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(54) **ELEVATOR FLOOR DOOR LOCK DEVICE AND ELEVATOR FLOOR DOOR DEVICE**

(57) The present invention discloses an elevator landing door lock device, comprising a contact switch, a connector, a rotating hook, a fixed lock hook, and a contact switch, wherein the fixed lock hook is fixed to an frame body of landing door device by means of a mounting plate; the connector is fixed on the rotating hook, the rotating hook is fixed on a driving door hanging plate; the connector comprises a conductive block, the conductive block is U-shaped, when the conductive block has a relatively large amount of extension in the vertical direction, two bending surfaces are respectively formed at two

branch ends of the U-shaped conductive block, bottoms of the two bending surfaces are flush; and when the connector is rotated into position with the rotating hook, one end of the conductive block of the connector may enter into the through groove of the insulating housing, in which case the conductive block presses the contact of the contact switch to switch on the contact. In the present invention, an electrical safety device of a landing door lock of an asynchronous door vane landing door device can satisfy the protection degree of IP2X. The present invention further discloses an elevator landing door device.

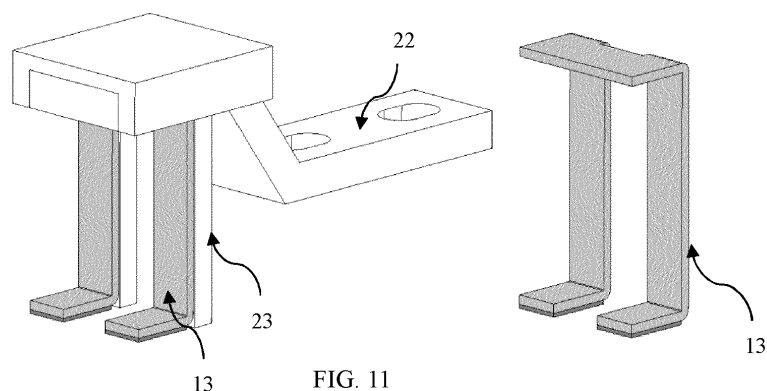


FIG. 11

Description

BACKGROUND OF THE INVENTION

5 Technical Field

[0001] The present invention relates to an elevator accessory, in particular to an elevator landing door lock device. The present invention further relates to an elevator landing door device.

10 Description of Related Art

[0002] With the increase of elevator accidents, people are paying increasingly more attention to elevator safety. Chinese standard regulations for the elevator industry are further improved after 2016. In the new Chinese national standard 5.10.1.2.2, it is clearly stipulated that "in the hoist well, machinery spaces, and pulley rooms, a protective enclosure (cover) shall be used to prevent direct contact with electrical equipment. The degree of protection provided by the used enclosure (cover) is at least IP2X". Additionally, in 5.3.9.1.3, it is stipulated that "The element of the electric safety device proving the locked condition of the door panel(s) shall be positively operated without any intermediate mechanism by the locking element". The locking of the landing door lock is confirmed by the electrical safety device in accordance with the national standard, that is, the electrical safety device on the landing door lock needs to satisfy the protection degree of IP2X.

[0003] According to the GB4208-2008 degree of protection provided by enclosures, the protection degree of IP2X needs to satisfy the following two points:

1. preventing access of fingers to a hazardous part, wherein an articulated test finger with the diameter of 12 mm and the length of 80 mm shall have a sufficient clearance with the hazardous part; and
2. preventing ingress of a solid foreign matter, wherein a spherical object probe with the diameter of 12.5 mm shall not be completely enterable into the enclosure.

[0004] For the size of the articulated test finger, reference may be made to "GB4208-2008 Degree of Protection Provided by Enclosures".

[0005] The linkage between the car door and landing door generally consists of a door vane on the car side and a door roller on the landing door side, thereby implementing the operation of opening and closing the elevator doors. Thus, the door operator vanes can be classified into two types, i.e., synchronous door vanes and asynchronous door vanes. Regarding the synchronous door vanes, the door vanes first implement the operation of clamping the landing door roller, and then the car door and the landing door are linked together; regarding the asynchronous door vanes, the door vanes and the car door move at the same time, and the car door generally moves for a certain distance before the car door and the landing door are linked together. When the door is closed to a certain position, the asynchronous door vanes may release the linkage with the landing door before the landing door is fully closed. In this case, it may happen that the landing door lock is first translated without being controlled by the car door vanes and then the rotating hook is rotated to the locking position.

[0006] Currently, the landing door device with the core of synchronous door vanes generally uses the pin-type in-position switch shown in FIG. 1 as an electrical safety device, wherein the pin 1-1 is mounted at the landing door lock hook, and the contact body 1-2 is fixed to the frame of landing door device fixing member. When the landing door lock is locked, the pin 1-1 is inserted into the contact body 1-2, and the switch is switched on. The enclosure of such the pin-type in-position switch satisfies the national standard requirement that the degree of protection is at least IP2X.

[0007] In the industry, the electrical safety device used in and the protective cover of the landing door device with the core of asynchronous door vanes are shown in FIG. 2a and FIG. 2b, wherein the structures are similar to that described above, with the stationary contact being exposed outside the housing of the electrical installation device. Therefore, a protective cover is required for implementing the IP2X protection. However, a motion space is required because of the relative motion between the stationary and movable contacts. Thus, it is still difficult to satisfy the national standard requirement that the degree of protection is at least IP2X even if a protective cover is configured.

[0008] In addition, because of the different operation modes of the synchronous door vane landing door device and the asynchronous door vane landing door device, the door lock of the synchronous door vane landing door device performs only a rotational motion, and the door lock of the asynchronous door vane landing door device sometimes needs to first perform a translational motion and then a rotational motion. Thus, the pin-type in-position switch is not applicable for mounting on the asynchronous door vane landing door device as an electrical safety device of the landing door lock for the reasons described above.

BRIEF SUMMARY OF THE INVENTION

[0009] The technical issue to be settled by the present invention is to provide an elevator landing door lock device which can satisfy a protection degree of IP2X, wherein the elevator landing door device can be used not only in a synchronous door vane landing door device but also in an asynchronous door vane landing door device.

[0010] To settle the above technical issue, the technical solution of the elevator landing door lock device provided by the present invention is as follows: an elevator landing door lock device comprises a contact switch 5, a connector 6, a rotating hook 3, a fixed lock hook 4, and a contact switch 5, wherein the fixed lock hook 4 is fixed to a frame body of landing door device 1 by means of a mounting plate 14; the connector 6 is fixed on the rotating hook 3, the rotating hook 3 is fixed on a driving door hanging plate 2;

the contact switch 5 comprises an insulating housing 7, at least two through grooves are formed in the insulating housing 7 and extend in the vertical direction, each through groove is respectively provided with an elastic element 8 therein, an active end of the elastic element 8 is provided with a contact 9, a fixed end of the elastic element 8 is fixedly connected to a groove bottom of the insulating housing 7; conductive surfaces of top surfaces of the contacts 9 are flush and the conductive surfaces face upward; live parts of the working contact switch 5 comprises the elastic element, a connecting member of the elastic element and the insulating housing 7, and the contact 9;

the connector 6 comprises an insulating block 12, a conductive block 13 is fixedly disposed at a bottom end of the insulating block 12, a cross section of the conductive block 13 matches a cross section of the through groove; a live part of the working connector 6 is the conductive block 13;

the conductive block 13 is U-shaped, when the conductive block 13 has a relatively large amount of extension in the vertical direction, two bending surfaces are respectively formed at two branch ends of the U-shaped conductive block, bottoms of the two bending surfaces are flush; and

when the connector 6 is rotated into position with the rotating hook 3, one end of the conductive block 13 of the connector 6 may enter into the through groove of the insulating housing 7, in which case the conductive block 13 presses the contact 9 of the contact switch 5 to switch on the contact 9.

[0011] Preferably, the conductive block is made of a conductive metal material.

[0012] Preferably, the direction of an edge of the bending surface is parallel to the groove direction of the through groove.

[0013] Preferably, the direction of an edge of the bending surface is perpendicular to the groove direction of the through groove.

[0014] Preferably, when the amount of extension in the vertical direction of the conductive block is greater than 15 mm, two bending surfaces are respectively formed at the two branch ends of the U-shaped conductive block.

[0015] Preferably, an insulating sheath 25 is disposed outside the insulating housing 7, two wings and a central partition 7d of the insulating housing 7 are fixedly sleeved with the insulating sheath 25, thereby forming an open groove for rotation and translation of the connector 6; the upper end width of the open groove is less than 12 mm, the shortest distance of this portion of the open groove from the live parts of the contact switch 5 is h;

a first protruding block 25a and a second protruding block 25b are formed on the insulating sheath 25, a middle portion G of a groove body is formed, a projection distance of the middle portion G in the z-direction is not greater than 11 mm; the second protruding block 25b makes the lower end widths b1, b2 of the open groove b, the shortest distance of the open groove from the live parts of the contact switch 5 is h; a rotating hook avoidance space 25c is formed at a lower end of the insulating housing 7 such that the rotating hook 3 can be rotated and translated into or out from the contact switch 5; and

h is greater than the following expression:

$$\max \left\{ \left(\frac{12.5}{2} - \sqrt{\left(\frac{12.5}{2} \right)^2 - \left(\frac{b}{2} \right)^2} \right), \left(\left(\frac{b}{2} \right) \cdot \cot(18.5^\circ) - 4.3 \right), \left(\left(\frac{b}{2} \right) \cdot \cot(7^\circ) - 28.8 \right) \right\}$$

;

wherein b is the width of the through groove, and $b \leq 12$ mm.

[0016] Preferably, the insulating block 12 completely covers an upper surface of the conductive block 13 and partially surrounds a side surface and a lower surface of the conductive block 13.

[0017] Preferably, when the connector 6 switches on the contact switch 5, the conductive block 13 of the connector 6 is in contact with the conductive surface of the contact 9 of the contact switch 5, the conductive block 13 enters into the groove of the insulating housing 7, a clearance c formed between the insulating block 12 of the connector 6 and the insulating housing 7 of the contact switch 5 is less than 4 mm, and a depth H1 from an outer contour of the device to the live part of the connector 6 herein is greater than the following expression:

$$\left(\frac{12.5}{2} - \sqrt{\left(\frac{12.5}{2} \right)^2 - \left(\frac{c}{2} \right)^2} \right).$$

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[0018] The present invention further provides an elevator landing door device, and the technical solution is as follows: the frame body of landing door device 1 is fixedly connected to the landing door guide rail 20, the driving door hanging plate 2 and the driven door hanging plate 15 can move horizontally on the landing door guide rail 20; the driving door hanging plate 2 and the driven door hanging plate 15 are respectively connected to a wire rope 17 by means of a first

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wire rope mounting base 18 and a second wire rope mounting base 19, the wire rope 17 passes around two wire rope pulleys 16 to form a loop; the contact switch 5 and the fixed lock hook 4 are fixed on the frame body of landing door device 1 by means of the mounting plate 14; and the connector 6 is fixed on the rotating hook 3, the rotating hook 3 is fixed on the driving door hanging plate 2.

[0019] The present invention can achieve the following technical effects:

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[0020] In the present invention, the electrical safety device of the landing door lock of the asynchronous door vane landing door device can satisfy the protection degree of IP2X, has a small volume, and occupies little space, saving material costs and facilitating processing.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

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[0021] The present invention will be described in further detail below with reference to the accompanying drawings and specific embodiments.

FIG. 1 is a schematic view of a pin-type in-position switch of an electrical safety device of a synchronous door vane landing door lock in the prior art;

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FIG. 2a and FIG. 2b are schematic views of an electrical safety device of an asynchronous door vane landing door lock in the prior art;

FIG. 3 is a schematic view of an elevator landing door device of the present invention;

FIG. 4 is a schematic view of an elevator landing door lock device of the present invention;

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FIG. 5 is a three-dimensional schematic view of the elevator landing door lock device of the present invention;

FIG. 6 is a top view of a contact switch of the elevator landing door lock device of the present invention;

FIG. 7 is a side view of the contact switch of the elevator landing door lock device of the present invention;

FIG. 8 is a three-dimensional schematic view of the contact switch of the elevator landing door lock device of the present invention;

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FIG. 9 is a schematic view of a connector and a conductive block in the first embodiment of the present invention;

FIG. 10 is a schematic view of a connector and a conductive block in the second embodiment of the present invention;

FIG. 11 is a schematic view of a connector and a conductive block in the third embodiment of the present invention; and

FIG. 12 is a schematic view of a connector and a conductive block in the fourth embodiment of the present invention.

40 Description of the reference numerals in the drawings:

[0022]

1. Frame body of landing door device
- 45 2. Driving door hanging plate
3. Rotating hook
4. Fixed lock hook
5. Contact switch
6. Connector
- 50 7. Insulating housing
- 7b, 7c. Through grooves
- 7d. Central partition
8. Leaf spring
9. Contact
- 55 10. Pressing plate
11. Screw fastener
12. Insulating block
13. Conductive block

- 14. Mounting plate
- 15. Driven door hanging plate
- 17. Wire rope
- 18. First wire rope mounting base
- 19. Second wire rope mounting base
- 20. Landing door guide rail
- 21. Insulating cover
- 22. Upper insulating block
- 23. Lower insulating block
- 24. Rivet
- 25. Insulating sheath
- 25a. First protruding block
- 25b. Second protruding block
- 25c. Avoidance space for the rotating hook of the contact switch

DETAILED DESCRIPTION OF THE INVENTION

[0023] FIG. 4 to FIG.10 show the first and second embodiments of an elevator landing door lock device of the present invention. The elevator landing door lock device of the present invention comprises a contact switch 5, a connector 6, a rotating hook 3, a fixed lock hook 4, and a contact switch 5, wherein the fixed lock hook 4 is mounted on a mounting plate 14, the mounting plate 14 is fixed on an frame body of landing door device 1; and the connector 6 is fixed on the rotating hook 3, the rotating hook 3 is fixed on a driving door hanging plate 2.

[0024] As shown in FIG. 8, an insulating housing 7 is arranged vertically, a central partition 7d is disposed in the insulating housing 7, the central partition 7d divides the insulating housing 7 into two parallel through grooves 7b and 7c extending in the vertical direction; an insulating sheath 25 is disposed outside the insulating housing 7, two wings and the central partition 7d of the insulating housing 7 are fixedly sleeved with the insulating sheath 25, thereby forming an open groove for rotation and translation of the connector 6; and the upper end width of the open groove is limited to be less than 12 mm, which is set to 11.5 mm in this embodiment, the shortest distance of this portion (an upper end of a groove body shown in FIG. 8 of the open groove from a live part is h.

[0025] A first protruding block 25a and a second protruding block 25b are formed on the insulating sheath 25, a middle portion G of the groove body is formed, a projection distance of the middle portion G in the z-direction is set to 11 mm, preventing ingress of a small ball with the diameter of 12.5 mm; and the first protruding block 25a and the second protruding block 25b can limit an ingress direction of an articulated test finger, the articulated test finger with the diameter of 12 mm cannot pass through the middle portion G to touch the live part.

[0026] Since a lower end of the open groove does not pass through the connector 6, the second protruding block 25b is configured to make the lower end widths b1 and b2 of the two open grooves smaller, which are set to 7.5 mm in this embodiment, and the shortest distance of this portion of the open groove from the live part is greater than 7 mm.

[0027] A rotating hook avoidance space 25c is formed at a lower end of the insulating housing 7 such that the rotating hook 3 can be rotated and translated into or out from the contact switch 5.

[0028] As shown in FIG. 4, a distance x of the bottom of the contact switch 5 from the fixed lock hook 4 is set to be less than 12 mm. Neither the articulated test finger with the diameter of 12 mm nor the small ball with the diameter of 12.5 mm can touch the live part.

[0029] As shown in FIG. 9 and FIG. 10, the connector 6 comprises a conductive block 13 and an insulating block 12, the conductive block 13 is U-shaped and extends in the vertical direction, the insulating block 12 completely covers an upper surface of the conductive block 13 and partially surrounds a side surface and a lower surface of the conductive block 13; and the conductive block 13 is made of a bent conductive metal material. A bending edge of the bending surface is parallel to the groove direction of the through groove. Since the volume of the conductive block is small and a bending inner cavity is thus also small, the conductive block of such the shape needs to be formed by stamping the conductive metal material with upper and lower correspondences with a die, and additionally, the vertical degree of the bending edge extending in the vertical direction needs to be ensured, so as to avoid rubbing and touching with the through groove. The conductive block of such the structure saves the material, thereby reducing costs.

[0030] FIG. 11 and FIG. 12 show conductive blocks in the third and fourth embodiments of the present invention. The conductive block 13 is made of a bent conductive metal material. The bending edge of the conductive block is perpendicular to the groove direction of the through groove, in which case the bending inner cavity is relatively large, so processing can be performed by means of an ordinary bending machine; and additionally, the bending edge extending in the vertical direction is not parallel to the groove direction of the through groove, so a small requirement is imposed on the vertical degree of the bending edge extending in the vertical direction. From the perspective of a material usage amount and a processing difficulty, this embodiment is more advantageous than embodiments 1 and 2.

[0031] The insulating block 12 consists of an upper insulating block 22 and a lower insulating block 23, the lower insulating block 23 fixes the conductive block 13 to the upper insulating block 22; and the lower insulating block 23 is fixed on the upper insulating block 22 by means of snap joint.

[0032] When a conductive surface of the conductive block 13 of the connector 6 is in contact with a conductive surface of the contact of the contact switch 5, the conductive block 13 enters into the groove of the insulating housing 7, and an opening at the end of the contact assembly 5 allows ingress and egress of a jaw of the connector 6. A clearance formed between the insulating block 12 of the connector 6 and the insulating housing 7 of the contact switch 5 and the insulating sheath 25 is limited to be less than 4 mm, which is set to 2 mm in this embodiment.

[0033] As shown in FIG. 4 to FIG. 8, when the connector 6 switches on the contact 9 of the contact switch 5, live bodies such as a leaf spring 8, the contact 9, a pressing plate 10, and a screw fastener 11 of the contact switch 5 and the conductive body of the connector 6 are located in a space formed by the insulating housing 7, the insulating sheath 25, the lower insulating block 23, and the rotating hook 3. The articulated test finger with the diameter of 12 mm cannot touch these live parts, and the ball with the diameter of 12.5 mm rolls outside the insulating housing 7 and the insulating block 12, without a contact with these parts.

[0034] When the landing door is closed, the protection degree of IP2X is achieved by means of the insulating housing 7, the insulating sheath 25, the rotating lock hook 3, and the insulating block 12. When the landing door is opened, the connector 6 leaves with the door hanging plate, the conductive block 13 of the connector 6 is no longer live, and the insulating housing 7, the insulating sheath 25, and the fixed lock hook 4 can also achieve IP2X protection.

[0035] As shown in FIG. 3, an elevator landing door device of the present invention comprises a frame body of landing door device 1, a driving door hanging plate 2, a driven door hanging plate 15, a wire rope pulley 16, a wire rope 17, a first wire rope mounting base 18, a second wire rope mounting base 19, and the landing door guide rail 20.

[0036] The landing door guide rail 20 is fixedly connected to the frame body of landing door device 1; the driving door hanging plate 2 and the driven door hanging plate 15 can move horizontally on the landing door guide rail 20; the driving door hanging plate 2 and the driven door hanging plate 15 are respectively connected to the wire rope 17 by means of the first wire rope mounting base 18 and the second wire rope mounting base 19; and the wire rope 17 passes around the two wire rope pulleys 16 to form a loop.

[0037] The contact switch 5 and the fixed lock hook 4 are fixed on the frame body of landing door device 1 by means of the mounting plate 14; and the connector 6 is fixed on the rotating hook 3, the rotating hook 3 is fixed on the driving door hanging plate 2.

[0038] When the landing door is closed, the driving door hanging plate 2 and the driven door hanging plate 15 synchronously get close to each other under the effect of the wire rope 17, the rotating hook 3 engages with the fixed lock hook 4, and a landing door lock is locked. In this case, the connector 6 enters into the through grooves 7b and 7c of the insulating housing 7, the conductive body 13 of the connector 6 applies a force to the contact 9, the leaf spring 8 serving as an elastic element thus is deformed under the effect of the force and accumulates elastic potential energy, then displacement of the contact 9 occurs therewith, the contact is switched on, and an electrical safety device issues a landing door lock locking signal. In this case, neither the articulated test finger with the diameter of 12 mm nor the small ball with the diameter of 12.5 mm can contact the live contact 9.

[0039] When the landing door is gradually opened, the driving door hanging plate 2 and the driven door hanging plate 15 are synchronously separated from each other under the effect of the wire rope 17, the rotating hook 3 leaves the fixed lock hook 4 after translation and rotation, and the landing door lock is opened. In this case, the connector 6 separates from the contact 9 after relative translation, the force applied to the contact 9 by the conductive body 13 of the connector 6 disappears, the leaf spring 8 releases the elastic potential energy and is restored to an initial state, and the contact 9 is also restored to an initial state. During this process, neither the articulated test finger with the diameter of 12 mm nor the small ball with the diameter of 12.5 mm can contact the contact 9.

[0040] The present invention can be applied not only to a synchronous door vane landing door device but also an asynchronous door vane landing door device.

[0041] The present invention is described in detail above by means of specific implementations and embodiments, which are not intended to limit the present invention. Those skilled in the art could further make many variations and improvements without departing from the principles of the present invention, which, however, also fall within the protection scope of the present invention.

Claims

1. An elevator landing door lock device, comprising a contact switch (5), a connector (6), a rotating hook (3), a fixed lock hook (4), and a contact switch (5), wherein the fixed lock hook (4) is fixed to an frame body of landing door device (1) by means of a mounting plate (14); the connector (6) is fixed on the rotating hook (3), the rotating hook (3) is fixed on a driving door hanging plate (2);

the contact switch (5) comprises an insulating housing (7), at least two through grooves are formed in the insulating housing (7) and extend in the vertical direction, each through groove is respectively provided with an elastic element (8) therein, an active end of the elastic element (8) is provided with a contact (9), a fixed end of the elastic element (8) is fixedly connected to a groove bottom of the insulating housing (7); conductive surfaces of top surfaces of the contacts (9) are flush and the conductive surfaces face upward; live parts of the working contact switch (5) comprises the elastic element, a connecting member of the elastic element and the insulating housing (7), and the contact (9); the connector (6) comprises an insulating block (12), a conductive block (13) is fixedly disposed at a bottom end of the insulating block (12), a cross section of the conductive block (13) matches a cross section of the through groove; a live part of the working connector (6) is the conductive block (13); the conductive block (13) is U-shaped, when the conductive block (13) has a relatively large amount of extension in the vertical direction, two bending surfaces are respectively formed at two branch ends of the U-shaped conductive block, bottoms of the two bending surfaces are flush; and when the connector (6) is rotated into position with the rotating hook (3), one end of the conductive block (13) of the connector (6) may enter into the through groove of the insulating housing (7), in which case the conductive block (13) presses the contact (9) of the contact switch (5) to switch on the contact (9).

2. The elevator landing door lock device according to claim 1, wherein the conductive block is made of a conductive metal material.

3. The elevator landing door lock device according to claim 2, wherein the direction of an edge of the bending surface is parallel to the groove direction of the through groove.

4. The elevator landing door lock device according to claim 2, wherein the direction of an edge of the bending surface is perpendicular to the groove direction of the through groove.

5. The elevator landing door lock device according to claim 2, wherein when the amount of extension in the vertical direction of the conductive block is greater than 15 mm, two bending surfaces are respectively formed at the two branch ends of the U-shaped conductive block.

6. The elevator landing door lock device according to claim 4 or 5, wherein an insulating sheath (25) is disposed outside the insulating housing (7), two wings and a central partition (7d) of the insulating housing (7) are fixedly sleeved with the insulating sheath (25), thereby forming an open groove for rotation and translation of the connector (6); the upper end width of the open groove is less than 12 mm, the shortest distance of this portion of the open groove from the live parts of the contact switch (5) is h;

a first protruding block (25a) and a second protruding block (25b) are formed on the insulating sheath (25), a middle portion G of a groove body is formed, a projection distance of the middle portion G in the z-direction is not greater than 11 mm; the second protruding block (25b) makes the lower end widths (b1, b2) of the open groove b, the shortest distance of the open groove from the live parts of the contact switch (5) is h; a rotating hook avoidance space (25c) is formed at a lower end of the insulating housing (7) such that the rotating hook (3) can be rotated and translated into or out from the contact switch (5); and h is greater than the following expression:

$$\max \left\{ \left(\frac{12.5}{2} - \sqrt{\left(\frac{12.5}{2} \right)^2 - \left(\frac{b}{2} \right)^2} \right), \left(\left(\frac{b}{2} \right) \cdot \cot(18.5^\circ) - 4.3 \right), \left(\left(\frac{b}{2} \right) \cdot \cot(7^\circ) - 28.8 \right) \right\};$$

wherein b is the width of the through groove, and $b \leq 12$ mm.

7. The elevator landing door lock device according to claim 6, wherein the insulating block (12) completely covers an upper surface of the conductive block (13) and partially surrounds a side surface and a lower surface of the conductive block (13).

8. The elevator landing door lock device according to claim 4 or 5, wherein when the connector (6) switches on the contact switch (5), the conductive block (13) of the connector (6) is in contact with the conductive surface of the contact (9) of the contact switch (5), the conductive block (13) enters into the groove of the insulating housing (7), a clearance c formed between the insulating block (12) of the connector (6) and the insulating housing (7) of the

contact switch (5) is less than 4 mm, and a depth H1 from an outer contour of the device to the live part of the connector (6) herein is greater than the following expression:

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$$\left(\frac{12.5}{2} - \sqrt{\left(\frac{12.5}{2} \right)^2 - \left(\frac{c}{2} \right)^2} \right).$$

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9. An elevator landing door device that adopts the elevator landing door lock device according to any one of claims 1-5, wherein the frame body of landing door device (1) is fixedly connected to the landing door guide rail (20), the driving door hanging plate (2) and the driven door hanging plate (15) can move horizontally on the landing door guide rail (20); the driving door hanging plate (2) and the driven door hanging plate (15) are respectively connected to a wire rope (17) by means of a first wire rope mounting base (18) and a second wire rope mounting base (19), and the wire rope (17) passes around two wire rope pulleys (16) to form a loop.

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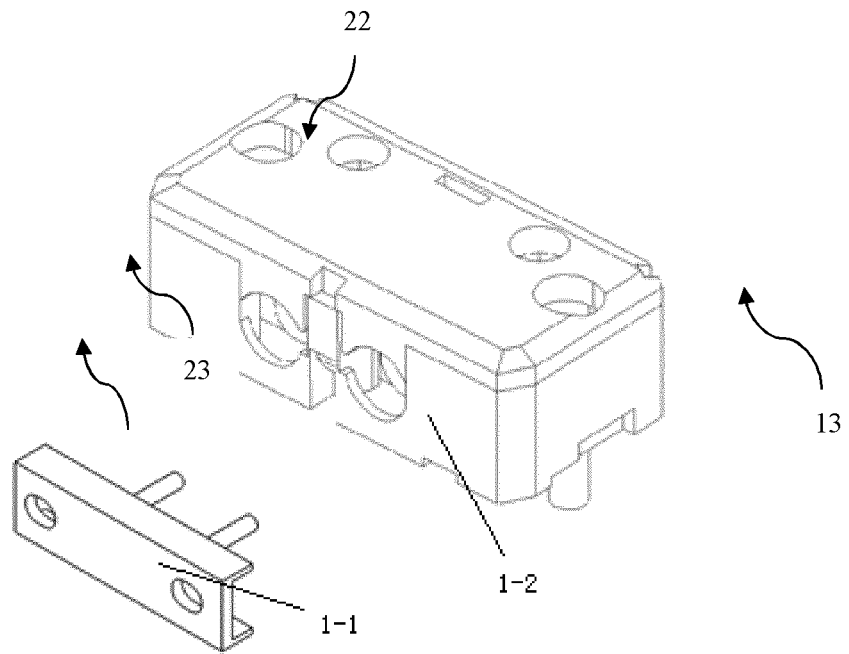


FIG. 1

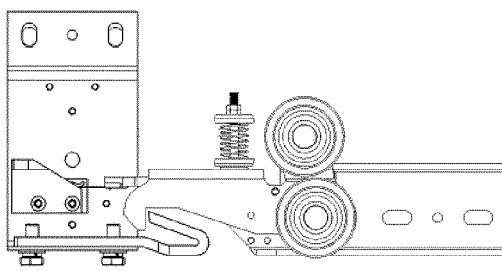


FIG. 2a

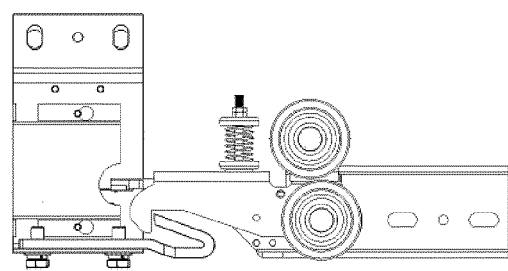


FIG. 2b

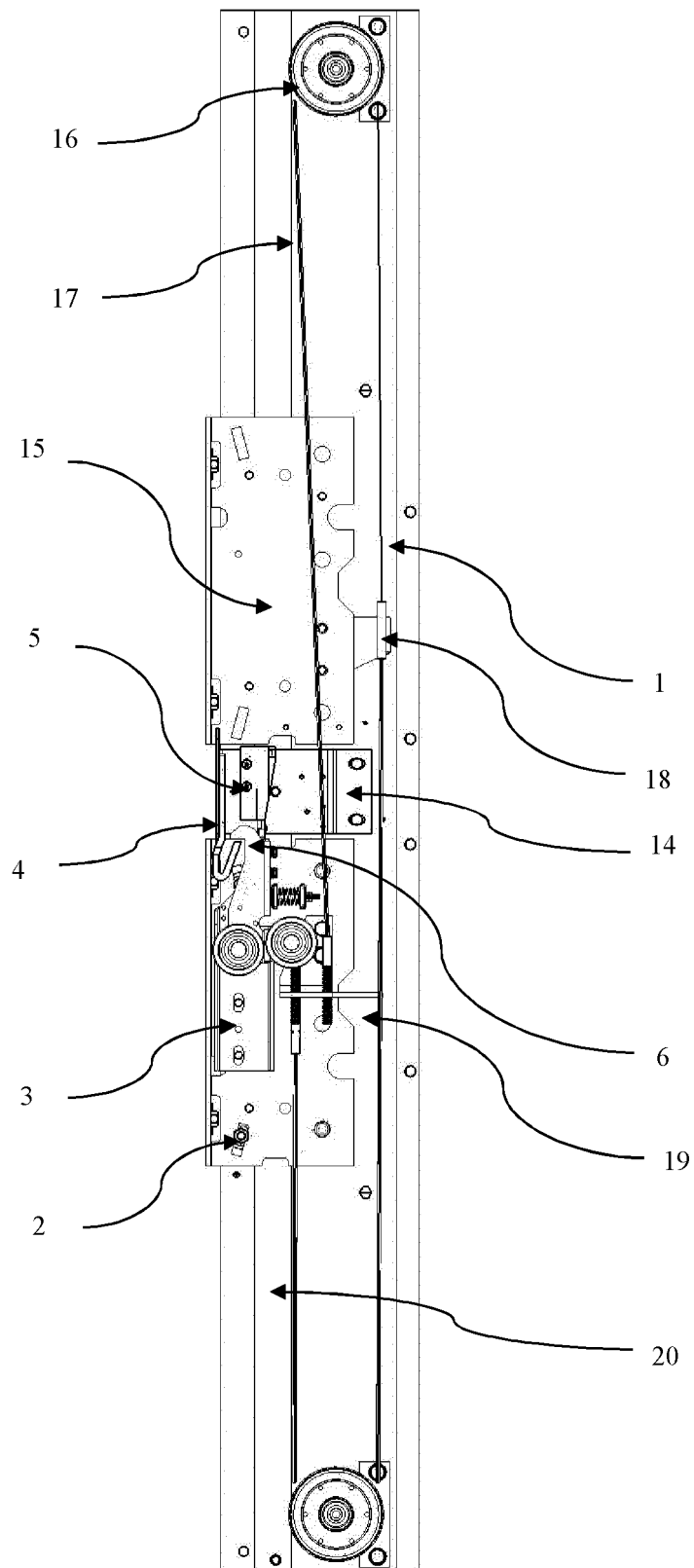


FIG. 3

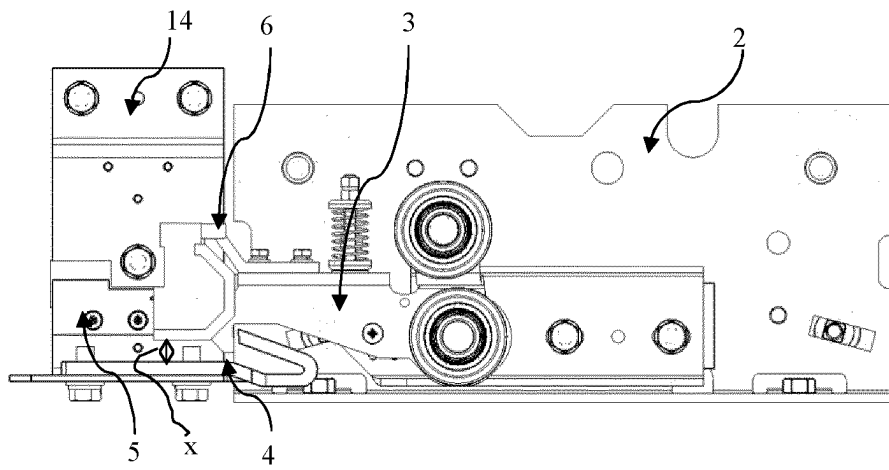


FIG. 4

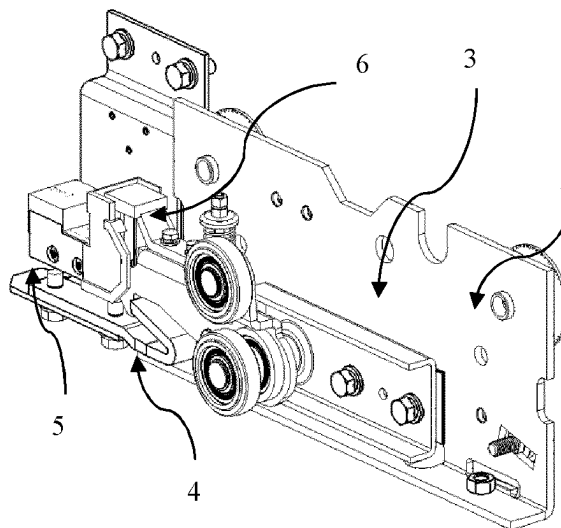


FIG. 5

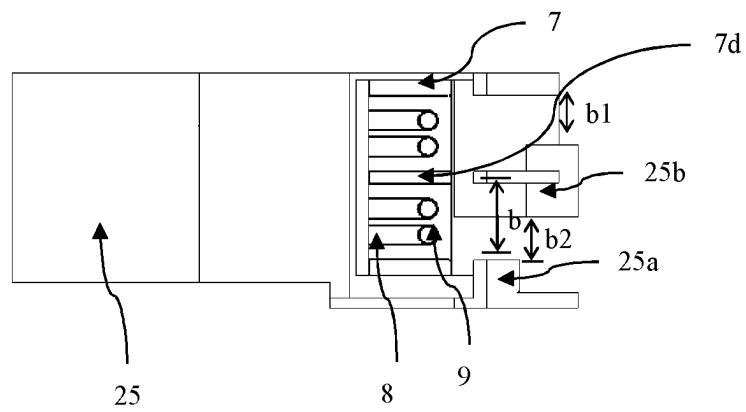


FIG. 6

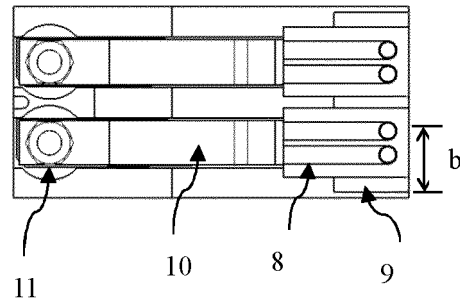


FIG. 7

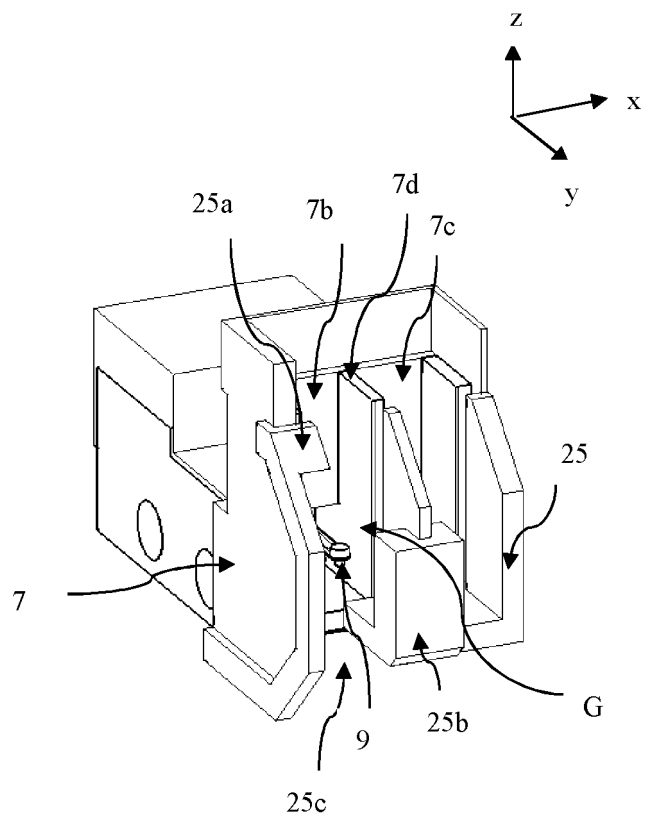


FIG. 8

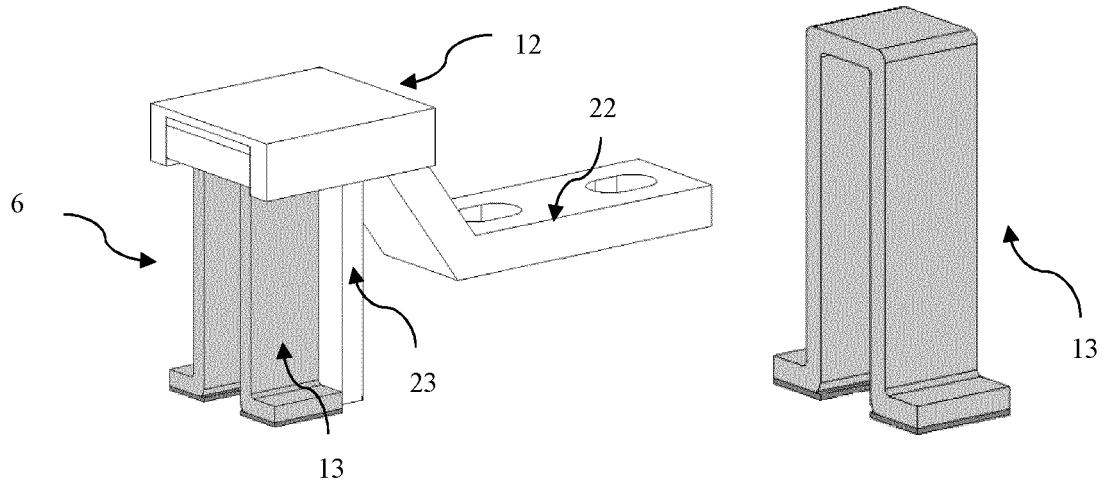


FIG. 9

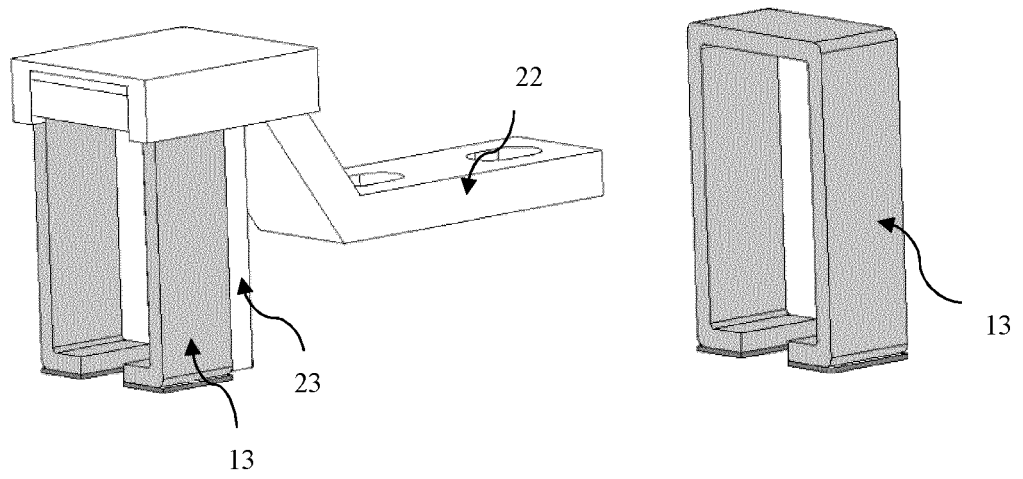


FIG. 10

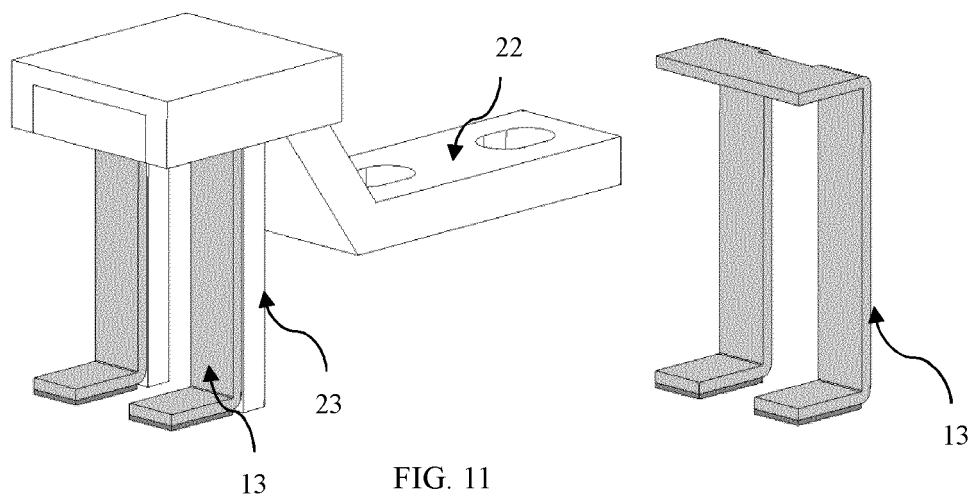


FIG. 11

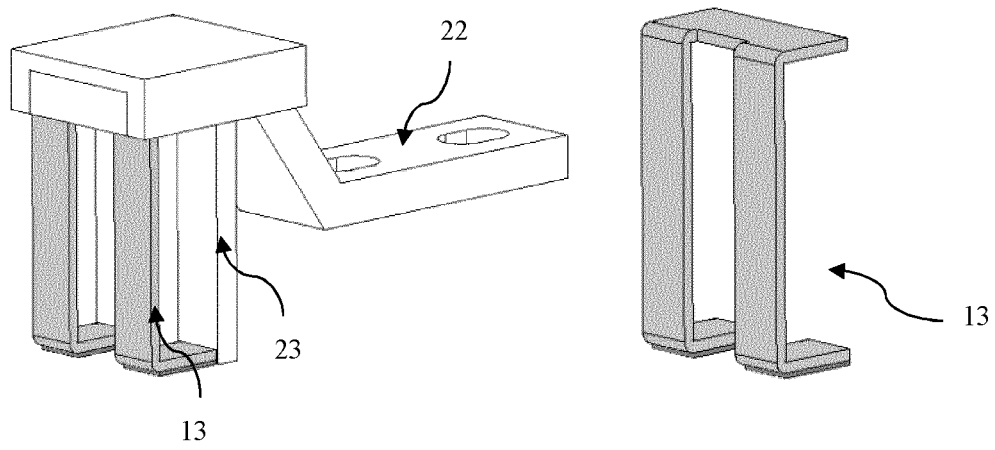


FIG. 12

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2018/098473

5	A. CLASSIFICATION OF SUBJECT MATTER		
	B66B 13/16(2006.01)i		
	According to International Patent Classification (IPC) or to both national classification and IPC		
	B. FIELDS SEARCHED		
10	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		
15	Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
	CNABS, SIPOABS, DWPI, CNTXT, CNKI: 电梯, 门锁, 层门, 钩, 检测, 触点, 开关, 防护, 防止, 进入, 壳, 槽; elevator, lock, landing, door, detect, contact, switch, prevent, housing, slot		
	C. DOCUMENTS CONSIDERED TO BE RELEVANT		
20	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	PX	CN 107792761 A (SHANGHAI MITSUBISHI ELEVATOR CO., LTD.) 13 March 2018 (2018-03-13) see description, paragraphs 11-37 and 95-112, and figures 11-16	1-9
25	A	JP 2003261282 A (FUJITEC KK) 16 September 2003 (2003-09-16) see description, paragraphs 9-18, and figures 1-5	1-9
	A	CN 103818809 A (CIXI HONGFENG ELEVATOR FITTINGS CO., LTD.) 28 May 2014 (2014-05-28) see entire document	1-9
	A	CN 202829244 U (JIANGSU LIDA ELEVATOR CO., LTD.) 27 March 2013 (2013-03-27) see entire document	1-9
30	A	CN 204529048 U (SHANGHAI BST DOOR SYSTEM CO., LTD.) 05 August 2015 (2015-08-05) see entire document	1-9
35	A	CN 101786569 A (NINGBO BEILUN XINLING ELEVATOR ACCESSORIES FACTORY) 28 July 2010 (2010-07-28) see entire document	1-9
	☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
40	* 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		
45			
	Date of the actual completion of the international search		Date of mailing of the international search report
	30 October 2018		08 November 2018
50	Name and mailing address of the ISA/CN		Authorized officer
	State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088 China		
55	Facsimile No. (86-10)62019451		Telephone No.

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2018/098473

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Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	107792761	A	13 March 2018	None			
JP	2003261282	A	16 September 2003	None			
CN	103818809	A	28 May 2014	CN	103818809	B	17 August 2016
CN	202829244	U	27 March 2013	None			
CN	204529048	U	05 August 2015	None			
CN	101786569	A	28 July 2010	CN	101786569	B	08 August 2012

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- GB 42082008 A [0003] [0004]