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(54) **STEP-MISSING-PREVENTING TREAD BOARD INSTALLATION STRUCTURE OF ESCALATOR.**

(57) The present invention discloses a step-missing-preventing tread board installation structure of an escalator, which includes a pit, a tread board, an installation mechanism and a safety detection mechanism; the installation mechanism includes two sets of trusses; the two sets of trusses are arranged on a left inner wall and a right inner wall of the pit; the rear side of the top of each set of truss is respectively provided with a set of upper corner piece; the inner side of the upper corner piece facing the pit is provided with an inner side opening; rear sides of two ends of a bottom surface of the tread board are respectively provided with a lower corner piece; an outer side of the lower corner piece facing the pit is provided with an outer side opening; the upper corner pieces are in snap fitting with the lower corner pieces; the tread board is installed on the two sets of trusses through the snap fitting of the upper corner pieces and the lower corner pieces; and the safety detection mechanism is installed on the front inner wall of the pit, and the bottom surface of the tread board is abutted against the safety detection mechanism. The present invention improves the safety of the tread board when in use and reduces the potential safety hazardD.

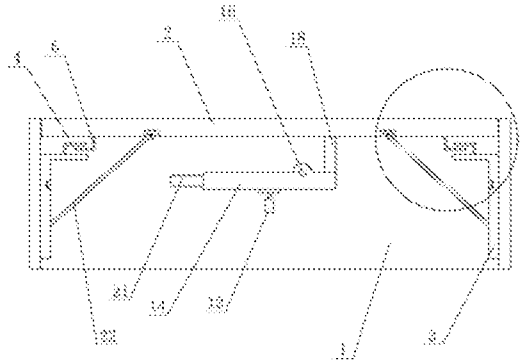

Fig. 1

STEP-MISSING-PREVENTING TREAD BOARD INSTALLATION STRUCTURE OF ESCALATOR

Technical Field

The present invention relates to an escalator, and particularly to a step-missing-preventing tread board installation structure of an escalator.

Background

Electric escalators, also referred to as escalators or automatic pedestrian elevators, hand elevators and electrical escalators, are stationary electric driving equipment with endlessly circulating steps for obliquely conveying passengers upwards or downwards.

A tread board is arranged at places where people get on and get off the escalator and used for people to tread on when getting on or leaving the escalator. In the past few years, when user used the escalator, the tread board dropped off when the user stepped on the tread board for leaving the escalator, and the user was involved into the escalator, leading to safety accidents.

Although a safety switch may be arranged at the bottom of the tread board, a protection switch apparatus used in the prior art adopts the lever principle which is similar to a seesaw structure, and the switch is often stuck by a movable cover plate and cannot be operated in a use process, resulting in failure of the protection switch apparatus, so that the effect is not ideal, and there is great potential safety hazard. At the same time, when the tread board is installed, the tread board directly covers the pit without any limiting means, so that the tread board is easy to lift or drop off, causing great potential safety hazard.

Summary

A purpose of the present invention is to provide a step-missing-preventing tread board installation structure of an escalator; and by using the structure, the use safety of a tread board is improved, the dropping of the tread board is prevented, and the potential safety hazard is reduced.

To achieve the above purpose, the present invention adopts the technical solution as follows: a step-missing-preventing tread board installation structure of an escalator includes a pit, a tread board installed at the top of the pit, an installation mechanism arranged at the side of the pit and a safety detection mechanism installed in the pit; the installation mechanism includes two sets of trusses; the two sets of trusses are arranged on a left inner wall and a right inner wall of the pit, and the two sets of trusses are oppositely arranged; the rear side of the top of each set of truss is respectively provided with a set of upper corner piece; the inner side of the upper corner piece facing the pit is provided with an inner side opening; rear sides of two ends of a bottom surface of the tread board are respectively provided with a lower corner piece; an outer side of the lower corner piece facing the pit is provided with an outer side opening; the upper corner pieces are in

snap fitting with the lower corner pieces; the tread board is installed on the two sets of trusses through the snap fitting of the upper corner pieces and the lower corner pieces; and the safety detection mechanism is installed on the front inner wall of the pit, and the bottom surface of the tread board is abutted against the safety detection mechanism.

In the above technical solution, the upper corner piece includes an upper vertical plate and an upper transverse plate which are connected end to end; the upper vertical plate is perpendicular to the upper transverse plate and the truss; an outer end of the upper transverse plate is installed at the top of the upper vertical plate; and an inner side opening facing inwards is formed among the upper transverse plate, the truss and the upper vertical plate; the lower corner piece includes a lower vertical plate and a lower transverse plate which are connected end to end; the lower vertical plate is perpendicular to the lower transverse plate and the tread board; an inner end of the lower transverse plate is installed at the bottom of the lower vertical plate; an outer side opening facing outwards is formed among the lower transverse plate, the tread board and the lower vertical plate; the lower transverse plate is inserted in the inner side opening; and the upper transverse plate is inserted in the outer side opening.

In the above technical solution, the safety detection mechanism includes a travel switch and a pressing apparatus arranged on the travel switch; the pressing apparatus includes a pressing plate, a connection plate, a force-bearing apparatus and a counterweight apparatus; the pressing plate is perpendicular to the connection plate; the pressing plate is installed at the front side of the middle bottom of the connection plate; the counterweight apparatus is arranged at the right side of the connection plate; the force-bearing apparatus is arranged at the left side of the connection plate; a through hole is arranged between the force-bearing apparatus and the pressing plate; a rotating shaft is inserted in the through hole; a front end of the rotating shaft is fixedly installed on a front inner wall of the pit, and the through hole is rotatably connected with the rotating shaft; the force-bearing apparatus is an L-shaped plate; the L-shaped plate includes a transverse plate and a vertical plate which are connected end to end; the vertical plate and the transverse plate are perpendicular to each other; the bottom of the vertical plate is installed at the left top of the connection plate; the transverse plate is installed at the front side of the top of the vertical plate; the vertical plate is perpendicular to the connection plate and the transverse plate; the transverse plate is arranged at the front sides of the connection plate and the vertical plate; the transverse plate is perpendicular to the connection plate; the top of the travel switch is provided with a contact; and the contact is arranged right below the pressing plate.

In the above technical solution, when the bottom surface of the tread board is abutted against the top surface of the transverse plate, the transverse plate drives the connection plate through the vertical plate to rotate counter clockwise around the rotating shaft, so that the bottom surface of the pressing plate is abutted against the contact, and the connection plate is parallel to the horizontal plane; and the tread board is separated from the transverse plate, and the counterweight apparatus drives the connection plate to rotate clockwise, so that the bottom

surface of the pressing plate presses the contact, and the connection plate supports the horizontal plane at an angle of 5° - 15°.

In the above technical solution, the counterweight apparatus includes an installation plate and a balance weight arranged at the right side of the installation plate; the installation plate is perpendicular to the connection plate; and the installation plate is arranged at the front end of the connection plate.

In the above technical solution, the inner side of each truss is also provided with a supporting rod; the bottom of the tread board is correspondingly provided with two sliding grooves; the two sliding grooves are arranged between the two sets of upper corner pieces; each sliding groove corresponds to one supporting rod; and the top of the supporting rod can be abutted against the sliding groove.

In the above technical solution, the bottom of the supporting rod is rotatably connected with the truss; the front side of the inner wall of the truss is also provided with an installation groove; the installation groove and the bottom of the pit form an angle of 30°-60°; the bottom of the supporting rod is rotatably connected with the truss; when the supporting rod is rotated clockwise, the supporting rod can be abutted against the installation groove; and when the supporting rod is rotated counter clockwise, the supporting rod and the truss form an angle of 30°- 60 °.

In the above technical solution, the top of the supporting rod is also provided with a spherical roller; the spherical roller is rotatably connected with the top of the supporting rod; the top of the spherical roller is abutted against the top of the sliding groove; and the spherical roller can roll in the sliding groove.

By adopting the above technical solutions, compared with the prior art, the present invention has the following advantages:

1. In the present invention, the truss is arranged at the side of the pit, the truss is provided with the lower corner pieces, and the bottom of the tread board is provided with the upper corner pieces; through the snap fitting of the upper corner pieces and the lower corner pieces, compared with a traditional structure in which the tread board is directly arranged at the top of the pit, the tread board can be limited to certain extent in the present invention so as to prevent the tread board from being lifted directly, the side portion of the tread board is also prevented from falling into the pit, the step missing caused by the loss of the tread board can be prevented, the use safety of the escalator is guaranteed, and the potential safety hazard is reduced effectively.
2. In the present invention, the connection plate is installed by using the rotating shaft, and the rotating shaft is arranged at one side away from the counterweight apparatus, so that in the normal situation, due to the balance weight, the connection plate may be driven not to be parallel to the horizontal plane, that is, the force-bearing apparatus may be driven to rise; due to the inclination of the connection plate, the pressing plate may be driven to be separated from the travel switch, that is, no stress is detected on the force-bearing apparatus, that is, the

tread board does not press the force-bearing apparatus, so that the travel switch controls the escalator to stop running in time, thereby guaranteeing the safety; and if the tread board always presses the force-bearing apparatus, the gravity of the balance weight may be overcome, so that the connection plate is parallel to the horizontal plane, the pressing plate may press the travel switch, and the travel switch is electrified, that is, the travel switch can detect the existence of the tread board, to ensure the use safety of the escalator.

3. In the present invention, the safety detection mechanism adopts the travel switch controlled by the balance weight, so that compared with the traditional structure that the travel switch is controlled by a spring which is easily rusted, stuck and damaged, the escalator can be stopped automatically after the loss of the tread board, thereby guaranteeing the use safety of the escalator; and at the same time, on the basis of the snap fitting of the upper corner pieces and the lower corner pieces, the use safety of the escalator is further improved;
4. In the present invention, by arranging the rotatable supporting rod, the supporting rod and the truss can be arranged obliquely to support the tread board, so that the use safety of the tread board can be further improved, the step missing problem can be further prevented; and at the same time, the supporting rod can also be accommodated in the truss, so that the normal use of the supporting rod in a narrow space of the pit can be guaranteed, the subsequent maintenance of the escalator is not affected, and not only the use safety can be guaranteed, but also the use convenience of the operation personnel can be guaranteed.

Description of Drawings

Fig. 1 is a structural schematic diagram in an embodiment 1 of the present invention;

Fig. 2 is a local enlarged diagram of Fig. 1;

Fig. 3 is a structural schematic diagram in the embodiment 1 of the present invention; and

Fig. 4 is a structural schematic diagram of a safety detection mechanism in the embodiment 1 of the present invention.

1, pit; 2, tread board; 3, truss; 4, upper corner piece; 5, inner side opening; 6, lower corner piece; 7, outer side opening; 8, upper vertical plate; 9, upper transverse plate; 10, lower vertical plate; 11, lower transverse plate; 12, travel switch; 13, pressing plate; 14, connection plate; 15, through hole; 16, rotating shaft; 17, transverse plate; 18, vertical plate; 19, contact; 20, installation plate; 21, balance weight; 22, supporting rod; 23, sliding groove; 24, installation groove; 25, spherical roller.

Detailed Description

The present invention is further described below in conjunction with accompanying drawings and embodiments:

Embodiment 1: as shown in Figs. 1-4, a step-missing-preventing tread board installation structure of an escalator includes a pit 1, a tread board 2 installed at the top of the pit, an

installation mechanism arranged at the side of the pit and a safety detection mechanism installed in the pit; the installation mechanism includes two sets of trusses 3; the two sets of trusses 3 are respectively arranged on a left inner wall and a right inner wall of the pit 1, and the two sets of trusses 3 are oppositely arranged; the rear side of the top of each set of truss 3 is respectively provided with a set of upper corner piece 4; an inner side of the upper corner piece 4 facing the pit 1 is provided with an inner side opening 5; rear sides of two ends of a bottom surface of the tread board 2 are respectively provided with a lower corner piece 6; an outer side of the lower corner piece 6 facing the pit 1 is provided with an outer side opening 7; the upper corner piece 4 is in snap fitting with the lower corner piece 6, and the tread board is installed on the two sets of trusses through the snap fitting of the upper corner pieces and the lower corner pieces; the safety detection mechanism is installed on a front inner wall of the pit; and the bottom surface of the tread board is abutted against the safety detection mechanism.

In the present embodiment, the pit is mainly used for installing components such as an escalator driving motor, and the space in the pit is relatively small, so that other parts cannot be installed inside the pit. In the present embodiment, the trusses are used for supporting the tread board, and the upper corner pieces and the lower corner pieces are used for limiting the tread board, so that when in use, when a user steps on the tread board, the shaking problem of the tread board may be prevented due to the existence of the upper corner pieces and the lower corner pieces; and at the same time, the problem that the side of the tread board falls into the pit may be prevented, so that the potential safety hazard of step missing can be prevented. At the same time, compared with the traditional way that the tread board directly covers the pit, the tread board can be prevented from being lifted directly by the user, thereby reducing the potential safety hazard. When in installation, the tread board is installed on the pit from front to rear; and during the installation, the upper corner piece is inserted into the lower corner piece from front to rear, so that the tread board can be limited by the upper corner piece and the lower corner piece. If the tread board needs to be disassembled, as long as the front end of the tread board can be partially raised, and the tread board is pulled forwards from the front side of the pit until the upper corner piece is separated from the lower corner piece, the separation of the tread board can be completed. Moreover, the tread board cannot be pulled out from the rear side; because the escalator is installed at the rear side, there is no place for pulling out the tread board; and the tread board may also be limited by the escalator.

As shown in Figs. 1 and 2, the upper corner piece 4 includes an upper vertical plate 8 and an upper transverse plate 9 which are connected end to end; the upper vertical plate is perpendicular to the upper transverse plate and the truss; an outer end of the upper transverse plate is installed at the top of the upper vertical plate; and an inner side opening facing inwards is formed among the upper transverse plate, the truss and the upper vertical plate; the lower corner piece 4 includes a lower vertical plate 10 and a lower transverse plate 11 which are connected end to end; the lower vertical plate is perpendicular to the lower transverse plate and the tread

board; an inner end of the lower transverse plate is installed at the bottom of the lower vertical plate; an outer side opening facing outwards is formed among the lower transverse plate, the tread board and the lower vertical plate; the lower transverse plate is inserted in the inner side opening; and the upper transverse plate is inserted in the outer side opening.

In the present embodiment, the lower corner piece is close to the rear side of the truss, and the upper corner piece is also close to the rear side of the tread board; the rear side of the truss is connected directly with the escalator, so that the tread board is installed obliquely; firstly, the rear side of the tread board is abutted against a top surface of the truss, the front side is raised, and then the tread board is installed at an oblique angle; then, the tread board is gradually pushed towards the rear side of the truss; in the pushing process, the front side of the tread board is lowered down gradually, that is, an oblique angle between the tread board and the truss is reduced gradually, and the oblique angle shall facilitate the insertion of the upper corner piece into the lower corner piece; when the upper corner piece needs to be inserted, the angle between the tread board and a horizontal plane is 5° - 15°; after the upper corner piece is completely inserted, the oblique angle shall not be greater than 10°; when the rear side of the tread board is abutted against the rear side of the pit, the installation of the tread board is completed, and at the time, the front side of the tread board can also be raised partially, so that the angle between the tread board and the horizontal plane is 3° - 5°; and then the operator releases the tread board, so that the tread board directly falls on the truss, thereby completing the installation of the tread board.

As shown in Figs. 1 and 4, the safety detection mechanism includes a travel switch 12 and a pressing apparatus arranged on the travel switch 12; the pressing apparatus includes a pressing plate 13, a connection plate 14, a force-bearing apparatus and a counterweight apparatus; the pressing plate 13 is perpendicular to the connection plate 14; the pressing plate 13 is installed at the front side of the middle bottom of the connection plate 14; the counterweight apparatus is arranged at the right side of the connection plate 14; the force-bearing apparatus is arranged at the left side of the connection plate; a through hole 15 is arranged between the force-bearing apparatus and the pressing plate 13; a rotating shaft 16 is inserted in the through hole 15; a front end of the rotating shaft 16 is fixedly installed on a front inner wall of the pit 1, and the through hole 15 is rotatably connected with the rotating shaft 16; the force-bearing apparatus is an L-shaped plate; the L-shaped plate includes a transverse plate 17 and a vertical plate 18 which are connected end to end; the vertical plate and the transverse plate are perpendicular to each other; the bottom of the vertical plate is installed at the left top of the connection plate; the transverse plate is installed at the front side of the top of the vertical plate; the vertical plate is perpendicular to the connection plate and the transverse plate; the transverse plate is arranged at the front sides of the connection plate and the vertical plate; the transverse plate is perpendicular to the connection plate; the top of the travel switch 12 is provided with a contact 19; and the contact 19 is arranged right below the pressing plate 13.

When the bottom surface of the tread board is abutted against the top surface of the transverse plate, the transverse plate drives the connection plate through the vertical plate to rotate counter clockwise around the rotating shaft, so that the bottom surface of the pressing plate is abutted against the contact, and the connection plate is parallel to the horizontal plane; and the tread board is separated from the transverse plate, and the counterweight apparatus drives the connection plate to rotate clockwise, so that the bottom surface of the pressing plate presses the contact, and the connection plate supports the horizontal plane at an angle of 5° - 15°.

The counterweight apparatus includes an installation plate 20 and a balance weight 21 arranged at the right side of the installation plate 20; the installation plate is perpendicular to the connection plate; and the installation plate is arranged at the front end of the connection plate.

In the present embodiment, the safety detection mechanism is installed on a front inner wall of the pit and arranged right below the tread board; after the tread board is installed, the front side of the tread board may press the transverse plate, and the transverse plate applies a force to the connection plate through the vertical plate to drive the connection plate to rotate counter clockwise around the rotating shaft, and the connection plate is parallel to the horizontal plane, so that the pressing plate may press the contact of the travel switch, the travel switch is electrified, and the escalator can run and work normally in this way. If the tread board is lost or drops off, the pressing force of the tread board on the transverse plate disappears; due to the existence of the balance weight, the balance weight may drive the connection plate to rotate clockwise around the rotating shaft, so that the pressing plate may be separated from the contact of the travel switch, the travel switch is powered off, and the escalator may be stopped automatically, thereby preventing the harm on the user, guaranteeing the safety of the escalator when in use, and reducing the potential safety hazard.

In the present embodiment, after the tread board is installed, the top surface of the tread board may be flush with the top surface of the pit; and when the tread board needs to be disassembled, it is necessary to slightly raise the front side of the tread board first, then the tread board is pulled forwards, and the tread board is pulled out of the lower corner piece. That is, to disassemble the tread board, the front side of the tread board shall be raised partially first, and then the tread board is pulled out from the front side; since the lower corner piece is arranged at the rear side of the truss and the rear side of the truss may be connected with the escalator, the tread board cannot be raised and pulled out from the rear side; moreover, the safety detection mechanism is installed right below the front side of the tread board; after the front side of the tread board is raised, the travel switch may be powered off, and the escalator may also be automatically stopped, that is, whether the tread board is actively disassembled by the maintenance personnel or carelessly lifted by the user, the escalator may be stopped automatically, so that the safety is higher, and the potential safety hazard is reduced.

As shown in Figs. 1 - 3, the inner side of each truss 3 is also provided with a supporting rod 22; the bottom of the tread board 2 is correspondingly provided with two sliding grooves 23; the

two sliding grooves 23 are arranged between the two sets of upper corner pieces 4; each sliding groove corresponds to one supporting rod; and the top of the supporting rod can be abutted against the sliding groove. The sliding grooves are communicated with the front side and rear side of the top of the tread board.

The bottom of the supporting rod 22 is rotatably connected with the truss; the front side of the inner wall of the truss 3 is also provided with an installation groove 24; the installation groove and the bottom of the pit form an angle of 30° - 60°; the bottom of the supporting rod is rotatably connected with the truss; when the supporting rod is rotated clockwise, the supporting rod can be abutted against the installation groove; and when the supporting rod is rotated counter clockwise, the supporting rod and the truss form an angle of 30° - 60 °.

The top of the supporting rod 22 is also provided with a spherical roller 25; the spherical roller is rotatably connected with the top of the supporting rod; the top of the spherical roller is abutted against the top of the sliding groove; and the spherical roller can roll in the sliding groove.

In the traditional structures, the periphery of the pit is generally used for supporting the tread board, that is, there is no support for the middle of the tread board, and the middle of the tread board is at a suspension state, so that after the tread board is stepped for a long time or when the tread board bears a large weight, the tread board is easy to sag and deform, causing the dropping of the tread board into the pit, and leading to the potential safety hazard of step missing. In the present embodiment, although two sides of the tread board are supported by the trusses, the middle of the tread board is also lack of support. Therefore, by arranging the supporting rod, the middle of the tread board can be supported, so that the deformation of the middle of the tread board caused by the long-time stepping can be prevented, and the potential safety hazard is reduced. At the same time, due to the existence of the supporting rod and the sliding grooves, the supporting rod is inserted in the sliding grooves, that is, the supporting rod may limit the sides of the tread board, so that even if the middle of the tread board is deformed, the periphery of the tread board may not be deformed and drop, and the tread board may not drop directly due to the deformation, which is convenient for the working personnel to discover and repair, thereby preventing instantaneous potential safety hazard.

Since the space in the pit is limited, the truss is provided with the installation groove; and when the tread board is opened for repairing the components inside the pit, the supporting rod can also be received into the installation groove, so that no impact is caused for the operating personnel. At the same time, since the tread board is inserted from front to rear, the bottom of the supporting rod is installed at the bottom of the rear side of the installation groove, so that after the supporting rod is opened, and when the tread board is installed, the supporting rod suffers a backward pushing force, that is, the supporting rod is driven to rotate counter clockwise; when the rotation of the supporting rod is limited, the supporting rod forms an angle of 30° - 60° with the truss, then the supporting rod may not move again, and the tread board can be supported only by the rolling of the spherical roller in the sliding grooves; and after the tread board is

installed, a triangular limit is formed, so that a firm support is formed for the tread board. In the disassembling process of the tread board, since the tread board is pulled out from rear to front, the tread board may drive the supporting rod to rotate clockwise, so that the supporting rod is easily driven to be separated from the tread board; and the supporting rod approaches the installation groove, so that the supporting rod may not affect the disassembling of the tread board, and the tread board is convenient and rapid to disassemble.

CLAIMS

1. A step-missing-preventing tread board installation structure of an escalator, comprising a pit, a tread board installed at the top of the pit, an installation mechanism arranged at the side of the pit and a safety detection mechanism installed in the pit, wherein
   - the installation mechanism comprises two sets of trusses;
   - the two sets of trusses are arranged on a left inner wall and a right inner wall of the pit, and the two sets of trusses are oppositely arranged;
   - the rear side of the top of each set of truss is respectively provided with a set of upper corner piece;
   - the inner side of the upper corner piece facing the pit is provided with an inner side opening;
   - rear sides of two ends of a bottom surface of the tread board are respectively provided with a lower corner piece;
   - an outer side of the lower corner piece facing the pit is provided with an outer side opening;
   - the upper corner pieces are in snap fitting with the lower corner pieces;
   - the tread board is installed on the two sets of trusses through the snap fitting of the upper corner pieces and the lower corner pieces;
   - the safety detection mechanism is installed on the front inner wall of the pit, and the bottom surface of the tread board is abutted against the safety detection mechanism;
   - the inner side of each truss is also provided with a supporting rod;
   - the bottom of the tread board is correspondingly provided with two sliding grooves;
   - the two sliding grooves are arranged between the two sets of upper corner pieces;
   - each sliding groove corresponds to one supporting rod;
   - the top of the supporting rod can be abutted against the sliding groove;
   - the bottom of the supporting rod is rotatably connected with the truss;
   - the front side of the inner wall of the truss is also provided with an installation groove;
   - the installation groove and the bottom of the pit form an angle of 30° - 60°;
   - the bottom of the supporting rod is rotatably connected with the truss;
   - when the supporting rod is rotated clockwise, the supporting rod can be abutted against the installation groove;
   - when the supporting rod is rotated counter clockwise, the supporting rod and the truss form an angle of 30° - 60°;
   - the top of the supporting rod is also provided with a spherical roller;
   - the spherical roller is rotatably connected with the top of the supporting rod;
   - the top of the spherical roller is abutted against the top of the sliding groove; and

– the spherical roller can roll in the sliding groove.

2. The step-missing-preventing tread board installation structure of the escalator according to claim 1, wherein

– the upper corner piece comprises an upper vertical plate and an upper transverse plate which are connected end to end;
– the upper vertical plate is perpendicular to the upper transverse plate and the truss;
– an outer end of the upper transverse plate is installed at the top of the upper vertical plate;
– an inner side opening facing inwards is formed among the upper transverse plate, the truss and the upper vertical plate;
– the lower corner piece comprises a lower vertical plate and a lower transverse plate which are connected end to end;
– the lower vertical plate is perpendicular to the lower transverse plate and the tread board;
– an inner end of the lower transverse plate is installed at the bottom of the lower vertical plate;
– an outer side opening facing outwards is formed among the lower transverse plate, the tread board and the lower vertical plate;
– the lower transverse plate is inserted in the inner side opening; and
– the upper transverse plate is inserted in the outer side opening.

3. The step-missing-preventing tread board installation structure of the escalator according to claim 1, the safety detection mechanism comprising a travel switch and a pressing apparatus arranged on the travel switch, wherein

– the pressing apparatus comprises a pressing plate, a connection plate, a force-bearing apparatus and a counterweight apparatus;
– the pressing plate is perpendicular to the connection plate;
– the pressing plate is installed at the front side of the middle bottom of the connection plate;
– the counterweight apparatus is arranged at the right side of the connection plate;
– the force-bearing apparatus is arranged at the left side of the connection plate;
– a through hole is arranged between the force-bearing apparatus and the pressing plate;
– a rotating shaft is inserted in the through hole;
– a front end of the rotating shaft is fixedly installed on a front inner wall of the pit;
– the through hole is rotatably connected with the rotating shaft;
– the force-bearing apparatus is an L-shaped plate;
– the L-shaped plate comprises a transverse plate and a vertical plate which are connected end to end;
– the vertical plate and the transverse plate are perpendicular to each other;

- the bottom of the vertical plate is installed at the left top of the connection plate;
- the transverse plate is installed at the front side of the top of the vertical plate;
- the vertical plate is perpendicular to the connection plate and the transverse plate;
- the transverse plate is arranged at the front sides of the connection plate and the vertical plate;
- the transverse plate is perpendicular to the connection plate;
- the top of the travel switch is provided with a contact; and
- the contact is arranged right below the pressing plate.

4. The step-missing-preventing tread board installation structure of the escalator according to claim 3, wherein
   - when the bottom surface of the tread board is abutted against the top surface of the transverse plate, the transverse plate drives the connection plate through the vertical plate to rotate counter clockwise around the rotating shaft, so that the bottom surface of the pressing plate is abutted against the contact, and the connection plate is parallel to the horizontal plane; and
   - the tread board is separated from the transverse plate, and the counterweight apparatus drives the connection plate to rotate clockwise, so that the bottom surface of the pressing plate presses the contact, and the connection plate supports the horizontal plane at an angle of 5° - 15°.

5. The step-missing-preventing tread board installation structure of the escalator according to claim 3, wherein
   - the counterweight apparatus comprises an installation plate and a balance weight arranged at the right side of the installation plate;
   - the installation plate is perpendicular to the connection plate; and
   - the installation plate is arranged at the front end of the connection plate.

ANSPRÜCHE

1. Ein Trittbrett-installationsstruktur einer Rolltreppe zum vorbeugen von Fehltritten, umfassend eine Grube, ein Trittbrett, das auf dem oberen Ende der Grube installiert ist, einen Installationsmechanismus, der auf der Seite der Grube angeordnet ist, und einen Sicherheitsdetektionsmechanismus, der in der Grube installiert ist, wobei
   - der Installationsmechanismus zwei Gruppen von Tragbalken umfasst;
   - die zwei Gruppen von Tragbalken jeweils auf einer linken Innenwand und einer rechten Innenwand der Grube angeordnet sind;
   - die zwei Gruppen von Tragbalken sich gegenüberliegen;
   - die hintere Seite des Oberen Endes jeder Tragbalkengruppe jeweils mit einer Gruppe von oberen Eckstücken versehen ist;
   - die oberen Eckstücke zur Außenseite der Grube mit Außenseitenöffnungen versehen sind;
   - die oberen Eckstücke mit unteren Eckstücken klemmend zusammenarbeiten;
   - das Trittbrett durch klemmendes Zusammenarbeiten der oberen Eckstücke und der unteren Eckstücke auf zwei Gruppen von Tragbalken installiert ist;
   - der Sicherheitsdetektionsmechanismus auf der vorderen Innenwand der Grube installiert ist;
   - eine Bodenfläche des Trittbretts an dem Installationsdetektionsmechanismus anliegt;
   - eine Innenseite eines Tragbalkens ferner mit einer Stützstange versehen ist;
   - der Boden des Trittbretts übereinstimmend mit zwei Rutschen versehen ist;
   - die zwei Rutschen sich zwischen zwei Gruppen von den oberen Eckstücken angeordnet sind;
   - jede Rutsche mit einer Stützstange übereinstimmt;
   - der Oberteil der Stützstange an dem Innern der Rutsche anliegen kann;
   - der Boden der Stützstange drehbar mit dem Tragbalken verbunden ist;
   - die Vorderseite der Innenwand des Tragbalkens ferner mit einem Installationsschlitz versehen ist;
   - der Installationsschlitz und der Boden der Grube in einem eingeschlossenen Winkel von 30° bis 60° sind;
   - der Boden der Stützstange drehbar mit dem Tragbalken verbunden ist;
   - wenn die Stützstange im Uhrzeigersinn gedreht wird, die Stützstange am Innern des Installationsschlitzes anliegen kann;
   - wenn die Stützstange gegen den Uhrzeigersinn gedreht wird, die Stützstange und der Tragbalken in einem eingeschlossenen Winkel von 30° bis 60° sind;
   - der Oberteil der Stützstange ferner mit einer Kugelrolle versehen ist;

- die Kugelrolle drehbar mit dem Oberteil der Stützstange verbunden ist;
- der Oberteil der Kugelrolle am Oberteil der Rutsche anliegt; und
- die Kugelrolle in der Rutsche rollen kann.

2. Der Trittbrett-installationsstruktur einer Rolltreppe zum vorbeugen von Fehltritten nach Anspruch 1, wobei
   - das obere Eckstück eine obere vertikale Platte und eine obere horizontale Platte umfasst, die Ende zu Ende verbunden sind;
   - die obere vertikale Platte senkrecht zur oberen horizontalen Platte und dem Tragbalken angeordnet ist;
   - ein äußeres Ende der oberen horizontalen Platte auf dem Oberteil der oberen vertikalen Platte installiert ist;
   - die obere horizontale Platte, und der Tragbalken und die obere vertikale Platte eine nach Innen eingestellte Innenseitenöffnung ausbilden;
   - dass das untere Eckstück eine untere vertikale Platte und eine untere horizontale Platte umfasst, die Ende zu Ende verbunden sind;
   - die untere vertikale Platte senkrecht zur unteren horizontalen Platte und dem Trittbrett angeordnet ist;
   - ein inneres Ende der unteren horizontalen Platte auf dem Boden der unteren vertikalen Platte installiert ist;
   - die untere horizontale Platte, das Trittbrett und die untere vertikale Platte eine nach Außen eingestellte Außenseitenöffnung ausbilden;
   - die untere Horizontale Platte in die Innenseitenöffnung eingeführt ist; und
   - die obere horizontale Platte in die Außenseitenöffnung eingeführt ist.

3. Der Trittbrett-installationsstruktur einer Rolltreppe zum vorbeugen von Fehltritten nach Anspruch 1, wobei der Sicherheitsdetektionsmechanismus einen Fahrschalter und eine auf dem Fahrschalter angeordnete Druckvorrichtung umfasst, wobei
   - die Druckvorrichtung eine Druckplatte, eine Verbindungsplatte, eine Krafttragevorrichtung und eine Gegengewichtsvorrichtung umfasst;
   - die Druckplatte senkrecht zur Verbindungsplatte angeordnet ist;
   - die Druckplatte auf der Vorderseite des mittleren Bodens der Verbindungsplatte installiert ist;
   - die Gegengewichtsvorrichtung auf der rechten Seite der Verbindungsplatte angeordnet ist;
   - die Krafttragevorrichtung auf der linken Seite der Verbindungsplatte angeordnet ist,;

- zwischen der Krafttragevorrichtung und der Druckplatte ein Durchgangsloch angeordnet ist;
- eine rotierende Welle in das Durchgangsloch eingeführt ist;
- ein vorderes Ende der rotierenden Welle an der vorderen Innenwand der Grube fest installiert ist;
- das Durchgangsloch drehend mit der rotierenden Welle verbunden ist;
- die Krafttragevorrichtung eine L-förmige Platte ist,
- die L-förmige Platte eine horizontale Platte und eine vertikale Platte umfasst, die Ende zu Ende verbunden sind;
- die vertikale Platte und die horizontale Platte vertikal miteinander angeordnet sind;
- der Boden der vertikalen Platte am oberen Ende der linken Seite der Verbindungsplatte installiert ist;
- die horizontale Platte an der Vorderseite des oberen Endes der vertikalen Platte installiert ist;
- die vertikale Platte vertikal zu der Verbindungsplatte und der horizontalen Platte angeordnet ist;
- die horizontale Platte an der Vorderseite der Verbindungsplatte und der vertikalen Platte angeordnet ist;
- die horizontale Platte vertikal zu der Verbindungsplatte angeordnet ist;
- das obere Ende des Fahrschalters mit einem Kontakt versehen ist; und
- der Kontakt direkt unter der Druckplatte angeordnet ist.

4. Der Trittbrett-installationsstruktur einer Rolltreppe zum vorbeugen von Fehltritten nach Anspruch 1, wobei
   - wenn eine Bodenfläche des Trittbretts an der Oberfläche der horizontalen Platte anliegt, die horizontale Platte durch die vertikale Platte die Verbindungsplatte antreibt, um sich gegen den Uhrzeigersinn um die rotierende Welle zu drehen, so dass die Bodenfläche der Druckplatte am Kontakt anliegt, und die Verbindungsplatte parallel zur horizontalen Ebene angeordnet ist;
   - wenn das Trittbrett sich von der horizontalen Platte löst, die Gegengewichtsvorrichtung die Verbindungsplatte antreibt, um sich im Uhrzeigersinn zu drehen, so dass die Bodenfläche der Druckplatte den Kontakt drückt, und die Verbindungsplatte in einen eingeschlossenen Winkel von 5° - 15°zur horizontalen Ebene gestützt ist.

5. Der Trittbrett-installationsstruktur einer Rolltreppe zum vorbeugen von Fehltritten nach Anspruch 1, wobei

- die Gegengewichtsvorrichtung eine Montageplatte und einen Gegengewichtsblock umfasst, der auf der rechten Seite der Montageplatte angeordnet ist;
- die Montageplatte senkrecht zur Verbindungsplatte angeordnet ist; und
- die Montageplatte am vorderen Ende der Verbindungsplatte angeordnet ist.

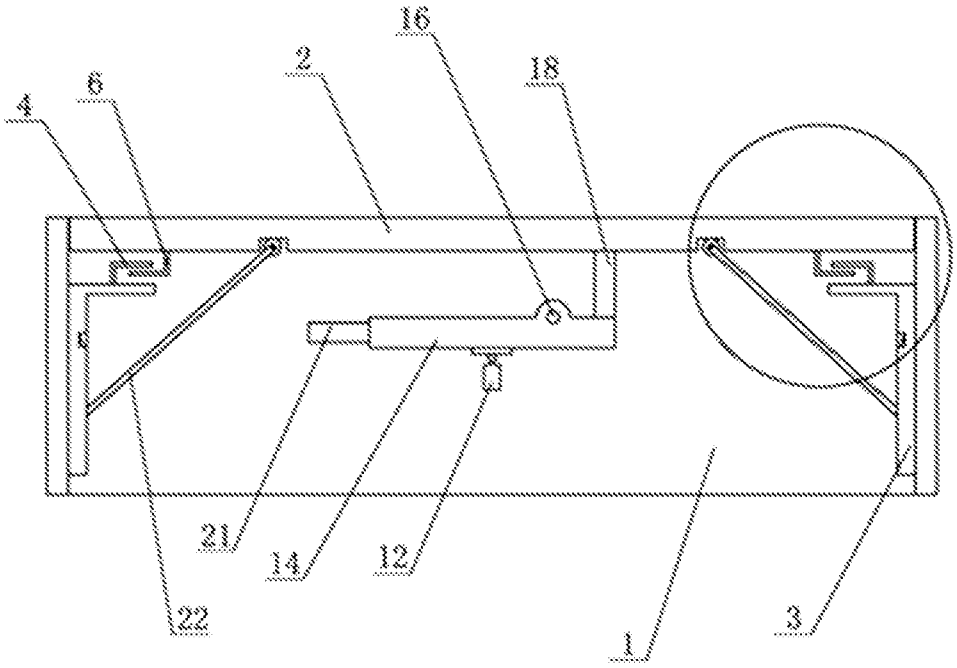

Fig. 1

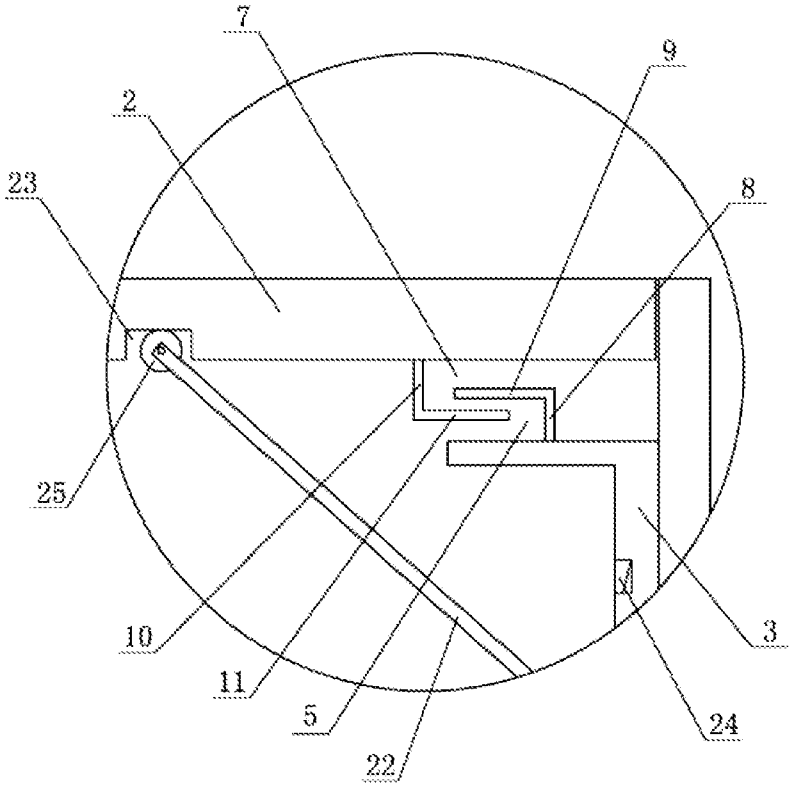

Fig. 2

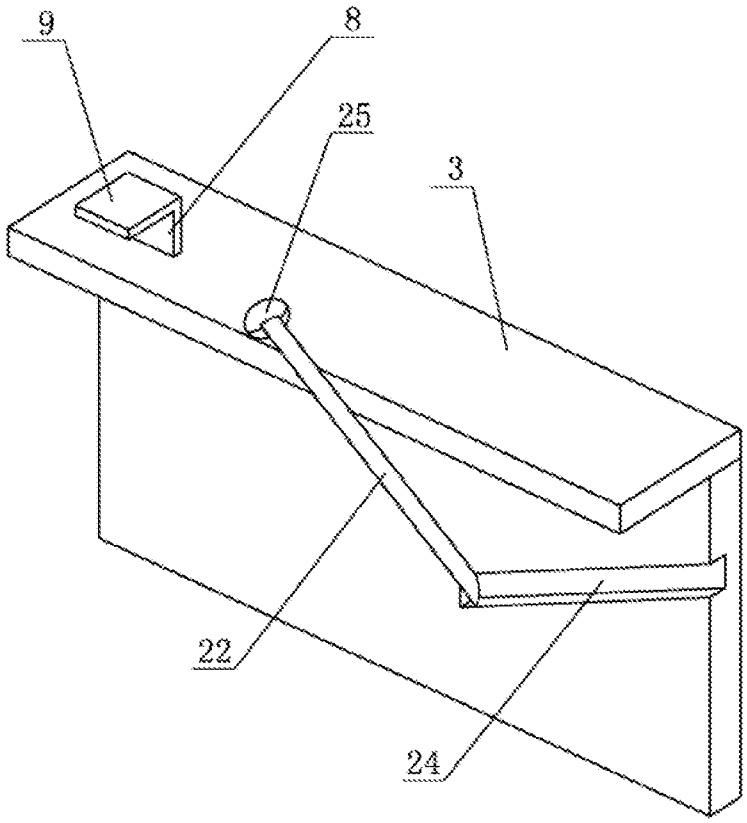

Fig. 3

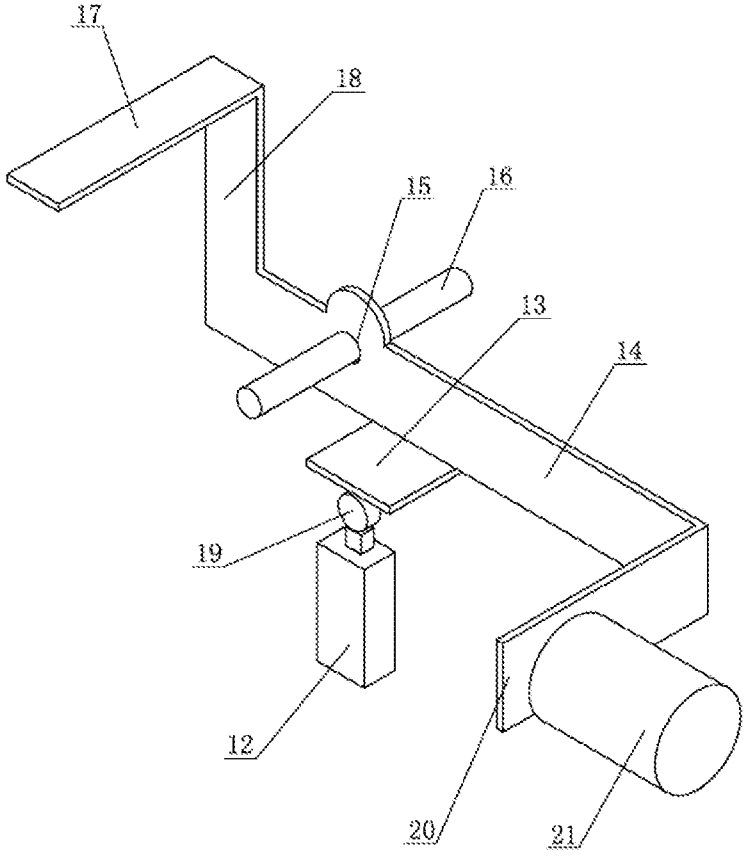

Fig. 4