

(19)



(11)

EP 4 091 979 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
23.11.2022 Bulletin 2022/47

(51) International Patent Classification (IPC):
B66B 25/00 (2006.01)

(21) Application number: **22174027.7**

(52) Cooperative Patent Classification (CPC):
B66B 25/006

(22) Date of filing: **18.05.2022**

(84) Designated Contracting States:
**AL 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 RS SE SI SK SM TR**
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

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(30) Priority: **19.05.2021 CN 202110546645**

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(54) STEP COLLAPSE RESET DEVICE FOR AN ESCALATOR

(57) A step collapse reset device for an escalator, which comprises a reset handle bar, and is characterized in that the step collapse reset device also comprises a link rod assembly; the reset handle bar is connected to

a cross beam rotating rod of the escalator through the link rod assembly; the rotation of the cross beam rotating rod is converted into a substantially linear motion of the reset handle bar through the link rod assembly.

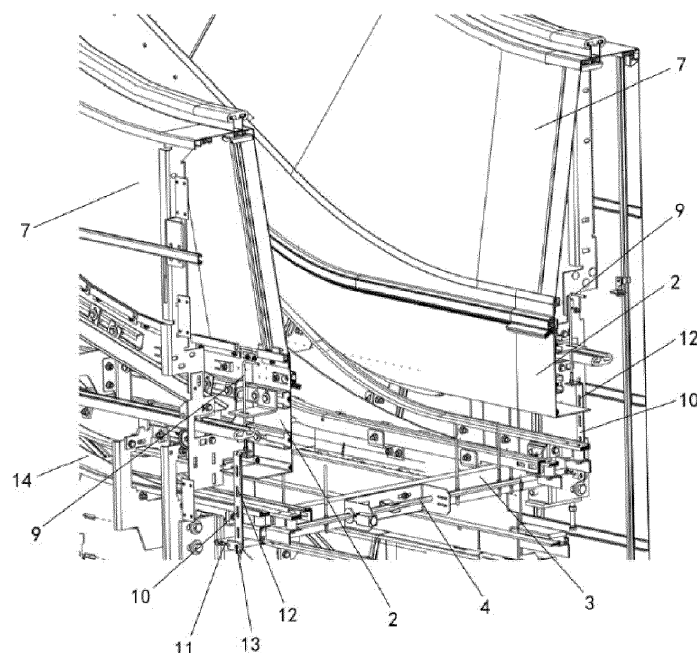


Fig. 4

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Description

TECHNICAL FIELD

[0001] The present disclosure relates to a step collapse reset device for an escalator.

BACKGROUND

[0002] As shown in figs. 1 and 2, the step collapse reset device in the prior art comprises a Z-shaped round rod handle (Fig. 2). Due to the requirements of safety regulations, the installation position of the step collapse reset device must be on the cross beam rotating rod at the first multi-function board (MPB) under the skirt panel near the inclined section of the escalator (Fig. 1). Since the original position of the round rod handle for resetting is relatively low, after the step collapse switch striking rod (Fig. 3) is deflected by the steps and triggers the step collapse safety switch via the safety switch actuating cam (see Fig. 3), the round rod handle will rotate away from the original position, resulting in its lower height (Fig. 2). Therefore, after troubleshooting, on the premise that only one inner wall plate above the skirt panel can be removed, the position of the round rod handle is inconvenient for personnel to operate, that is, it is not convenient to reset the round rod handle, and it is also not convenient to test the function of the step collapse safety switch.

[0003] In addition, if one simply lengthens the round rod handle, the problem of interference between the round rod handle and other parts of the escalator will occur due to space limitation.

SUMMARY

[0004] In order to solve one or more defects in the prior art, according to one aspect of the present disclosure, a step collapse reset device for an escalator is proposed, which comprises a reset handle bar.

[0005] The step collapse reset device also comprises a link rod assembly.

[0006] The reset handle bar is connected to the cross beam rotating rod of the escalator through the link rod assembly.

[0007] The rotation of the cross beam rotating rod is converted into a substantially linear motion of the reset handle bar through the link rod assembly.

[0008] According to the above aspects of the present disclosure, the link rod assembly comprises a swinging arm.

[0009] One end of the swinging arm is fixedly connected to the cross beam rotating rod.

[0010] The rotation of the cross beam rotating rod can drive the swinging arm to swing.

[0011] According to the above aspects of the present disclosure, the link rod assembly further comprises a connecting bracket.

[0012] The other end of the swinging arm is pivotally

connected to one end of the connecting bracket through a hinge part, so that the connecting bracket can rotate relative to the swinging arm.

[0013] The other end of the connecting bracket is connected to one end of the reset handle bar through a fastener.

[0014] According to the above aspects of the present disclosure, the connecting bracket is L-shaped, so as to avoid interference with the handrail belt of the escalator.

[0015] According to the above aspects of the present disclosure, the other end of the reset handle bar can extend to a height that is flush with the upper edge of the skirt panel of the escalator.

[0016] According to the above aspects of the present disclosure, the step collapse reset device further comprises a guide bracket.

[0017] The guide bracket is installed on the skirt panel of the escalator through fasteners.

[0018] The guide bracket is provided with a slender guide bracket opening.

[0019] The reset handle bar passes through the guide bracket opening, so that the guide bracket opening can limit the swing of the reset handle bar in the linear motion process thereof.

[0020] According to the above aspects of the present disclosure, the hinge part comprises a screw and a nut.

[0021] According to the above aspects of the present disclosure, the link rod assembly is arranged at two ends of the cross beam rotating rod of the escalator.

[0022] According to the above aspects of the present disclosure, a step collapse switch striking rod and a safety switch actuating cam are arranged on the cross beam rotating rod.

[0023] After the step collapse switch striking rod is deflected by the steps of the escalator and rotates away from its initial position, the cross beam rotating rod is driven to rotate, so that the safety switch actuating cam triggers the step collapse safety switch of the escalator.

[0024] The rotation of the cross beam rotating rod drives the swinging rod to swing.

[0025] The swing of the swinging rod makes the reset handle bar to move in the direction towards the cross beam rotating rod through the connecting bracket.

[0026] According to the above aspects of the present disclosure, when the step collapse safety switch and the step collapse switch striking rod of the escalator need to be reset, the other end of the reset handle bar is pulled, so that the reset handle bar moves in the direction away from the cross beam rotating rod, and the movement of the reset handle bar drives the cross beam rotating rod to rotate through the connecting bracket and the swinging arm, and the rotation of the cross beam rotating rod drives the step collapse switch striking rod to return to its initial position and causes the safety switch actuating cam to release the trigger to the step collapse safety switch of the escalator.

[0027] According to the technical scheme of the present disclosure, the rotation of the step collapse

switch striking rod is converted into a substantially linear up-and-down motion through the link rod assembly connected together via the hinge device, which optimizes the spatial structure and avoids the interference problem from simply lengthening the handle.

[0028] In addition, by raising the reset handle bar to a position in which the upper edge of the handle is flush with that of the skirt panel, it becomes easy for operators to observe and operate.

[0029] So far, in order that the detailed description of the present disclosure can be better understood, and that the contribution of the present disclosure to the prior art can be better recognized, the present disclosure has outlined the contents of the disclosure quite extensively. Of course, the embodiments of the present disclosure will be described below and will form the subject of the appended claims.

[0030] Likewise, those skilled in the art will realize that the concept on which the present disclosure is based can be easily used as a basis for designing other structures, methods and systems for implementing several purposes of the present disclosure. Therefore, it is important that the appended claims should be considered to include such equivalent structures as long as they do not exceed the substance and scope of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0031] Through the following drawings, those skilled in the art will have a better understanding of the present disclosure, and the advantages of the present disclosure can be more clearly reflected. The drawings described here are only for illustrative purposes of selected embodiments, not all possible embodiments, and are intended not to limit the scope of the present disclosure.

Figs. 1 to 3 illustrate a step collapse reset device for an escalator according to the prior art;

Figs. 4 to 5 illustrate a step collapse reset device for an escalator according to the present disclosure.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0032] In the prior art as shown in figs. 1 to 3, the step collapse reset device includes a Z-shaped round rod handle 1. Due to the requirements of safety regulations, the installation position of the step collapse reset device must be on the cross beam rotating rod 4 at the first multi-function board 3 (MPB) below the skirt panel 2 near the inclined section of the escalator. Since the original position of the round rod handle 1 for resetting is relatively low, after the step collapse switch striking rod 5 is deflected by the steps and triggers the step collapse safety switch 6 via the safety switch actuating cam 8, the round rod handle 1 will rotate away from the original position, resulting in its lower height (as shown by the arrow in Figure 2). Therefore, after troubleshooting, on the premise that only one inner wall plate 7 above the skirt

panel 2 can be removed, the position of the round rod handle 1 is inconvenient for personnel to operate, that is, it is not convenient to reset the round rod handle 1, and it is also not convenient to test the function of the step collapse safety switch 6.

[0033] Next, with reference to figs. 4 to 5, specific embodiments according to the present disclosure will be described in detail below, in which the same components as those in the prior art keep the same reference numerals.

[0034] According to one embodiment of the present disclosure, a step collapse reset device for an escalator is proposed, which comprises a reset handle bar 9.

[0035] The step collapse reset device further comprises a link rod assembly 10.

[0036] The reset handle bar 9 is connected to the cross beam rotating rod 4 of the escalator through the link rod assembly 10. The cross beam rotating rod 4 is rotatably installed on the multi-function board 3 of the escalator.

[0037] The rotation of the cross beam rotating rod 4 is converted into a substantially linear motion of the reset handle bar 9 through the link rod assembly 10. In fig. 4 and 5, the linear motion is up-and-down motion.

[0038] According to the above embodiments of the present disclosure, the link rod assembly 10 includes a swinging arm 11.

[0039] One end of the swinging arm 11 is fixedly connected to the cross beam rotating rod 4.

[0040] The rotation of the cross beam rotating rod 4 can drive the swinging arm 11 to swing.

[0041] According to the above embodiments of the present disclosure, the link rod assembly 10 further comprises a connecting bracket 12.

[0042] The other end of the swinging arm 11 is pivotally connected to one end of the connecting bracket 12 through a hinge part 13, so that the connecting bracket 12 can rotate relative to the swinging arm.

[0043] The other end of the connecting bracket 12 is connected to one end of the reset handle bar 9 through a fastener.

[0044] According to the above embodiments of the present disclosure, the connecting bracket 12 is L-shaped, so as to avoid interference with the handrail belt 14 of the escalator.

[0045] According to the above embodiments of the present disclosure, the other end of the reset handle bar 9 can extend to a height that is flush with an upper edge of the skirt panel 2 of the escalator.

[0046] According to the above embodiments of the present disclosure, the step collapse reset device further comprises a guide bracket 15.

[0047] The guide bracket 15 is installed on the skirt panel 2 of the escalator through fasteners 16.

[0048] The guide bracket 15 is provided with a slender guide bracket opening 15-1 thereon.

[0049] The reset handle bar 9 passes through the guide bracket opening 15-1, so that the guide bracket opening 15-1 can limit the swing of the reset handle bar

9 in the linear motion process thereof.

[0050] According to the above embodiments of the present disclosure, the hinge part 13 comprises a screw and a nut.

[0051] According to the above embodiments of the present disclosure, the link rod assembly 10 is arranged at two ends of the cross beam rotating rod 4 of the escalator.

[0052] According to the above embodiments of the present disclosure, a step collapse switch striking rod 5 and a safety switch actuating cam 8 are arranged on the cross beam rotating rod 4.

[0053] After the step collapse switch striking rod 5 is deflected by the steps of the escalator and rotates away from its initial position, the cross beam rotating rod 4 is driven to rotate, so that the safety switch actuating cam 8 triggers the step collapse safety switch 6 of the escalator.

[0054] The rotation of the cross beam rotating rod 4 drives the swinging rod 11 to swing.

[0055] The swing of the swinging rod 11 makes the reset handle bar 9 to move in a direction towards the cross beam rotating rod 4, that is, downward in figs. 4 and 5, via the connecting bracket 12.

[0056] According to the above embodiments of the present disclosure, when the step collapse safety switch 6 and the step collapse switch striking rod 5 of the escalator need to be reset, the operator can observe the position status of the reset handle bar 9 and can very easily access the reset handle bar 9 only by detaching the inner wall plate 7, and the operator pulls the other end of the reset handle bar 9 so that the reset handle bar 9 moves in a direction away from the cross beam rotating rod 4 (i.e. upward in figs. 4 and 5), the movement of the reset handle bar 9 drives the cross beam rotating rod 4 to rotate through the connecting bracket 12 and the swinging arm 11, and the cross beam rotating rod 4 rotates to drive the step collapse switch striking rod 5 to return to its initial position and causes the safety switch actuating cam 8 to release the trigger to the step collapse safety switch 6 of the escalator (at this time, the switch contact of the step collapse safety switch 6 is in the cam recess of the safety switch actuating cam 8 as shown in fig. 3).

[0057] The foregoing disclosure provides illustration and description, but it is not intended to be exhaustive or to limit the embodiments to the precise form disclosed. Modifications and variations can be made in light of the above disclosure, or can be acquired from the practice of the embodiments.

[0058] Even though specific combinations of features are recited in the claims and/or disclosed in the specification, these combinations are not intended to limit the disclosure of various embodiments. In fact, many of these features can be combined in ways not specifically stated in the claims and/or not specifically disclosed in the specification. Although each dependent claim listed below may directly depend on only one claim, the disclosure of various embodiments includes each dependent claim

combined with every other claim in the claim set.

[0059] Unless explicitly stated, no element, action or instruction used herein should be interpreted as critical or necessary. In addition, as used herein, the articles "a" and "an" are intended to include one or more items and can be used interchangeably with "one or more". Furthermore, as used herein, the article "the" is intended to include one or more items cited in connection with the article "the" and can be used interchangeably with "one or more". Furthermore, as used herein, the term "set" is intended to include one or more items (e.g., related items, unrelated items, combinations of related and unrelated items, etc.) and can be used interchangeably with "one or more". When only one item is intended, the phrase "only one" or similar language is used. In addition, as used herein, the term "have" and its variants are intended to be open-ended terms. In addition, the phrase "based on" is intended to mean "at least partially based on" unless otherwise explicitly stated. In addition, as used herein, the term "or" is intended to be inclusive when used in series, and can be used interchangeably with "and/or" unless otherwise explicitly stated (for example, if used in combination with "or" or "only one of them").

Claims

1. A step collapse reset device for an escalator, which comprises a reset handle bar (9), **characterized in that:**
 - the step collapse reset device also comprises a link rod assembly (10);
 - the reset handle bar (9) is connected to a cross beam rotating rod (4) of the escalator through the link rod assembly (10);
 - the rotation of the cross beam rotating rod (4) is converted into the substantially linear motion of the reset handle bar (9) through the link rod assembly (10).
2. The step collapse reset device according to claim 1, **characterized in that:**
 - the link rod assembly (10) comprises a swinging arm (11);
 - one end of the swinging arm (11) is fixedly connected to the cross beam rotating rod (4);
 - the rotation of the cross beam rotating rod (4) can drive the swinging arm (11) to swing.
3. The step collapse reset device according to claim 2, **characterized in that:**
 - the link rod assembly (10) also comprises a connecting bracket (12);
 - the other end of the swinging arm (11) is pivotally connected to one end of the connecting bracket

(12) through a hinge part (13), so that the connecting bracket (12) can rotate relative to the swinging arm (11);
the other end of the connecting bracket (12) is connected to one end of the reset handle bar (9) through a fastener.

4. The step collapse reset device according to claim 3, **characterized in that**,
the connecting bracket (12) is L-shaped, thus avoiding interference with the handrail belt (14) of the escalator.
5. The step collapse reset device according to claim 3, **characterized in that**,
the other end of the reset handle bar (9) can extend to a height flush with an upper edge of the skirt panel of the escalator.
6. The step collapse reset device according to claim 3, **characterized in that**,

the step collapse reset device also comprises a guide bracket (15);
the guide bracket (15) is installed on the skirt panel of the escalator through fasteners (16);
a slender guide bracket opening (15-1) is arranged on the guide bracket (15);
the reset handle bar (9) passes through the opening of the guide bracket (15-1), so that the opening of the guide bracket (15-1) can limit the swing of the reset handle bar (9) in the linear motion process thereof.
7. The step collapse reset device according to claim 3, **characterized in that**,
the hinge part (13) comprises a screw and a nut.
8. The step collapse reset device according to claim 3, **characterized in that**,
the link rod assembly (10) is arranged at two ends of the cross beam rotating rod (4) of the escalator.
9. The step collapse reset device according to claim 3, **characterized in that**,

a step collapse switch striking rod (5) and a safety switch actuating cam (8) are arranged on the cross beam rotating rod (4);
after that striking rod of the step collapse switch (5) is deflected by the steps of the escalator and rotates away from its initial position, the cross beam rotating rod (4) is driven to rotate, so that the safety switch actuating cam (8) triggers a step collapse safety switch (6) of the escalator;
the rotation of the cross beam rotating rod (4) drives the swinging rod (11) to swing;
the swing of the swing rod (11) makes the reset

handle bar (9) move in the direction close to cross beam rotating rod (4) through the connecting bracket (12).

10. The step collapse reset device according to claim 9, **characterized in that**,
when it is necessary to reset the escalator step collapse safety switch (6) and the step collapse switch striking rod (5), pull the other end of the reset handle bar (9), so that the reset handle bar (9) moves in the direction away from the cross beam rotating rod (4), which drives the cross beam rotating rod (4) to rotate through the connecting bracket (12) and the swinging arm (11), and the cross beam rotating rod (4) rotates to drive the step collapse switch striking rod (5) to return to its initial position and make the safety switch actuating cam (8) release the trigger to the step collapse safety switch (6) of the escalator.

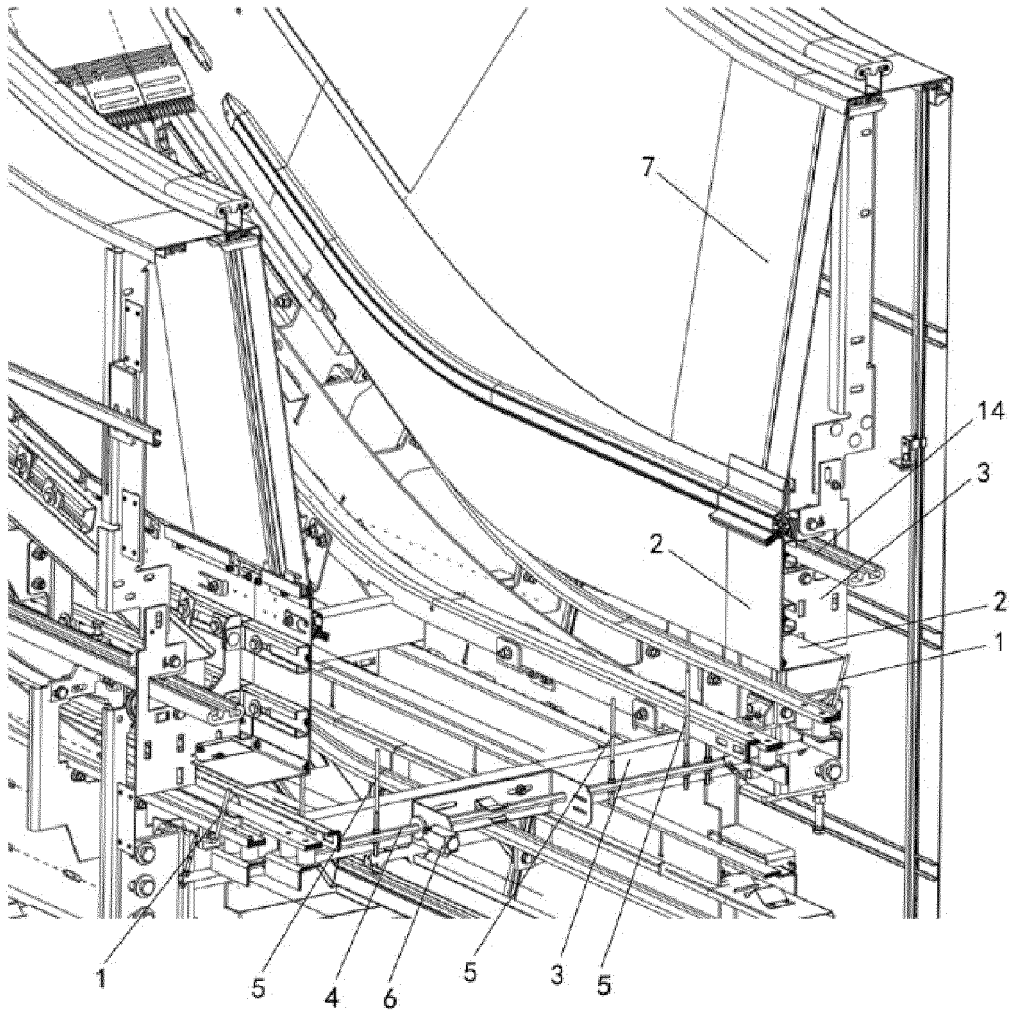


Fig. 1

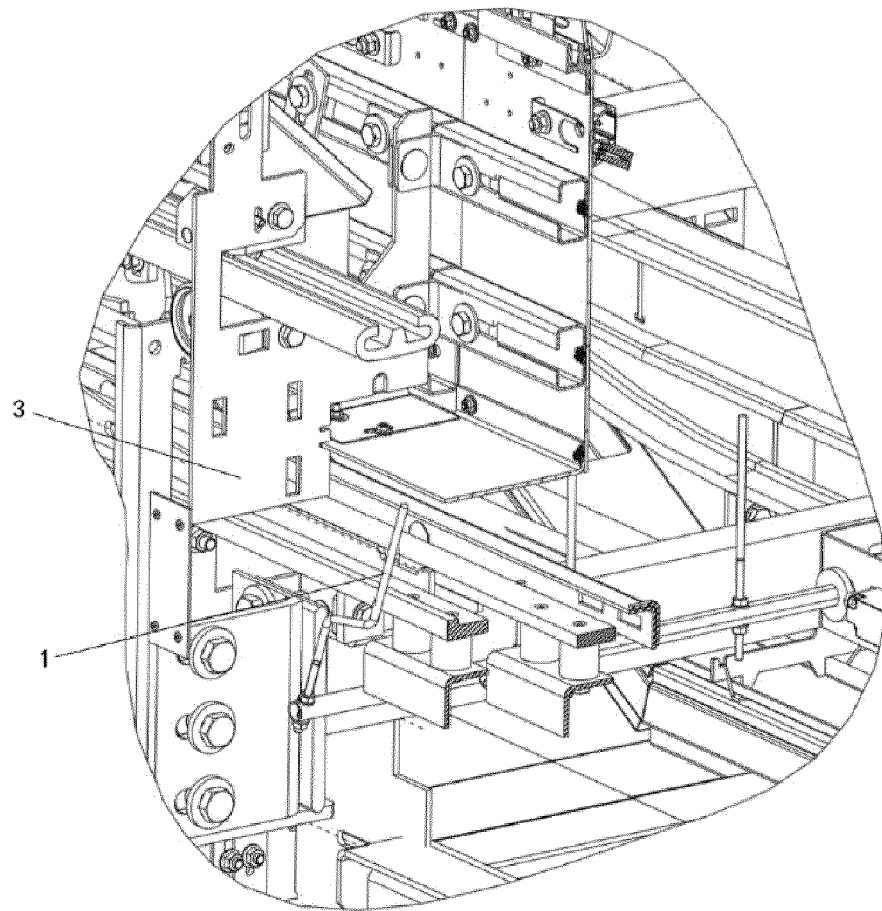


Fig. 2

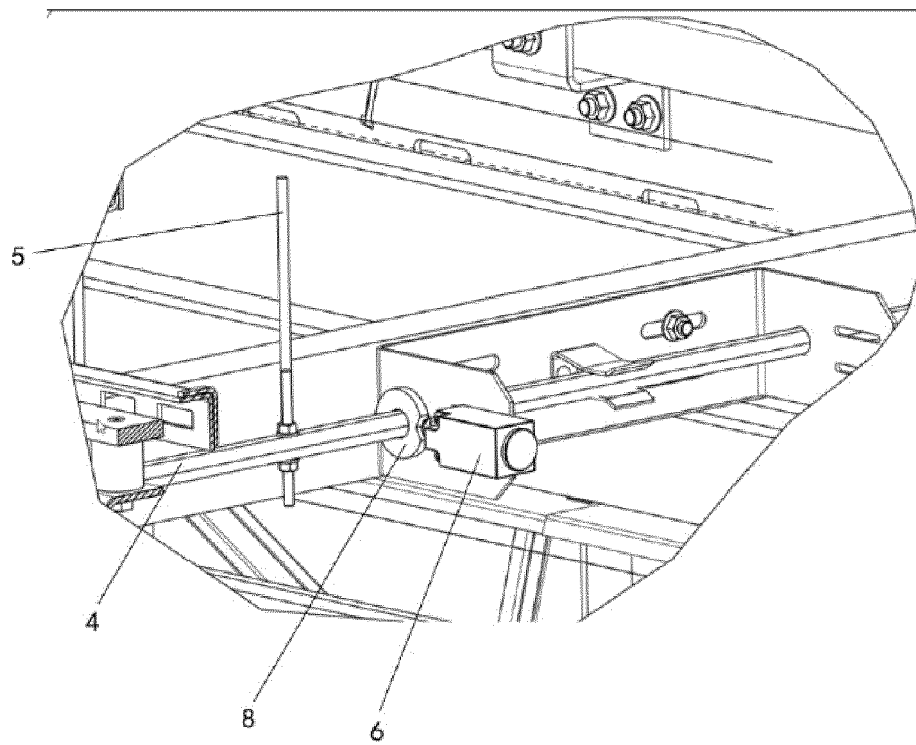


Fig. 3

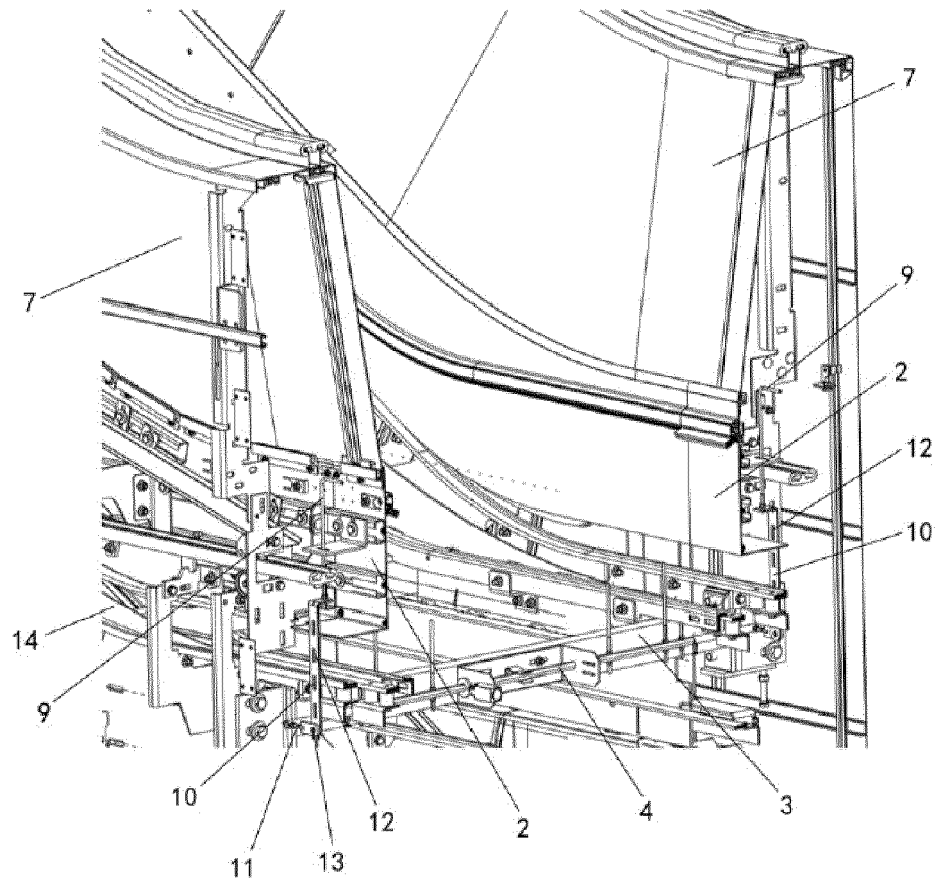


Fig. 4

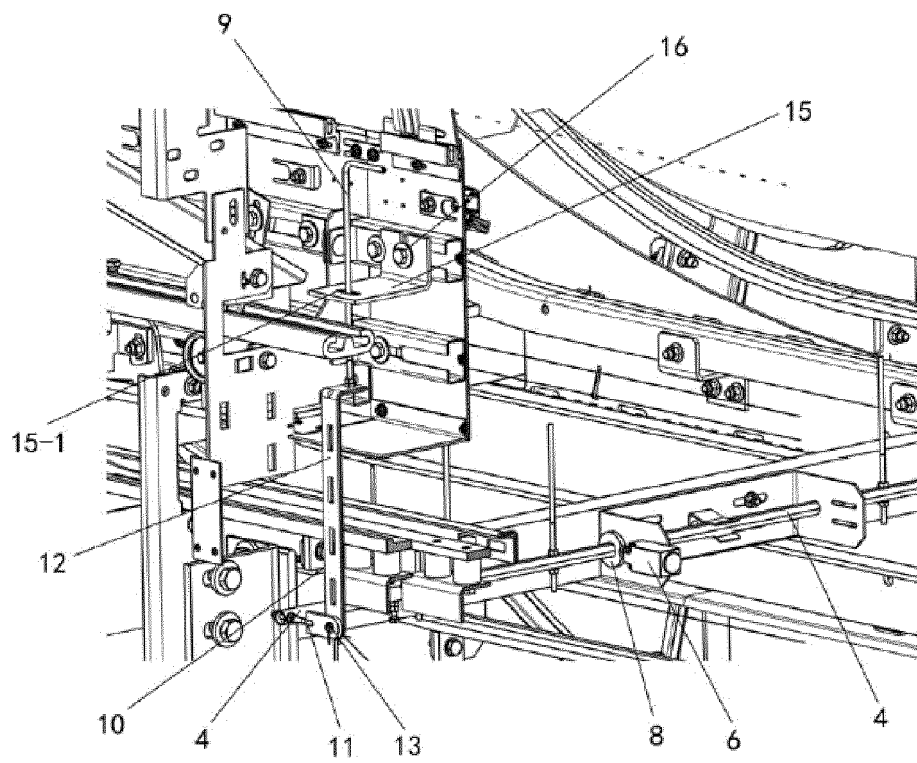


Fig. 5



EUROPEAN SEARCH REPORT

Application Number

EP 22 17 4027

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	CN 206 156 553 U (SUZHOU NFTESL EXPRESS ELEVATOR CO LTD) 10 May 2017 (2017-05-10) * abstract; figures 1,2 * -----	1-10	INV. B66B25/00
A	CN 201 473 168 U (ZHEJIANG HENGDA FUJI ELEVATOR CO LTD) 19 May 2010 (2010-05-19) * abstract; figure 1 * -----	1-10	
			TECHNICAL FIELDS SEARCHED (IPC)
			B66B
The present search report has been drawn up for all claims			

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EPO FORM 1503 03.82 (P04C01)

Place of search	Date of completion of the search	Examiner
The Hague	27 September 2022	Miklos, Zoltan
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ON EUROPEAN PATENT APPLICATION NO.

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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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27-09-2022

10	Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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