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(71) Applicant: **Dynatech, Dynamics & Technology, S. L.**
Pina de Ebro 50750 (ES)

(72) Inventor: **MATEO MUR, Francisco de Asis**
E-50750 Pina De Ebro (ES)

(74) Representative: **Hernández Hernández, Carlos**
Olten Patentes y Marcas
Entença, 332-334 3º-2ª
08029 Barcelona (ES)

(54) INTEGRAL SYSTEM OF CORNER BRACKETS FOR AN ELEVATOR FRAME

(57) The invention relates to an integral system of corner brackets for an elevator frame, said system allowing an elevator frame to be produced using the corner brackets into which all of the dynamic elements required in an elevator frame have been incorporated, such as safety and guide systems. The system comprises two lower corner brackets which form part of the elevator frame and include the safety and guide systems. In addition, depending on the case, one or two upper angle brackets can be used, the heavy-duty part of the frame being integrated with the safety and guide equipment.

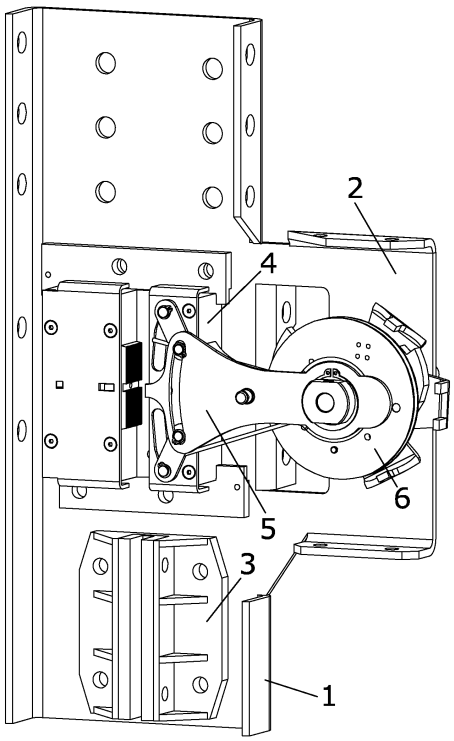

FIG.4

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Description

OBJECT OF THE INVENTION

[0001] The present invention is intended for a integral system of corner brackets for an elevator frame, which allows an elevator frame to be manufactured from said corner brackets wherein all the dynamic elements needed in an elevator frame such as safety and guidance systems are integrated.

[0002] The system object of the invention is formed by two lower corner brackets forming part of the elevator frame and which include such safety and guidance systems. In addition, depending on the cases, the two upper corner brackets, or only one of them, can also be used.

[0003] Due to its special configuration, the system integrates the lower resistant part of the frame with safety and guidance equipments, which allows an elevator frame to be manufactured from the corner brackets and just adding vertical stringers and horizontal transoms, which simplifies the manufacturing process since the stringers do not have to be adapted to the parachute conditions.

BACKGROUND OF THE INVENTION

[0004] Elevator frames are known in the state of the art. Said frames support the weight of the cabin and people who are inside. The frames are basically composed of a resistant structure with rectangular shape inside of which the cabin is placed. The cabin directly or indirectly rests on the bottom of the frame, formed by two or more pieces called lower transoms. Said transoms are directly connected at their ends to vertical pieces called stringers, which shift the load to an upper piece or pieces of the frame called upper transoms. The upper ends of stringers are directly connected to the ends of the upper transom.

[0005] If the cabin is centered in the frame, the configuration is called "gantry" and if the cabin is off-centered the configuration is called "backpack". In either of the two cases, the basic structure consists of stringers and transoms directly connected to each other.

[0006] On this basic structure, securing and guidance elements, in addition to the cabin, such as parachutes and slide or roller guide shoes are placed. In some cases, the speed limiter is also placed on said frame. This can be done in two ways: directly on the frame or as a subsystem formed by parachutes and limiter, but in any case, this subsystem has no resistant purpose over the frame. Sometimes the parachute alone or the parachute together with the limiter is placed on a support installed at the bottom of the frame.

[0007] As the parachute is usually a bulky element, having to place it inside the stringer sometimes causes said stringer to be larger than it is strictly necessary, which increases its cost.

[0008] Another disadvantage of the current systems is that different types and sizes of stringers have to be designed and manufactured according to the different types and sizes of parachutes to be housed, thus complicating production processes and generating high stock levels.

[0009] These drawbacks are solved by the present invention because among other advantages, avoids having to adapt the frame stringers to the elevator parachute conditions, in addition that the corner bracket, by acting as a common support piece for the guidance and safety elements, enables to reduce the number of pieces required for constructing these elements. Therefore, this invention reduces the number of required pieces compared to current racks with consequent cost and weight savings.

DESCRIPTION OF THE INVENTION

[0010] The present invention relates to a corner bracket integrated system for elevator frame, which allows an elevator frame to be manufactured from said corner brackets wherein all the dynamic elements needed in an elevator frame such as safety and guidance systems are integrated.

[0011] The integral system of corner brackets of the present invention, besides incorporating safety and guidance elements, has a structural function within the frame, so that the loads generated by the cabin are shifted to the stringers through the integral system of corner brackets of the present invention, and not directly.

[0012] The integral system of corner brackets includes two lower corner brackets that comprise safety and guidance systems, and two upper corner brackets incorporating the guidance system.

[0013] Guidance systems are responsible for maintaining the frame in contact with the installation guides; slide or roller guide shoes may be used.

[0014] Security systems are a pair of parachutes that allow the frame to be wedged into the guides in case of emergency, and a speed limiter which wedges the parachutes if a predetermined speed limit is exceeded.

[0015] In this way, starting from the integral system of corner brackets; the rack is completed by simply adding vertical stringers and horizontal transoms.

[0016] The lower corner brackets consist of a main base plate wherein the parachute and guidance system are integrated, which can be a slide or roller guide shoe. Of the two lower corner brackets, one left and one right, one further includes the speed limiter.

[0017] On the top of each lower corner bracket two vertical stringers are connected through connecting means. The central part of each corner bracket has some folds and holes suitable for fitting the horizontal transoms therein. Once fitted into the holes, said transoms can be connected through connecting means, each lower corner bracket also having a series of holes for fixing the parachute.

[0018] Each lower corner bracket has a friction plate that can be placed at its bottom, below the parachute or either at the top of the corner bracket, above the para-

chute. Roller guide shoes can also be placed over or beneath the parachute.

[0019] Each upper corner bracket consists of a main base plate that comprises the guidance system, which can be a slide or roller guide shoe. There is an upper left corner bracket and an upper right corner bracket.

[0020] The upper corner bracket on the same side wherein the speed limiter is located further comprises the return pulley for the speed limiter cable.

[0021] On the other hand, the corner brackets support the parachutes driving mechanism, allowing both to be connected in order to act simultaneously.

[0022] Similarly, the integral system of corner brackets allows assembling the frame with the width, height and payload data thus determining the extent of stringers and transoms.

[0023] The payload determines the parachute model to be placed in the corner bracket. Depending on the payload and the extensions, the length and section measurements of the transoms and stringers are determined.

[0024] The central part of the corner bracket houses the parachute, while the top allows placing a stringer narrower than it would be necessary in order to house the parachute therein.

[0025] In case of actuating the parachutes, the integral system of corner brackets has enough robustness to withstand loads generated during the emergency braking and shift them to the guides, which allows placing a stringer of lower section than those placed in the frames of state of the art, wherein the parachute is placed on the stringer.

[0026] On the other hand, the integral system of corner brackets acts as base plate for the driving mechanism and as a main support for the limiter, cable of which is held to the guides and may be tightening by mass, springs or a mixed system, whereas the use of the limiter with return pulley in an upper corner bracket makes the rack also suitable for installations with reduced pit.

[0027] The integral system of corner brackets can have a configuration without speed limiter, in which case the lower corner bracket consists of a base plate wherein the parachute and the guidance system, which can be slide or roller guide shoe are integrated, there being a lower left corner bracket a lower right corner bracket.

[0028] In the previous case in which there is no speed limiter in the lower corner bracket, the upper corner brackets are similar, consisting of a main base plate comprising the guidance system, which can be slide or roller guide shoe, there being also a left corner bracket and a right corner bracket.

[0029] The present invention can also be made with multiple combinations of components, all of which being object of the present invention, that is to say:

- Two lower corner brackets and two upper corner brackets.
- Two lower corner brackets and one upper corner bracket.
- Two lower corner brackets and no upper corner bracket, by directly connecting the top of the stringers to the ends of the upper transom.
- Only one lower corner bracket and no upper corner bracket.
- etc.

[0030] It is also the object of the present invention the placing of safety elements in the upper corner brackets instead of in the lower ones.

[0031] Another object of the present invention is the use of the main plate of each corner bracket as fastening system for slip elements of the slide shoes, thus avoiding the need to use the slip material support of known slide shoes.

DESCRIPTION OF DRAWINGS

[0032]

Figure 1 shows a perspective view of a lower corner bracket attached to a stringer and transoms, forming part of the integral system of corner brackets of the present invention.

Figure 2 shows a detailed view of an upper corner bracket forming part of the integral system of corner brackets of the present invention, with a return pulley and a slide shoe.

Figure 3 shows the set of the whole frame formed by the lower corner brackets, upper corner brackets, stringers and transoms.

Figure 4 shows a detailed view of the lower corner bracket shown in Figure 1.

Figure 5 shows a detailed view of the upper corner bracket shown in Figure 2, with the return pulley.

Figure 6 shows the set of the frame as that shown in Figure 3 which has roller guide shoes instead of slide shoes.

Figure 7 is an application of this invention to a gantry-type frame.

Figure 8 is an application of this invention to a backpack-type frame.

Figure 9 shows an embodiment example wherein one of the lower corner brackets adjacently comprises the limiter and the return pulley.

Figure 10 shows the cable arrangement of the speed limiter with respect to the integral system of corner brackets of the present invention.

PREFERRED EMBODIMENT OF THE INVENTION

[0033] In view of the aforementioned, the present invention relates to a set of two upper corner brackets and two lower corner brackets in order to simplify the manufacturing and assembly of a frame sliding through the guides (22) of the elevator shaft.

[0034] As shown in Figure 1, the lower corner bracket (1) consists of the following components: a main plate (2), on which a friction plate (3) or guidance system is placed, a parachute (4), the driving mechanism (5) and a speed limiter (6).

[0035] The top of the main plate (2) of the lower corner bracket (1) is connected by screws (7) to a stringer (8), whereas the central part of the main plate (2) of the lower corner bracket (1) is connected by screws (9) to two horizontal transoms (10).

[0036] Figure 2 shows the detail of an upper corner bracket (17) with return pulley (12). The cable of speed limiter (11) passes through the return pulley (12) for allowing the proper actuation of the speed limiter (6). The return pulley (12) is held by an axis (13) to the main plate (14) of the upper corner bracket and to an auxiliary plate (15), whereas the main base plate (14) supports an upper friction plate (16).

[0037] Thus, the upper corner (17) comprises the following components: main plate (14), auxiliary plate (15), axis (13), return pulley (12) and friction plate (16).

[0038] The entire frame, shown in Figure 3, including the integrated system has a lower corner bracket (1) with friction plate (3), parachute (4) and limiter (6), a stringer (8), an upper corner bracket (17) with a return pulley (12) and friction plate (16), upper transom (18), an upper corner bracket (19) with slide show, a stringer (20), a lower corner bracket (21) with slide shoes and parachutes, and finally transoms (10).

[0039] As can be seen in the Figure, all the necessary dynamic components of the frame such as slide shoes and parachutes are placed in lower corner brackets (1, 21) and upper corner brackets (17, 19), releasing the stringers (8, 20) and transoms (10, 18) from these functions.

[0040] The speed limiter (6) is included in the lower corner bracket (1) and moves therewith, so that in order to detect speeding and actuate the parachute (4) it is provided with a static cable (11) placed along the entire path. This is done via a cable tied to the top of the shaft and to the bottom of the shaft. A return pulley (12) is placed at the top of the frame, specifically in the upper corner bracket with return pulley (17) for ensuring proper contact between the speed limiter (6) and the cable (11) of the limiter.

[0041] Figures 1, 2, 10 show how the cable of the speed limiter (11) which is held to the top of the shaft goes down to the speed limiter (6), maintains a contact of 180° and goes up towards the return pulley (12), therewith maintaining a contact of 180° and continues down to the lower tying of the limiter cable placed in the pit.

[0042] The integral system described above can be used for manufacturing a gantry-type and also a backpack-type frame.

Claims

1. Integral system of corner brackets for an elevator frame **characterized in that** it comprises at least one corner bracket forming part of the elevator frame, corner bracket which shift the loads between stringers (8, 20) and transoms (10, 18) integrating the structural components of the frame.

2. Integral system of corner brackets for an elevator frame defined in claim 1 **characterized in that** said corner brackets comprise the dynamic components of the frame.

3. Integral system of corner brackets for an elevator frame defined in claim 2 **characterized in that** the dynamic components are the safety and guidance systems.

4. Integral system of corner brackets for an elevator frame defined in claim 3 **characterized in that** it comprises two lower corner brackets (1, 21) wherein the safety and guidance systems are integrated, and two upper corner brackets (17, 19) wherein the guidance system is integrated.

5. Integral system of corner brackets for an elevator frame defined in claim 4 **characterized in that** the lower corner brackets (1, 21) consist of a main base plate (2) comprising the parachute (4) and the guidance system (3).

6. Integral system of corner brackets for an elevator frame defined in claim 4 **characterized in that** a lower corner bracket (1, 21) further includes the speed limiter (6).

7. Integral system of corner brackets for an elevator frame defined in claim 4 **characterized in that** one of the corner brackets includes the speed limiter (6) and the return pulley (12).

8. Integral system of corner brackets for an elevator frame defined in claim 4 **characterized in that** at the top of each lower corner bracket (1, 21) stringers (8, 20) are connected though connecting means.

9. Integral system of corner brackets for an elevator frame defined in claim 4 **characterized in that** the central part of each lower corner bracket (1, 21) has folds and holes suitable for inserting the transoms (10, 18) therein.

10. Integral system of corner brackets for an elevator frame defined in claim 4 **characterized in that** each lower corner bracket (1, 21) has a series of holes for fixing the parachute (4).

11. Integral system of corner brackets for an elevator frame defined in claim 6 **characterized in that** an upper corner bracket (17) further comprises the return pulley (12) of the speed limiter cable.

12. Integral system of corner brackets for an elevator frame defined in claim 4 **characterized in that** each lower corner bracket (1, 21) has a friction plate (3) or either a roller guide shoe which can be placed therein, beneath the parachute or at the top of the corner bracket, over the parachute(4), as well.

13. Integral system of corner brackets for an elevator frame defined in claim 4 **characterized in that** each upper corner bracket (17, 19) consists of a main base plate (14) wherein the guidance system is integrated, which can be a slide or roller guide shoe (16).

14. Integral system of corner brackets for an elevator frame defined in claim 4 **characterized in that** the safety components are arranged on the upper corner brackets (17, 19).

15. Integral system of corner brackets for an elevator frame defined in claim 5 or 10 **characterized in that** the lower corner brackets (1, 21) support the driving mechanism (5) for the parachutes (4), allowing both to be connected for acting simultaneously.

16. Integral system of corner brackets for an elevator frame defined in any of the preceding claims **characterized in that** it is used for manufacturing gantry-type frame.

17. Integral system of corner brackets for an elevator frame defined in any of the preceding claims **characterized in that** it is used for manufacturing back-pack-type frame.

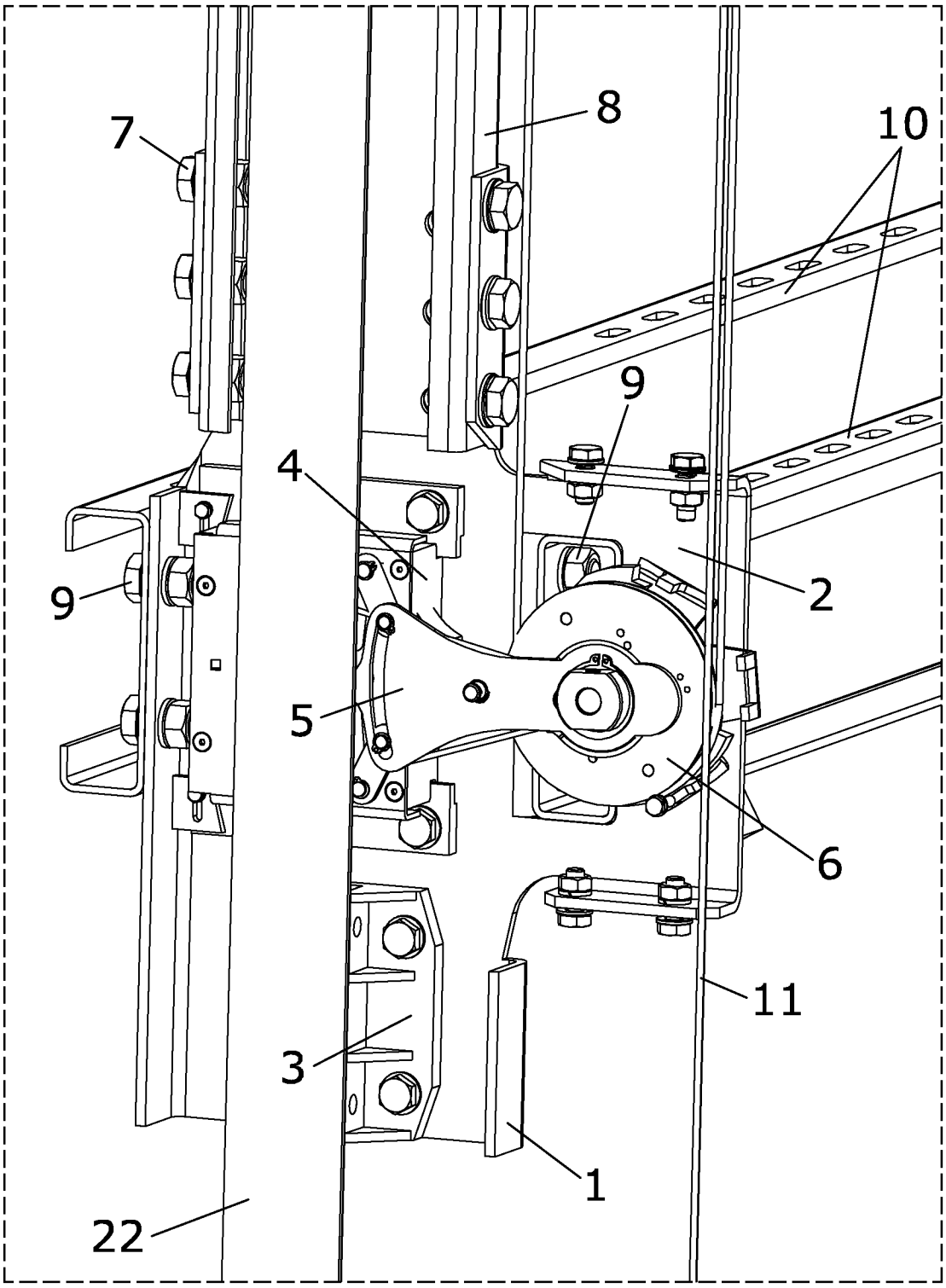

FIG.1

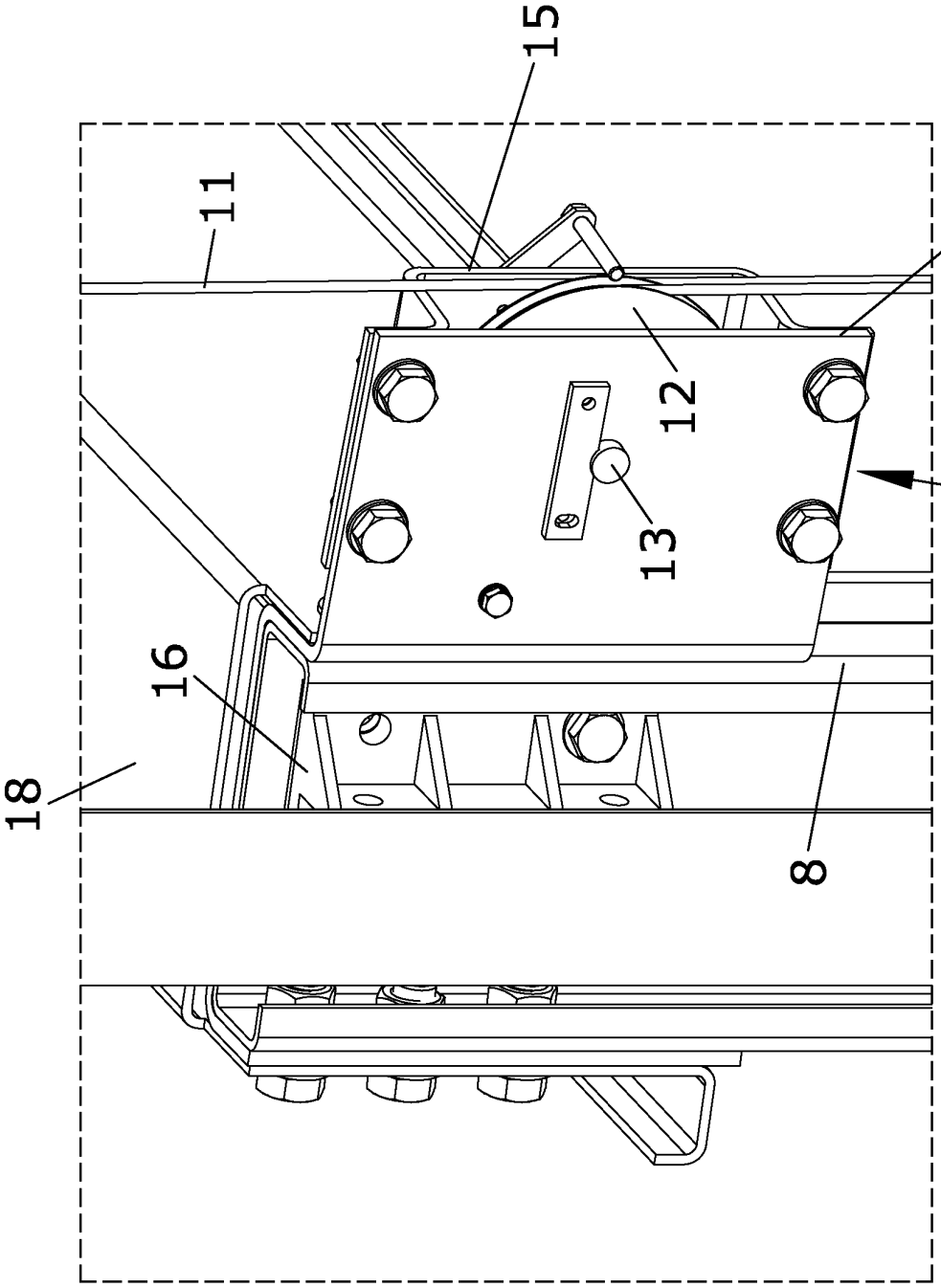

FIG.2

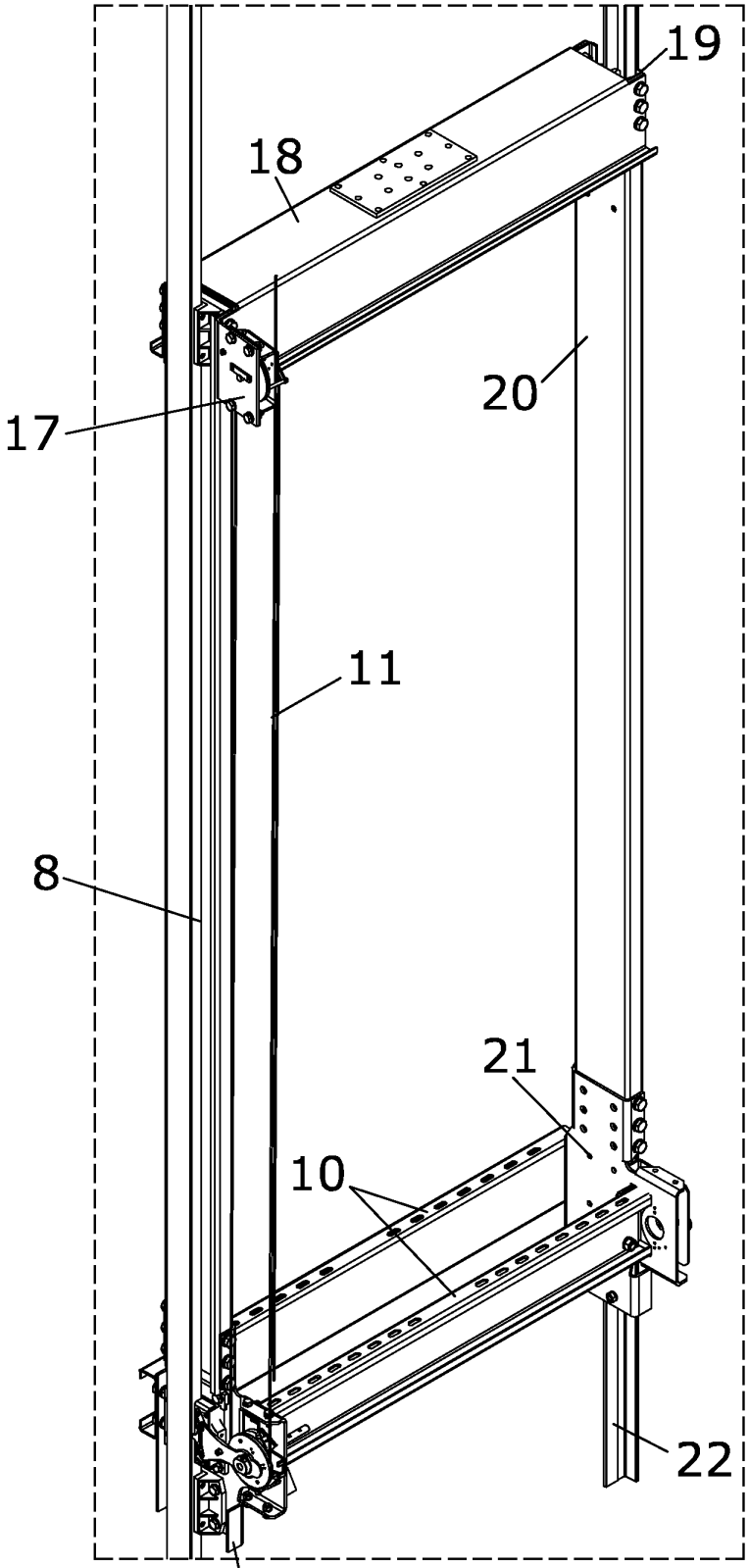

FIG.3

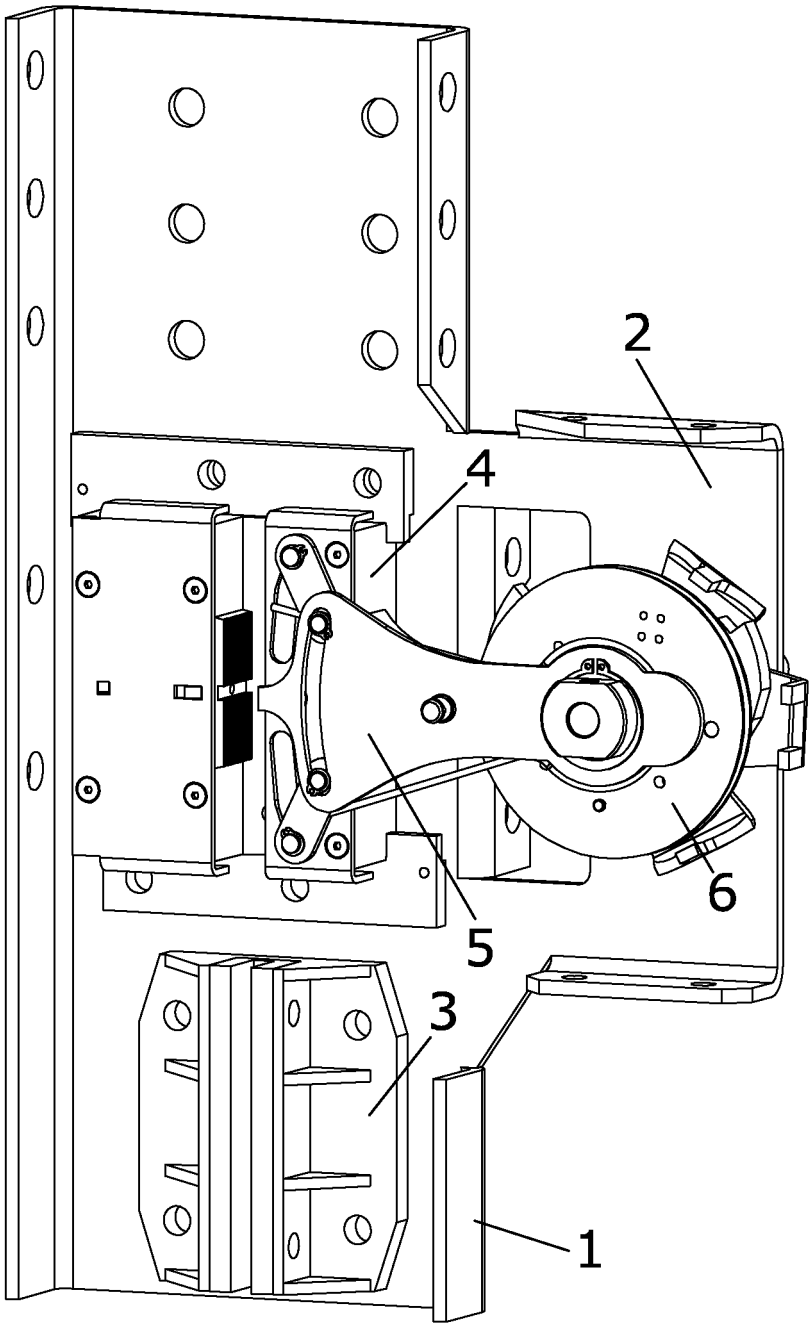

FIG.4

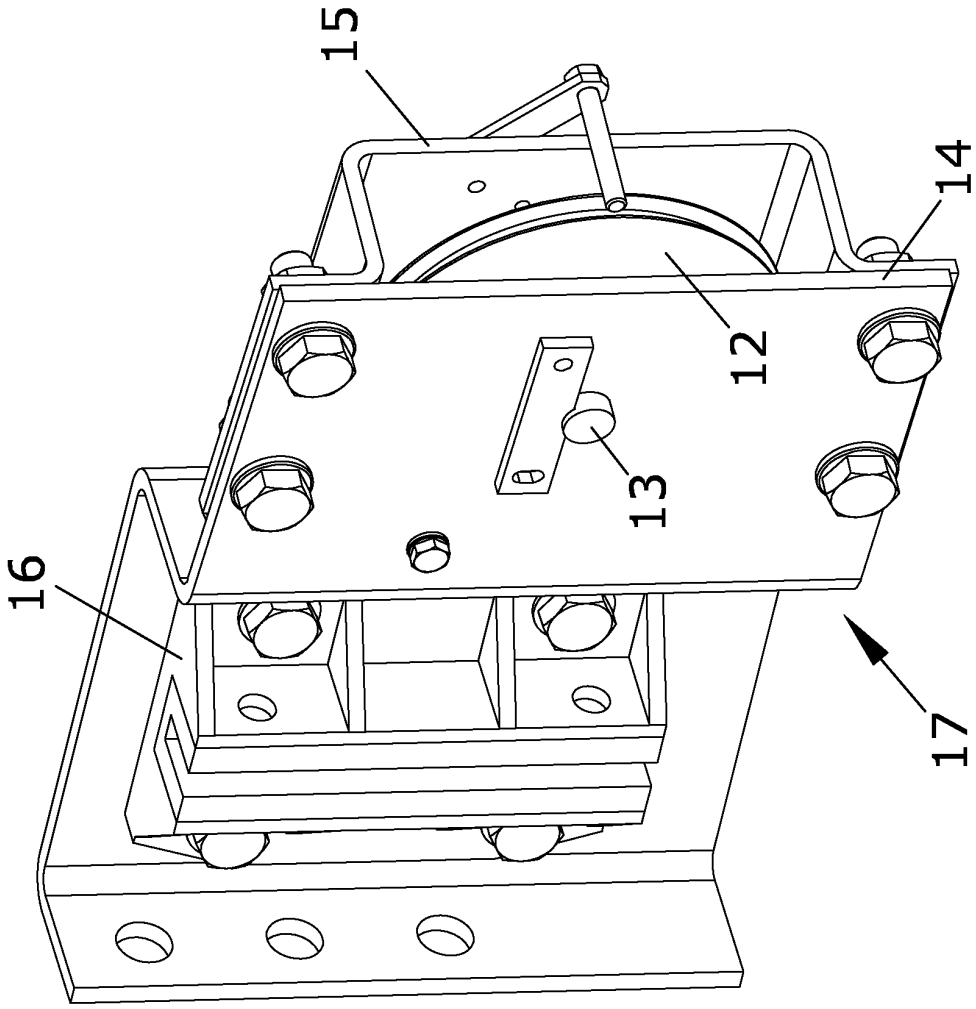

FIG.5

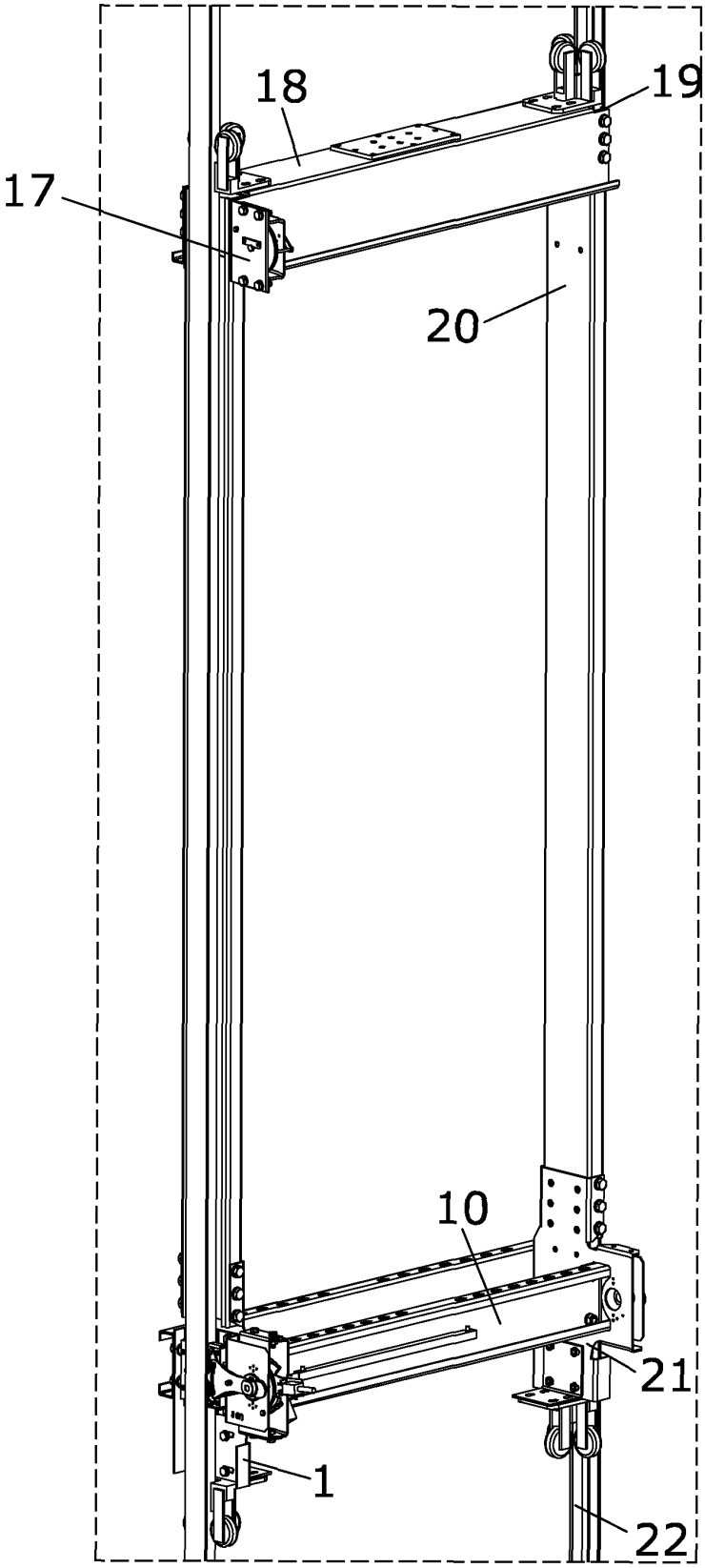

FIG.6

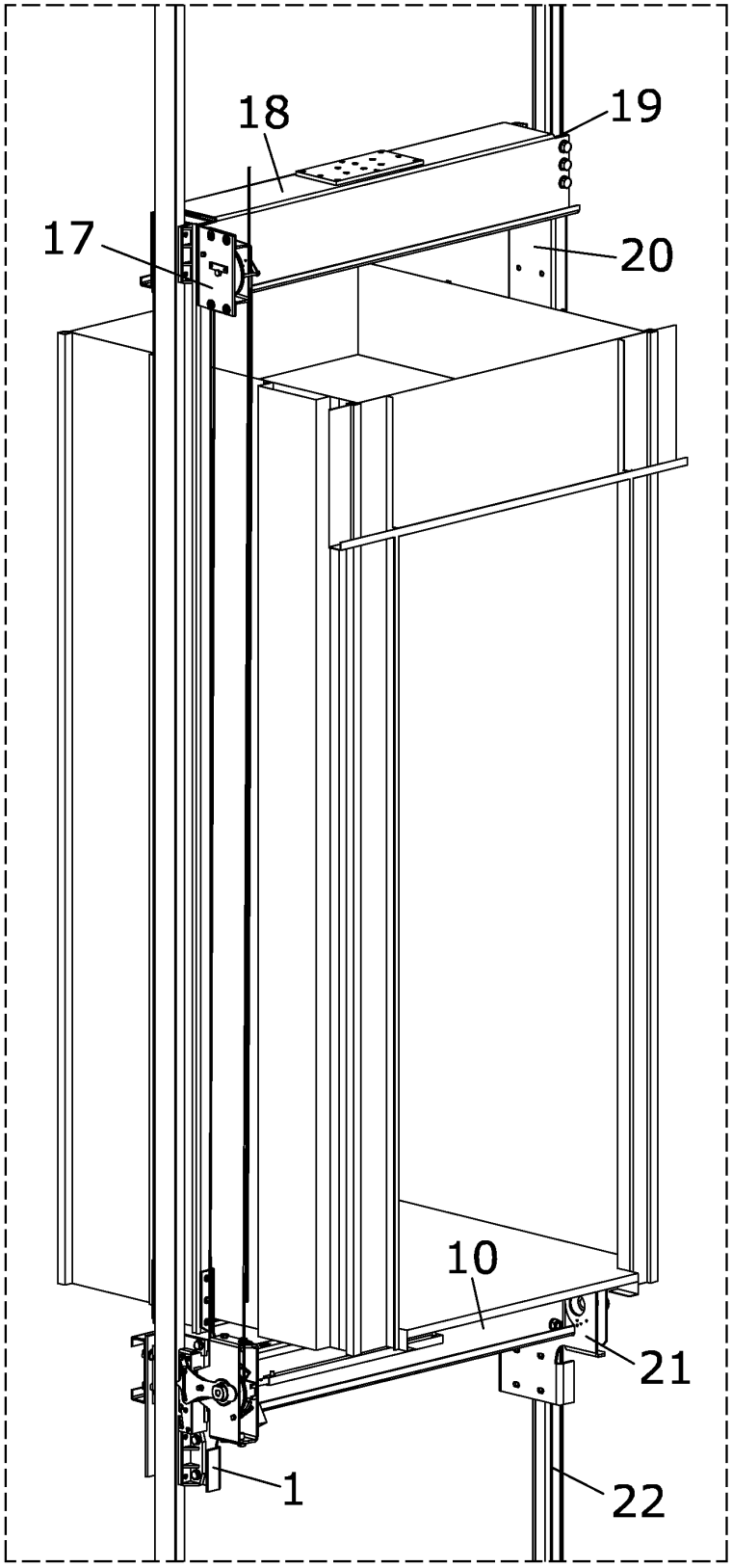

FIG.7

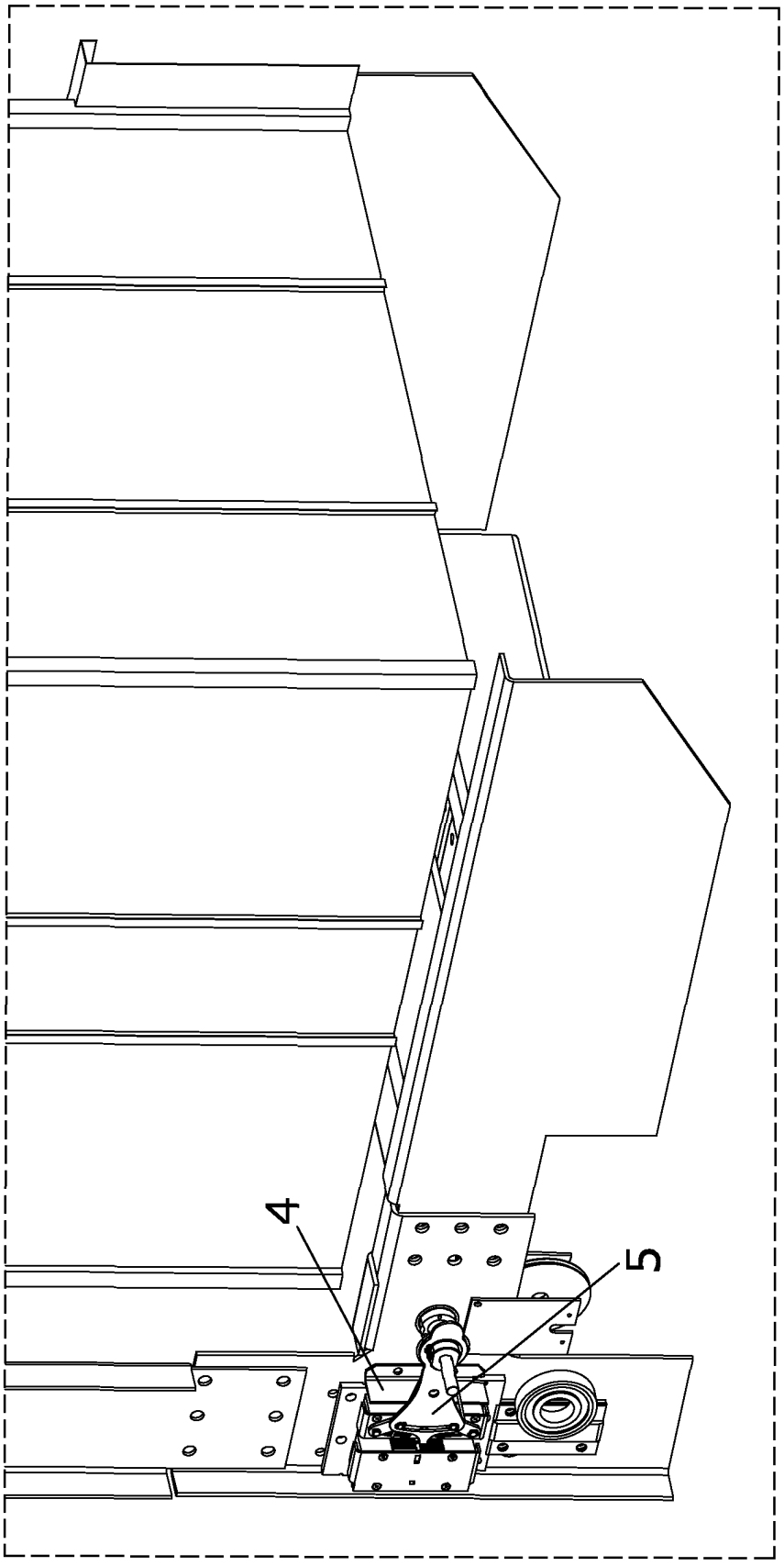

FIG.8

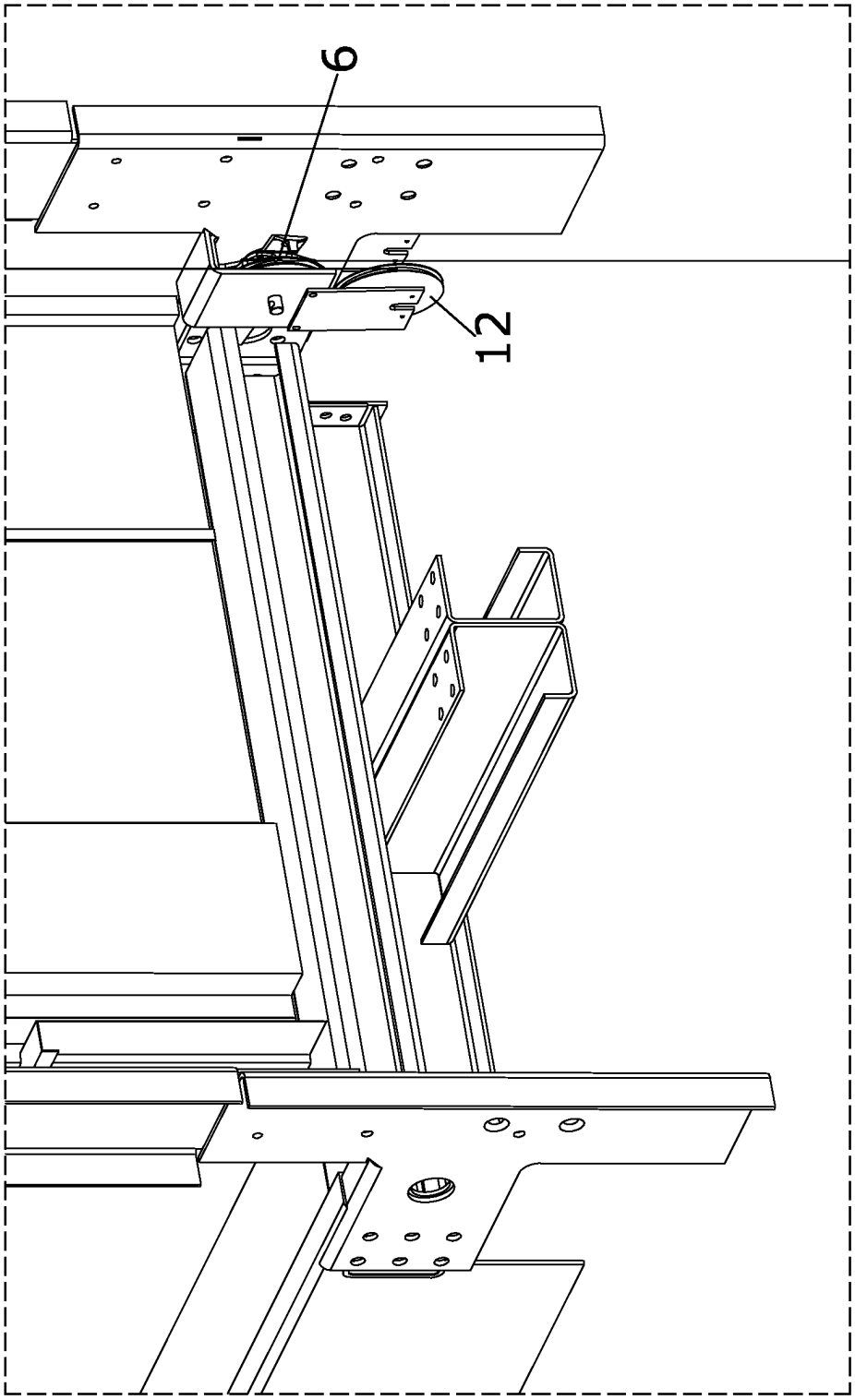

FIG.9

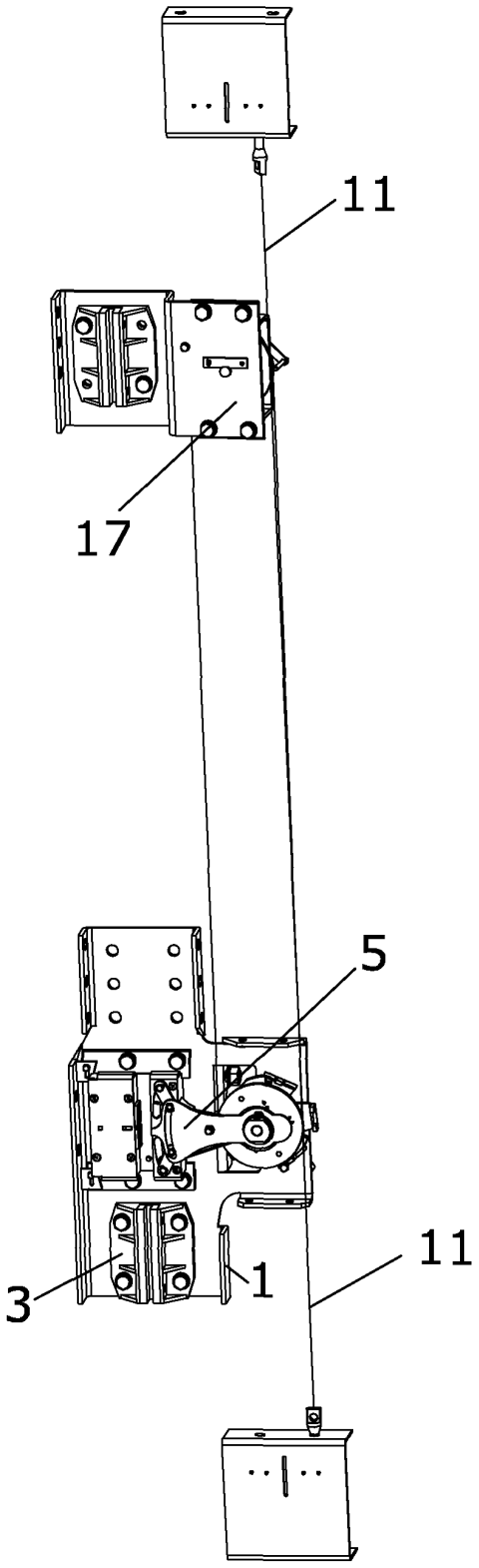

FIG.10

INTERNATIONAL SEARCH REPORT

International application No
PCT/ES2010/070621

A. CLASSIFICATION OF SUBJECT MATTER
INV. B66B11/02
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B66B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	JP 61 157578 U (UNKNOWN) 30 September 1986 (1986-09-30) figures 1-6	1-5,8, 10,12, 13,15-17 6,7,11, 14

Y	JP 2006 182483 A (MITSUBISHI ELECTRIC CORP) 13 July 2006 (2006-07-13) figures 1-3	6,7,11

Y	FR 2 293 393 A1 (AZURMENDI INCHAUSTI JUAN [ES]) 2 July 1976 (1976-07-02) figure 2	14

X	JP 6 329370 A (MITSUBISHI ELECTRIC CORP) 29 November 1994 (1994-11-29) abstract; figures 1-4	1-4,8,9, 12,13, 16,17

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
16 June 2011	24/06/2011

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Janssens, Gerd

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/ES2010/070621

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