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(54) **MAINTENANCE PLATFORM**

(57) An elevator door frame comprising a back panel movable between normal position and maintenance position is disclosed. The back panel is connected to the door frame so that when in maintenance position the maintenance person can step on the back panel and operate or change the device. When the back panel is in normal position the back panel covers the cavity.

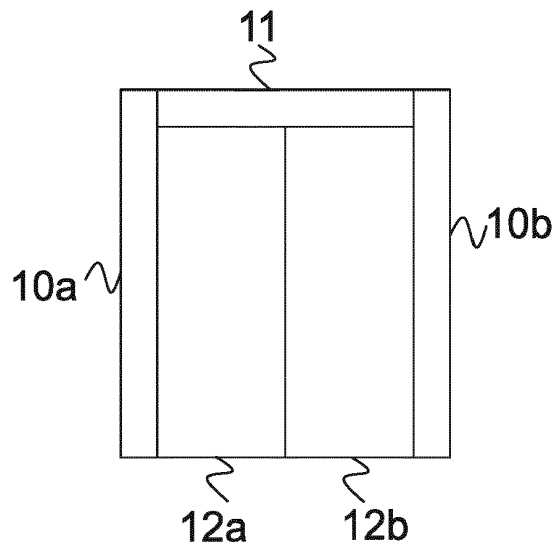


Fig. 1a

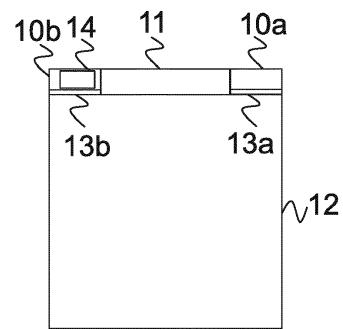


Fig. 1b

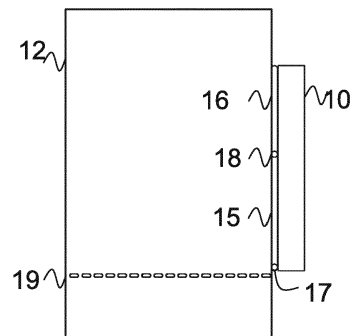


Fig. 1c

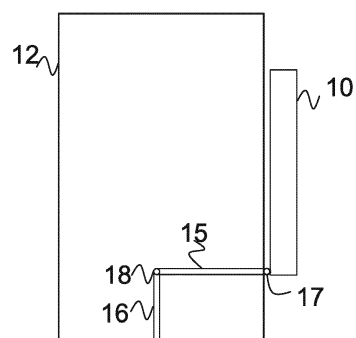


Fig. 1d

Description

FIELD OF THE INVENTION

[0001] The invention relates to elevators and more particularly to elevator maintenance.

BACKGROUND

[0002] Modern elevators include a plurality of components that need to be accessed during maintenance. One of the components mentioned is a controller or a controlling device that is used to control an elevator. Typically this controller needs to be accessed during different maintenance operations by connecting a cable to the device. Sometimes, when the controller is not working properly, the whole controller needs to be changed.

[0003] Recently elevator door frames having a cavity for storing a controller have been introduced. These special door frames are used in the floor where the controller is located. Typically the access to the controller is from the landing side of the door frame. In some cases, the controller is accessed from an elevator shaft by opening a protective cover that is arranged to close the cavity from open environment.

[0004] As the controller needs to be accessed from the elevator shaft a maintenance platform or other means for supporting the maintenance man is needed. One known solution is to move the elevator car in the shaft to such position that the roof of the elevator car can be used as a maintenance platform.

SUMMARY

[0005] An elevator door frame comprising a back panel movable between normal position and maintenance position is disclosed. The back panel is connected to the door frame so that when in maintenance position the maintenance person can step on the back panel and operate or change the device. When the back panel is in normal position the back panel covers the cavity.

[0006] An elevator door frame comprises at least one vertical frame part comprising a cavity. The vertical frame part comprising the cavity further comprises a back panel pivotally connected to the vertical frame part comprising a cavity, wherein the back panel is movable between a first position and a second position and in the first position the back panel is configured to cover the cavity and in the second position the back panel is configured to act as a support platform.

[0007] Using elevator car floor as a maintenance platform has some drawbacks. For example, if the door frame comprising the controller is located in the bottom floor there has to be a pit deep enough so that the roof of the elevator car can be to the same level with the floor of the bottom floor. In other words, the elevator must be driven so that the maintenance person can easily step on the roof of the elevator car. This might be undesired for many rea-

sons. For example, on the top of the elevator car there may be components that can be easily broken if the maintenance man is not careful. Furthermore, sometimes the deep pit is not a desired solution for constructional reasons or the pit may contain further components that need to be accessed and access to these components would be harder when the pit is really deep.

[0008] In an embodiment the back panel comprises a first part and a second part pivotally connected to each other, wherein the second part is movable between a first position and a second position and when the first part and the second part are in the second position the second part is configured to support the back panel so that it can be used as a support platform. In an alternative embodiment the back panel is configured to meet a counterpart notch when the back panel is in the second position.

[0009] In a further embodiment the door frame further comprises a pivotally connected handrail, the handrail being movable between a first position and a second position.

[0010] In an embodiment the handrail comprises a first part and a second part pivotally connected to each other and movable between a first position and a second position, wherein the second part is configured to be supported by the first part of back panel when the second part is in the second position. In an embodiment the elevator door frame further comprises a lock mechanism for locking the second part of the handrail to the first part of the back panel. In an alternative embodiment the handrail is configured to meet a counterpart notch when the hand rail is in the second position.

[0011] A benefit of the embodiments discussed above is that they provide an easy access to the cavity so that a maintenance person can easily check the controller in the cavity without bringing additional ladder or similar. When the back panel is in normal position it may act as a protective cover. Furthermore, when in normal position the back panel arrangement does not disturb the operation of the elevator. Furthermore, when a back panel as described above is used, the elevator roof needs not to be used as a supporting platform. Thus, the controller can be easily located in the bottom floor when there is no need for pit that is deep enough so that the elevator roof could be driven to the floor level.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The accompanying drawings, which are included to provide a further understanding and constitute a part of this specification, illustrate embodiments and together with the description help to explain the principles of embodiments. In the drawings:

Fig. 1a is a front view of an example embodiment, Fig. 1b is a top view of an example embodiment, Fig. 1c is a side view of an example embodiment, Fig. 1d is a side view of an example embodiment, Fig. 2a is a side view of an example embodiment,

Fig. 2b is a side view of an example embodiment,
Fig. 3a is a top view of an example embodiment,
Fig. 3b is a side view of an example embodiment,
Fig. 3c is a side view of an example embodiment,
 and
Fig. 3d is a top view of an example embodiment.

DETAILED DESCRIPTION

[0013] Reference will now be made in detail to the embodiments, examples of which are illustrated in the accompanying drawings.

[0014] In figure 1a a front view of an example embodiment is disclosed. In the figure an elevator door frame including vertical frame parts 10a and 10b and a horizontal frame part 11 is shown. In addition to the frame the door leaves 12a and 12b are shown in closed position. Thus, the elevator car might not be behind the door leaves or the door is just closed for some other reason. The door leaves 12a and 12b must be chosen such that they do not block the access to a door frame cavity comprising a controller. As such door leave arrangements are known for door frames comprising a cavity for controller they are omitted from later figures.

[0015] In figure 1b is a top view of the example of figure 1a. In the figure the elevator shaft 12 is shown. In the figure vertical frame parts 10a and 10b comprise a back panel 13a and 13b respectively. The horizontal frame part 11 is shown also in the figure, however, in the embodiment it does not have any special purpose. In the embodiment two back panels 13a and 13b are shown, however, it is possible to make an embodiment having only back panel 13b, which is arranged to the vertical frame part 10b comprising a cavity for a controller 14. In the figure there is no separate cover for the cavity 14, however, an additional cover may be added if needed, for example, a tight cover for preventing dust entering the cavity. At least one of the vertical frame parts 10a, 10b may also comprise a door or hatch which opens to the landing, such that the controller 14 is accessible from landing, outside of the shaft 12. This way it may be possible, for example, for a serviceman to operate manual rescue drive buttons of the controller from the landing.

[0016] Figure 1c is a side view of the embodiment discussed above. In the figure the back panel is seen behind a vertical frame part 10. In figure the shaft 12 can be seen extending downwards and upwards from the door frame. Below line 19 is the pit having bottom a little bit lower from the door frame. The back panel comprises a first part 15 and a second part 16. The first part is mounted to the door frame by using a pivotal connection 17 so that the first part of the back panel 15 can be moved between first and second position. A typical example of a pivotal connection is a hinge. Hinges are available in various forms, however, also other pivotal connections may be used. Correspondingly the second part of the back panel 16 is mounted to the first part of the back panel 15 by using a pivotal connection 18 so that the second part of

the back panel can be moved between the first and the second position.

[0017] Figure 1d is a further side view where in the first 15 and second 16 parts of the back panel are shown in the second position. For the sake of clarity the stroked line 19 is omitted from the figure. From the figure it can be seen that the first part 15 of the back panel has been turned into the second position, which is a horizontal position so that the first part 15 of the back panel now forms a maintenance platform on which a maintenance person can step when accessing the cavity 14. The second part 16 of the back panel is further turned so that it will act as a support for the first part 15. Pivotal connections 17 and 18 can be such connections that they can be turned only 90 degrees and automatically lock in both positions for making the use of the support plane easier. When the maintenance work is over both parts can be turned back to their normal position so that they will be against the vertical frame part so that the elevator car can freely move in the shaft.

[0018] The above embodiment can be implemented so that only the frame part comprising the cavity has a movable back panel, however, sometimes it might be beneficial to have a movable back panel in both of the vertical parts. In such case an additional support platform can be placed on these pivotally mounted back panels. This additional support platform may be brought by the maintenance man or it may be permanently attached to the side wall of the elevator shaft 12 so that it can be switched between the maintenance and normal operation position, for exempla, by using a corresponding pivotal connection as the back panel.

[0019] Figure 2a shows a modification of an embodiment discussed above. The modification includes a hand rail and it may also be combined to other embodiments when a hand rail is needed or considered useful. The hand rail comprises a first part 20 and a second part 21. Furthermore, the first part is mounted to the door frame 10 by pivotal connection 22 so that the first part of the hand rail 20 can be moved between first and second position. Correspondingly the second part of the hand rail 21 is mounted to the first part of the hand rail 20 by using a pivotal connection 23 so that the second part of the hand rail can be moved between the first and the second position.

[0020] Figure 2b is a further side view where in the first 20 and second 21 parts of the hand rail are shown in the second position. In this embodiment, when the hand rail 20, 21 and back panel 15, 16 are in the first position, the hand rail 20, 21 is located between the back panel 15, 16 and the door frame 10. Thus, when the handrail 15, 16 and the back panel 20, 21 are turned into the second position the back panel 15, 16 supports the hand rail 20, 21. Dimensions and the location of the handrail 15, 16 should be chosen so that it can be easily grabbed. As explained above, also pivotal connections 22 and 23 can be such connections that they can be turned only 90 degrees and automatically lock in both positions for making

the use of the support plane easier. When the maintenance work is over both parts can be turned back to their normal position so that they will be against the vertical frame part so that the elevator car can freely move in the shaft. Figure 2b further discloses a locking mechanism 24. The purpose of the locking mechanism is to hold the second part of the handrail 21 in correct position so that the stability of the hand rail is increased. The locking mechanism 24 is not necessary and instead of various different commonly known locking mechanisms it is possible to provide, for example, a small notch that will hold the handrail in correct position.

[0021] Figures 3a - 3d show a further embodiment that differs from earlier embodiments by having one part back panels 13a, 13b, 15 with pivotal connection 17. Back panels 13a and 13b are connected to the door frame 10a, 10b respectively and the cavity 15 is protected by a back panel. The panel is turned so that the back panel when the panel is in the second position for maintenance operations it is supported by a counterpart notch 30. The location of notches is indicated also in figures 3a and 3d even if they cannot be seen from the above. In figures 3a - 3d a further support platform 31 is shown. The platform 31 is also pivotally mounted and can be turned to a second position as shown in figures 3c and 3d. The support platform 31 is supported by back panels 13a and 13b. Thus, the maintenance man can easily access the cavity 14.

[0022] Figures 3a - 3d illustrate a notch that can be used for supporting a one-part back panel. Corresponding arrangement can be provided for the hand rail disclosed in figures 2a and 2b. Even if figures 3a - 3d disclose use of two back panels the support platform 31 can be arranged to be supported by the pivotal connection and one back panel.

[0023] It is obvious to a person skilled in the art that with the advancement of technology, the basic idea of the invention may be implemented in various ways. The invention and its embodiments are thus not limited to the examples described above; instead they may vary within the scope of the claims.

Claims

1. An elevator door frame comprising at least one vertical frame part (10, 10b) comprising a cavity (14), said vertical frame part (10, 10b) comprising said cavity (14) further comprising:

a back panel (13b, 15, 16) pivotally (17) connected to said vertical frame part (10, 10) comprising a cavity (14), wherein said back panel (13b, 15, 16) is movable between a first position and a second position and in said first position said back panel (13b, 15, 16) is configured to cover said cavity (14) and in said second position said back panel (13b,

15, 16) is configured to act as a support platform.

2. An elevator door frame according to claim 1, wherein said back panel comprises a first part (15) and a second part (16) pivotally (18) connected to each other, wherein said second part (16) is movable between a first position and a second position and when said first part (15) and said second part (16) are in the second position said second part (16) is configured to support said back panel (15) so that it can be used as a support platform.
3. An elevator door frame according to claim 1, wherein said back panel (13b) is configured to meet a counterpart notch (30) when said back panel is in said second position.
4. An elevator door frame according to any of preceding claims 1 - 3, wherein said door frame further comprises a pivotally (20) connected handrail (21, 22), said handrail (21, 22) being movable between a first position and a second position.
5. An elevator door frame according to claim 4, wherein said handrail comprises a first part (21) and a second part (22) pivotally connected to each other and movable between a first position and a second position, wherein said second part (22) is configured to be supported by said first part of back panel (15) when said second part (22) is in said second position.
6. An elevator door frame according to claim 5, wherein said elevator door frame further comprises a lock mechanism for locking said second part of the handrail (22) to said first part of the back panel (15).
7. An elevator door frame according to claim 4, wherein said handrail (21, 22) is configured to meet a counterpart notch (30) when said hand rail is in said second position.
8. An elevator comprising a door frame according to any of preceding claims 1 - 7.
9. An elevator according to claim 8, wherein said door frame is located in the bottom floor.

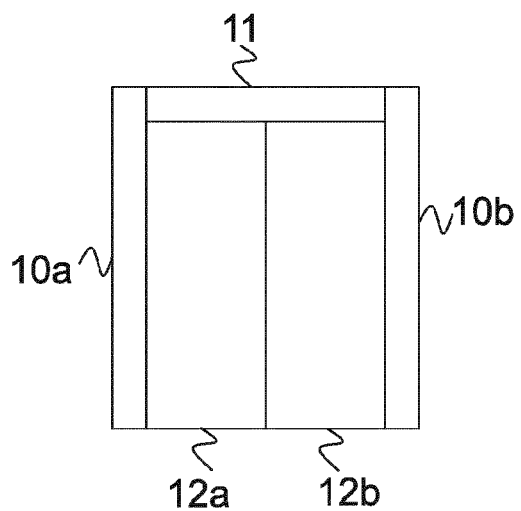


Fig. 1a

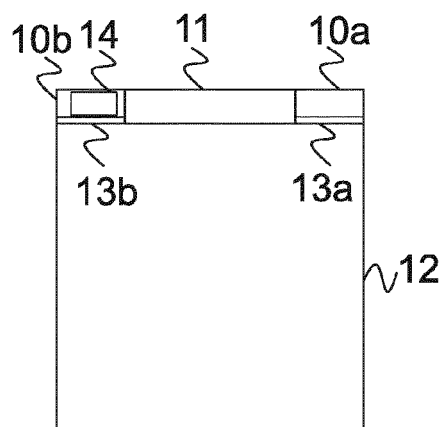


Fig. 1b

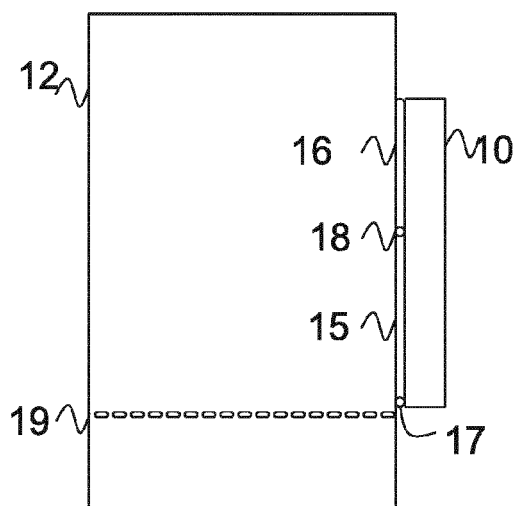


Fig. 1c

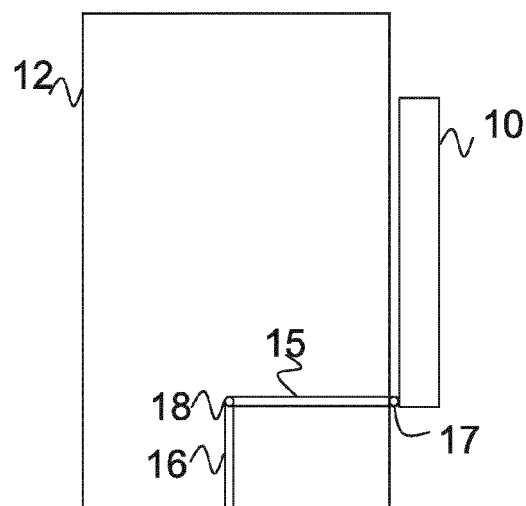


Fig. 1d

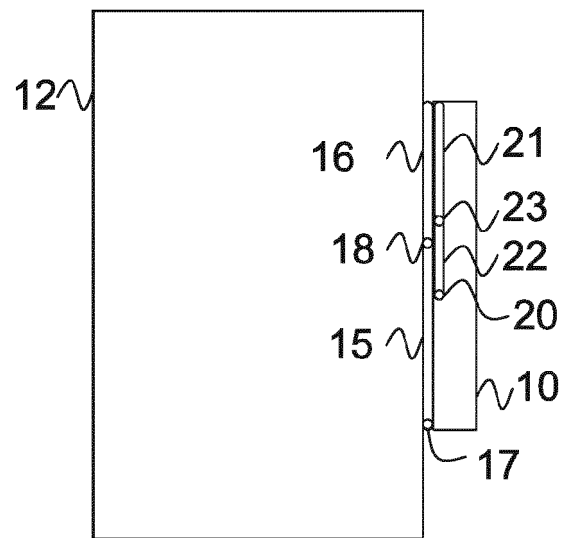


Fig. 2a

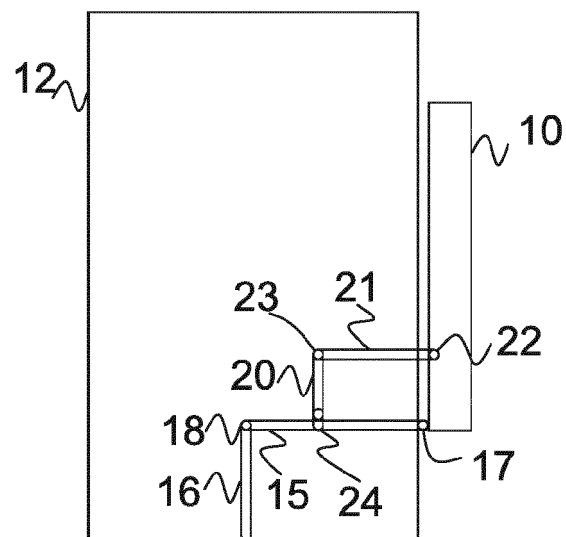


Fig. 2b

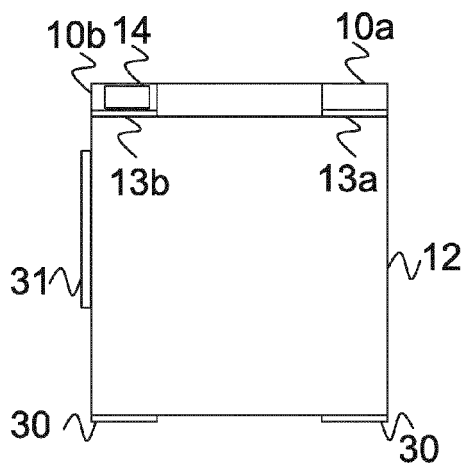


Fig. 3a

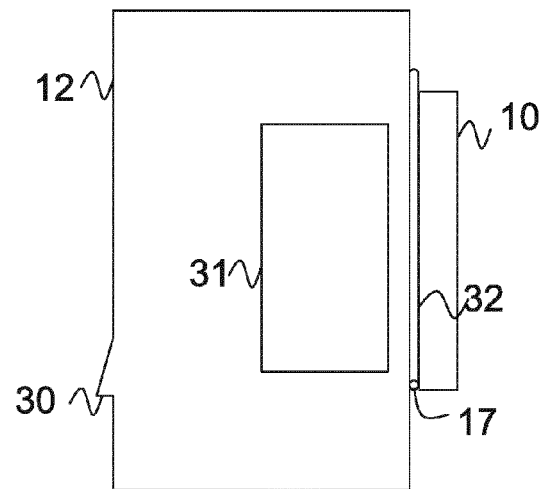


Fig. 3b

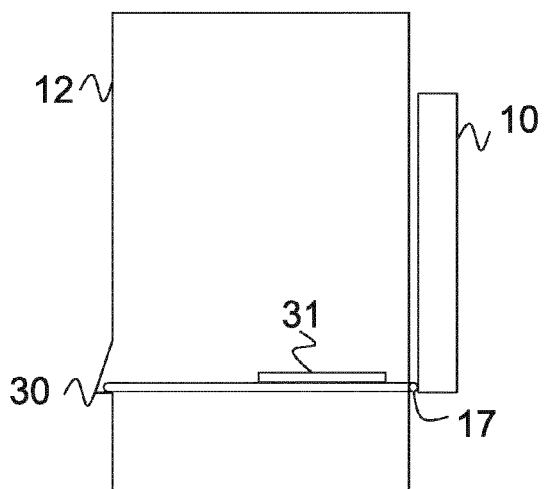


Fig. 3c

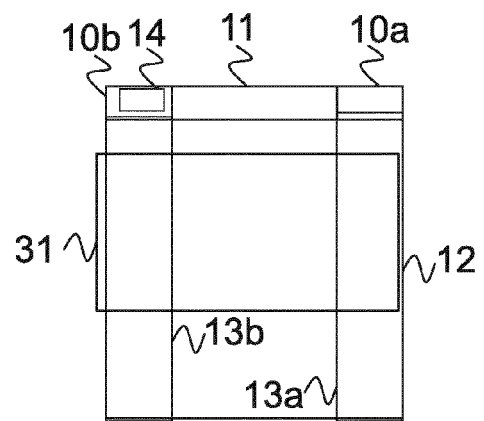


Fig. 3d



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Application Number
EP 15 16 5895

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X	US 2001/022253 A1 (REUTER GUNTER [DE] ET AL) 20 September 2001 (2001-09-20) * paragraphs [0016], [0018], [0019], [40.43], [0052] - [0054]; figures 1-4 *	1-9	INV. B66B5/00 B66B11/02 B66B13/30
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Place of search The Hague		Date of completion of the search 30 September 2015	Examiner Iuliano, Emanuela
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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