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(54) **Title:** INTELLIGENT ELEVATOR

(57) **Abstract:** An intelligent elevator mainly comprises a guide rail (4), a chassis (7), a solar power supply system (1), a safety fence (8), a safety door (6), a curved sliding door (15), an entrance door (2), an elevator car (5), a guide rail connecting cross member (12), an oil pump system (24) and transmission, which adopts brake motors (30) and worm reduction (28) forming dual brake, and sets a safety gear (10), the elevator car (5) is powered by battery, the use of solar power supply system (1) and 220V household electricity form a dual power supply system, and the curved sliding door (15) is a kind of structure of the car door and the entrance door by adopting center opening type or right-angle type, hidden inside of the elevator car (5) side wall and inside the door frame of the entrance door (2), forming a largest elevator with a smallest volume. The elevator is a new type intelligent elevator with more advantages of safety, no crashes, no power failure, passengers will not be trapped in the car, energy saving and environmental protection, no elevator shaft, small occupied area, convenient installation, new fire safety passage creation and lower cost.

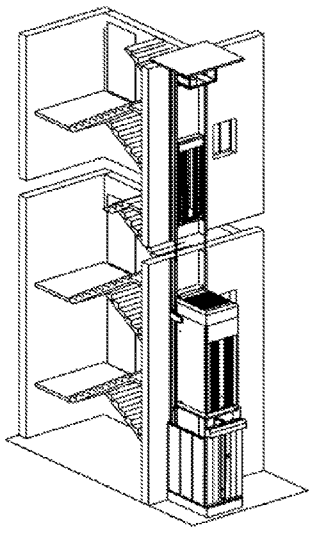

Fig.4

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INTELLIGENT ELEVATOR

FIELD OF THE INVENTION

The invention relates to an outdoor passenger elevator, especially a gear rack intelligent elevator, additionally provided in a seven-story old building.

BACKGROUND OF THE INVENTION

To add an outdoor elevator for a seven-story old building is a major policy for the benefit of the people now, and the policy is to address the problem of population aging. However, there are still technical problems in adding an outdoor elevator to the seven-story old buildings, the technical problems are mainly due to the fact that the original design of an old seven-story building did not reserve the position of the elevator, and the traditional elevator covers a large area and cannot installation. In order to solve the above technical problems, the present invention designs an intelligent elevator, the outer dimensions of the elevator only 1.2 meters wide and 1.6 meters long, the internal dimensions of the elevator only 1.0 meters wide and 1.2 meters long, the elevator may carrying 6 passenger and just be installed at the entrance of the seven-story old building unit door, the total width of the old building corridor is generally 2.3 meters, the intelligent elevator of the present invention occupies a width of 1.2 meters, leaving 1.1 meters wide staircase to ensure the safe passage. The elevator gets the largest space with minimum volume, and highly intelligent, but the price is cheaper than the traditional elevator.

DESCRIPTION OF THE INVENTION

The purpose of the present invention is to provide an outdoor passenger intelligent elevator which can be installed at the entrance of the seven-story old building unit door, which is a gear rack intelligent elevator different from traditional traction elevator or hydraulic elevator. The intelligent elevator mainly comprises a guide rail, a rack, a chassis, a solar power supply system, a safety fence, a safety door, a curved sliding door, an entrance door, an elevator car, a guide rail connecting cross member, and an oil pump system; wherein the guide rail comprising two C-shape steel bars which are connected in parallel through a rail connecting cross member, and two racks which are mounted in parallel to the

inside of the C-shape steel bar of the guide rail, and the guide rail is connected at right angles to the chassis of the rectangle block; the solar power supply system is mounted on the guide rail near the top of the building forming a dual power supply system of the elevator together with 220V household electricity, wherein a lower part of the solar power supply system comprises a power charging terminal for charging the elevator car, and the elevator car is connected to the guide rail wireless; the safety door adopting triple retractable door of center opening comprises a waterproof cover of the safety door, a tertiary door plate, a secondary door plate, a primary door plate, a touch operating system of the safety door, a guide rail of the safety door, a driven pulley of the safety door, a slider, a cylindrical linear guide rail of the safety door, a transmission belt of the safety door, a transmission motor of the safety door, an electrical control system of the safety door, and a leading sheave of the safety door; the curved sliding door via frame comprises an infrared sensor, a curved sliding door section, a hinge connecting the curved sliding door section, a sealing strip of the curved sliding door section, a guide rail section of the curved sliding door, an upper guide rail of the curved sliding door, an upper sliding wheel of the guide rail of the curved sliding door, a lower guide rail of the curved sliding door, and a lower sliding wheel of the guide rail of the curved sliding door, wherein comprising three different types of transmission: first type is a linear transmission comprising a drive motor of the elevator car curved sliding door, a cylindrical linear guide rail and a ball screw, second type is a linear transmission comprising two sets of electric sliding table, third type is a curve profile transmission comprising a driving gear set, a door motor, a large profile pulley, a belt, and a small profile pulley; the entrance door is a curve profile transmission, comprising an infrared sensor, an outer packaging plate of the entrance door, a touch operation system of the entrance door, an inner packaging plate of the entrance door, a floor of the entrance door, a frame of the entrance door, an electrical control system of the entrance door, a curved sliding door, a drive gear set, a door motor, a large profile pulley, a belt and a small profile pulley; the elevator car mainly comprises a body of the elevator car, a promotion dynamic system of the elevator car, a safety mechanism, a power supply, an electrical apparatus control system, a door of the elevator car and a transmission system, the body of the elevator car comprises a frame of the elevator car, a curved sliding door, an outer packaging plate of the elevator car, an inner packaging plate of the elevator car, a floor of the elevator

car, and a beautification cover of the elevator car, the promotion dynamic system of the elevator car comprises a brake motor, a worm reduction, a transmission shaft, a transmission chain box, a gear, and a guide pulley, the safety mechanism comprises a travel switch, a safety gear, a level sensor, a weight sensor, an infrared sensor and a waterproof cover, the power supply comprises an inverter, a car charging terminal, a car battery, the electrical apparatus control system comprises an elevator electrical apparatus control system, a touch operating system of the elevator car, the door of the elevator car and the transmission system comprise a drive motor of the elevator car curved sliding door, a cylindrical linear guide rail and a ball screw, wherein the elevator car with the door of the elevator car comprising two transmission ways, one is a linear transmission, comprising a drive motor of the elevator car curved sliding door, a cylindrical linear guide rail and a ball screw, forming an elevator car center opening of straight in and out; another is a linear transmission, comprising electric sliding table, forming a side open elevator car of right-angle.

Wherein, the curved sliding door is a kind of structure of the car door and the entrance door, hidden inside of the elevator car side wall and inside the door frame of the entrance door.

Wherein, the safety door corresponds to the car entrance and forms a safety zone of the block with the safety fence.

Wherein, the elevator electrical apparatus control system, the electrical control system of the entrance door and the electrical control system of the safety door on the elevator car all comprise wireless communication module.

Specifically, the tertiary door plate, the secondary door plate and the primary door plate are in the shape of a U-shaped upper connecting the slider and upper hoisting through the cylindrical linear guide rail of the safety door; the transmission belt of the safety door is connecting the slider, the guide rail of the safety door and the primary door plate form the door frame together, the guide rail of the safety door and the leading sheave of the safety door are configured as a lower guide of the triple retractable door, the touch operating system of the safety door is mounted in the tertiary door plate, the electrical control system of the

safety door is mounted in the upper door frame of the safety door; the touch operation system of the entrance door is mounted on the door frame; the transmission chain box is connecting the transmission shaft movably, and the transmission chain box may swing up and down, the guide pulley comprising four symmetries in the up-down and left-right are mounted on the inside of the frame to guide the elevator car sliding up and down on the guide rail; the travel switch comprising four symmetries in the up-down and left-right is mounted on the front of the guide pulley, each one up and down, each set of two is connected parallel to ensure the travel of the elevator car ending safety; the safety gear is a non-rotatable gear, one end of the gear connecting arm is connecting the frame of the elevator car to swing up and down and is supported on the transmission chain box, the safety gear and the rack do not bite and keep a distance; the level sensor is mounted on the middle of the rear side of the elevator car top; the weight sensor is mounted on the bottom of the elevator car, and the floor of the elevator car is mounted on the weight sensor; the infrared sensor is mounted on the curved sliding door; the elevator electrical apparatus control system adopts microcontroller or PIC control system; and the touch operating system of the elevator car is mounted on the inner packaging plate of the elevator car.

The description of the formation about the main structure:

1.Guide rail, which is two C-shape steel bars connected in parallel through a rail connecting cross member, and the height accords with the height of the building; the rack is the national standard rack; and two racks which are mounted in parallel to the inside of the C-shape steel bar of the guide rail.

2.Chassis, which is a rectangle block in shape, and connected to the guide rail at right angle 90 degrees.

3. Solar power supply system, which is mounted on the guide rail near the top of the building, forming a dual power supply system of the elevator together with 220V household electricity; wherein a lower part of the solar power supply system comprises a power charging terminal for charging the elevator car.

4.Safety fence, the elevator of the present invention is no hoistway elevator, the safety fence is main to protect the safety and to prevent risk from something placed in under the moving trajectory of the elevator car, the safety door corresponds to the car entrance and forms a safety zone of the block with the safety fence.

5. Safety door, adopts triple retractable door of center opening, may also as a kind

of structure of the car door and the entrance door, the safety door comprises a waterproof cover of the safety door, a tertiary door plate, a secondary door plate, a primary door plate, a touch operating system of the safety door, a guide rail of the safety door, a driven pulley of the safety door, a slider, a cylindrical linear guide rail of the safety door, a transmission belt of the safety door, a transmission motor of the safety door, an electrical control system of the safety door, and a leading sheave of the safety door. The tertiary door plate, the secondary door plate and the primary door plate are in the shape of a U-shaped upper connecting the slider and upper hoisting through the cylindrical linear guide rail of the safety door, the transmission belt of the safety door is connecting the slider, the guide rail of the safety door and the primary door plate form the door frame together, the guide rail of the safety door and the leading sheave of the safety door are configured as a lower guide of the triple retractable door, the use of the driven pulley of the safety door, the transmission belt of the safety door and the transmission motor of the safety door to achieve triple retractable door under the control of the electrical control system of the safety door, to achieve the safety door three telescopic and center opening, the touch operating system of the safety door is mounted in the tertiary door plate to control the safety door closed and call the car, the electrical control system of the safety door is mounted in the upper door frame of the safety door to control the safety door, the wireless communication module in the electrical control system of the safety door and the wireless communication module in the elevator electrical apparatus control system on the elevator car to achieve information source exchange and control. The waterproof cover of the safety door is to protect the appliance from water.

6. Curved sliding door, which is via frame comprising an infrared sensor, a curved sliding door section, a hinge connecting the curved sliding door section, a sealing strip of the curved sliding door section, a guide rail section of the curved sliding door, an upper guide rail of the curved sliding door, an upper sliding wheel of the guide rail of the curved sliding door, a lower guide rail of the curved sliding door, and a lower sliding wheel of the guide rail of the curved sliding door. The curved sliding door comprises three different types of transmission: first type is a linear transmission comprising a drive motor of the elevator car curved sliding door, a cylindrical linear guide rail and a ball screw, second type is a linear transmission comprising two sets of electric sliding table, third type is a curve profile transmission comprising a driving gear set, a door motor, a large profile pulley, a

belt, and a small profile pulley. The curved sliding door is a kind of structure of the car door and the entrance door, hidden inside of the elevator car side wall and inside the door frame of the entrance door to achieve design goals of a small size but space not small.

7.Entrance door, adopts curved sliding door of center opening, which is a curve profile transmission, comprising an infrared sensor, an outer packaging plate of the entrance door, a touch operation system of the entrance door, an inner packaging plate of the entrance door, a floor of the entrance door, a frame of the entrance door, an electrical control system of the entrance door, a curved sliding door, a drive gear set, a door motor, a large profile pulley, a belt and a small profile pulley. The touch operation system of the entrance door is mounted on the door frame to control the entrance door closed and call the car, the wireless communication module in the electrical control system of the entrance door and the wireless communication module in the elevator electrical apparatus control system on the elevator car to achieve information source exchange and control.

8. Elevator car, mainly comprises a body of the elevator car, a promotion dynamic system of the elevator car, a safety mechanism, a power supply, an electrical apparatus control system, a door of the elevator car and a transmission system. The body of the elevator car comprises a frame of the elevator car, a curved sliding door, an outer packaging plate of the elevator car, an inner packaging plate of the elevator car, a floor of the elevator car, and a beautification cover of the elevator car. The promotion dynamic system of the elevator car comprises a brake motor, a worm reduction, a transmission shaft, a transmission chain box, a gear, and a guide pulley. The transmission chain box is connecting the transmission shaft movably, and the transmission chain box may swing up and down, which may let the elevator car through the gear free to hang rack bite naturally, the guide pulley comprising four symmetries in the up-down and left-right are mounted on the inside of the frame to guide the elevator car sliding up and down on the guide rail; the safety mechanism comprises a travel switch, a safety gear, a level sensor, a weight sensor, an infrared sensor and a waterproof cover.The travel switch comprising four symmetries in the up-down and left-right is mounted on the front of the guide pulley, each one up and down, each set of two is connected parallel to ensure the travel of the elevator car ending safety.The safety gear is a non-rotatable gear, With ratchet function, one end of the gear connecting arm is connecting the frame of the elevator car to swing up and down and is supported

on the transmission chain box, the safety gear and the rack do not bite and keep a distance, if the transmission shaft and the transmission chain box are broken, the safety gear will lose the support of the transmission chain box and engage with the rack directly to ensure that the car does not slip or fall. The level sensor is mounted on the middle of the rear side of the elevator car top, if one tooth of the gear and rack broken can be detected immediately to protect the safe operation of the elevator. The weight sensor is mounted on the bottom of the elevator car, and the floor of the elevator car is mounted on the weight sensor to prevent over loading. The infrared sensor is mounted on the curved sliding door to prevent clipping person. The oil pump system may supply oilto the gear and the rack automatically for lubrication to ensure safety, the waterproof cover is to protect the appliance from water. The power supply comprises an inverter, a car charging terminal, a car battery, the car battery supplies power to the brake motor through the inverter, and is connected to the power charging terminal through the car charging terminal to receive the power supply of the solar power system. The electrical apparatus control system comprises an elevator electrical apparatus control system and a touch operating system of the elevator car, the elevator electrical apparatus control system adopts microcontroller or PIC control system, and the wireless communication module in the elevator electrical apparatus control system achieves information source exchange and control among the safety door and the entrance door. The touch operating system of the elevator car is mounted on the inner packaging plate of the elevator car. The door of the elevator car and the transmission system, wherein the door of the elevator car main adopts curved sliding door, the elevator car with the door of the elevator car comprising two transmission ways, one is a linear transmission, comprising a drive motor of the elevator car curved sliding door, a cylindrical linear guide rail and a ball screw, forming an elevator car center opening of straight in and out; another is a linear transmission of right-angle, comprising two electric sliding tables, forming a side open elevator car of right-angle.

Installation:

The elevator without hoistway, without civil engineering, the chassis is supported in the building foundation, the guide rail that is equipped with the rack is to be installed on the floor of the building with the body of parallel connected guide rail through the cross member from the outer wall layer by layer, the same installation

platform with the elevator car, install steadily layer by layer from the floor to the roof, the solar power supply system is mounted on the guide rail near the top of the building, open the entrance wall for the installation of the entrance door, the gear of the elevator car hang on the rack of the guide rail, then install the safety fence and the safety door, connect the power of the entrance door and the safety door to the solar power supply system, begin debugging and testing of the entrance door, the safety door, the solar power supply system and the various electrical control system of the elevator car, to ensure that all electrical control systems to achieve information source exchange and control wireless, as well as the normal use of all the touch operating system.

Instructions:

The method of using the elevator and the traditional elevator is basically the same, onlychange the traditional physical operating keys to touch operating keys.

Compared with the traditional traction elevator has the following advantages:

A, safer

a, the elevator will not slip and fall, adopts brake motors and worm reduction forming dual brake, plus the safety gear, the elevator car does not appear slippage and crashes.

b, no power failure and passengers will not be trapped in the car, the elevator car is powered by battery, the use of solar power supply system and 220V household electricity form a dual power supply system, the elevator car wireless operation, and achieve wireless internet intelligent control with the entrance door and the safety door, when the charge lower than a certain value, the elevator will automatically recharge the power supply, when the solar power supply system and 220V household electricity form the dual power supply system are all no electricity, and the car battery power below the safety value, the elevator will stop working and refused to run, it will not appear the case of a traditional elevator power-down that will trap occupants in the elevator car.

c, the elevator may meet emergency, when the user home emergency patients or fire, press 120 or 119, when the car battery power below the safe value can still run a certain number of times to help passengers out of danger.

B, small occupied area

The elevator has the largest space with minimum volume, the smallest space to be used in the same space, reduce the use of land and avoid damaging the existing

building pattern, suit to install at the entrance of building unit where traditional elevator installation is not reserved, not only ensure the normal functions of the elevator, but also protect secure passage with stairs 1 meter wide.

C, no elevator shaft

The elevator adopts rail which attached wall installation, supported in the building foundation, reducing civil engineering and underground pipe network damage.

D, easy to install

The elevator adopts gear and rack lifting technology, installed steadily layer by layer from the floor to the roof, can be installed without using large lifting equipment and large aerial work aids.

E, to create a new fire safety passage

The traditional elevator is forbidden to use in the fire, while the present elevator is outdoors, no elevator shaft,with an independent power supply system, it may become a fire safety passage in the event of a fire.

F, the cost is lower

Including installation costs, infrastructure costs and maintenance costs.

BRIF DESCRIPTION OF THE DRAWINGS

FIG.1 is a left view 45° structure of the present invention.

FIG.2 is a front view of the present invention and installation diagram.

FIG.3 is a left view of the present invention and installation diagram.

FIG.4 is a left view 45° structure of the present invention and installation diagram.

FIG.5 is a schematic diagram of the structure of the guide rail, the gear, the rack and the safety gear of the present invention.

FIG.6 is a schematic view of the guide rail and chassis structure of the present invention.

FIG.7 is a left view 45° structure of the center openingelevator car of the present invention.

FIG.8 is a left view 45° structure of the center opening elevator car of the present invention.

FIG.9 is a left view 45° structure of the center opening elevator car of the present invention.

FIG.10 is a cross-sectional view of the center opening elevator car door of the present invention and a schematic diagram of a curved sliding door.

FIG.11 is a schematic diagram of the guiderail and the sliding wheel of the curved sliding door of the center opening car door of the present invention.

FIG.12 is a left view 45° structure of the sideopening car of the present invention.

FIG.13 is a left view 45° structure of the sideopening car of the present invention.

FIG.14 is a left view 45° structure of the sideopening car of the present invention.

FIG.15 is a cross-sectional view of the sideopening car door of the present invention and a schematic diagram of the curved sliding door.

FIG.16 is a schematic diagram of the guide rail and the sliding wheel of the curved sliding door of the side opening car door of the present invention.

FIG.17 is a left view 45° structure of the entrance door of the present invention.

FIG.18 is a left view 45° structure of the entrance door of the present invention.

FIG.19 is a top view of the entrance door of the present invention.

FIG.20 is a cross-sectional view of the entrance door and curved sliding door structure of the present invention.

FIG.21 is a schematic diagram of the guide rail and the sliding wheel of the curved sliding door of the entrance door of the present invention.

FIG.22 is a right view 45° structure of the safety door of the present invention.

FIG.23 is a right 45° perspective view of the safety door of the present invention.

FIG.24 is a top view of the entrance door of the present invention.

Wherein, 01-Solar power supply system, 02-Entrance door, 03-Rack, 04-Guide rail, 05-Elevator car, 06-Safety door, 07-Chassis, 08-Safety fence, 09-Power charging terminal, 10-Safety gear, 11-Gear, 12-Guide rail connecting cross member, 13-Waterproof cover, 14-Outer packaging plate of the elevator car, 15-Curved sliding door, 16-Inner packaging plate of the elevator car, 17-Floor of the elevator car, 18-Beautification cover of the elevator car, 19-Charging terminal of the elevator car, 20-Travel switch 21-Guide pulley, 22-Transmission chain box, 23-Transmission shaft, 24-Oil pump system, 25-Inverter, 26-Infrared sensor, 27-Weight sensor, 28-Worm reduction, 29-Level sensor, 30-Brake motor, 31-Elevator electrical apparatus control system, 32-Battery of the elevator car, 33-Frame of the elevator car,34-Drive motor of the elevator car curved sliding door, 35-Cylindrical linear guide rail, 36-Ball screw, 37-Upper guide rail of the curved sliding door, 38-Touch operating system of the elevator car, 39-Lower guide rail of the curved sliding door, 40-Hinge connected with the curved sliding

door section,41-Hinge connected with the curved sliding door section, 42-Sealing strip of the curved sliding door section, 43-Guide rail section of the curved sliding door, 44-Upper sliding wheel of the guide rail of the curved sliding door, 45-Lower sliding wheel of the guide rail of the curved sliding door, 46-Electric sliding table,47-Outer packaging board of the entrance door, 48-Touch operation system of the entrance door,49-Inner packaging board of the entrance door, 50-Floor of the entrance door, 51-Frame of the entrance door, 52-Driving gear set, 53-Electrical control system of the entrance door, 54-Door motor, 55-Large profile pulley, 56-Belt, 57-Small profile pulley, 58-Waterproof cover of the safety door, 59-Tertiary door plate, 60-Secondary door plate, 61-Primary door plate, 62-Touch operating system of the safety door, 63-Guide rail of the safety door, 64-Driven pulley of the safety door, 65-Slider, 66-Cylindrical linear guide rail of the safety door, 67-Transmission belt of the safety door, 68-Transmission motor of the safety door, 69-Electrical control system of the safety door, 70-Leading sheave of the safety door.

DETAILED DESCRIPTION OF PARTICULAR EMBODIMENTS

As shown in FIG. 1~24, the intelligent elevator comprises a guide rail 04, a rack 03, a chassis 07, a solar power supply system 01, a safety fence 08, a safety door 06, a curved sliding door 15, an entrance door 02, an elevator car 05, a guide rail connecting cross member 12 and an oil pump system 24; wherein the guide rail 04 comprises two C-shape steel bars connected in parallel through a rail connecting cross member, and two racks 03 mounted in parallel to the inside of the C-shape steel bar of the guide rail 04, and connected at right angles to the chassis 07 of the rectangle block; the solar power supply system 01, mounted on the guide rail 04 near the top of the building, forming a dual power supply system of the elevator together with 220V household electricity, wherein a lower part of the solar power supply system 01 comprises a power charging terminal 09 for charging the elevator car 05, and the elevator car 05 is running connected to the guide rail wireless; the safety door 06, adopting triple retractable door of center opening, comprising a waterproof cover of the safety door 58, a tertiary door plate 59, a secondary door plate 60, a primary door plate 61, a touch operating system of the safety door 62, a guide rail of the safety door 63, a driven pulley of the safety door 64, a slider 65, a cylindrical linear guide rail of the safety door 66, a transmission belt of the safety door 67, a transmission motor of the safety door 68,

an electrical control system of the safety door 69 and a leading sheave of the safety door 70; the safety door 06 corresponds to the entrance of the elevator car 05 and forms a safety zone of the block with the safety fence 08; the curved sliding door 15 via frame comprises an infrared sensor 26, a curved sliding door section 41, a hinge connecting the curved sliding door section 40, a sealing strip of the curved sliding door section 42, a guide rail section of the curved sliding door 43, an upper guide rail of the curved sliding door 37, an upper sliding wheel of the guide rail of the curved sliding door 44, a lower guide rail of the curved sliding door 39 and a lower sliding wheel of the guide rail of the curved sliding door 45, wherein main comprises three different types of transmission: first type is a linear transmission, comprising a drive motor of the elevator car curved sliding door 34, a cylindrical linear guide rail 35 and a ball screw 36, second type is a linear transmission, comprising two sets of electric sliding table 46,third type is a curve profile transmission, comprising a driving gear set 52, a door motor 54, a large profile pulley 55, a belt 56, and a small profile pulley 57, the curved sliding door 15 is a kind of structure of the car door and the entrance door 02, hidden inside of the elevator car 05 side wall and inside the door frame of the entrance door 02; the entrance door 02 is a curve profile transmission, comprisingan infrared sensor 26, an outer packaging plate of the entrance door 47, a touch operation system of the entrance door48, an inner packaging plate of the entrance door 49, a floor of the entrance door 50, a frame of the entrance door 51, an electrical control system of the entrance door 53, a curved sliding door 15, a drive gear set 52, a door motor 54, a large profile pulley 55, a belt 56 and a small profile pulley 57; the elevator car 05 mainly comprises a body of the elevator car, a promotion dynamic system of the elevator car, a safety mechanism, a power supply, an electrical apparatus control system, a door of the elevator car and a transmission system, wherein the body of the elevator car, comprising a frame of the elevator car 33, a curved sliding door 15, an outer packaging plate of the elevator car 14, an inner packaging plate of the elevator car 16, a floor of the elevator car 17, and a beautification cover of the elevator car 18, wherein the promotion dynamic system of the elevator car, comprising a brake motor 30, a worm reduction 28, a transmission shaft 23, a transmission chain box 22, a gear 11, a guide pulley 21, wherein the safety mechanism, comprising a travel switch 20, a safety gear 10, a level sensor 29, a weight sensor 27, an infrared sensor 26 and a waterproof cover 13, wherein the power supply, comprising an inverter 25,

a car charging terminal 19 and a car battery 32, wherein the electrical apparatus control system, comprising an elevator electrical apparatus control system 31 and a touch operating system of the elevator car 38, wherein the door of the elevator car and the transmission system, comprising a drive motor of the elevator car curved sliding door 34, a cylindrical linear guide rail 35 and a ball screw 36, wherein the elevator car 05 with the door of the elevator car comprising two transmission ways, one is a linear transmission, comprising a drive motor of the elevator car curved sliding door 34, a cylindrical linear guide rail 35 and a ball screw 36, forming an elevator car center opening of straight in and out; one is a linear transmission, comprising electric sliding table 46, forming a side open elevator car of right-angle.Wherein, the elevator electrical apparatus control system 31, the electrical control system of the entrance door 53 and the electrical control system of the safety door 69 on the elevator car 05allcomprise wireless communication module.

In addition, the tertiary door plate 59, the secondary door plate 60 and the primary door plate 61 above are in the shape of a U-shaped upper connecting the slider 65 and upper hoisting through the cylindrical linear guide rail of the safety door 66; the transmission belt of the safety door 67 is connecting the slider 65, the guide rail of the safety door 63 and the primary door plate 61 form the door frame together, the guide rail of the safety door 63 and the leading sheave of the safety door 70 are configured as a lower guide of the triple retractable door, the touch operating system of the safety door 62is mounted in the tertiary door plate 59, the electrical control system of the safety door 69 is mounted in the upper door frame ofthe safety door 06;the touch operation system of the entrance door 48 is mounted on the door frame; the transmission chain box 22 is connecting the transmission shaft 23 movably, and the transmission chain box 22 may swing up and down, the guide pulley 21 comprising four symmetries in the up-downandleft-right are mounted on the inside of the frame to guide the elevator car 05 sliding up and down on the guide rail 04; the travel switch 20 comprising four symmetries in the up-downandleft-right are mounted on the front of the guide pulley 21, eachone up anddown, each set of two is connected parallel to ensure the travel ofthe elevator car 05ending safety; the safety gear 10 is a non-rotatable gear, one end of the gear connecting arm is connecting the frame of the elevator car 33 to swing up and down and is supported on the transmission chain box, the safety gear 10 and the rack 03 do not bite and keep a distance; the

level sensor 29 is mounted on the middle of the rear side of the elevator car top; the weight sensor 27 is mounted on the bottom of the elevator car, and the floor of the elevator car 17 is mounted on the weight sensor; the infrared sensor 26 is mounted on the curved sliding door 15; the elevator electrical apparatus control system 31 adopts microcontroller or PIC control system; and the touch operating system of the elevator car 38 is mounted on the inner packaging plate of the elevator car.

The description of the formation about the main structure:

1. Guide rail 04, which is two C-shape steel bars connected in parallel through a rail connecting cross member 12, and the height accords with the height of the building; the rack 03 is the national standard rack; and two racks 03 which are mounted in parallel to the inside of the C-shape steel bar of the guide rail 04.

2. Chassis 07, which is a rectangle block in shape, and connected to the guide rail 04 at right angle 90 degrees.

3. Solar power supply system 01, which is mounted on the guide rail 04 near the top of the building, forming a dual power supply system of the elevator together with 220V household electricity; wherein a lower part of the solar power supply system 01 comprises a power charging terminal 09 for charging the elevator car 05.

4. Safety fence 08, the elevator of the present invention is no hoistway elevator, the safety fence 08 is main to protect the safety and to prevent risk from something placed in under the moving trajectory of the elevator car 05, the safety door 06 corresponds to the car entrance of the elevator car 05 and forms a safety zone of the block with the safety fence 08.

5. Safety door 06, adopts triple retractable door of center opening, may also as a kind of structure of the car door and the entrance door, the safety door comprises a waterproof cover of the safety door 58, a tertiary door plate 59, a secondary door plate 60, a primary door plate 61, a touch operating system of the safety door 62, a guide rail of the safety door 63, a driven pulley of the safety door 64, a slider 65, a cylindrical linear guide rail of the safety door 66, a transmission belt of the safety door 67, a transmission motor of the safety door 68, an electrical control system of the safety door 69 and a leading sheave of the safety door 70. The tertiary door plate 59, the secondary door plate 60 and the primary door plate 61 are in the shape of a U-shaped upper connecting the slider 65 and upper hoisting through the cylindrical linear guide rail of the safety door 66, the

transmission belt of the safety door 67 is connecting the slider, the guide rail of the safety door 63 and the primary door plate 61 form the door frame together, the guide rail of the safety door 63 and the leading sheave of the safety door 70 are configured as a lower guide of the triple retractable door, the use of the driven pulley of the safety door 64, the transmission belt of the safety door 67 and the transmission motor of the safety door 68 to achieve triple retractable door under the control of the electrical control system of the safety door 69, to achieve the safety door06 three telescopic and center opening, the touch operating system of the safety door62 is mounted in the tertiary door plate 59, to control the safety door 06 closed and call the elevator car 05, the electrical control system of the safety door 69 is mounted in the upper door frame of the safety door 06, to control the safety door 06, the wireless communication module built in the electrical control system of the safety door and the wireless communication module built in the elevator electrical apparatus control system 31 on the elevator car 05 to achieve information source exchange and control. The waterproof cover of the safety door 58 is to protect the appliance from water.

6. Curved sliding door 15, which is via frame comprising an infrared sensor 26, a curved sliding door section 41, a hinge connecting the curved sliding door section 40, a sealing strip of the curved sliding door section 42, a guide rail section of the curved sliding door 43, an upper guide rail of the curved sliding door 37, an upper sliding wheel of the guide rail of the curved sliding door 44, a lower guide rail of the curved sliding door 39 and a lower sliding wheel of the guide rail of the curved sliding door 45. The curved sliding door 15 comprises three different types of transmission: first type is a linear transmission comprising a drive motor of the elevator car curved sliding door 34, a cylindrical linear guide rail 35 and a ball screw 36, second type is a linear transmission comprising two sets of electric sliding table 46, third type is a curve profile transmission comprising a driving gear set 52, a door motor 54, a large profile pulley 55, a belt 56, and a small profile pulley 57. The curved sliding door 15 is a kind of structure of the car door and the entrance door 02, hidden inside of the elevator car 05 side wall and inside the door frame of the entrance door 02 to achieve design goals of a small size but space not small.

7. Entrance door 02, adopts curved sliding door 15 of center opening, which is a curve profile transmission, comprising an infrared sensor 26, an outer packaging plate of the entrance door 47, a touch operation system of the entrance door 48, an

inner packaging plate of the entrance door 49, a floor of the entrance door 50, a frame of the entrance door 51, an electrical control system of the entrance door 53, a curved sliding door 15, a drive gear set 52, a door motor 54, a large profile pulley 55, a belt 56 and a small profile pulley 57. The touch operation system of the entrance door 48 is mounted on the door frame to control the entrance door 02 closed and call the elevator car 05, the wireless communication module built in the electrical control system of the entrance door 02 and the wireless communication module built in the elevator electrical apparatus control system 31 on the elevator car 05 to achieve information source exchange and control.

8. Elevator car 05, mainly comprises a body of the elevator car, a promotion dynamic system of the elevator car, a safety mechanism, a power supply, an electrical apparatus control system, a door of the elevator car and a transmission system. The body of the elevator car comprises a frame of the elevator car 33, a curved sliding door 15, an outer packaging plate of the elevator car 14, an inner packaging plate of the elevator car 16, a floor of the elevator car 17, and a beautification cover of the elevator car 18. The promotion dynamic system of the elevator car comprises a brake motor 30, a worm reduction 28, a transmission shaft 23, a transmission chain box 22, a gear 11 and a guide pulley 21. The transmission chain box 22 is connecting the transmission shaft 23 movably, and the transmission chain box 22may swing up and down, which may let the elevator car 05 through the gear 11 free to hang rack 03 bite naturally, the guide pulley 21 comprising four symmetries in the up-down and left-right are mounted on the inside of the frame to guide the elevator car 05 sliding up and down on the guide rail 04; the safety mechanism comprises a travel switch 20, a safety gear 10, a level sensor 29, a weight sensor 27, an infrared sensor 26 and a waterproof cover 13. The travel switch 20 comprising four symmetries in the up-down and left-right are mounted on the front of the guide pulley 21, each one up and down, each set of two is connected parallel to ensure the travel of the elevator car 05 ending safety. The safety gear 10 is a non-rotatable gear, With ratchet function, one end of the gear connecting arm is connecting the frame of the elevator car 33 to swing up and down, and is supported on the transmission chain box 22, the safety gear 10and the rack 03 do not bite and keep a distance, if the transmission shaft 23 and the transmission chain box 22 are broken, the safety gear 10 will lose the support of the transmission chain box 22 and engage with the rack 03 directly to ensure that the elevator car 05 does not slip or fall. The level sensor 29 is

mounted on the middle of the rear side of the elevator car 05 top, if one tooth of the gear 11 and rack 03 broken can be detected immediately to protect the safe operation of the elevator. The weight sensor 27 is mounted on the bottom of the elevator car 05, and the floor of the elevator car 17 is mounted on the weight sensor to prevent overloading. The infrared sensor 26 is mounted on the curved sliding door 15 to prevent clipping person. The oil pump system 24 may supply oil to the gear 11 and the rack 03 automatically for lubrication to ensure safety, the waterproof cover 13 is to protect the appliance from water. The power supply comprises an inverter 25, a car charging terminal 19, a car battery 32, the car battery 32 supplies power to the brake motor 30 through the inverter25, and is connected to the power charging terminal 09 through the car charging terminal 19 to receive the power supply of the solar power system 01. The electrical apparatus control system comprises an elevator electrical apparatus control system 31 and a touch operating system of the elevator car 38, the elevator electrical apparatus control system 31 adopts microcontroller or PIC control system, and the wireless communication module built in the elevator electrical apparatus control system achieves information source exchange and control among the safety door 06 and the entrance door 02. The touch operating system of the elevator car 38 is mounted on the inner packaging plate of the elevator car 16. The door of the elevator car and the transmission system, wherein the door of the elevator car main adopts curved sliding door 15, the elevator car 05 with the door of the elevator car comprising two transmission ways, one is a linear transmission, comprising a drive motor of the elevator car curved sliding door 34, a cylindrical linear guide rail 35 and a ball screw 36, forming an elevator car 05 center opening of straight in and out; another is a linear transmission of right-angle, comprising two electric sliding tables 46, forming a side open elevator car 05 of right-angle.

Installation:

The elevator without hoistway, without civil engineering, the chassis 07 is supported in the building foundation, the guide rail 04 that is equipped with the rack 03 is to be installed on the floor of the building with the body of parallel connected guide rail through the cross member 12 from the outer wall layer by layer, the same installation platform with the elevator car 05, install steadily layer by layer from the floor to the roof, the solar power supply system 01 is mounted on the guide rail near the top of the building, open the entrance wall for the installation of the entrance door 02, the gear 11 of the elevator car 05 hang on the

rack 03 of the guide rail 04, then install the safety fence 08 and the safety door 06, connect the power of the entrance door 02 and the safety door 06 to the solar power supply system 01, begin debugging and testing of the entrance door 02, the safety door 06, the solar power supply system 01 and the various electrical control system of the elevator car 05, to ensure that all electrical control systems to achieve information source exchange and control wireless, as well as the normal use of all the touch operating system.

Instructions:

The method of using the elevator and the traditional elevator is basically the same, only change the traditional physical operating keys to touch operating keys.

The above specific embodiments are merely used to describe the present invention, wherein the structure and connection manner of the components may be changed. Any equivalent transformation and improvement based on the technical solutions of the present invention should not be excluded outside the scope of the invention.

Claims

1. An intelligent elevator comprising:

A guide rail; a rack; a chassis; a solar power supply system; a safety fence; a safety door; a curved sliding door; an entrance door; an elevator car; a guide rail connecting cross member; an oil pump system;

Wherein the guide rail comprising:

-Two C-shape steel bars, connected in parallel through a rail connecting cross member, and

-Two racks, mounted in parallel to the inside of the C-shape steel bar of the guide rail and connected at right angles to the chassis of the rectangle block;

The solar power supply system, mounted on the guide rail near the top of the building, forming a dual power supply system of the elevator together with 220V household electricity,

Wherein a lower part of the solar power supply system comprises a power charging terminal for charging the elevator car, and the elevator car is connected to the guide rail wireless;

The safety door, adopting triple retractable door of center opening, comprising:

a waterproof cover of the safety door, a tertiary door plate, a secondary door plate, a primary door plate, a touch operating system of the safety door, a guide rail of the safety door, a driven pulley of the safety door, a slider, a cylindrical linear guide rail of the safety door, a transmission belt of the safety door, a transmission motor of the safety door, an electrical control system of the safety door, and a leading sheave of the safety door;

The curved sliding door, via frame comprising:

An infrared sensor, a curved sliding door section, a hinge connecting the curved sliding door section, a sealing strip of the curved sliding door section, a guide rail section of the curved sliding door, an upper guide rail of the curved sliding door, an upper sliding wheel of the guide rail of the curved sliding door, a lower guide rail of the curved sliding door, a lower sliding wheel of the guide rail of the curved sliding door, and

Wherein using one or two or three of the three different types of transmission:

-First type is a linear transmission, comprising a drive motor of the elevator car curved sliding door, a cylindrical linear guide rail and a ball screw,

-The second type is a linear transmission, comprising two sets of electric sliding table,

-The third type is a curve profile transmission, comprising a driving gear set, a door motor, a large profile pulley, a belt, and a small profile pulley;

The entrance door is a curve profile transmission, comprising:

-An infrared sensor, an outer packaging plate of the entrance door, a touch operation system of the entrance door, an inner packaging plate of the entrance door, a floor of the entrance door, a frame of the entrance door, an electrical control system of the entrance door, a curved sliding door, a drive gear set, a door motor, a large profile pulley, a belt and a small profile pulley;

The elevator car, mainly comprising:

A body of the elevator car, a promotion dynamic system of the elevator car, a safety mechanism, a power supply, an electrical apparatus control system, a door of the elevator car and a transmission system,

-The body of the elevator car, comprising a frame of the elevator car, a curved sliding door, an outer packaging plate of the elevator car, an inner packaging plate of the elevator car, a floor of the elevator car, and a beautification cover of the elevator car,

-The promotion dynamic system of the elevator car, comprising a brake motor, a worm reduction, a transmission shaft, a transmission chain box, a gear, a guide pulley,

-The safety mechanism, comprising a travel switch, a safety gear, a level sensor, a weight sensor, an infrared sensor and a waterproof cover,

-The power supply, comprising an inverter, a car charging terminal, a car battery,

-The electrical apparatus control system, comprising an elevator electrical apparatus control system, a touch operating system of the elevator car,

-The door of the elevator car and the transmission system, comprising a drive motor of the elevator car curved sliding door, a cylindrical linear guide rail and a ball screw,

Wherein the elevator car with the door of the elevator car using one or two of the following two transmission ways:

-A type: a linear transmission, comprising a drive motor of the elevator car

curved sliding door, a cylindrical linear guide rail and a ball screw, forming an elevator car center opening of straight in and out;

-B type: a linear transmission, comprising electric sliding table, forming a side open elevator car of right-angle.

2. The intelligent elevator of claim 1, wherein the curved sliding door is a kind of structure of the car door and the entrance door, hidden inside of the elevator car side wall and inside the door frame of the entrance door.

3. The intelligent elevator of claim 1 or 2, wherein the safety door corresponds to the car entrance and forms a safety zone of the block with the safety fence.

4. The intelligent elevator of claim 3, wherein the elevator electrical apparatus control system, the electrical control system of the entrance door and the electrical control system of the safety door on the elevator car all comprise wireless communication module.

5. The intelligent elevator of claim 4 further comprising:

-the tertiary door plate, the secondary door plate and the primary door plate are in the shape of a U-shaped upper connecting the slider and upper hoisting through the cylindrical linear guide rail of the safety door;

-the transmission belt of the safety door is connecting the slider, the guide rail of the safety door and the primary door plate form the door frame together, the guide rail of the safety door and the leading sheave of the safety door are configured as a lower guide of the triple retractable door, the touch operating system of the safety door is mounted in the tertiary door plate, the electrical control system of the safety door is mounted in the upper door frame of the safety door;

-the touch operation system of the entrance door is mounted on the door frame;

-the transmission chain box is connecting the transmission shaft movably, and the transmission chain box may swing up and down, the guide pulley comprising four symmetries in the up-down and left-right are mounted on the inside of the frame to guide the elevator car sliding up and down on the guide rail;

-the travel switch comprising four symmetries in the up-down and left-right is

mounted on the front of the guide pulley, each one up and down, each set of two is connected parallel to ensure the travel of the elevator car ending safety;

-the safety gear is a non-rotatable gear, one end of the gear connecting arm is connecting the frame of the elevator car to swing up and down and is supported on the transmission chain box, the safety gear and the rack do not bite and keep a distance;

-the level sensor is mounted on the middle of the rear side of the elevator car top;

-the weight sensor is mounted on the bottom of the elevator car, and the floor of the elevator car is mounted on the weight sensor;

-the infrared sensor is mounted on the curved sliding door;

-the elevator electrical apparatus control system adopts microcontroller or PIC control system; and

-the touch operating system of the elevator car is mounted on the inner packaging plate of the elevator car.

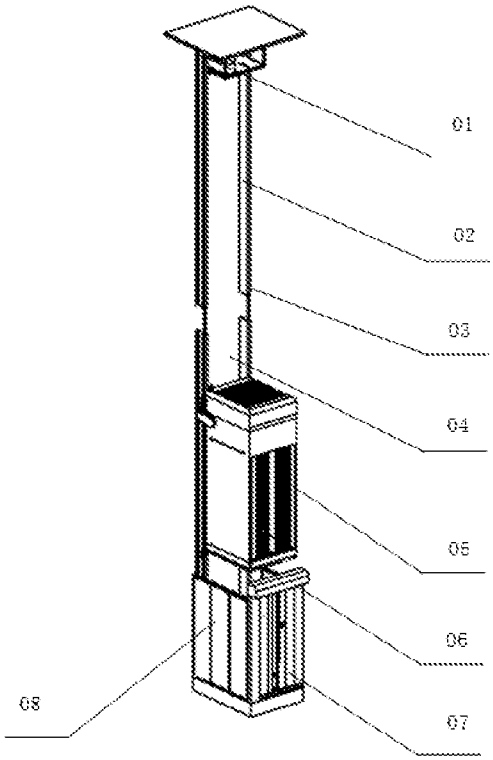

Fig.1

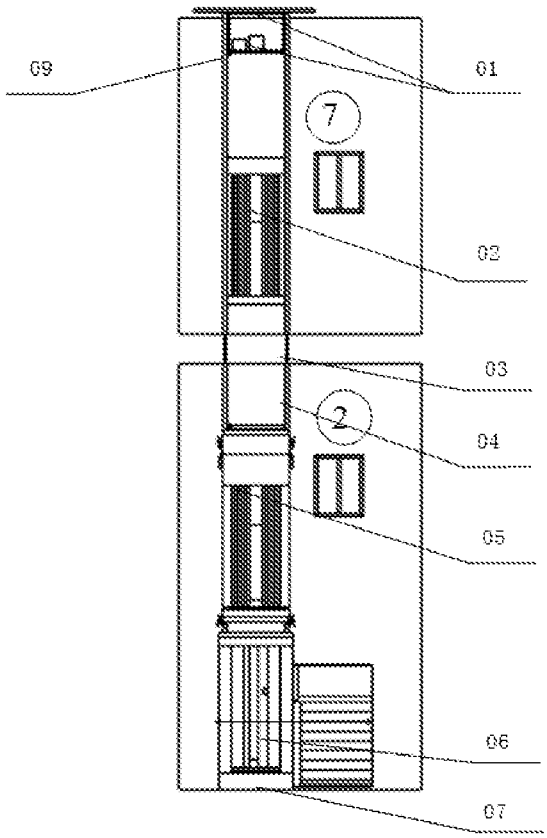

Fig.2

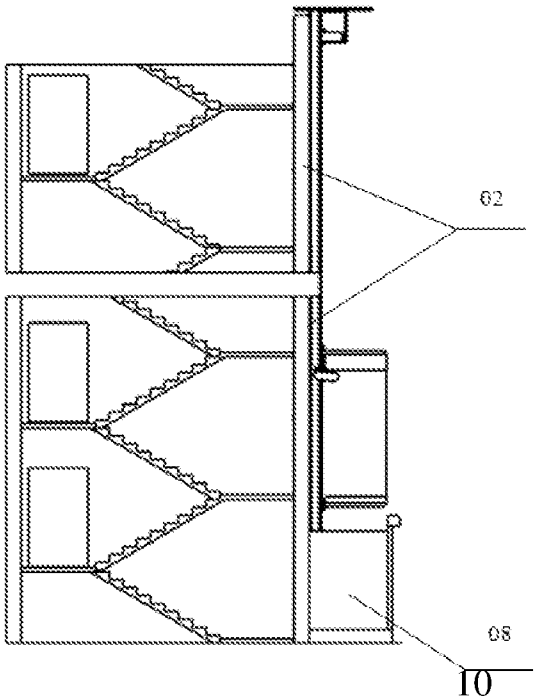

Fig.3

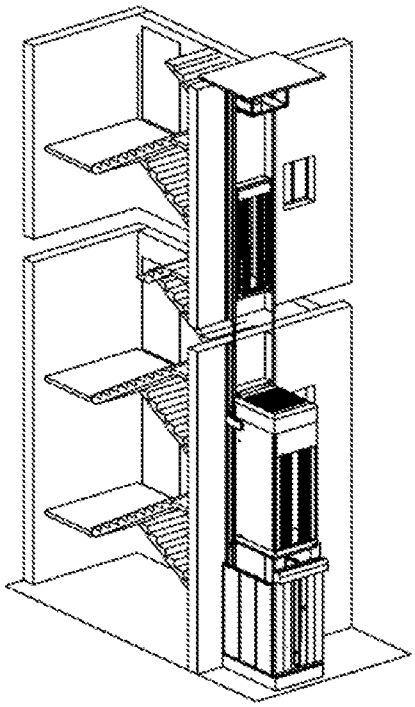

Fig.4

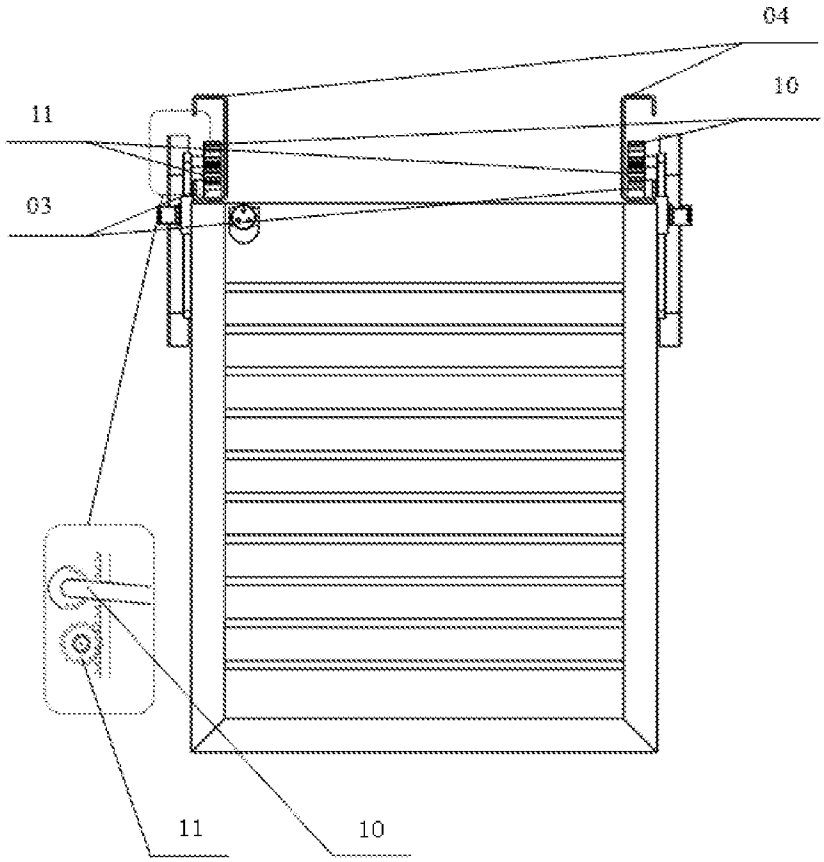

Fig.5

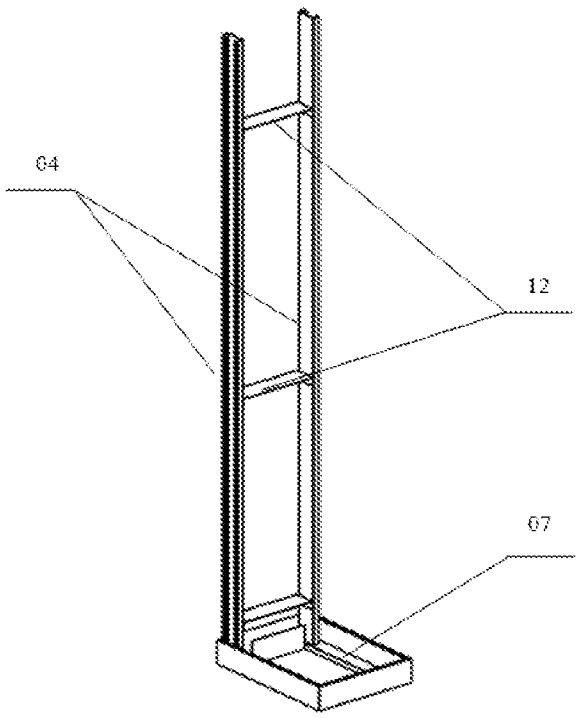

Fig.6

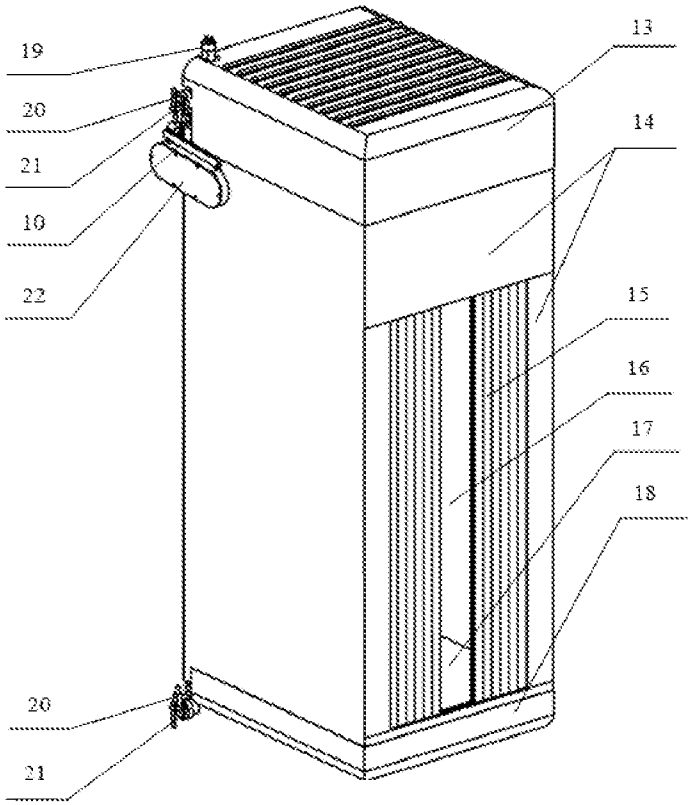
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Fig.7

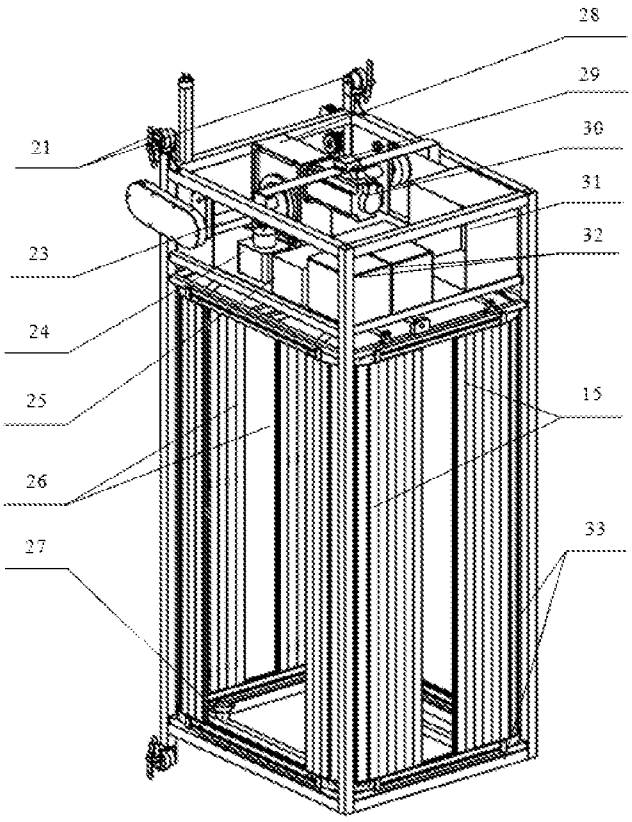
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Fig.8

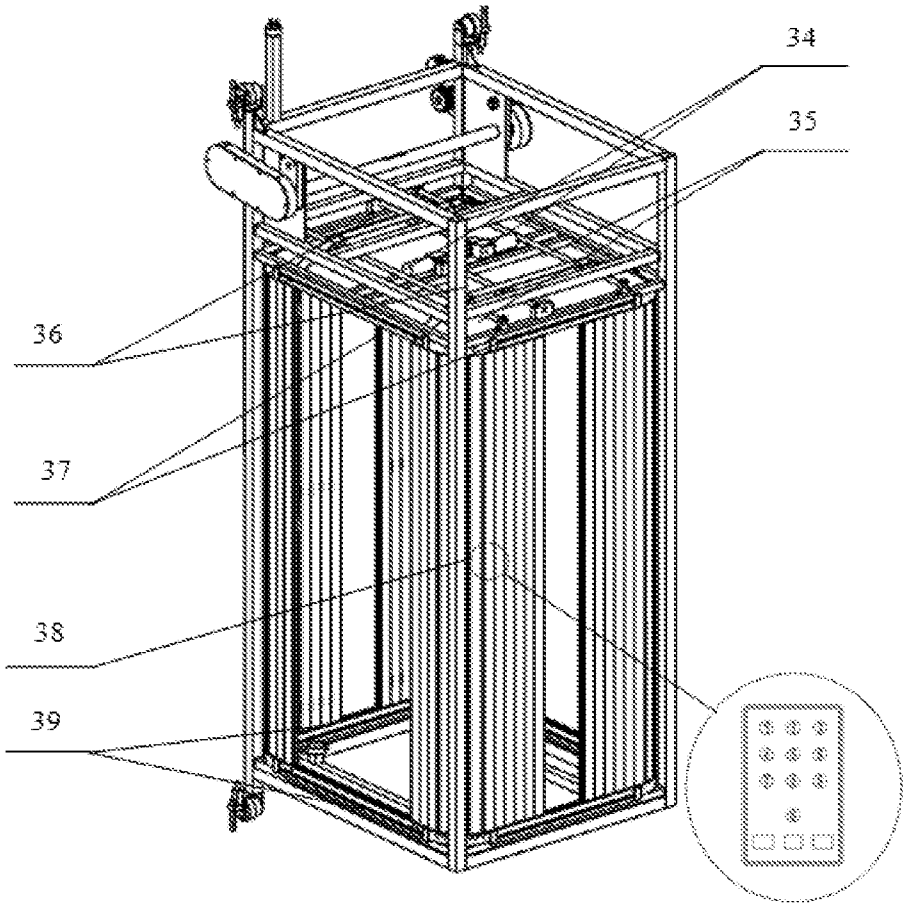

Fig.9

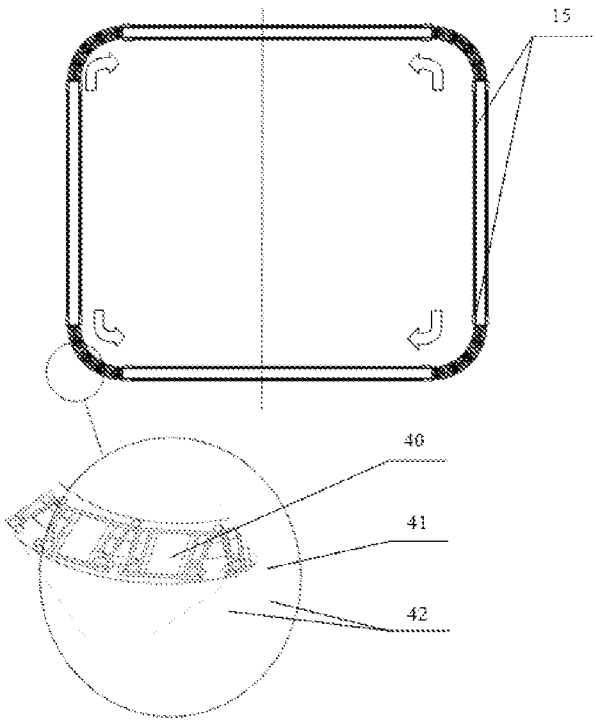

Fig.10

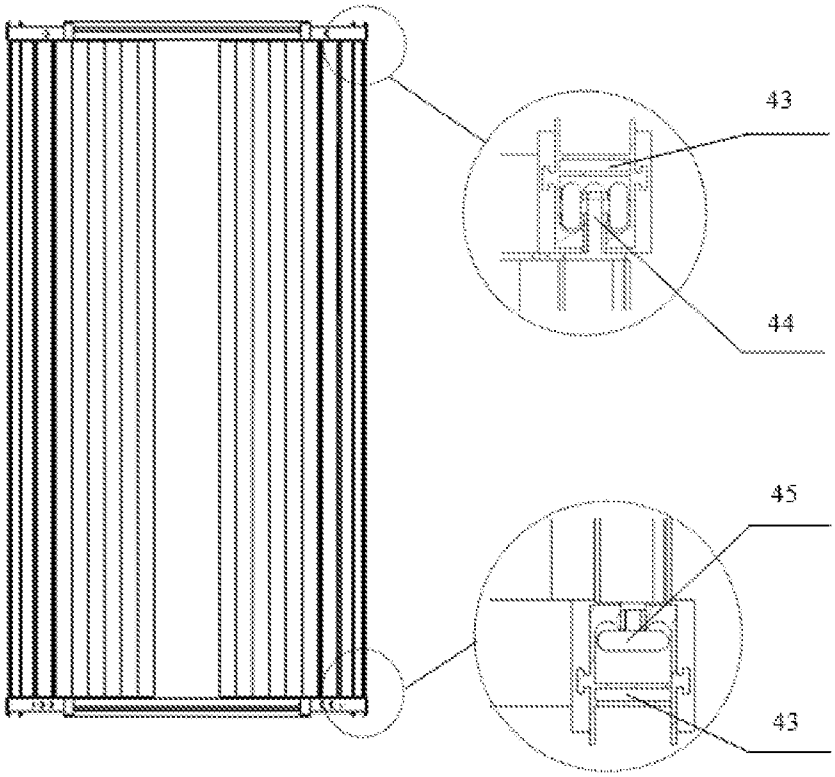

Fig.11

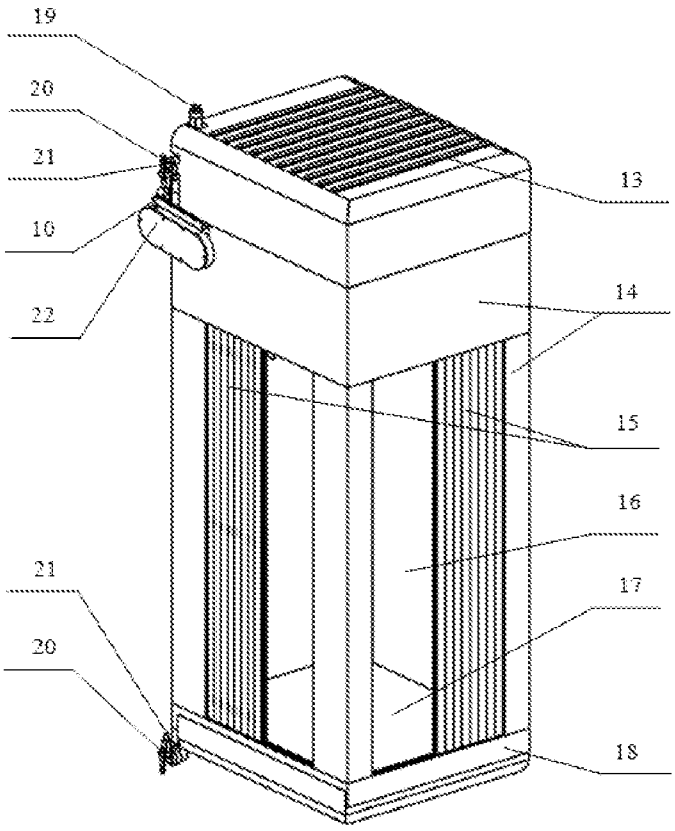

Fig.12

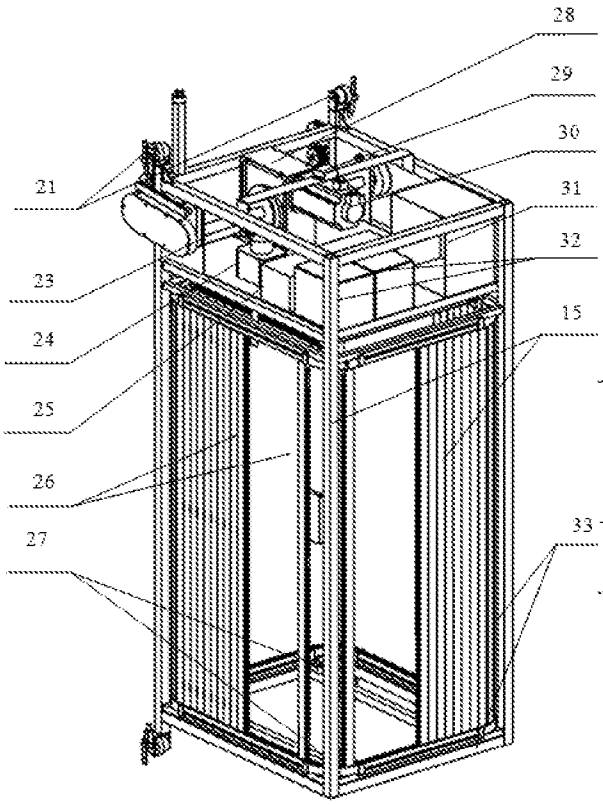

Fig.13

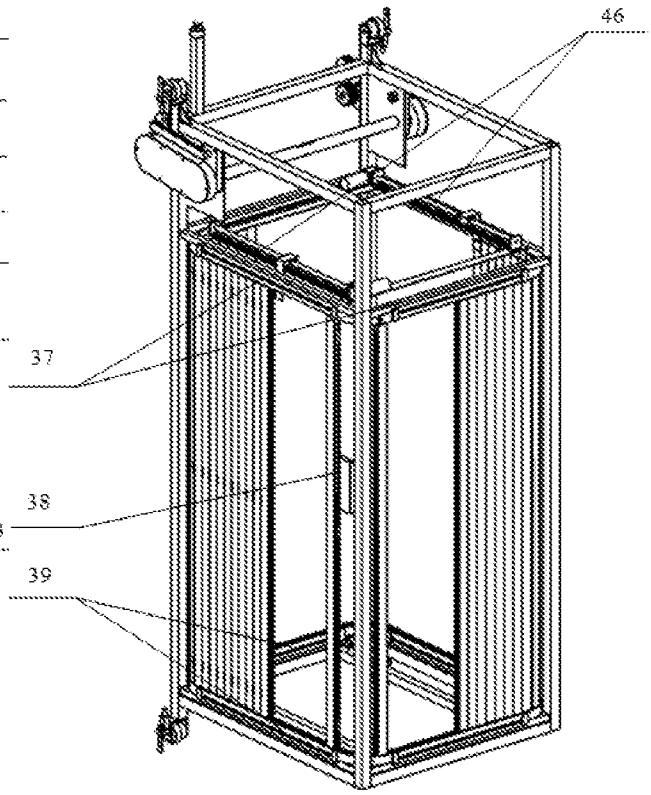

Fig.14

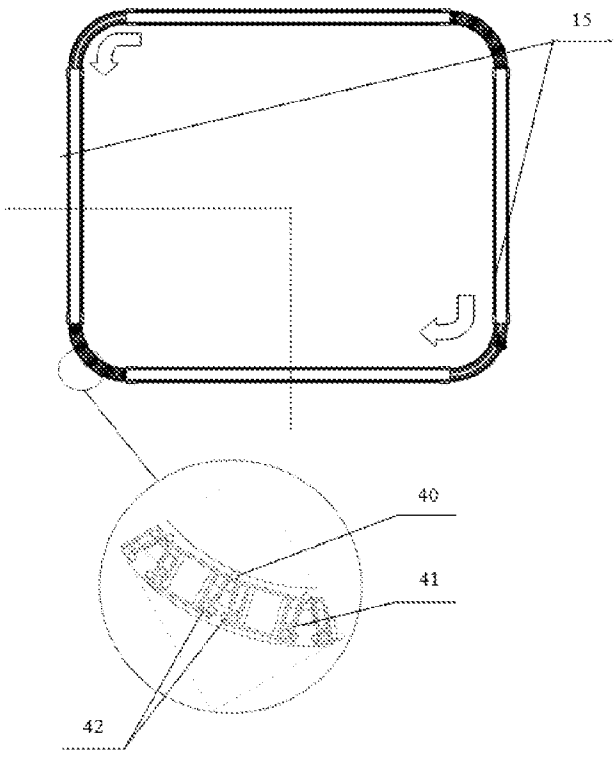

Fig.15

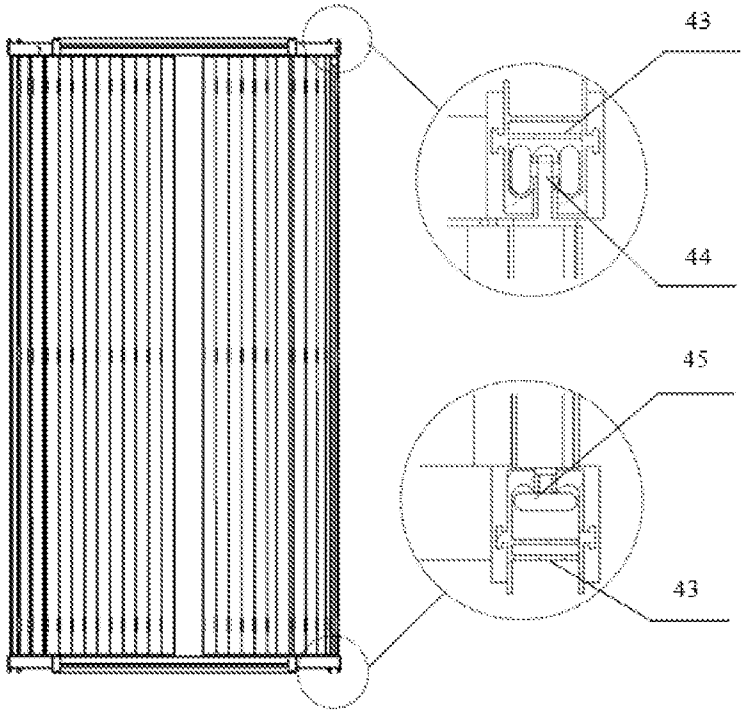

Fig.16

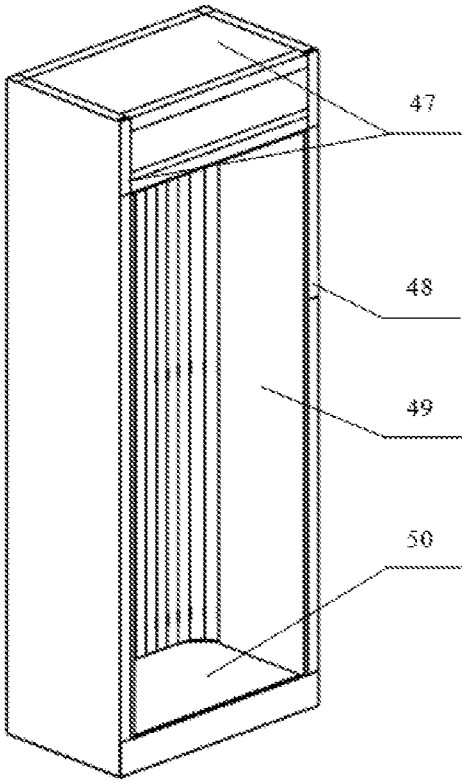

Fig.17

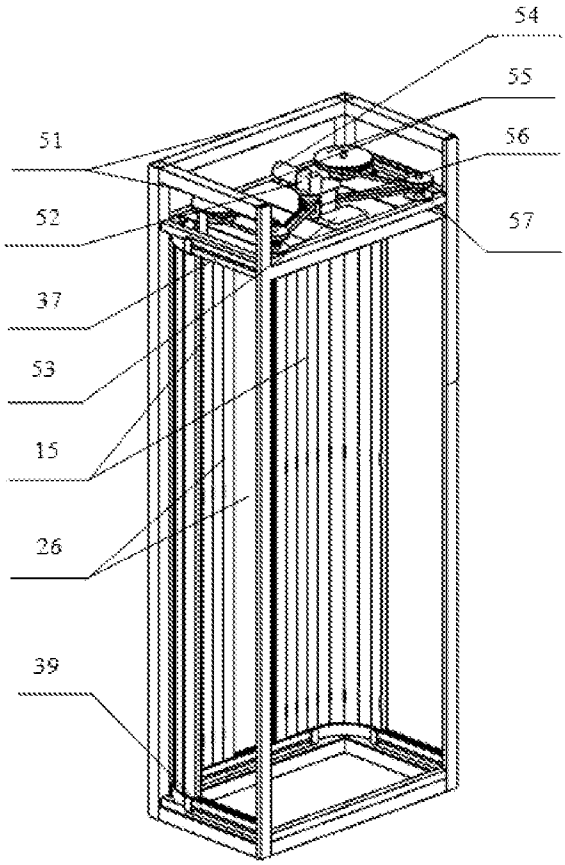

Fig.18

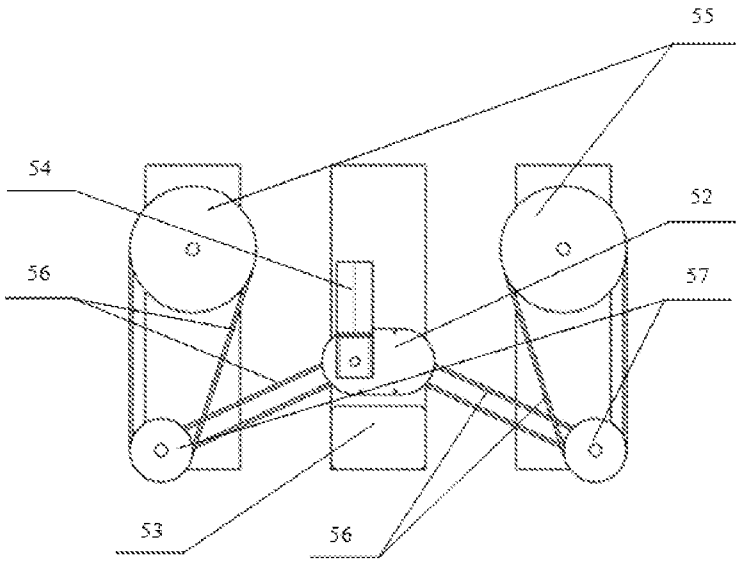

Fig.19

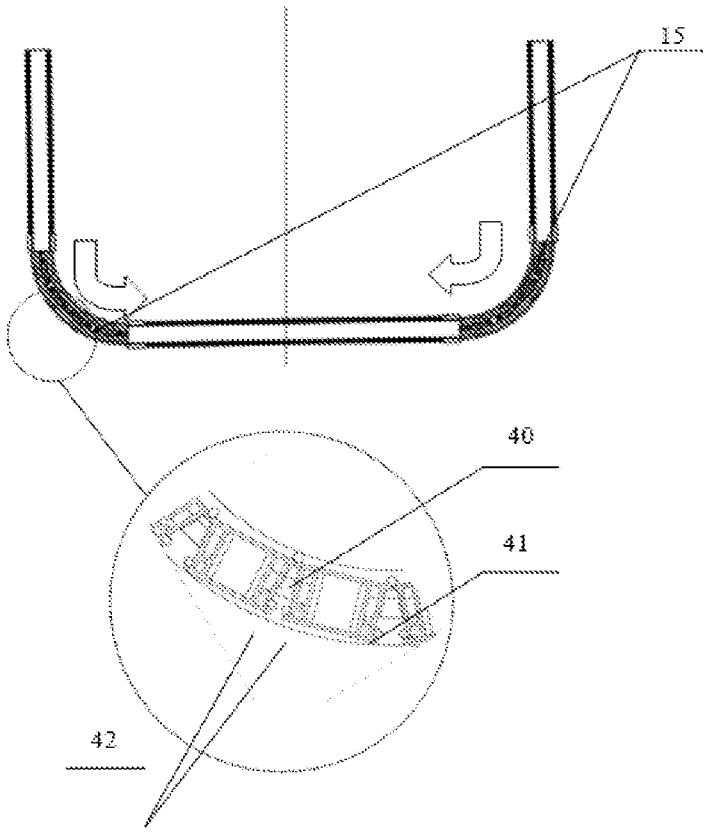

Fig.20

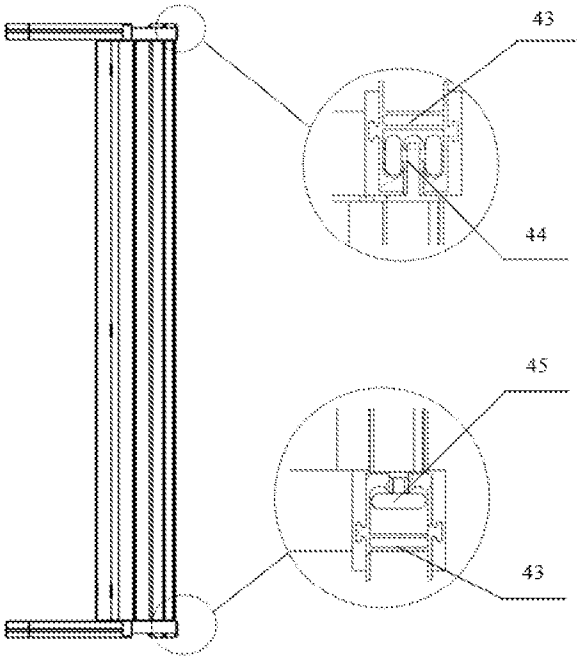

Fig.21

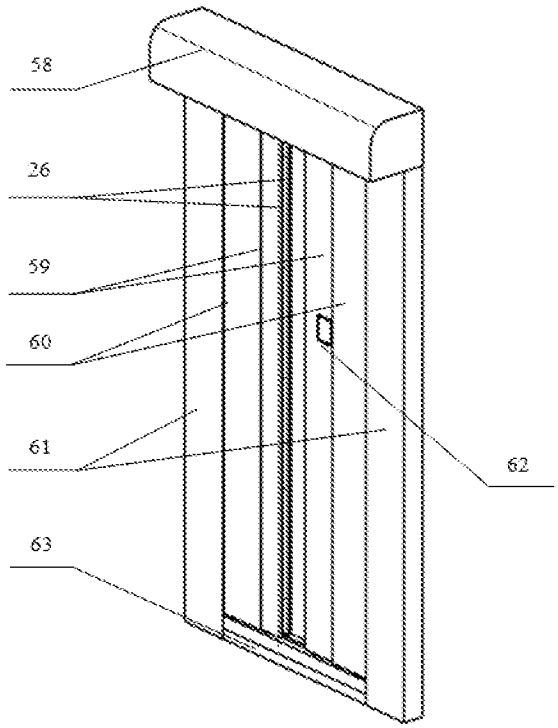

Fig.22

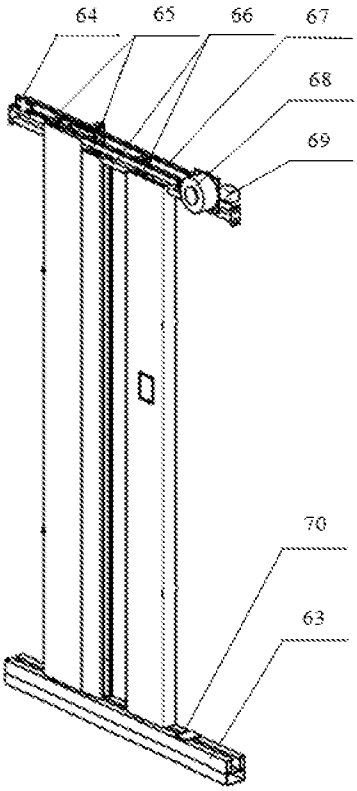

Fig.23

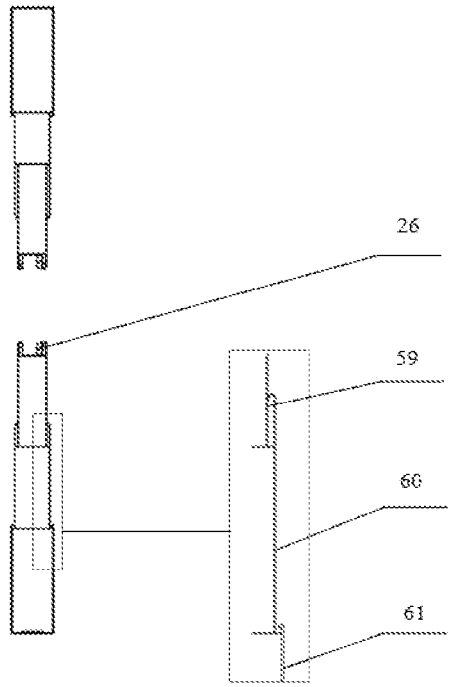

Fig.24

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2017/114378

A. CLASSIFICATION OF SUBJECT MATTER

B66B 9/00(2006.01)i

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; B61B; E06B

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 practicable, search terms used)

EPODOC,WPI,CNPAT,CNKI:elevator, rail, rack, solar, safety, fense, door, elevator 2d car, entrance 2d door, slid+, external, outside

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 2808850 Y (LIU, WENRUI) 23 August 2006 (2006-08-23) page 2 of description and figures 1-6	1-5
A	CN 204873354 U (GUANGDONG APXO ELEVATOR CO., LTD.) 16 December 2015 (2015-12-16) the whole document	1-5
A	CN 2797147 Y (FANGDA GROUP CO., LTD.) 19 July 2006 (2006-07-19) the whole document	1-5
A	CN 103588066 A (JIN, XIAN ET AL.) 19 February 2014 (2014-02-19) the whole document	1-5
A	CN 203513035 U (ZOU, LISHENG) 02 April 2014 (2014-04-02) the whole document	1-5
A	CN 101003343 A (JINAN HEAVY IND. CO., LTD.) 25 July 2007 (2007-07-25) the whole document	1-5
A	US 2011/0061976 A1 (TINER, JAMES L.) 17 March 2011 (2011-03-17) the whole document	1-5

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

☑ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
10 February 2018	**26 February 2018**

Name and mailing address of the ISA/CN	Authorized officer
STATE INTELLECTUAL PROPERTY OFFICE OF THE P.R.CHINA **6, Xitucheng Rd., Jimen Bridge, Haidian District, Beijing 100088** **China**	**FENG, Junhua**
Facsimile No. **(86-10)62019451**	Telephone No. **(86-10)010-61648170**

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2017/114378

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 2808850 Y	23 August 2006	None	
CN 204873354 U	16 December 2015	None	
CN 2797147 Y	19 July 2006	None	
CN 103588066 A	19 February 2014	None	
CN 203513035 U	02 April 2014	None	
CN 101003343 A	25 July 2007	None	
US 2011/0061976 A1	17 March 2011	None	