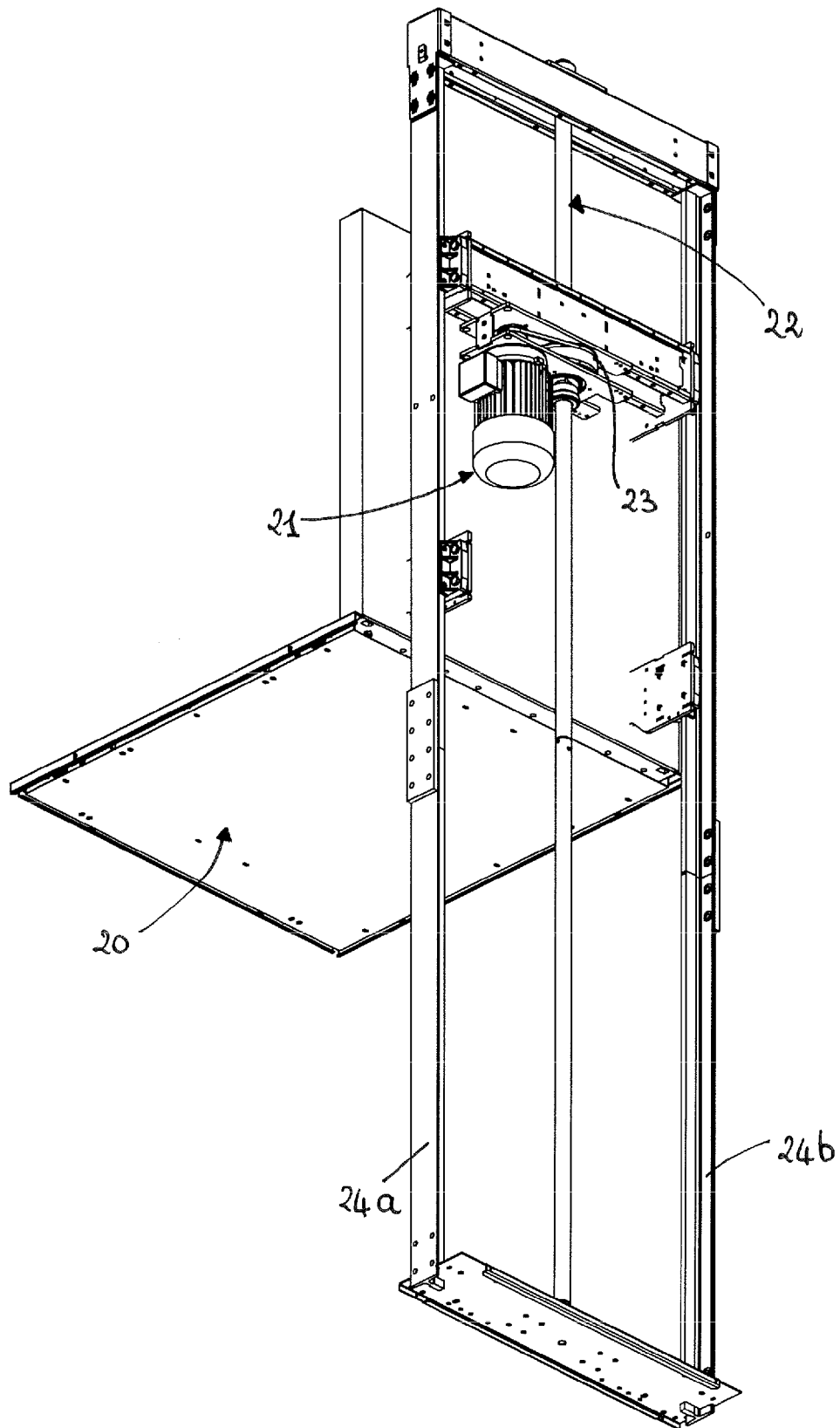


FIG. 2

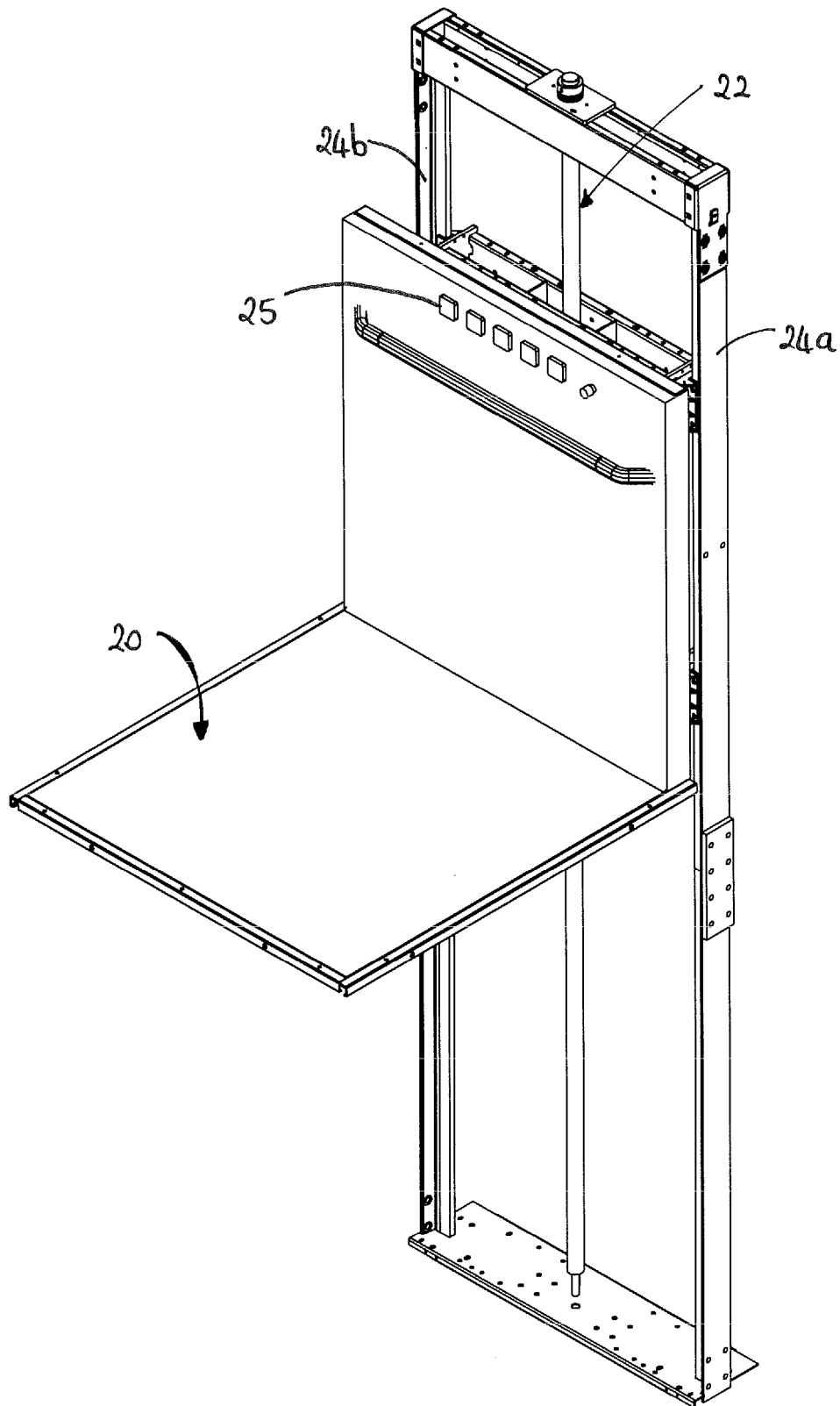


FIG. 3

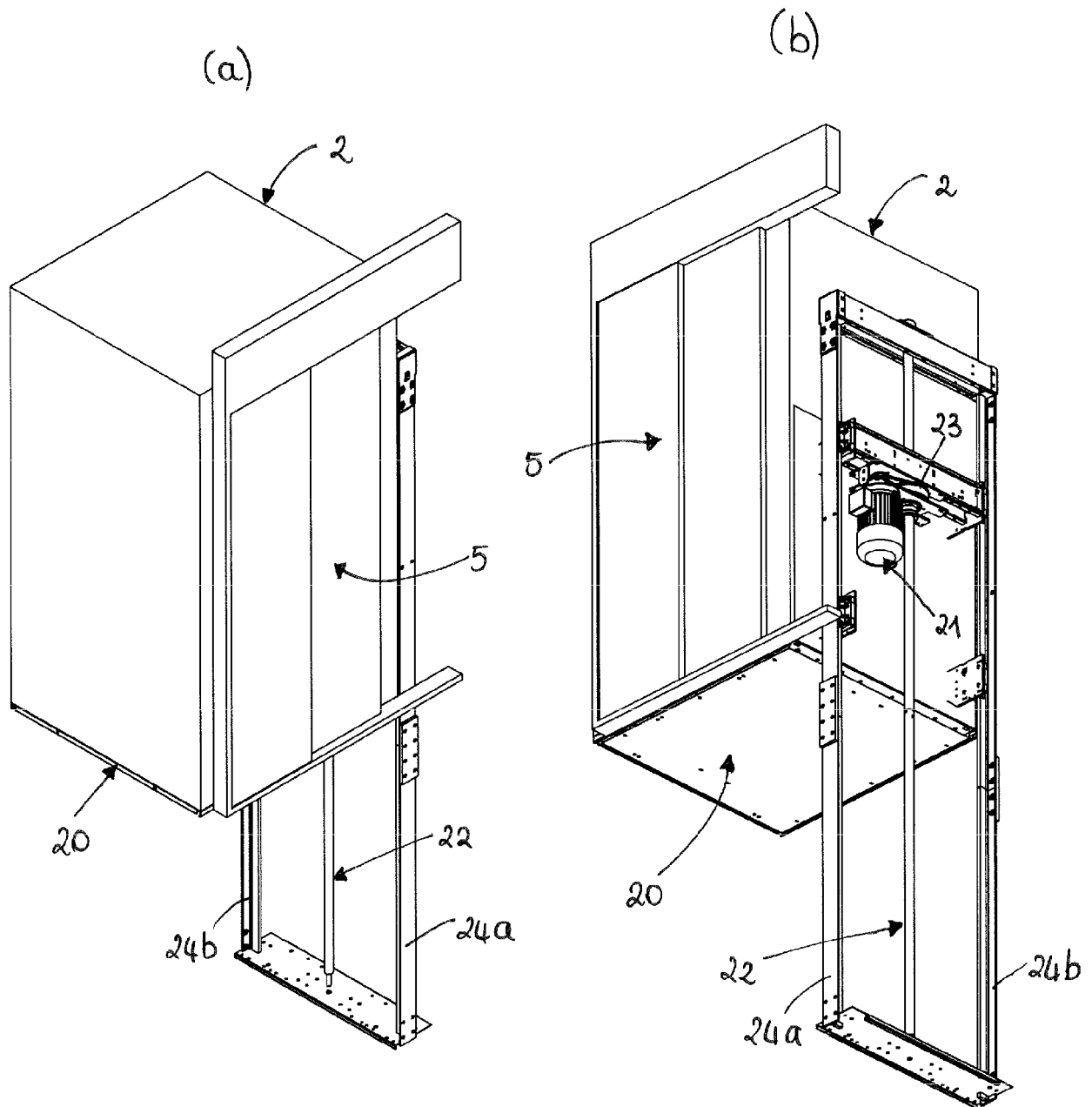


FIG. 4

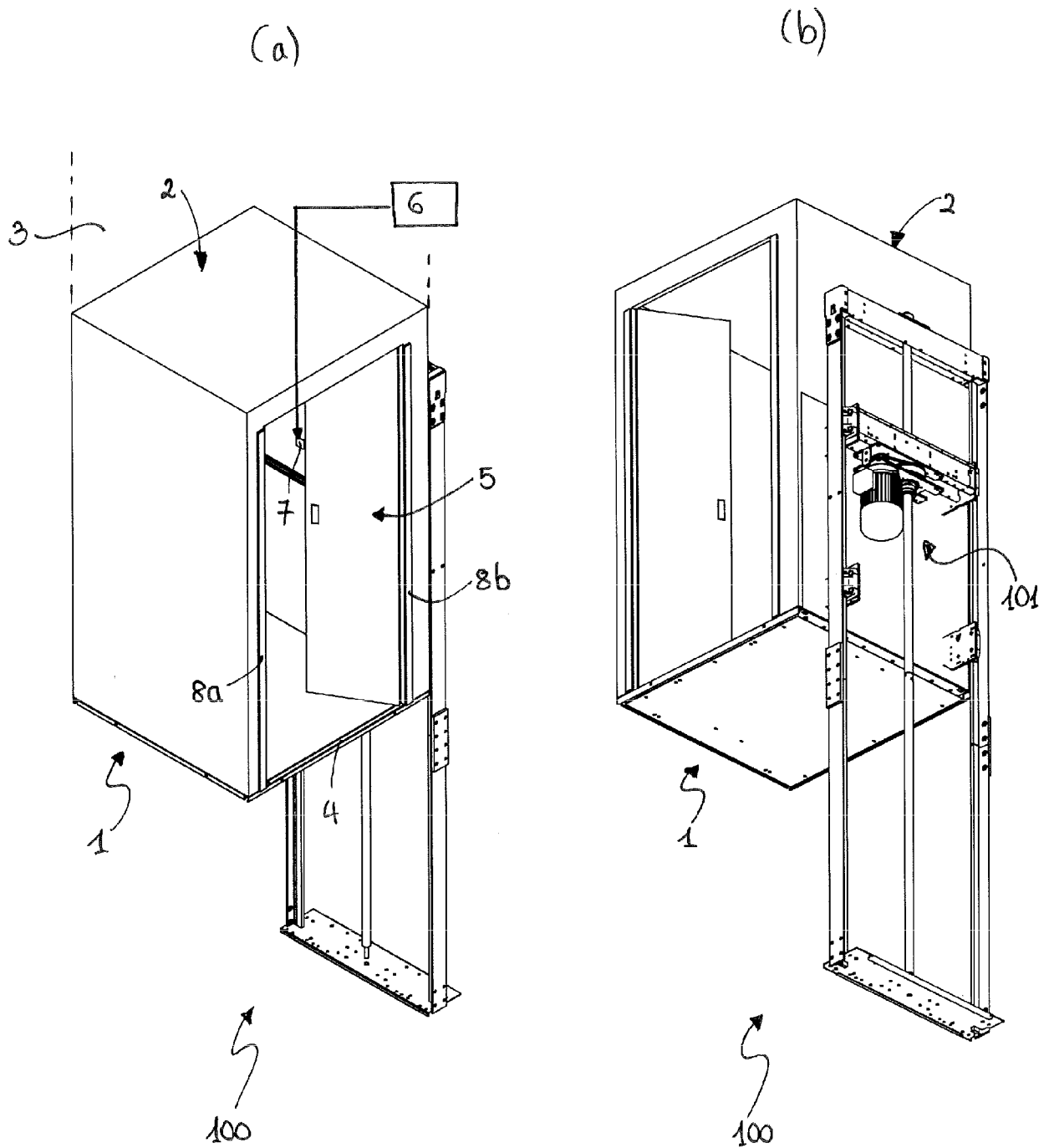


FIG. 5

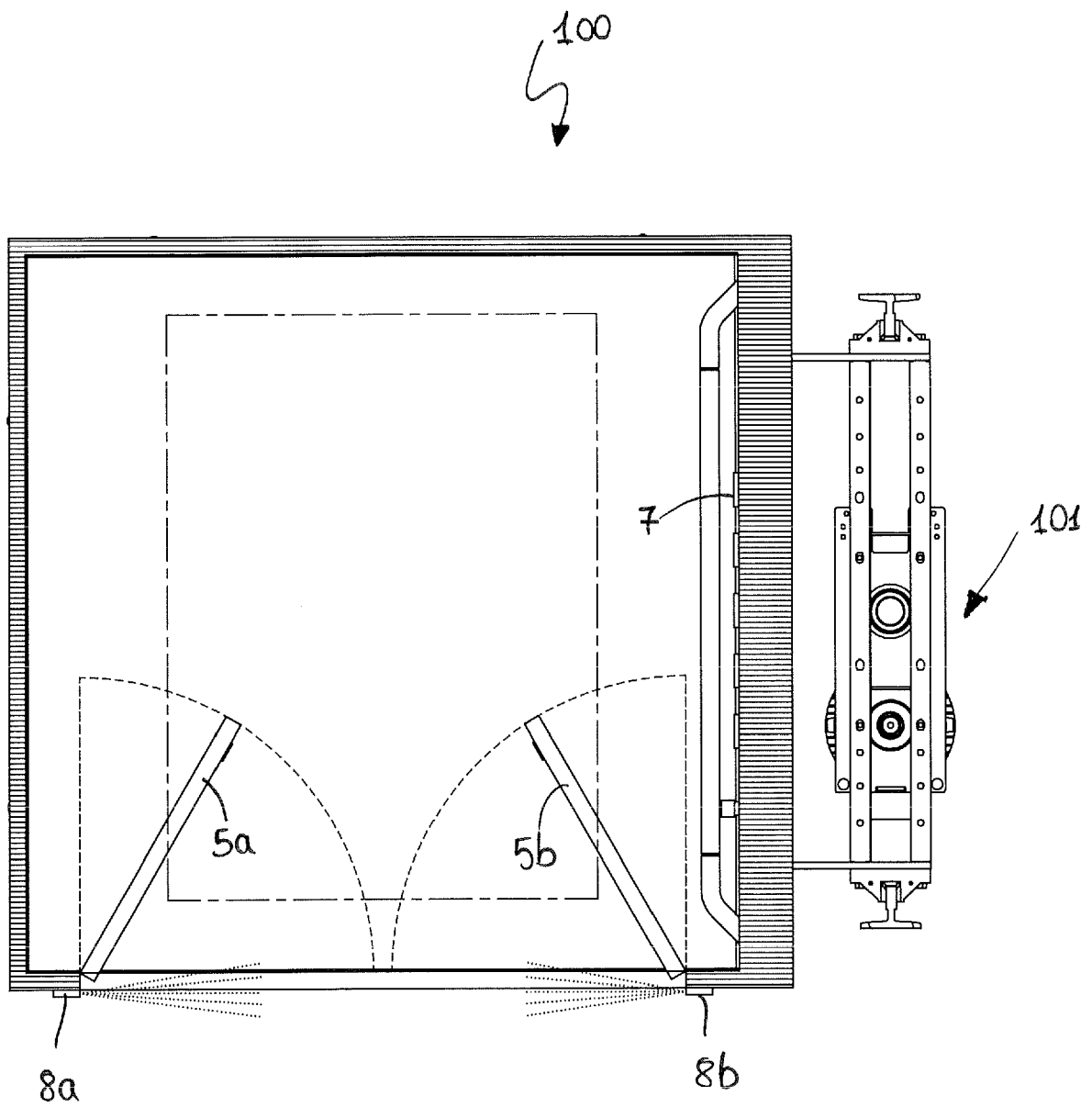
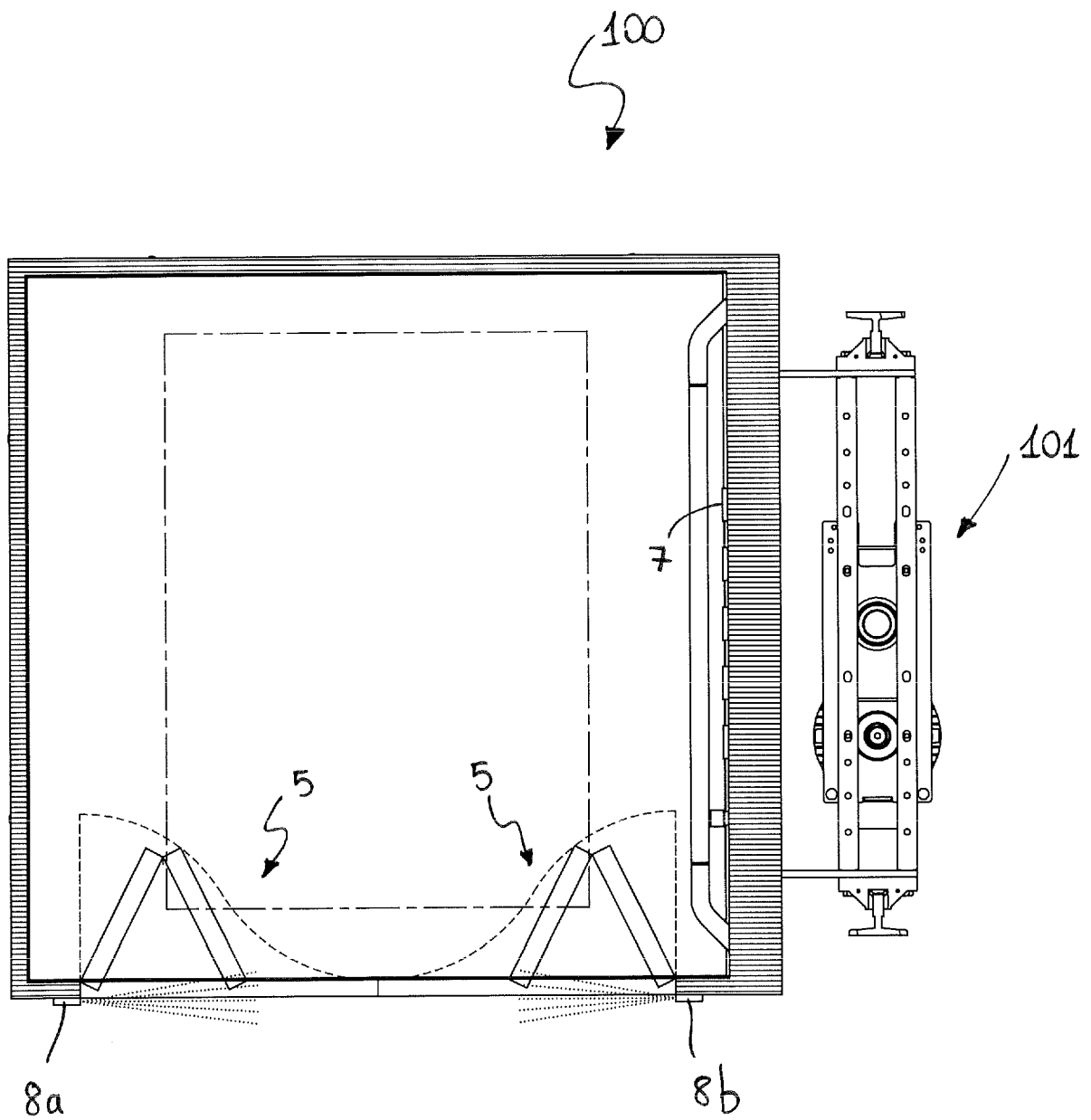


FIG. 6





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Application Number
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			B66B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 18 September 2020	Examiner Szován, Levente
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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