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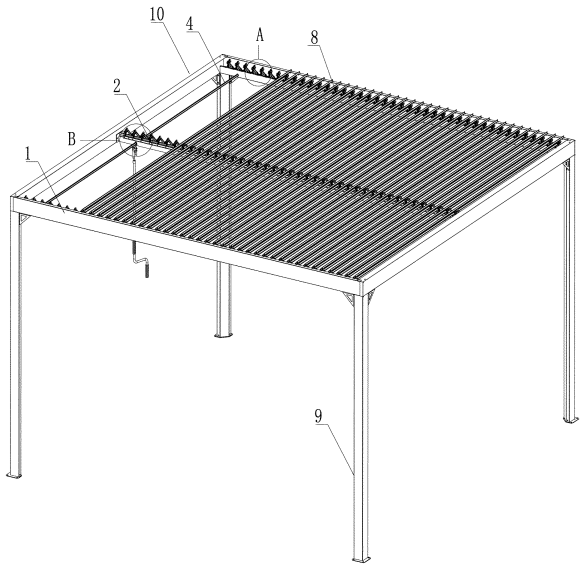
(54) CANOPY WITH A CENTER-DRIVEN LONG LOUVER OPENING AND CLOSING STRUCTURE

(57) The invention pertains to the field of outdoor supplies and specifically relates to a tent with a center-driven long louver canopy opening and closing structure. The tent comprises a tent frame, a louver board set, linkage bars, a louver transmission mechanism, a transmission rod and a driving mechanism. The tent frame comprises two first ring beams and a middle beam. The louver board set comprises a set of louver boards arranged in a row. Two ends of each louver board are mounted and fit with the two first ring beams through first mounting components. The middle part of each louver board is mounted and fit with the middle beam through a set of provided second mounting components. The mounting components include louver board fixing seats and louver board rotating parts. The beneficial effects of the invention are as follows: the driving mechanism of the tent with a center-driven long louver canopy opening and closing structure is mounted on the middle beam and drives the louver transmission mechanism on both sides through the a transmission rod to realize the opening and closing of the louver boards, which can avoid distortion of the louver boards; the louver board fixing seats in the invention are snap-fit and assembled with the first ring beams and the middle beam, which simplifies the assembly method of the louver boards and reduces labor costs and material costs.



[Figure No.] Fig. 1

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Description

TECHNICAL FIELD

[0001] The present invention pertains to the field of outdoor supplies and specifically relates to a tent with a center-driven long louver canopy opening and closing structure.

BACKGROUND ART

[0002] The louver boards of the tents with a louver canopy on the present market are fixed by the following methods: In the first method, louver boards are assembled on a rotating part, and the rotating part is mounted on the inner side face of a ring beam of the tent by means of hinge pin screws; in the second method, a small tube is arranged on a louver board profile, one end of a hinge pin is fit and assembled with the small tube and the other end of the hinge pin is inserted into the inner side face of a ring beam of the tent, or a fixing part is mounted on the inner side face of the tent, and the hinge pin is fit and assembled with this fixing part in a rotatable manner. Such assembly methods all require perforating the inner side face of the ring beam. As the tent canopy needs a certain number of louver boards, a certain number of holes need to be opened on the ring beam (the holes are at the same spacing) and rivet nuts matched with the hinge pin screws or fixing parts need to be assembled on the holes. Such processes have the following defects: 1. The required production precision is high. For example, if there are 30 holes and the error of the spacing between the holes is 0.1 mm, the accumulated error of the last hole will be 3 mm; 2. A rivet nut needs to be assembled on each hole; the louver board rotating parts or the fixing parts are assembled on the ring beam by means of hinge pin screws or screws. This process is tedious, resulting in a high labor cost; 3. After the product has been used for a long time, the hinge pin screws are at risk of falling off after the louver boards have rotated many times, thereby affecting the normal use of the product.

[0003] Next, for an existing tent with a louver canopy, a driving mechanism is arranged on one side of the louver boards in general, the end of each louver board adjacent to a worm gear mechanism is relatively flat in a closed state, while the closure at the other end relies on the drive of the closure of the left end. Due to process limitations, when the length of the pipe reaches a certain amount, it is prone to distortions and other problems, thereby causing failure of complete closure of the right end of the louver board in a closed state and other functional failures.

SUMMARY OF THE INVENTION

[0004] In order to make up for the defects of the prior art, the present invention provides the following technical solution.

[0005] A tent with a center-driven long louver canopy opening and closing structure, wherein the tent comprises:

a tent frame, the tent frame comprising first ring beams located on the left end and the right end of the tent frame, respectively and a middle beam located between the two first ring beams;

a louver board set, the louver board set comprising a set of louver boards arranged in a row, two ends of each louver board being mounted and fit with the two first ring beams through a set of provided first mounting components, the middle part of each louver board being mounted and fit with the middle beam through a set of provided second mounting components, the mounting components including louver board fixing seats and louver board rotating parts, one end of each louver board fixing seat being snap-fit with the corresponding first ring beam or middle beam, the other end being fit with a louver board rotating part in an articulated manner, and the louver board rotating part being snap-fit with the corresponding louver board;

linkage bars, the linkage bars being articulated with the louver board rotating parts, and used for driving the louver boards to open and close through the mounting components;

a louver transmission mechanism, the louver transmission mechanism being used for driving the linkage bars to move;

a transmission rod, the transmission rod being used for driving the louver transmission mechanism to rotate; and

a driving mechanism, the driving mechanism being mounted and fit on the middle beam and used for driving the transmission rod to rotate.

[0006] The tent with a center-driven long louver canopy opening and closing structure, wherein one of the first ring beams and the louver board fixing seats is provided with slots, and the other is provided with insertion portions used for insertion fit with the corresponding slots.

[0007] The tent with a center-driven long louver canopy opening and closing structure, wherein one of the middle beam and the louver board fixing seats is provided with slots, and the other is provided with insertion portions used for insertion fit with the corresponding slots.

[0008] The tent with a center-driven long louver canopy opening and closing structure, wherein a groove is arranged on one of the inner wall of each slot and the outer wall of each insertion portion, and a back tooth used for snap-fit with the groove is arranged on the other.

[0009] The tent with a center-driven long louver canopy

opening and closing structure, wherein each louver board comprises a first buckle portion, and each louver board rotating part comprises a second buckle portion used for snap-fit with the first buckle portion of the corresponding louver board.

[0010] The tent with a center-driven long louver canopy opening and closing structure, wherein the first buckle portion comprises a buckle rib and a buckle insertion bar, and the second buckle portion comprises a buckle groove used for snap-fit with the buckle rib, and a buckle slot used for insertion and snap-fit with the buckle insertion bar.

[0011] The tent with a center-driven long louver canopy opening and closing structure, wherein the front end of each louver board fixing seat is provided with a third buckle portion, the rear end is provided with a fourth buckle portion, and adjacent louver board fixing seats are snap-fit through the third buckle portion and the fourth buckle portion.

[0012] The tent with a center-driven long louver canopy opening and closing structure, wherein the louver transmission mechanism comprises a rotating part and a transmission part, one end of the rotating part is in transmission fit with the transmission rod, the other end is articulated with the transmission part, and the transmission part is articulated with the linkage bars.

[0013] The tent with a center-driven long louver canopy opening and closing structure, wherein the driving mechanism is in transmission fit with a rotating shaft, each of the two sides of the rotating shaft is in transmission and insertion fit with a transmission rod, and the transmission rod is in transmission and insertion fit with the corresponding rotating part.

[0014] The tent with a center-driven long louver canopy opening and closing structure, wherein a first through hole for allowing the transmission rod or the rotating shaft to pass through and a first notch for allowing the bottom of the driving mechanism to be exposed are arranged on the middle beam, a drainage channel is arranged on a first ring beam, and a second through hole for allowing the transmission rod to pass through and a second notch for allowing the lower end of the rotating part to be exposed are arranged on the drainage channel.

[0015] Compared with the prior art, the present invention has the following beneficial effects: the driving mechanism in the present invention is mounted on the middle beam and drives the louver transmission mechanism on the two sides by means of the transmission rod to open and close the louver boards. As the driving mechanism is on the middle beam, the errors and torsions after conduction to the two sides are similar, thereby achieving synchronous motions on the two sides and avoiding distortion of the louver boards; in the present invention, the louver board fixing seats are snap-fit and assembled with the first ring beams and the middle beam, which simplifies the assembly method of the louver boards and reduces labor costs and material costs.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]

Fig. 1 is a structural schematic view of the present invention;

Fig. 2 is an enlarged view of Area A in Fig. 1;

Fig. 3 is an enlarged view of Area B in Fig. 1;

Fig. 4 is a structural schematic view of the connection among a first ring beam, a louver transmission mechanism, a linkage bar and a transmission rod in the present invention;

Fig. 5 is a structural schematic view of the connection among a louver transmission mechanism, a linkage bar and a transmission rod in the present invention;

Fig. 6 is a structural schematic view of the connection among a middle beam, a driving mechanism, a rotating shaft and a transmission rod in the present invention;

Fig. 7 is a structural schematic view of the connection among a first ring beam, a louver transmission mechanism, a linkage bar, a louver board fixing seat, a louver board rotating part and a transmission rod in the present invention;

Fig. 8 is a structural schematic view 1 of the connection between a first ring beam and a louver board fixing seat in the present invention;

Fig. 9 is a structural schematic view 2 of the connection between the first ring beam and the louver board fixing seat in the present invention;

Fig. 10 is a structural schematic view 1 of the connection between a middle beam and a louver board fixing seat in the present invention;

Fig. 11 is a structural schematic view 2 of the connection between the middle beam and the louver board fixing seat in the present invention;

Fig. 12 is a structural schematic view of the connection among a first ring beam, a louver board fixing seat, a louver board rotating part and a louver board in the present invention;

Fig. 13 is a structural schematic view of the connection among a middle beam, a louver board fixing seat, a louver board rotating part and a louver board in the present invention;

Fig. 14 is a structural schematic view of a first ring

beam in the present invention;

Fig. 15 is a structural schematic view of a middle beam in the present invention;

Fig. 16 is a structural schematic view of the connection between a driving mechanism and a rotating shaft in the present invention;

Fig. 17 is a structural schematic view of the connection between a louver transmission mechanism and linkage bars in the present invention;

Fig. 18 is a structural schematic view of a transmission rod in the present invention;

Fig. 19 is a structural schematic view of a louver board fixing seat in the present invention;

Fig. 20 is a structural schematic view of a louver board rotating part in the present invention;

Fig. 21 is a structural schematic view of a louver board in the present invention.

DETAILED DESCRIPTION

[0017] The present invention will be further illustrated with reference to the accompanying drawings.

[0018] Fig. 1 to Fig. 21 show a tent with a center-driven long louver canopy opening and closing structure, comprising:

a tent frame, the tent frame comprising first ring beams 1 located on the left end and the right end of the tent frame, respectively and a middle beam 2 located between the two first ring beams 1;

a louver board set, the louver board set comprising a set of louver boards 8 arranged in a row, two ends of each louver board 8 being mounted and fit with the two first ring beams 1 through a set of provided first mounting components, the middle part of each louver board being mounted and fit with the middle beam 2 through a set of provided second mounting components, the mounting components including louver board fixing seats 6 and louver board rotating parts 7, one end of each louver board fixing seat 6 being snap-fit with the corresponding first ring beam 1 or middle beam 2, the other end being fit with a louver board rotating part 7 in an articulated manner, and the louver board rotating part 7 being snap-fit with the corresponding louver board 8;

linkage bars 5c, the linkage bars 5c being articulated with the louver board rotating parts 7 and used for driving the louver boards 8 to open and close through the mounting components;

a louver transmission mechanism, the louver transmission mechanism being used for driving the linkage bars 5c to move;

a transmission rod 4, the transmission rod 4 being used for driving the louver transmission mechanism to rotate; and

a driving mechanism 3, the driving mechanism 3 being mounted and fit on the middle beam 2 and used for driving the transmission rod 4 to rotate.

[0019] In the foregoing structure, the tent frame further comprises four columns 9 and two second ring beams 10, which form a square structure with the first ring beams 1. The middle beam 2 is fixed between the two second ring beams 10. The linkage bars 5c are arranged on the two first ring beams 1 and the middle beam 2, but only the linkage bars 5c on the first ring beams 1 are fit and used in cooperation with together with the louver transmission mechanism. Nevertheless, if needed, corresponding louver transmission mechanisms can be added for the linkage bars 5c on the middle beam 2.

[0020] As an optimization, one of the first ring beams 1 and the louver board fixing seats 6 is provided with slots, and the other is provided with insertion portions 6a used for insertion and snap-fit with the corresponding slots. In actual implementation, slots are arranged on the first ring beams 1—the slots are ring beam slots 1a—and insertion portions 6a are arranged on the louver board fixing seats 6.

[0021] As an optimization, one of the middle beam 2 and the louver board fixing seats 6 is provided with slots, and the other is provided with insertion portions 6a used for insertion and snap-fit with the corresponding slots. During specific implementation, slots are arranged on the middle beam 2—the slots are middle beam slots 2b—and insertion portions 6a are arranged on the louver board fixing seats 6.

[0022] In the foregoing structure, a groove is arranged on one of the inner wall of each slot and the outer wall of each insertion portion 6a, and a back tooth 6aa used for snap-fit with the groove is arranged on the other. In actual implementation, back teeth 6aa are arranged on the two outer side walls of the insertion portions 6a, ring beam grooves 1aa are arranged on the two inner side walls of the ring beam slots 1a, and middle beam grooves 2ba are arranged on the two inner side walls of the middle beam slots 2b.

[0023] As an optimization, each louver board 8 comprises a first buckle portion, and each louver board rotating part 7 comprises a second buckle portion used for snap-fit with the first buckle portion of the corresponding louver board 8.

[0024] In the foregoing structure, the first buckle portion comprises a buckle rib 8a and a buckle insertion bar 8b arranged on the two sides of the louver board 8, and the second buckle portion comprises a buckle groove 7b

used for snap-fit with the buckle rib 8a and a buckle slot 7d used for insertion and snap-fit with the buckle insertion bar 8b. The buckle groove 7b and the buckle slot 7d are arranged on the two sides of the louver board rotating part 7, and the buckle slot 7d has certain resilience and can clamp the buckle insertion bar 8b through interference fit.

[0025] As an optimization, the front end of each louver board fixing seat 6 is provided with a third buckle portion 6c, the rear end is provided with a fourth buckle portion 6d, and adjacent louver board fixing seats 6 are snap-fit through the third buckle portion 6c and the fourth buckle portion 6d. During specific implementation, the third buckle portion 6c is an L-shaped bar, the fourth buckle portion 6d is an L-shaped slot in a corresponding shape, and adjacent louver board fixing seats 6 are snap-fit through the L-shaped bars and the L-shaped slots. This structure can make the mounting of the louver board fixing seats 6 even firmer.

[0026] As an optimization, the louver transmission mechanism comprises a rotating part 5a and a transmission part 5b, one end of the rotating part 5a is in transmission fit with the transmission rod 4, the other end is articulated with the transmission part 5b, and the transmission part 5b is articulated with the linkage bars 5c.

[0027] In the foregoing structure, the driving mechanism 3 is in transmission fit with a rotating shaft 3a, each of the two sides of the rotating shaft 3a is in transmission and insertion fit with a transmission rod 4, and the transmission rod 4 is in transmission and insertion fit with the corresponding rotating part 5a. During specific implementation, the driving mechanism 3 is normally a worm and gear mechanism and is in transmission fit with the rotating shaft 3a in a known manner. The cross section of the rotating shaft 3a is rectangular, the transmission rod 4 has a rectangular hole 4a corresponding thereto, the rotating shaft 3a is in insertion fit with the rectangular hole 4a, and the rotating shaft 3a and the transmission rod 4 transfer power through matched shapes. The exterior of the transmission rod 4 adopts an irregularly shaped structure similar to a spline, the rotating part 5a is in insertion fit with an irregularly shaped hole 5aa corresponding thereto, the transmission rod 4 is in insertion fit with the irregularly shaped hole 5aa, and the transmission rod 4 and the rotating part 5a transfer power through matched shapes.

[0028] In the foregoing structure, a first through hole 2a for allowing the transmission rod 4 or the rotating shaft 3a to pass through and a first notch 2c for allowing the bottom of the driving mechanism 3 to be exposed are arranged on the middle beam 2.

[0029] In the foregoing structure, a drainage channel 1b is arranged on a first ring beam 1, and a second through hole 1ba for allowing the transmission rod 4 to pass through and a second notch 1bb for allowing the lower end of the rotating part 5a to be exposed are arranged on the drainage channel 1b.

[0030] Further, the louver board fixing seats 6 are further provided with rotation support portions 6b, a set of first articulating portions 5ca are arranged along the length direction of the linkage bars 5c, and the louver board rotating parts 7 comprise second articulating portion parts 7a used for articulating the rotation support portions 6b, as well as second articulating portions 7c used for articulating the first articulating portions 5ca.

[0031] During work, the driving mechanism 3 drives the rotating shaft 3a to rotate, the rotating shaft 3a drives the transmission rod 4 to rotate, the transmission rod 4 drives the louver transmission mechanism to rotate, the louver transmission mechanism drives the linkage bars 5c to move, the linkage bars 5c drive the louver board rotating parts 7 to rotate with the louver board fixing seats 6 as fulcrums, and the louver board rotating parts 7 drive the louver boards 8 to flip to achieve the opening and closure of the louver boards 8.

[0032] The present invention has the following features:

1) The driving mechanism is mounted on the middle beam, synchronously drives the two ends of the louver boards to realize complete closure of the louver, makes the power transfer more balanced and can avoid distortion of the louver boards;

2) The louver board fixing seats are fixed on the first ring beams and the middle beam in a buckle manner, and meanwhile, the louver boards are also mounted on the louver board rotating parts in a buckle manner. This buckle structure can make the assembly of the tent with a center-driven long louver canopy opening and closing structure more convenient. During transportation, the mounting components and the louver boards can be disassembled. After the customer receives them, the customer can assemble them easily without assistance.

[0033] Further description on feature 1): It is designed that the driving mechanism is mounted on the middle beam and drives the louver transmission mechanism on the two sides by means of the transmission rod to open and close the louver boards. As the driving mechanism is on the middle beam, the errors and torsions after conduction to the two sides are similar, thereby achieving synchronous motions on the two sides.

[0034] Further description on feature 2): It is designed that the louver board fixing seats are snap-fit and assembled with the first ring beams and the middle beam, which simplifies the assembly method of the louver boards, and reduces labor costs and material costs.

[0035] Lastly, it should be noted that the foregoing embodiments are intended to describe and not to limit the technical solutions of the present invention. Although the present invention has been elaborated by referring to the foregoing embodiments, those of ordinary skills in the art should understand that can they still modify the technical solutions of the foregoing embodiments, or equivalently

replace some or all of the technical features therein, and such modifications or replacements will not result in essential departure of the corresponding technical solutions from the scope of the technical solutions of the embodiments of the present invention.

Claims

1. A tent with a center-driven long louver canopy opening and closing structure, wherein the tent comprises:

   a tent frame, the tent frame comprising first ring beams (1) located on the left end and the right end of the tent frame, respectively and a middle beam (2) located between the two first ring beams (1);
   a louver board set, the louver board set comprising a set of louver boards (8) arranged in a row, two ends of each louver board (8) being mounted and fit with the two first ring beams (1) through a set of provided first mounting components, the middle part of the each louver board being mounted and fit with the middle beam (2) through a set of provided second mounting components, the mounting components including louver board fixing seats (6) and louver board rotating parts (7), one end of each louver board fixing seat (6) being snap-fit with the corresponding first ring beam (1) or middle beam (2), the other end being fit with a louver board rotating part (7) in an articulated manner, and the louver board rotating parts (7) being snap-fit with the corresponding louver boards (8);
   linkage bars (5c), the linkage bars (5c) being articulated with the louver board rotating parts (7) and used for driving the louver boards (8) to open and close through the mounting components;
   a louver transmission mechanism, the louver transmission mechanism being used for driving the linkage bars (5c) to move;
   a transmission rod (4), the transmission rod (4) being used for driving the louver transmission mechanism to rotate; and
   a driving mechanism (3), the driving mechanism (3) being mounted and fit on the middle beam (2) and used for driving the transmission rod (4) to rotate.

2. The tent with a center-driven long louver canopy opening and closing structure according to claim 1, wherein one of the first ring beams (1) and the louver board fixing seats (6) is provided with slots, and the other is provided with insertion portions (6a) used for insertion fit with the corresponding slots.

3. The tent with a center-driven long louver canopy opening and closing structure according to claim 1, wherein one of the middle beam (2) and the louver board fixing seats (6) is provided with slots, and the other is provided with insertion portions (6a) used for insertion fit with the corresponding slots.

4. The tent with a center-driven long louver canopy opening and closing structure according to claim 2 or 3, wherein a groove is arranged on one of the inner wall of each slot and the outer wall of each insertion portion (6a), and a back tooth (6aa) used for snap-fit with the groove is arranged on the other.

5. The tent with a center-driven long louver canopy opening and closing structure according to claim 1, wherein each louver board (8) comprises a first buckle portion, and each louver board rotating part (7) comprises a second buckle portion used for snap-fit with the first buckle portion of the corresponding louver board (8).

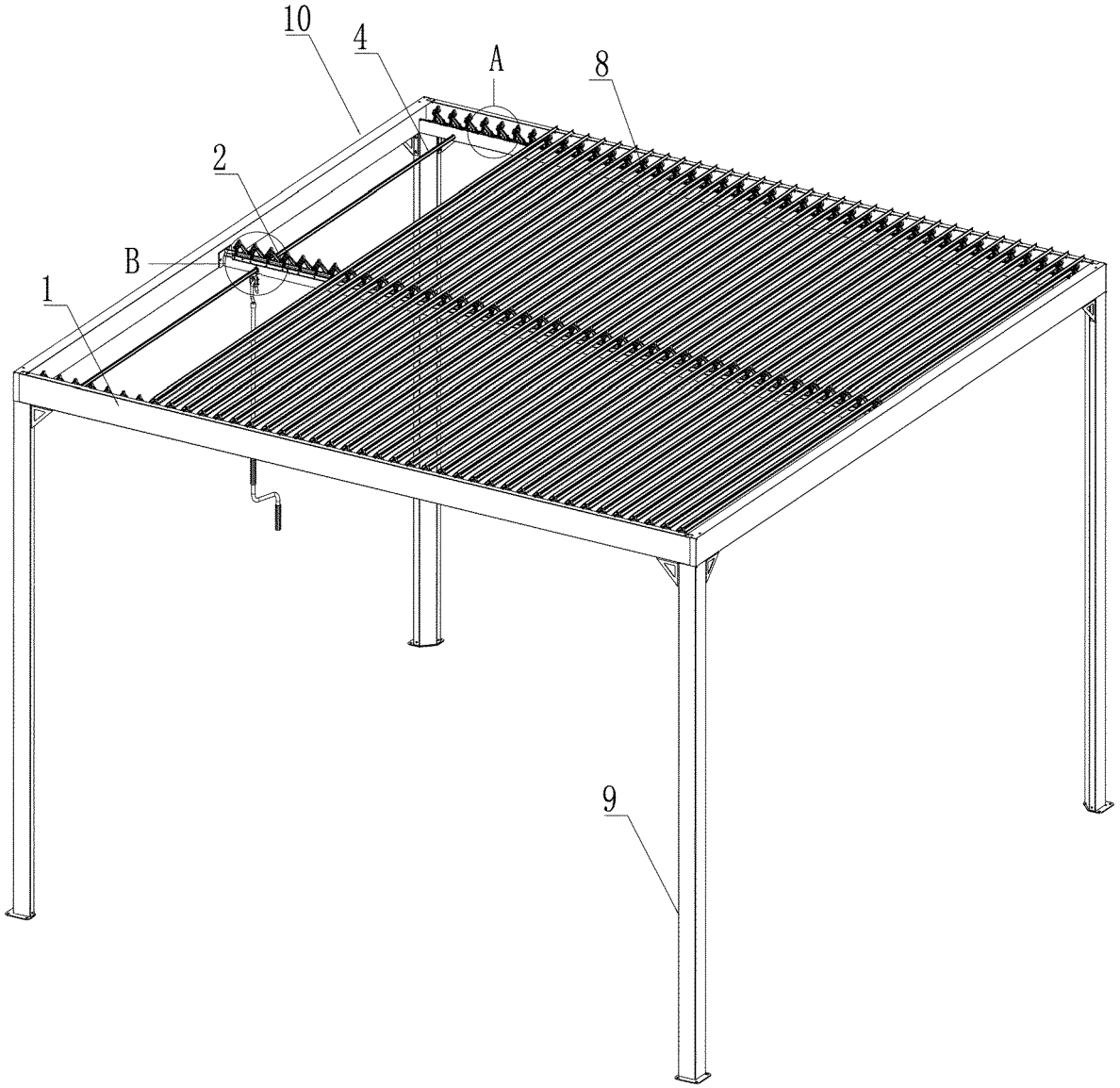
6. The tent with a center-driven long louver canopy opening and closing structure according to claim 5, wherein the first buckle portion comprises a buckle rib (8a) and a buckle insertion bar (8b), and the second buckle portion comprises a buckle groove (7b) used for snap-fit with the buckle rib (8a) and a buckle slot (7d) used for insertion and snap-fit with the buckle insertion bar (8b).

7. The tent with a center-driven long louver canopy opening and closing structure according to claim 1, 2, 3, 5 or 6, wherein the front end of each louver board fixing seat (6) is provided with a third buckle portion (6c), the rear end is provided with a fourth buckle portion (6d), and adjacent louver board fixing seats (6) are snap-fit through the third buckle portion (6c) and the fourth buckle portion (6d).

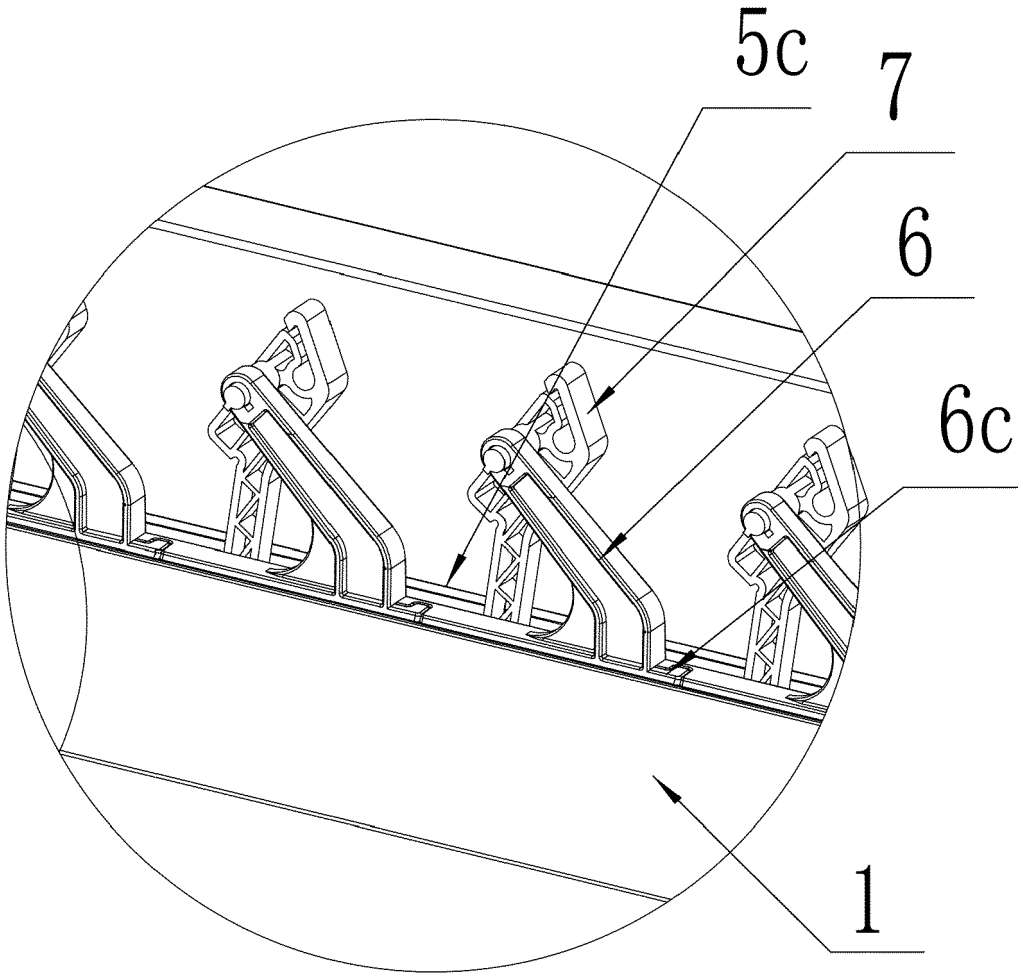
8. The tent with a center-driven long louver canopy opening and closing structure according to claim 1, 2, 3, 5 or 6, wherein the louver transmission mechanism comprises a rotating part (5a) and a transmission part (5b), one end of the rotating part (5a) is in transmission fit with the transmission rod (4), the other end is articulated with the transmission part (5b), and the transmission part (5b) is articulated with the linkage bars (5c).

9. The tent with a center-driven long louver canopy opening and closing structure according to claim 8, wherein the driving mechanism (3) is in transmission fit with a rotating shaft (3a), each of the two sides of the rotating shaft (3a) is in transmission and insertion fit with a transmission rod (4), and the transmission rod (4) is in transmission and insertion fit with the corresponding rotating part (5a).

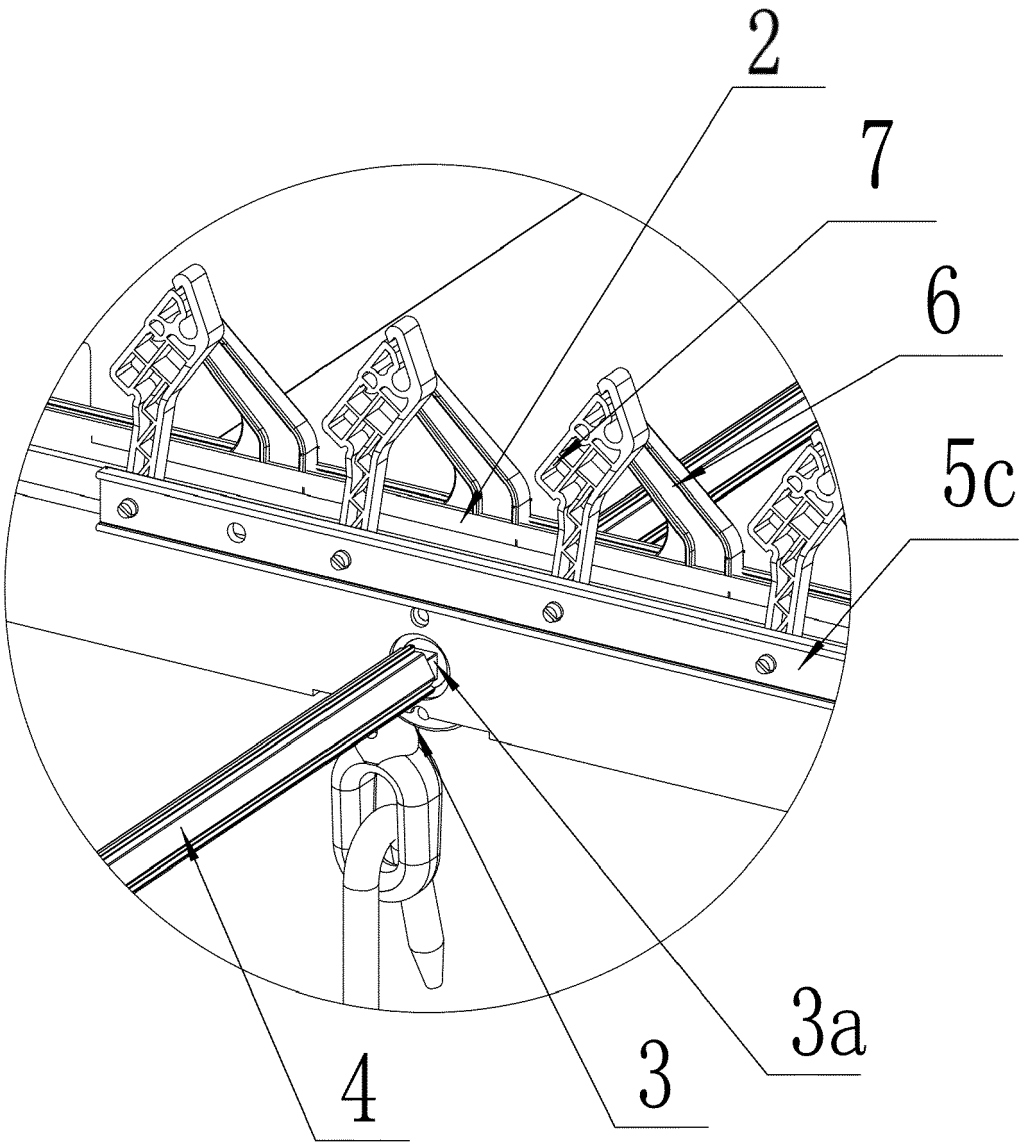
10. The tent with a center-driven long louver canopy opening and closing structure according to claim 9, wherein a first through hole (2a) for allowing the transmission rod (4) or the rotating shaft (3a) to pass through and a first notch (2c) for allowing the bottom of the driving mechanism (3) to be exposed are arranged on the middle beam (2), a drainage channel (1b) is arranged on a first ring beam (1), and a second through hole (1ba) for allowing the transmission rod (4) to pass through and a second notch (1bb) for allowing the lower end of the rotating part (5a) to be exposed are arranged on the drainage channel (1b).



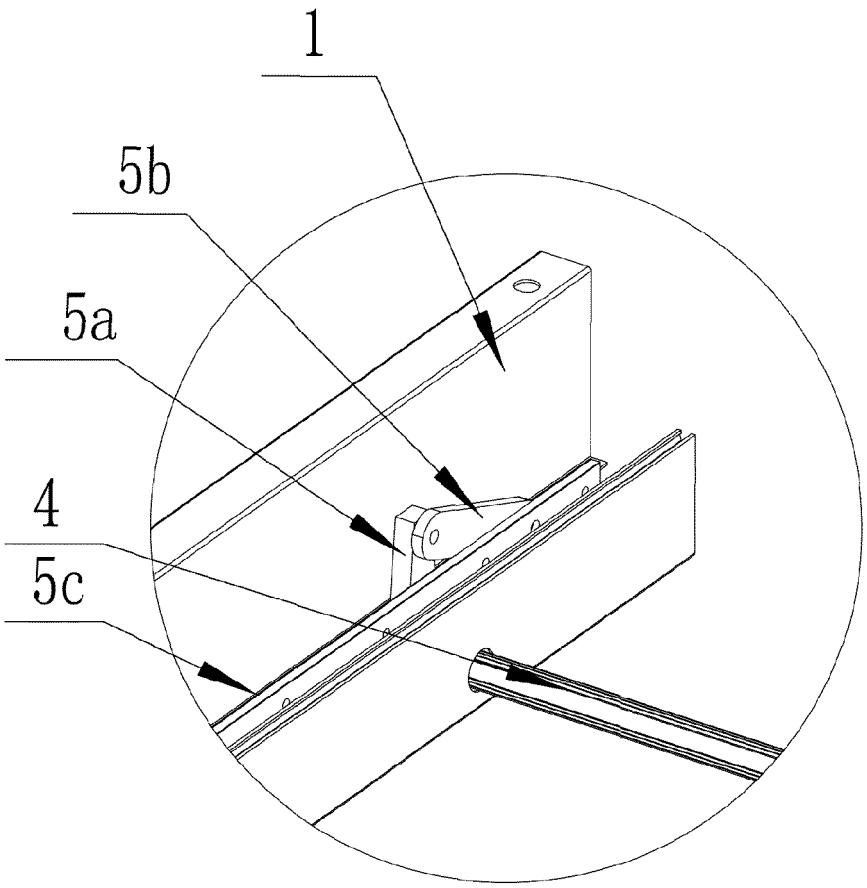
[Figure No.] Fig. 1



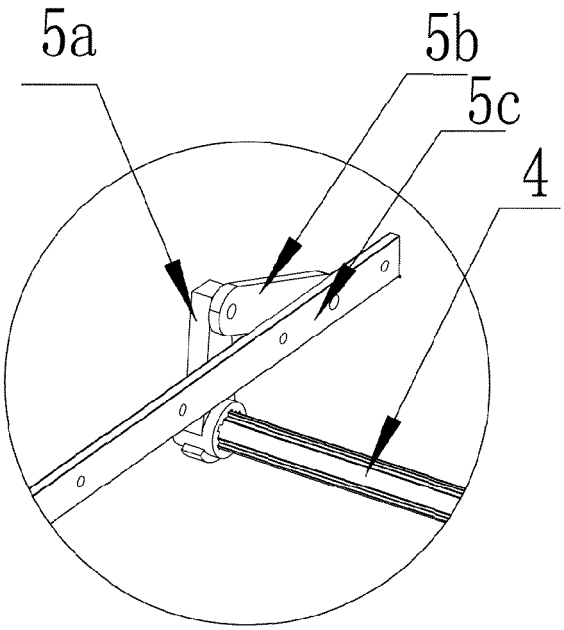
[Figure No.] Fig. 2



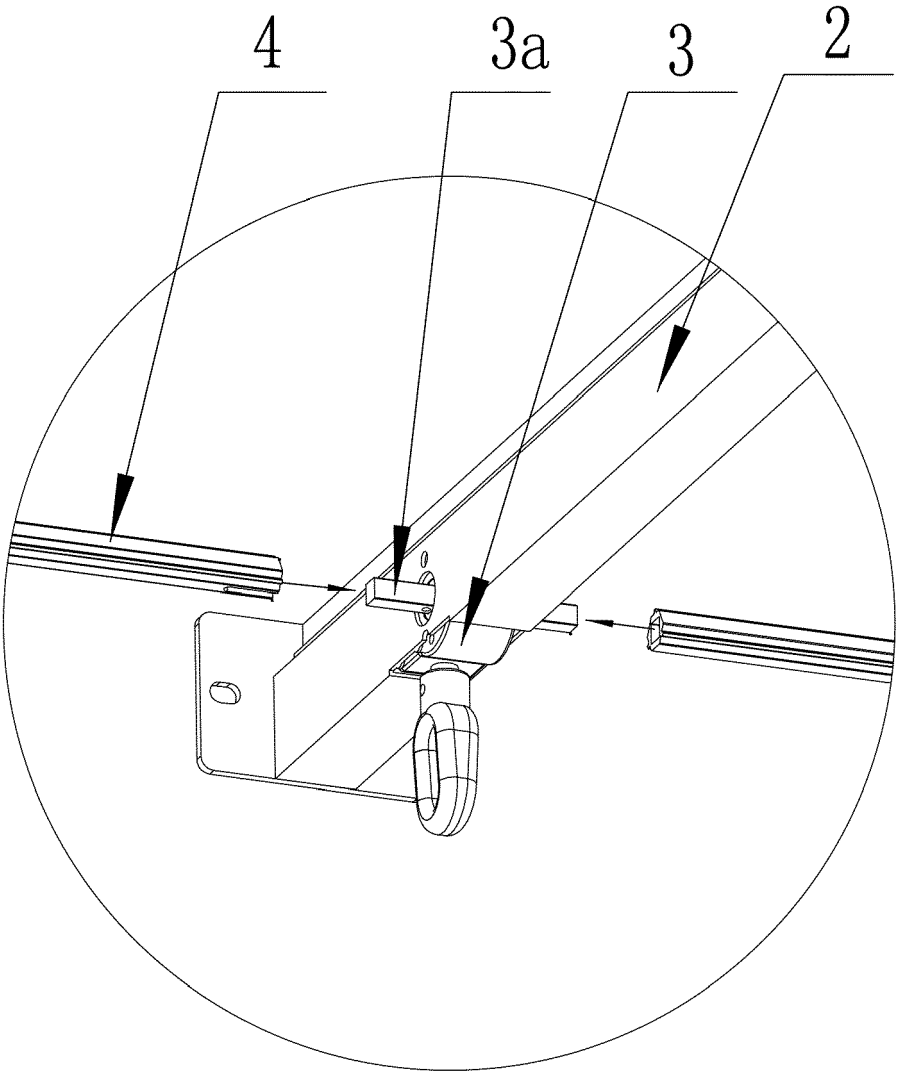
[Figure No.] Fig. 3



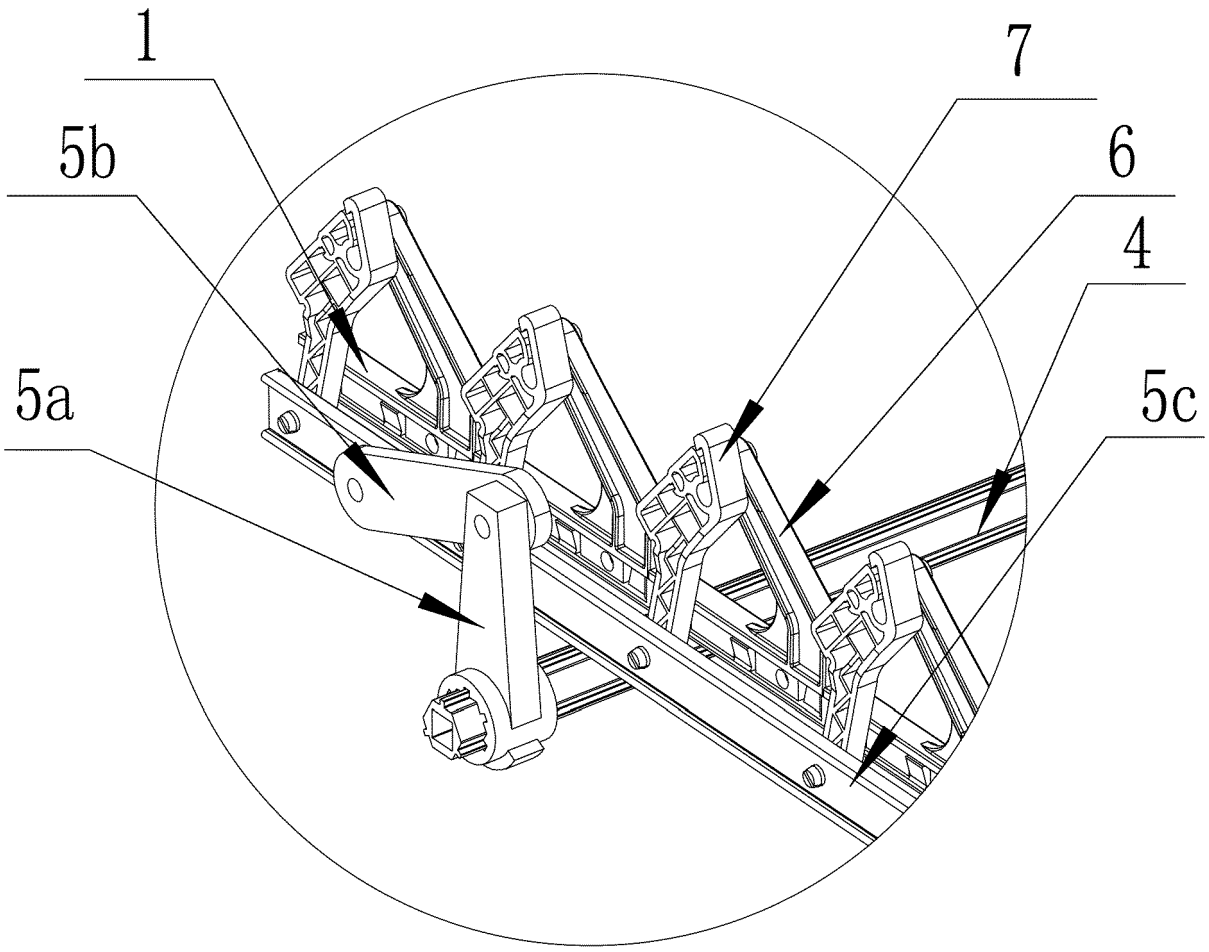
[Figure No.] Fig. 4



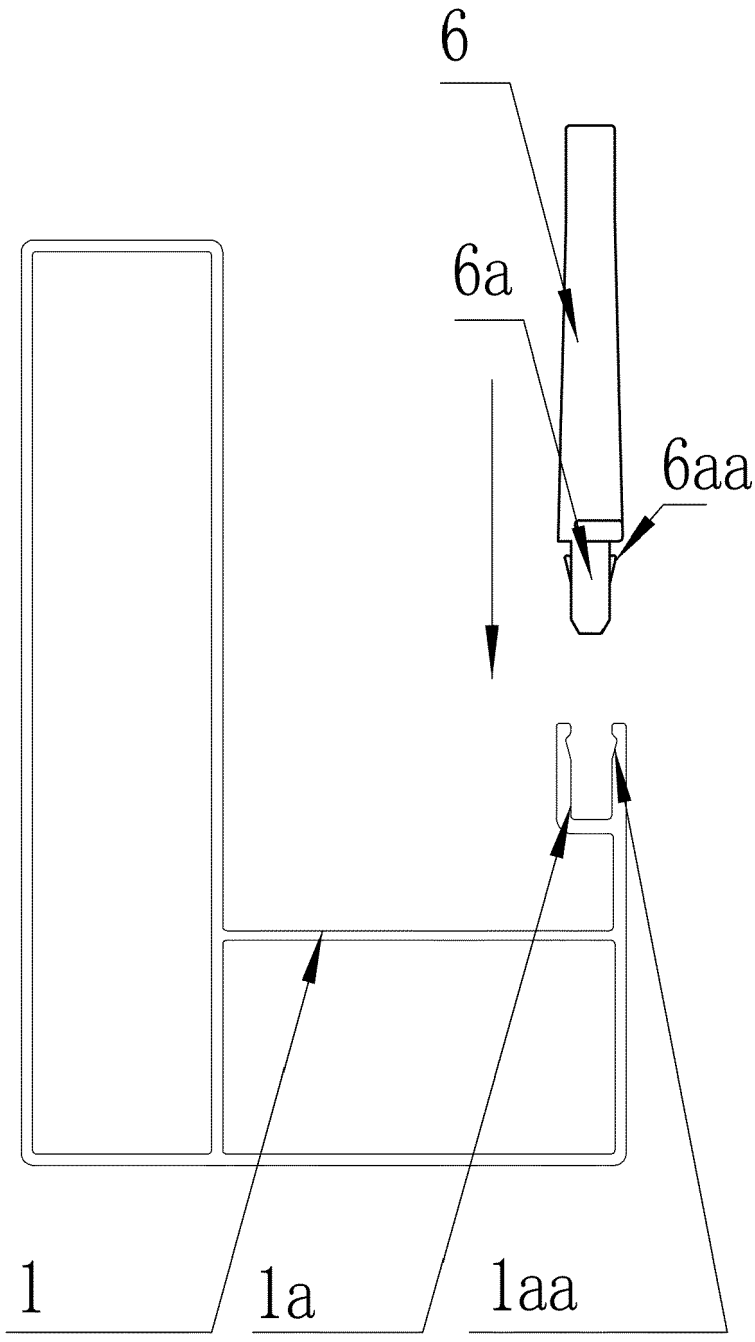
[Figure No.] Fig. 5



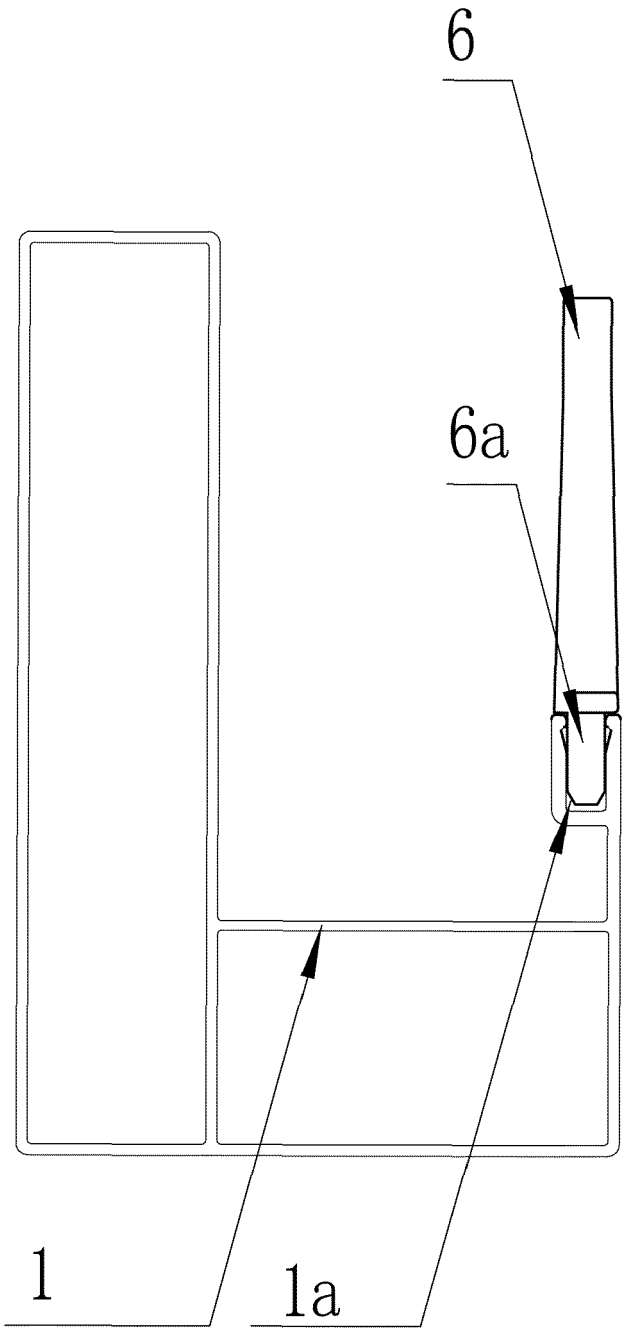
[Figure No.] Fig. 6



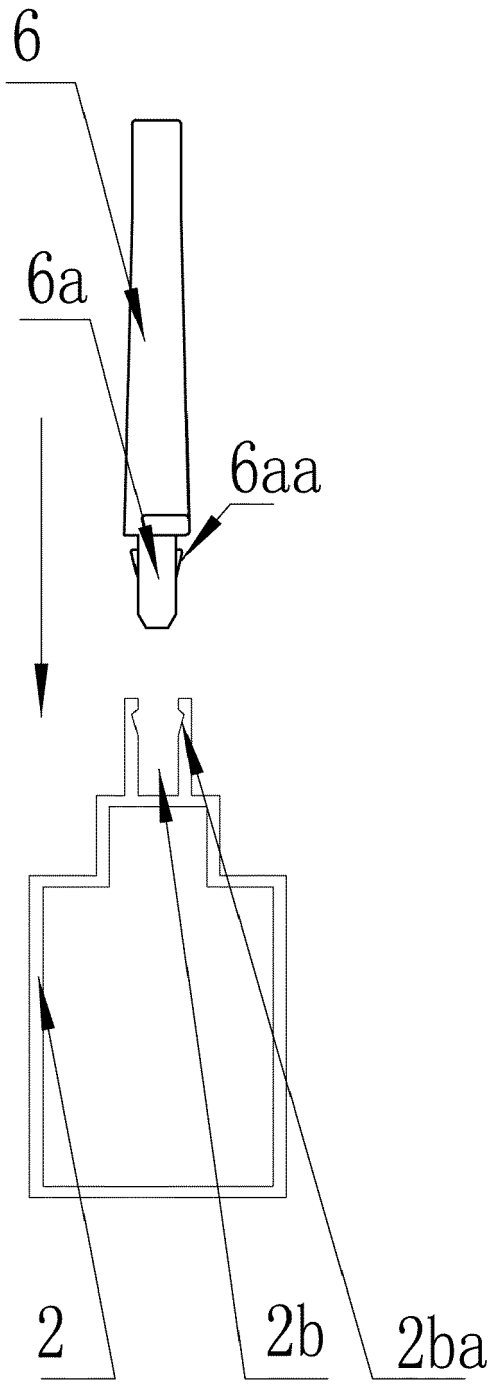
[Figure No.] Fig. 7



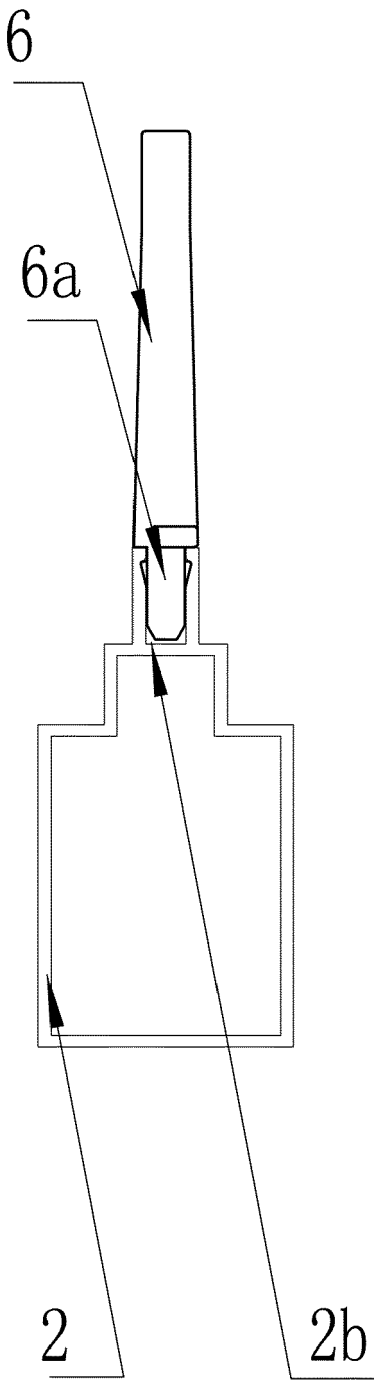
[Figure No.] Fig. 8



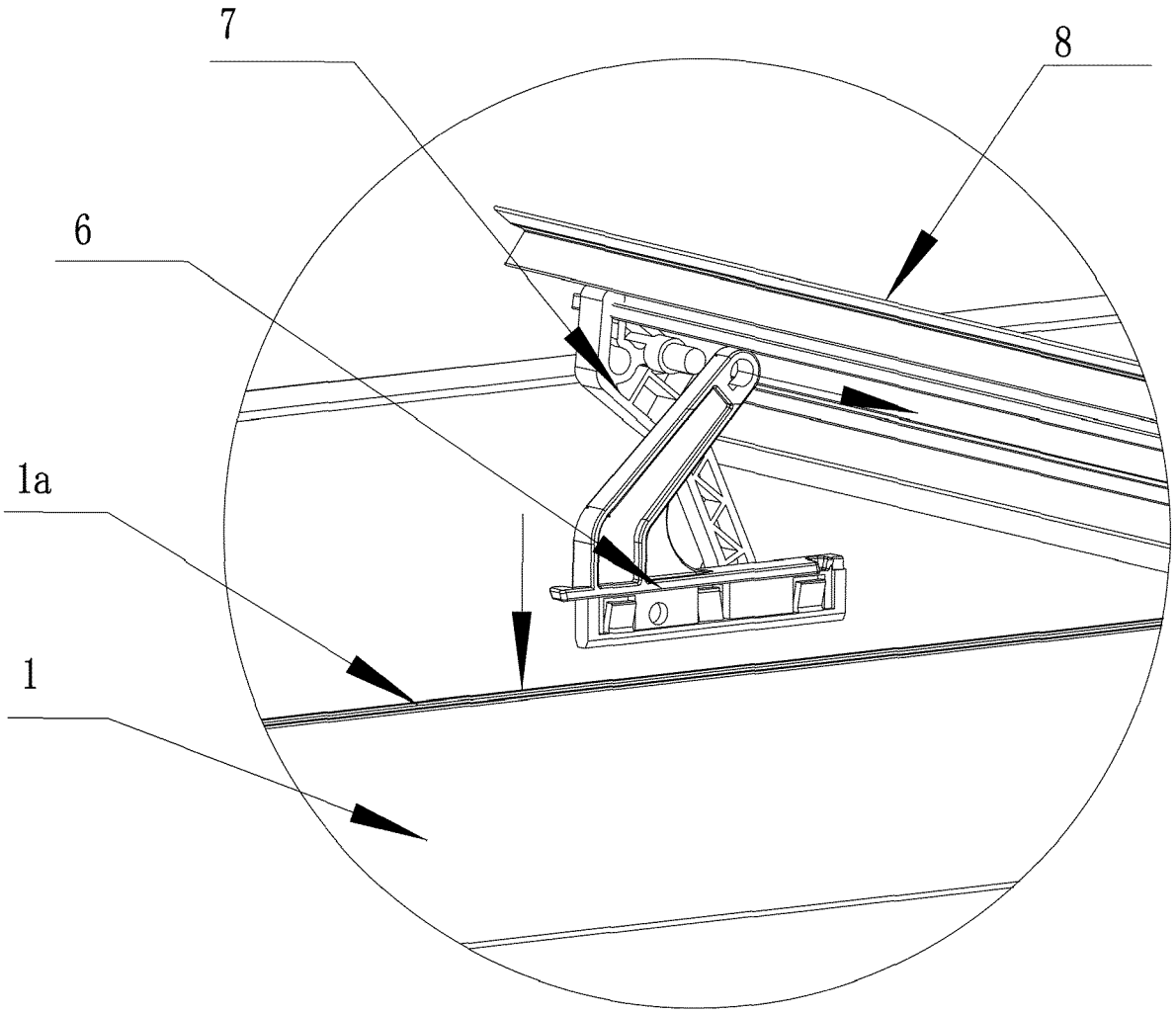
[Figure No.] Fig. 9



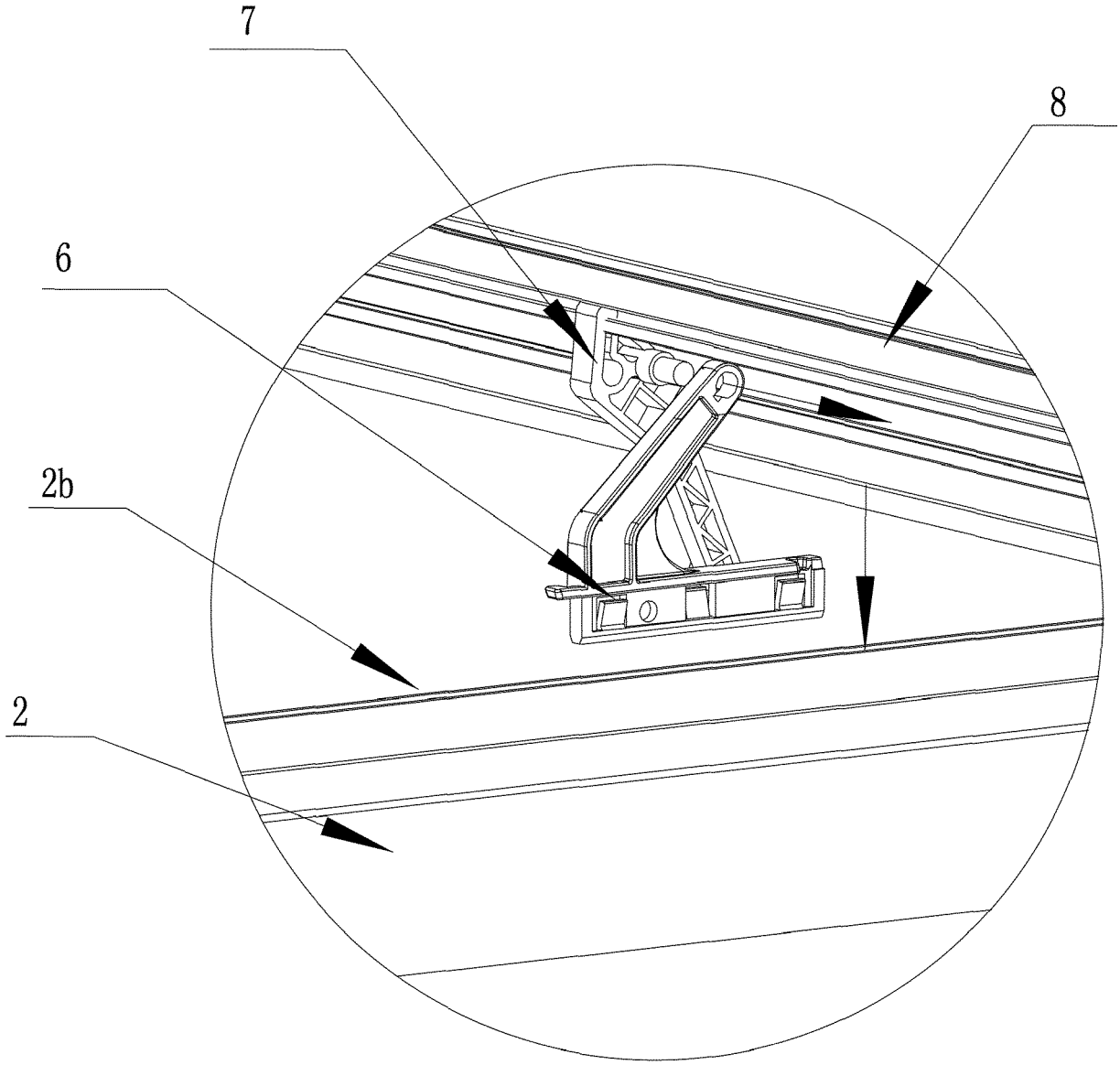
[Figure No.] Fig. 10



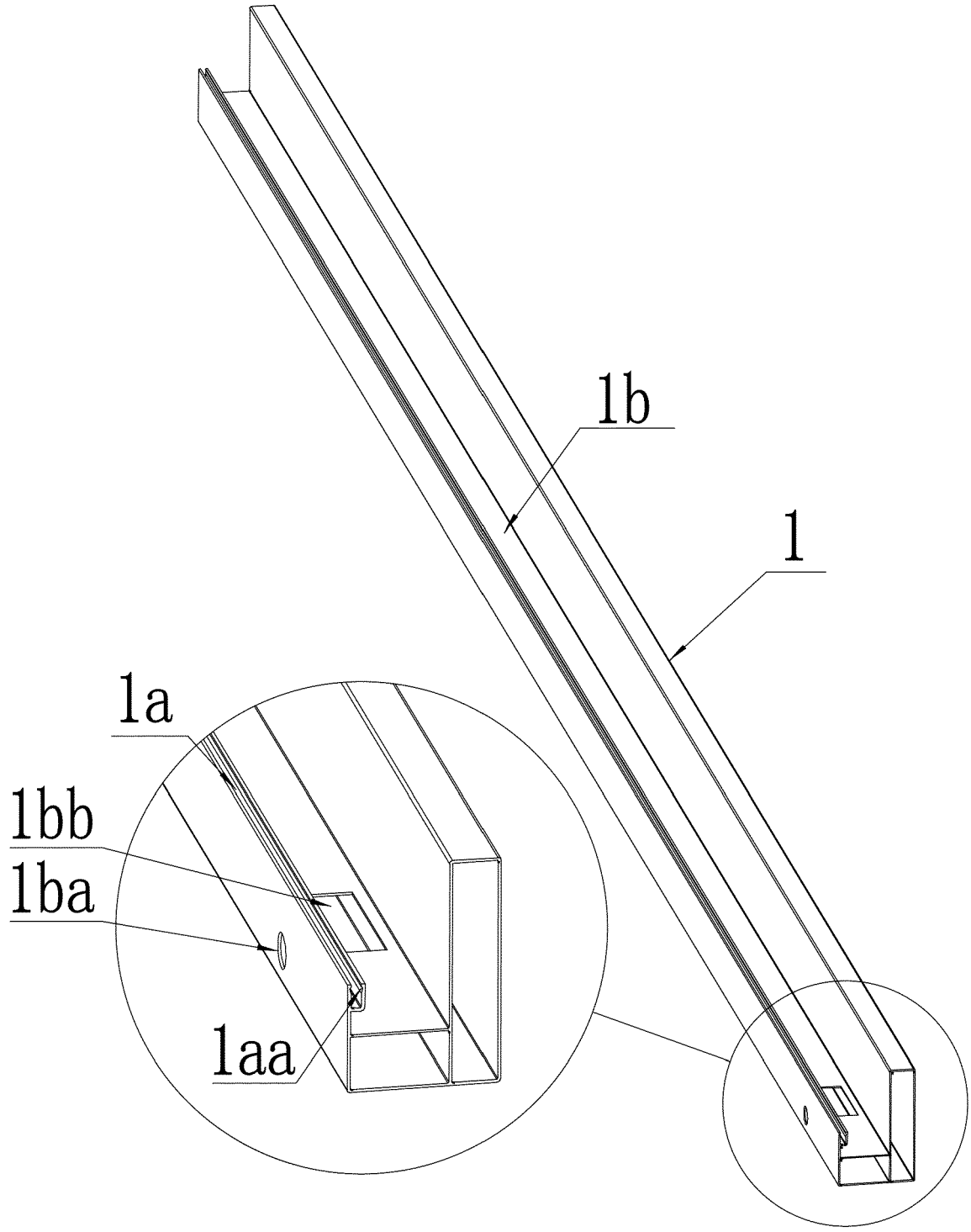
[Figure No.] Fig. 11



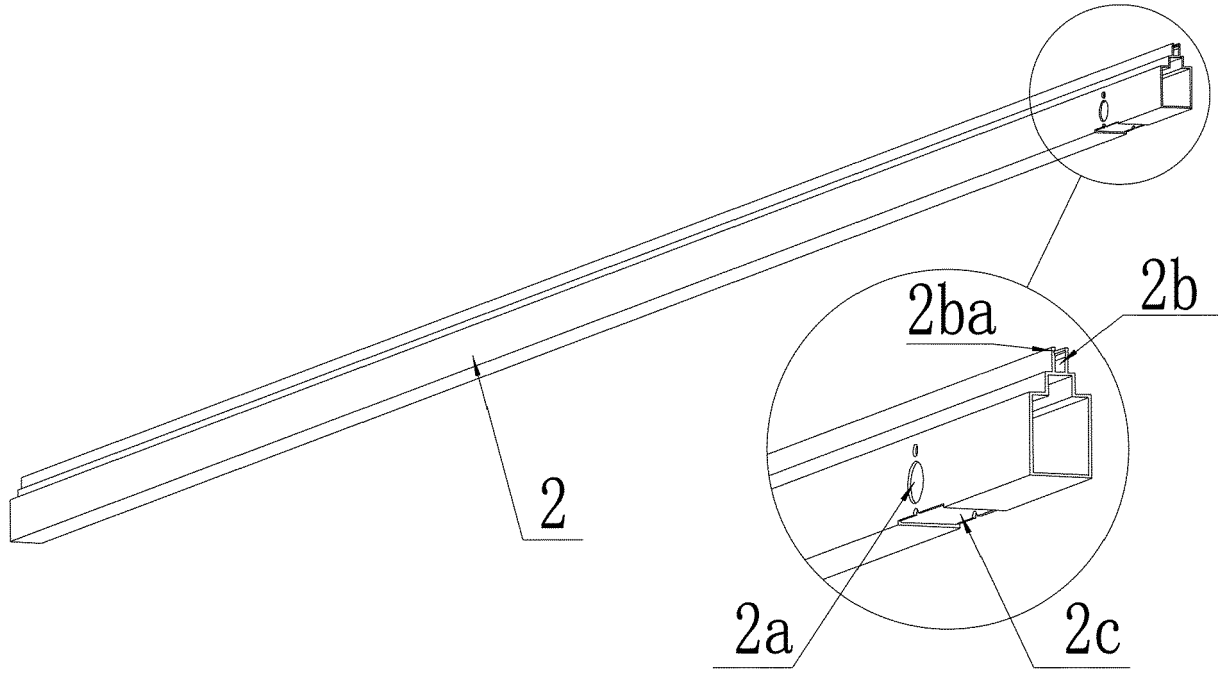
[Figure No.] Fig. 12



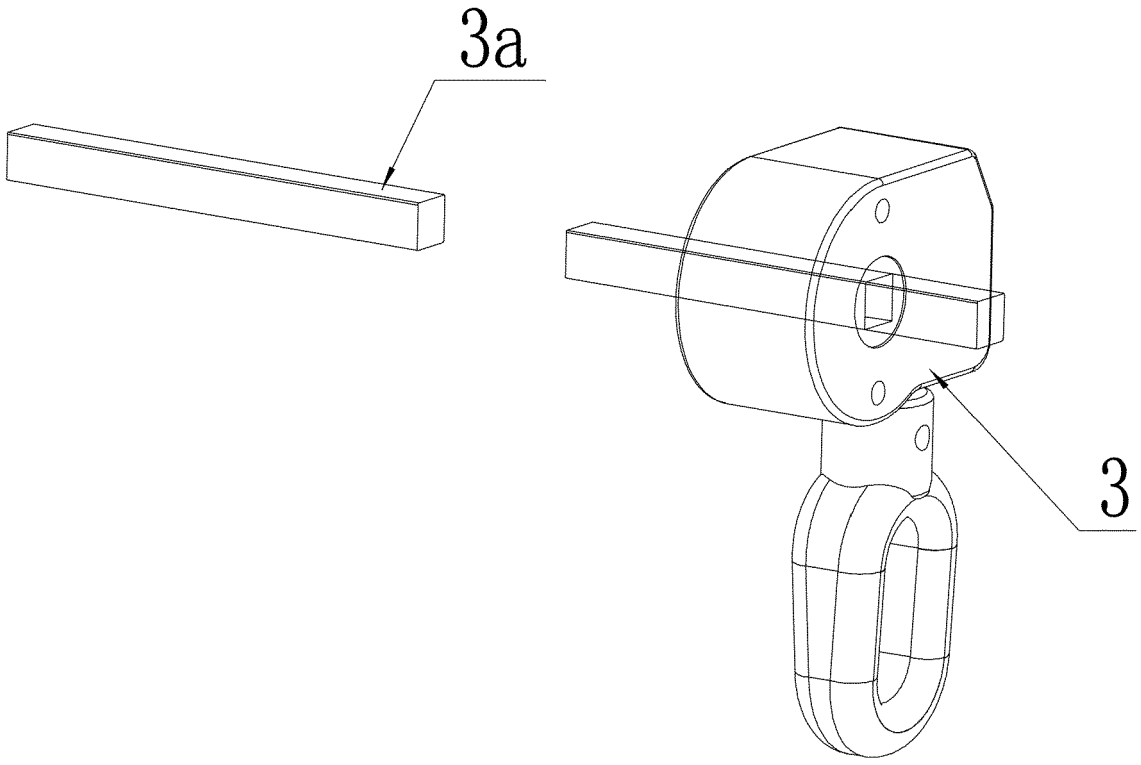
[Figure No.] Fig. 13



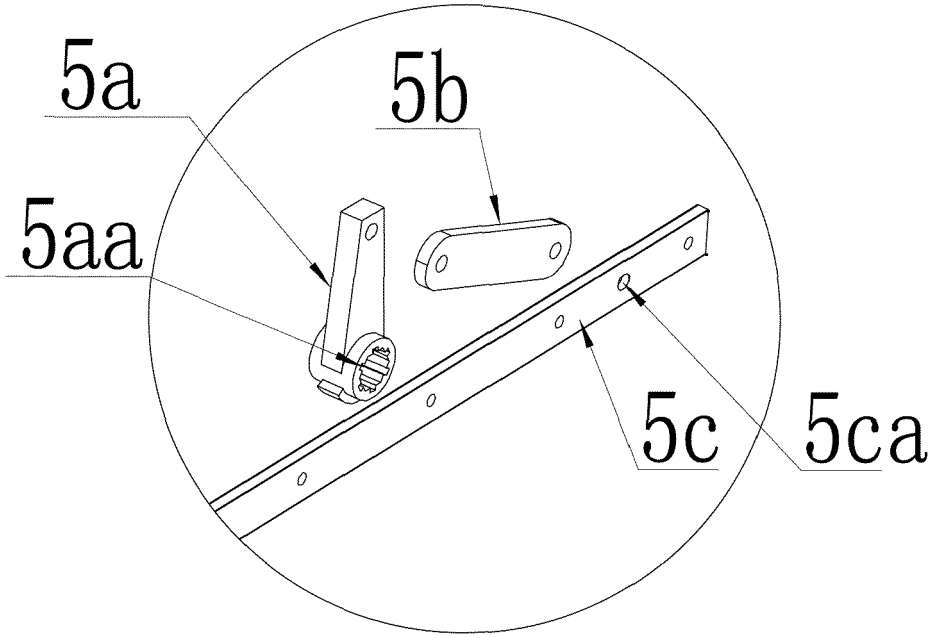
[Figure No.] Fig. 14



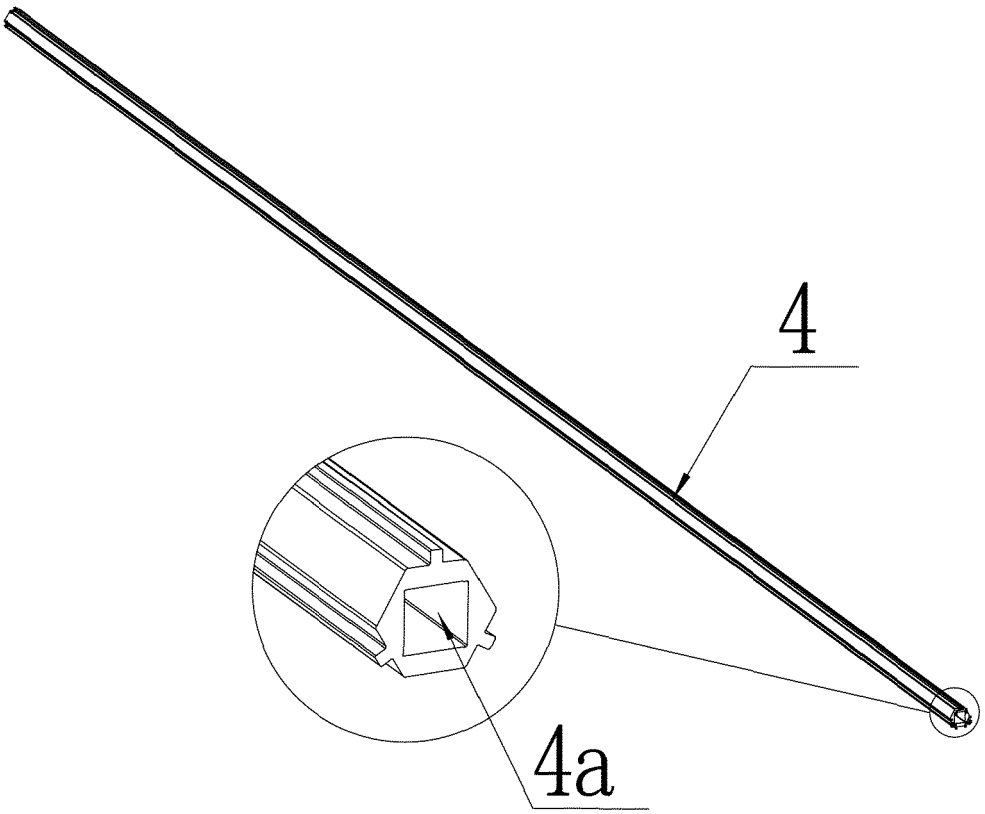
[Figure No.] Fig. 15



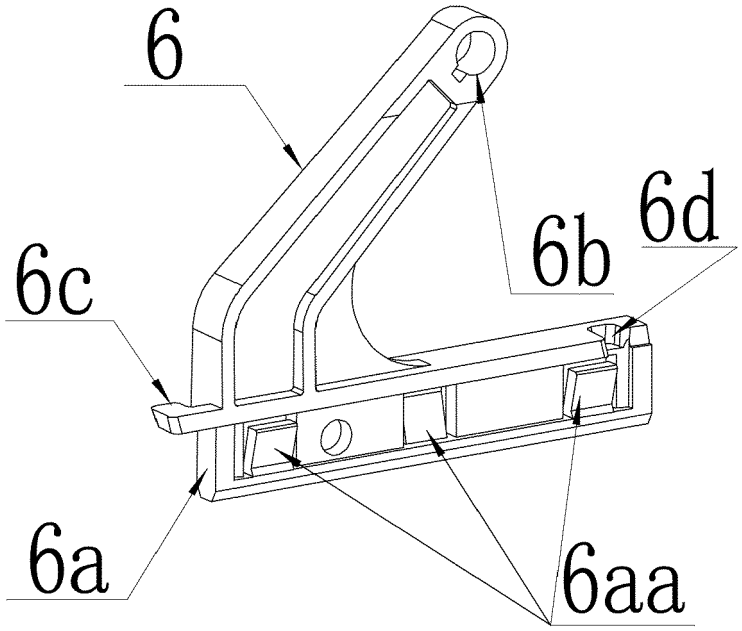
[Figure No.] Fig. 16



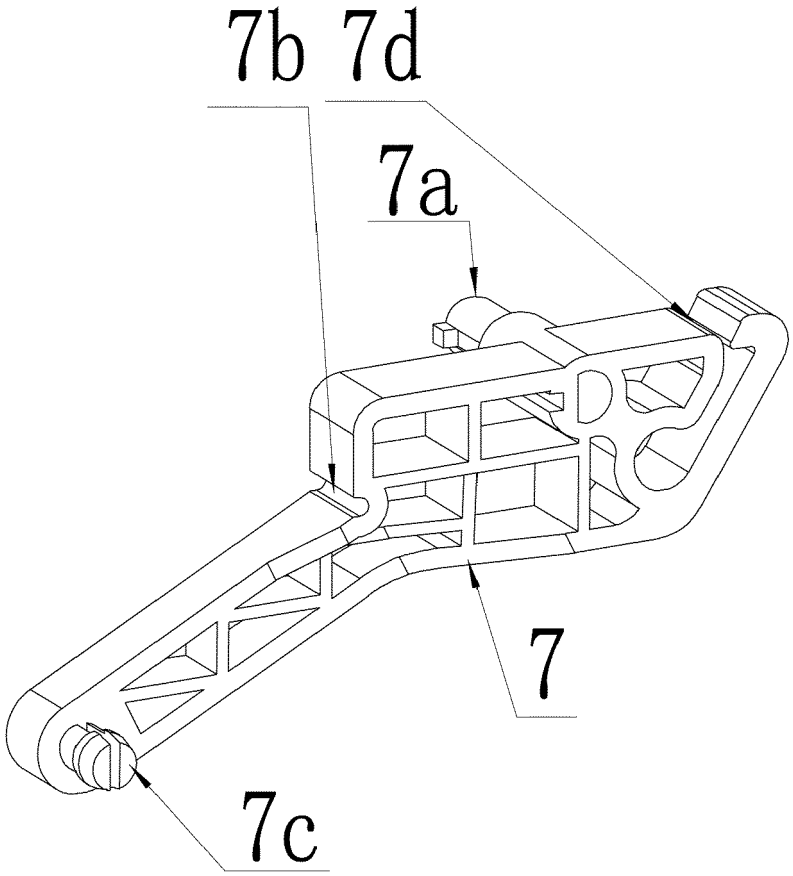
[Figure No.] Fig. 17



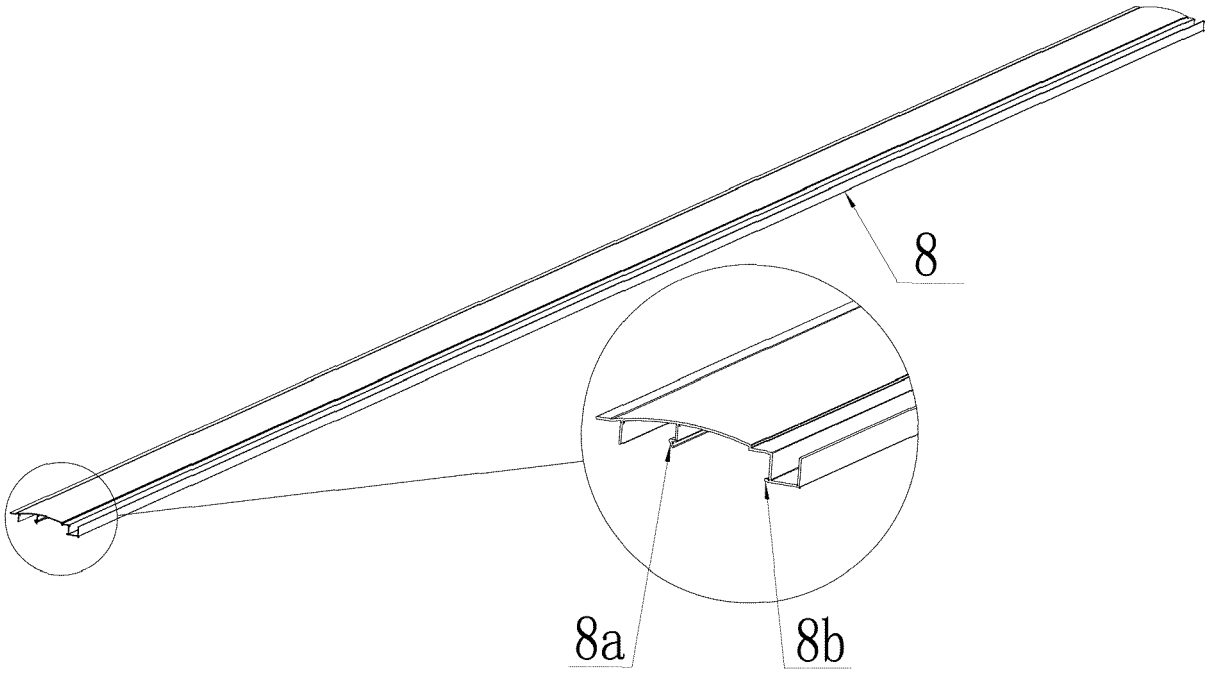
[Figure No.] Fig. 18



[Figure No.] Fig. 19



[Figure No.] Fig. 20



[Figure No.] Fig. 21

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Application Number
EP 21 17 8651

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	22 November 2021	Tänzler, Ansgar

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