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JOINT MECHANISM AND CHILD SAFETY SEAT

ABSTRACT

5

A joint structure includes: a fixing part, which is connected to a first object, and has a cylindrical fixing part side wall having an open end and a receiving end provided opposite to each other; an inserting part, which is connected to a second object, has a cylindrical inserting part side wall, and is inserted and sleeved into the fixing part side wall along an insertion direction through the open end; a closing member, which is provided inside the fixing part side wall, positioned between the receiving end of the fixing part and the inserting part, and is movable between the open end and the receiving end, the closing member has a closing plate adjacent to the open end and is shaped corresponding to a cross-sectional shape of the fixing part side wall at the open end; a first elastic member, which exerts a force that biases the closing member toward the open end, wherein when the inserting part is not inserted into the fixing part, the closing member is biased to the open end by the first elastic member; and when the inserting part is inserted into the fixing part, the closing member is pushed to the receiving end by the inserting part and thus disengaged from the open end.

(Fig. 4B)

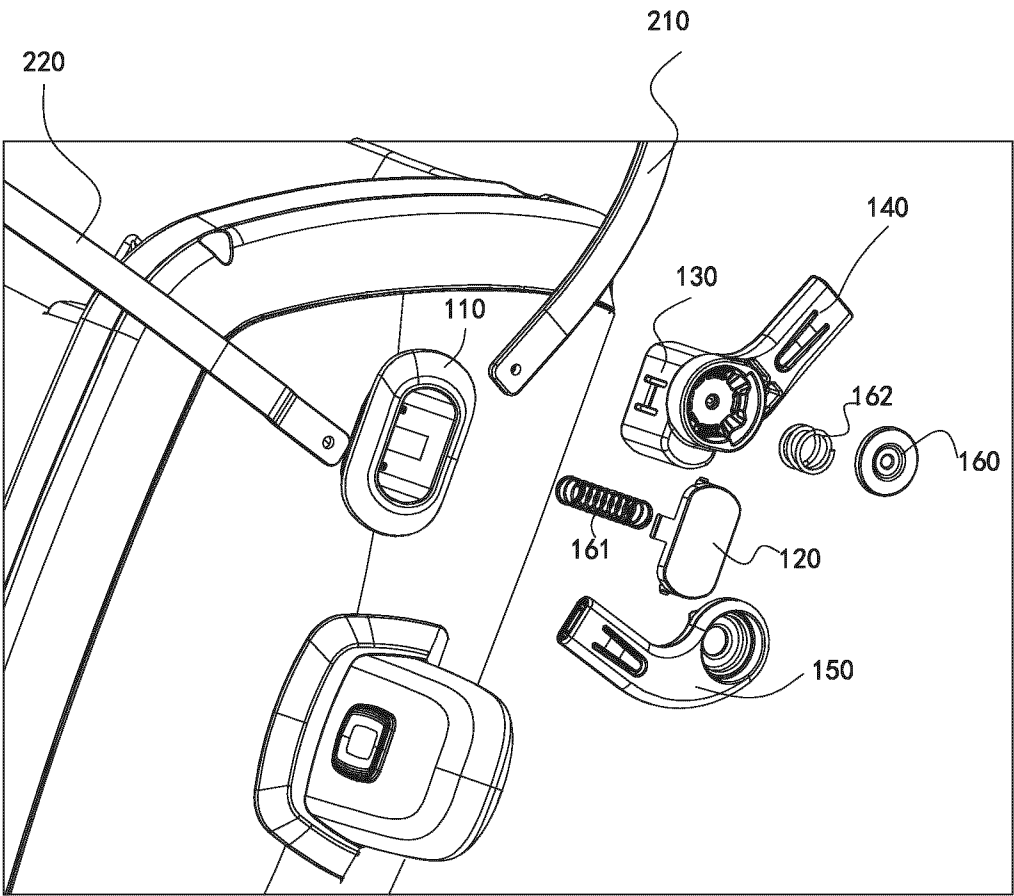


FIG. 4B

JOINT MECHANISM AND CHILD SAFETY SEAT

The present application is a divisional of Australian Patent Application No 2022351379, which is a national phase entry of International Patent Application
5 No. PCT/EP2022/076386, which claims the benefit of and priority to Chinese Patent Application No. 202111108106.X, the entire contents of each are incorporated herein by reference.

TECHNICAL FIELD

10 This disclosure relates to a joint mechanism and a child safety seat with the joint mechanism.

BACKGROUND

15 A child safety seat is a conventional device, in which children at different ages are allowed to sit. The child safety seat is designed for consideration of safety of the child in a vehicle, to restrain dangerous behaviors of the child during travelling and protect the child from being injured in the case of an accident such as a sudden collision.

20 The child safety seat in the prior art is generally not provided with a canopy, which is detrimental to use the child safety seat for example in a top-opened vehicle or outdoors. Even for child safety seat with a canopy, the canopy is usually designed to be fixed to the seat, and thus is not convenient to be removed.

25 Any reference to or discussion of any document, act or item of knowledge in this specification is included solely for the purpose of providing a context for the present invention. It is not suggested or represented that any of these matters or any combination thereof formed at the priority date part of the common general knowledge, or was known to be relevant to an attempt to solve any problem with which this specification is concerned.

SUMMARY

According to a first aspect, the present disclosure provides a joint structure, comprising: an inserting part; a fixing part having an open end for the inserting part to be inserted into the fixing part; and a closing member accommodated in the fixing part and movable within the fixing part; wherein when the inserting part is not inserted into the fixing part, the closing member closes the open end; wherein when the inserting part is inserted into and connected to the fixing part, the closing member moves away from the open end and is positioned between the fixing part and the inserting part.

According to a second aspect, the present disclosure provides a joint structure, comprising: a fixing part; an inserting part inserted into and connected to the fixing part; a closing member positioned between the fixing part and the inserting part and movably connected to the fixing part; and a first elastic member positioned between the fixing part and the closing member, the first elastic member exerting a force that biases the closing member toward the inserting part.

According to a third aspect, the present disclosure provides a child safety seat, comprising: a seat body; a canopy; and the joint structure according to the second aspect, wherein the fixing part is connected to the seat body, and the inserting part is connected to the canopy.

According to a fourth aspect, the present disclosure provides a joint structure, comprising: a fixing part having an open end; a closing member closing the open end and movably connected to the fixing part; and a first elastic member positioned between the fixing part and the closing member, the first elastic member exerting a biasing force on the closing member towards the open end.

According to an aspect, the present disclosure provides a joint structure according to the present disclosure for detachably joining a first object to a second object. The joint structure includes a fixing part connected to the first object, the fixing part having a cylindrical fixing part side wall, and the fixing part side wall

having an open end and a receiving end provided opposite to each other; an inserting part connected to said second object, the inserting part having a cylindrical inserting part side wall, and the inserting part being inserted and sleeved into the fixing part side wall along an insertion direction through the open end, such that the second object is jointed to the first object; a closing member provided inside the fixing part side wall, positioned between the receiving end of the fixing part and the inserting part, and being movable between the open end and the receiving end; the closing member having a closing plate adjacent to the open end, and the closing plate being shaped corresponding to a cross-sectional shape of the fixing part side wall at the open end; a first elastic member provided between the closing member and the receiving end, for exerting a force that bias the closing member toward the open end, such that the closing member elastically abuts against the inserting part; wherein when the inserting part is not inserted into the fixing part, the closing member is biased to the open end by the first elastic member; and when the inserting part is inserted into the fixing part, the closing member is pushed to the receiving end by the inserting part and leaves the open end.

In one embodiment, a stopper is provided on an inner side of the fixing part side wall, and is positioned between the open end and the receiving end and protrudes inwardly from the inner side of the fixing part side wall; a protruding part is provided on an outer side of the inserting part side wall, and protrudes outwardly from the outer side of the inserting part side wall; when the inserting part is inserted into the fixing part, the protruding part travels over the stopper and abuts against the stopper from a side adjacent to the receiving end, to prevent disengagement of the inserting part from the fixing part.

In one embodiment, the stopper is formed in a circle along an inner circumference of the fixing part side wall, or is symmetrically provided on the inner circumference of the fixing part side wall in a discrete manner.

In one embodiment, the closing member is provided with a barb that extends from the closing plate toward the receiving end and has a hook portion

protruding toward the fixing part side wall at a bottom end; and the barb is configured to abut against the stopper from the side adjacent to the receiving end to prevent the disengagement of the closing member from the fixing part when the closing member is biased to the open end by the first elastic member.

5 In one embodiment, a cross section of the fixing part side wall is substantially presented as a rectangle, and the stopper is provided on each of long sides and short sides of the rectangle; a plurality of protruding parts is provided on the inserting part side wall, and respectively correspond to the stoppers on the long sides and/or the short sides of the fixing part side wall; and
10 the closing member has a plurality of barbs that are configured to correspond to the stoppers on the long sides and/or the short sides of the fixing part side wall.

In one embodiment, the protruding part extends on the inserting part side wall in a direction perpendicular to the insertion direction, and a slot parallel to the insertion direction is provided on the inserting part side wall at either end of
15 the protruding part.

In one embodiment, the joint structure further includes a release button which is provided on the inserting part side wall and partially inserted in the inserting part; the release button is slidable between a locked position away from the inserting part and a release position close to the inserting part in a
20 direction perpendicular to the insertion direction of the inserting part, to selectively lock the inserting part to the fixing part.

In one embodiment, the release button includes: a pushing portion protruding outwardly at a side away from the fixing part and perpendicular to the insertion direction of the inserting part; a locking portion protruding outwardly at
25 a side away from the fixing part and perpendicular to the insertion direction of the inserting part, and is closer to the fixing part than the pushing portion; when the inserting part is inserted into the fixing part, the pushing portion remains outside the fixing part, and the locking portion is inserted into the fixing part and is snapped on an inner side of the stopper of the fixing part.

30 In one embodiment, the fixing part further has a fixing part edge that

extends outwardly from an edge of the open end of the fixing part side wall; when the inserting part is not inserted into the fixing part, a closing plate of the closing member is substantially flush with the fixing part edge.

In one embodiment, in the insertion direction of the inserting part, a sum of
5 lengths of the inserting part and the closing member is approximately equal to a length of the fixing part, such that the closing member abuts against the receiving end of the fixing part when the inserting part is inserted into the fixing part.

According to an aspect, the present disclosure provides a child safety seat
10 including a seat body; a canopy configured to join to an upper part of the seat body; the joint structure according to an aspect of the present disclosure, wherein the first object is the seat body and the second object is the canopy; the two joint structures are respectively provided on both sides of the seat body, and the receiving end of the fixing part is embedded into the seat body from a corresponding side surface of the seat body, and the open end of the fixing part is
15 exposed out of a corresponding side surface of the seat body.

In one embodiment, the canopy includes a first canopy rod and a second canopy rod that are substantially U-shaped, the joint structure includes a first canopy rod fixing member and a second canopy rod fixing member, wherein the
20 first canopy rod fixing member is fixed on the inserting part, and the second canopy rod fixing member is pivotally connected to the first canopy rod fixing member; two ends of the first canopy rod are fixedly connected to the corresponding first canopy rod fixing members of the two joint structures, respectively; and two ends of the second canopy rod are fixedly connected to the corresponding second canopy rod fixing members of the two joint structures,
25 respectively, so that the second canopy rod is rotatable about an axis parallel to the insertion direction of the inserting part with respect to the first canopy rod.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the present disclosure will be specifically described below
30 in conjunction with accompanying drawings, in which:

Fig. 1 is a perspective view showing a child safety seat according to the present disclosure, in which a state that a canopy rod is engaged to a seat body is shown;

Fig. 2 is a perspective view showing a child safety seat according to the present disclosure, in which a state that the canopy rod is separated from the seat body is shown;

Fig. 3 shows a perspective view of a canopy of the child safety seat according to the present disclosure;

Fig. 4A shows a perspective view of a child safety seat according to the present disclosure, in which a joint structure is shown in an exploded view;

Fig. 4B is an enlarged view of a block portion of Fig. 4A;

Fig. 5A is a perspective view of a child safety seat according to the present disclosure from another angle, in which the joint structure is shown in an exploded view;

Fig. 5B is an enlarged view of a block portion of Fig. 5A;

Figs. 6A and 6B are two perspective views of a closing member viewed from different angles, respectively;

Figs. 7A and 7B are two perspective views of a inserting part and a first canopy rod fixing member viewed from different angles, respectively;

Figs. 8A and 8B are two perspective views of a second canopy rod fixing member viewed from different angles, respectively;

Fig. 9A is a cross-sectional view taken along line A-A in Fig. 1;

Fig. 9B is a partial enlarged view of the block portion in Fig. 9A;

Fig. 10A is a cross-sectional view taken along line B-B in Fig. 2;

Fig. 10B is a partial enlarged view of a block portion in Fig. 10A;

Fig. 11A is a perspective view of another embodiment of a joint structure according to the present disclosure;

Fig. 11B is a partial enlarged view of a block portion of Fig. 11A;

Fig. 11C is a perspective view of a closing member and a inserting part on an opposite side of the block portion in Fig. 11A;

Fig. 12A is a perspective view of a joint structure and a canopy rod in Fig. 11A, in which the canopy rod is in an open state;

Figs. 12B and 12C are partial enlarged views of upper and lower blocks in Fig. 12A, respectively;

Fig. 13A is a perspective view of the joint structure and the canopy rod in Fig. 11A, in which the canopy rod is in a closed state;

Figs. 13B and 13C are partial enlarged views of upper and lower blocks in Fig. 13A, respectively;

Fig. 14A is a cross-sectional view taken along line C-C of Fig. 11A, from which the seat body is omitted;

Figs. 14B and 14C are partial enlarged views of upper and lower blocks in Fig. 14A, respectively.

The list of reference numerals is as follows:

100 JOINT STRUCTURE

110 FIXING PART

111 FIXING PART EDGE

112 FIXING PART SIDE WALL

1121 OPEN END

1122 RECEIVING END

114 STOPPER

120 CLOSING MEMBER

121 CLOSING PLATE

122 BARB

130 INSERTING PART

131 INSERTING PART SIDE WALL

132 PROTRUDING PART

133 SLOT

134 LIMITING PORTION

140 FIRST CANOPY ROD FIXING MEMBER

141 FIRST DISC-SHAPED PART

5

142 FIRST CANOPY ROD CONNECTION

143 RECEIVING SPACE

144 POSITIONING GROOVE

150 SECOND CANOPY ROD FIXING MEMBER

151 SECOND DISC-SHAPED PART

152 SECOND CANOPY ROD CONNECTION

153 ROTATING PART

154 POSITIONING PROTRUSION

155 THROUGH HOLE

10

160 CAP

161 FIRST ELASTIC MEMBER

162 SECOND ELASTIC MEMBER

163 THIRD ELASTIC MEMBER

170 RELEASE BUTTON

15

171 PUSHING PORTION

172 LOCKING PORTION

173 RELEASE BUTTON ELASTIC MEMBER MOUNT

200 CANOPY

210 FIRST CANOPY ROD

20

220 SECOND CANOPY ROD

300 SEAT BODY

310 PROTECTION BLOCK

301 CASING

302 HEADREST PORTION

25

303 BACKREST PORTION

304 SEAT PORTION

305 RECEIVING CHAMBER

DETAILED DESCRIPTION

30

The present disclosure is illustrated and described herein with reference to

specific embodiments, the present disclosure should not be limiting portioned to the details as illustrated. More specifically, various modifications may be made to these details within equivalents of the claims but without departing from the present disclosure.

5 The descriptions of directions such as “front”, “rear”, “up” and “down” involved herein are merely for the convenience of understanding, and the present invention is not limiting portioned thereto, and can be adjusted according to actual situations. The present disclosure has been described in the typical embodiments as listed, the terms in use are exemplary and explanatory but not
10 restrictive of the invention as claimed.

Referring to Fig. 1 to Fig. 3, a child safety seat according to the present disclosure is generally described. The child safety seat includes a seat body 300 that has a casing 301, a headrest portion 302, a backrest portion 303 and a seat portion 304. In addition, in this embodiment, a receiving chamber 305 is further
15 provided on either side of the seat body 300 (see Fig. 4A). The receiving chambers 305 are preferably positioned on the casing 301 with respect to an upper edge of the headrest portion 302. In other embodiments, the receiving chamber 305 may also be positioned between positions of the casing 301 corresponding to the upper edge of the headrest portion 302 and an upper edge
20 of the casing 301.

In other embodiments, a side impact protection block 310 is provided on either side of the seat body 300. In these embodiments, the receiving chambers 305 are positioned between the side impact protection blocks 310 and the upper edge of the casing 301, and the present disclosure is not limiting portioned
25 thereto.

The child safety seat as disclosed in this embodiment further includes a canopy 200 and a joint structure 100 connecting the seat body 300 and the canopy 200. The canopy 200 has a canopy rod detachably joined to left and right sides of the seat body 300 through the joint structure 100 of the present
30 disclosure. The joint structure 100 may be provided individually or

symmetrically on the left and right sides of the seat body 300. The joint structure 100 is divided into two parts, one of which is a fixing part 110 embedded in the receiving chamber 305, and the other of which is an inserting part 130 connected to the canopy rod.

For convenience of observation, only two canopy rods of the canopy 200 are shown, and a canopy cloth installed on the canopy rods is not shown. It should be noted that although the canopy of the embodiments as shown in the figures includes two canopy rods, that is a first canopy rod 210 and a second canopy rod 220, which may be rotated relative to each other to fold the canopy 200 (described in detail later), the joint structure 100 of the present disclosure is applicable to canopy rods at any numbers, and to foldable or non-foldable canopy structures. The joint structure 100 of the present disclosure includes a design that allows two canopy rods to rotate relative to each other. However, the design is not necessary, and can be varied according to types of the canopies.

Components of the joint structure 100 according to the present disclosure will be briefly described with reference to Figs. 4A-5B.

The joint structure 100 includes a fixing part 110, an inserting part 130, a closing member 120, a first canopy rod fixing member 140, a second canopy rod fixing member 150, a cap 160, a first elastic member 161, and a second elastic member 162. The fixing part 110 is embedded in the seat body 300. The inserting part 130 is connected to the canopy 200, and the inserting part 130 may be inserted into the fixing part 110 in order to assemble the canopy 200 to the seat body 300. The closing member 120 is positioned in the fixing part 110 for closing an opening of the fixing part 110 when the inserting part 130 is not inserted into the fixing part 110. The first canopy rod fixing member 140 and the second canopy rod fixing member 150 are connected to the inserting part 130, for connecting the first canopy rod 210 and the second canopy rod 220, respectively.

The specific mechanism of the fixing part 110 will be described with reference to Figs. 4B , 9B and 10B.

The fixing part 110 has a cylindrical fixing part side wall 112 that has an open end 1121 and a receiving end 1122 disposed opposite to each other. The cross section of the fixing part side wall 112 is a non-circular structure, for example, may be roughly presented in a rectangle having a pair of opposite sides that are arc-shaped edges. As such, when the inserting part 130 having a shape corresponding to that of the fixing part 110 is inserted into the fixing part 110, the rotation of the inserting part 130 in the fixing part 110 can be retrained. It should be understood that the cross-section of the fixing part side wall 112 may also be in other shapes, for example square, trapezoid, oval, and the like.

The fixing part 110 also has a fixing part edge 111 that extends outwardly from an edge of the open end 1121 of the fixing part side wall 112. The fixing part edge 111 is provided to facilitate fixing the fixing part 110 onto the seat body 300 and can modify an appearance of the fixing part 110. In one embodiment, the fixing part edge 111 extends in a flipped manner from the open end 1121 of the fixing part side wall 112 toward the receiving end 1122, to facilitate fixing the fixing part 110 to the seat body 300, and forming a good transition and engagement between the fixing part 110 and the seat body 300.

A direction from the open end 1121 of the fixing part side wall 112 to the receiving end 1122 is referred as an insertion direction. In this insertion direction, the cross-section of the fixing part side wall 112 is substantially uniform. A stopper 114 is provided on an inner side of the fixing part side wall 112, and is located between the open end 1121 and the receiving end 1122 and protrudes inwardly from the inner side of the fixing part side wall 112. The stopper 114 may be close to the open end 1121, for example, a distance from the stopper 114 to the open end 1121 in the insertion direction is approximately 1/2 to 1/3 of a total length of the fixing part 110.

The specific structure of the closing member 120 will be described with reference to Figs. 6A-6B.

The closing member 120 is a member that is positioned inside the fixing part side wall 112 and is movable between the open end 1121 and the receiving

end 1122. The closing member 120 has a closing plate 121 at a position adjacent to the open end 1121, and a shape of the closing plate 121 corresponds to the cross-sectional shape of the fixing part side wall 112 at the open end 1121. In the embodiments as shown in Figs. 6A-6B, the closing member 120 is generally plate-shaped. However, it should be understood that the closing member 120 can be in any suitable shapes, such as a block shape and a cone shape, as long as the closing plate 121 suitable for closing the open end 1121 is provided.

In one embodiment, the closing member 120 is provided with a barb 122 that extends from the closing plate 121 toward the receiving end 1122 and has a hook portion protruding toward the fixing part side wall 112 at an bottom end. The barb 122 is adapted to snap onto the stopper 114 of the fixing part side wall 112. When the closing member 120 is biased by the first elastic member 161 to the open end 1121, the barb 122 abuts against the stopper 114 from a side adjacent to the receiving end 1122 to prevent the disengagement of the closing member 120 from the fixing part 110. In one embodiment, the closing member 120 has a plurality of barbs 122 that are provided to correspond to the stoppers 114 on long and/or short sides of the fixing part side wall 112, respectively. In other embodiments, the closing member 120 may be blocked and positioned in other manners, for example, the cross section of the open end 1121 is configured to be smaller than that of the closing plate 121 to prevent the disengagement of the closing member 120 from the fixing part 110.

The specific structures of the inserting part 130 and the first canopy rod fixing member 140 will be described with reference to Figs. 7A-7B.

It should be understood that the inserting part 130 in the present disclosure is assembled to the first canopy rod fixing member 140, the inserting part 130 of the present disclosure may be applied to different objects.

The inserting part 130 has a cylindrical inserting part side wall 131 so that the inserting part 130 can be inserted and sleeved into the fixing part side wall 112 through the open end 1121 along an insertion direction. A protruding part 132 is provided on an outer side of the inserting part side wall 131, and

protrudes outwardly from the outer side of the inserting part side wall 131. When the inserting part 130 is inserted into the fixing part 110, the protruding part 132 travels over the stopper 114 and abuts against the stopper 114 from a side adjacent to the receiving end 1122 to prevent the disengagement of the inserting part 130 from the fixing part 110.

In one embodiment, the inserting part side wall 131 has a plurality of protruding parts 132 that respectively correspond to the stoppers 114 on the long and/or short sides of the fixing part side wall 112. This design allows all sides of the inserting part 130 to be locked in the fixing part 110, thereby increasing stability of the canopy 200.

In one embodiment, the protruding part 132 extends on the inserting part side wall 131 along a direction perpendicular to the insertion direction, and slots 133 parallel to the insertion direction are provided on the inserting part side wall 131 at both ends of the protruding part 132 respectively. Such design allows the protruding part 132 to be depressed by virtue of elastic deformation, to travel over the stopper 114 easily during the insertion of the inserting part 130. Moreover, when the user intends to pull out the inserting part 130, the protruding part 132 can disengage from the fixing part 110 by travelling over the stopper 114 only with minimal force exerted by the user.

It should be understood that the inserting part 130 may be fixed to the fixing part 110 by different ways, such as a snap fit, a friction fit, or the like, in other embodiments.

The first canopy rod fixing member 140 is attached to an outer surface of the inserting part 130 in the insertion direction. In this way, when the inserting part 130 is completely inserted into the fixing part 110, the first canopy rod fixing member 140 approaches a side surface of the seat body 300 and partially shields the joint structure 100, so that the entire joint structure 100 has a few to be exposed outside, and a neat appearance can be formed. In this embodiment, the first canopy rod fixing member 140 and the inserting part 130 are formed as one component. It should be understood that the first canopy rod fixing member

140 and the inserting part 130 may be respectively formed as separate components in other embodiments.

The first canopy rod fixing member 140 includes a first disc-shaped part 141 and a first canopy rod connection 142. The first disc-shaped part 141 is provided on a side of the inserting part 130. The first canopy rod connection 142 has one end that is connected to an outer circumference of the first disc-shaped part 141, and the other end that extends obliquely and upwardly toward the child safety seat and is connected to one end of the U-shaped first canopy rod 210. A center of the first disc-shaped part 141 is a hollow receiving space 143 for receiving at least part of the second canopy rod fixing member 150, the second elastic member 162, and the cap 160. A plurality of positioning grooves 144 are formed on a circumferential inner wall of the receiving space 143, for rotational positioning between the second canopy rod fixing member 150 and the first canopy rod fixing member 140.

The second canopy rod fixing member 150 will be described in detail with reference to Figs. 8A-8B.

The second canopy rod fixing member 150 includes a second disc-shaped part 151 and a second canopy connection 152. The second disc-shaped part is rotatably attached to the first canopy rod fixing member 140. The second canopy connection 152 has one end that is connected to an outer circumference of the second disc-shaped part 151, and the other end that extends obliquely and forwardly toward the child safety seat and is connected to one end of the U-shaped second canopy rod 220. A rotating part 153 is provided on a side of the second disc-shaped part 151 facing the first disc-shaped part 141, and the rotating part 153 has a size approximately corresponding to the receiving space 143 of the first disc-shaped part 141 so as to be rotatably received in the receiving space 143. A positioning protrusion 154 is provided on the outer circumference of the rotating part 153, and corresponds to the positioning groove 144 on the circumferential inner wall of the receiving space 143, so that the second canopy rod fixing member 150 can be positioned at several specific

angular positions with respect to the first canopy rod fixing member 140. A through hole 155 is opened in the center of the rotating part 153 so that a portion of the cap 160 is connected to the first canopy rod fixing member 140 through the through hole 155 of the second canopy rod fixing member 150 so as to form a rotational connection between the second canopy rod fixing member 150 and the first canopy rod fixing member 140.

A second elastic member 162, for example a torsion spring is provided between the second disc-shaped part 151 and the first disc-shaped part 141, and biases the first canopy rod fixing member 140 and the second canopy rod fixing member 150 to pivot toward a closing direction. The arrangement of the second elastic member 162 has been known in the art and will not be discussed here.

Specifically, the assembly of the child safety seat according to the present disclosure will be described with reference to Figs. 9A-10B.

In states as shown in Figs. 9A-9B, the inserting part 130 has been inserted into the fixing part 110. Meanwhile, the protruding part 132 on the outer wall of the inserting part 130 is engaged with the stopper 114 provided on the inner side of the fixing part 110 from one side adjacent to the receiving end 1122, so that the inserting part 130 is kept inside the fixing part 110. The closing member 120 is pressed by the inserting part 130, and moves to the vicinity of the receiving end 1122 on the fixing part side wall against a biasing force of the first elastic member 161. The first canopy rod fixing member 140 (and the first canopy rod 210 mounted thereon) approaches the side surface of the seat body 300.

In states as shown in Figs. 10A-10B, the inserting part 130 has been pulled out of the fixing part 110, and the canopy rod has been removed accordingly. Meanwhile, the closing member 120 is biased by the first elastic member 161 and moves to the open end 1121 of the fixing part 110. The barb 122 of the closing member 120 is engaged with the stopper 114 provided on the inner side of the fixing part 110 from the side adjacent to the receiving end 1122, so that the closing member 120 is kept inside the fixing part 110. The closing member 120 is sized that the closing plate 121 is just flush with the open end 1121 when

the barb 122 is engaged with the stopper 114. In this way, the closing plate 121 closes the open end 1121 of the fixing part side wall 112.

Another embodiment of the joint structure according to the present disclosure will be described with reference to Figs. 11A to 14C. This embodiment is substantially the same as the preceding embodiment, except that the joint structure also has a release button 170. A function of the release button 170 is to facilitate separating the inserting part 130 from the fixing part 110.

The release button 170 is provided on a side surface of the inserting part 130, and is partially inserted in the inserting part 130. More specifically, the release button 170 is slidable between a locked position away from the inserting part 130 and a release position close to the inserting part 130 in a generally up-down direction (i.e., perpendicular to the insertion direction of the inserting part 130).

The release button 170 is provided with a pushing portion 171 and a locking portion 172 on a side thereof away from the inserting part 130. The pushing portion 171 and the locking portion 172 are exposed outside the inserting part 130, both of which protrude outwardly in a direction perpendicular to the insertion direction of the inserting part 130, and the locking portion 172 is closer to the fixing part 110 than the pushing portion 171. A release button elastic member mount 173 is provided on a side of the release button 170 toward the inserting part 130. The third elastic member 163 in a form of a spring has one end that is fixed on the release button elastic member mount 173, and the other end that abuts against the inside of the inserting part 130, to bias the release button 170 against the locked position. A limiting portion 134 is also provided in the inserting part 130 to prevent the movement and the disengagement of the release button 170 from the inserting part 130.

In this way, when the inserting part 130 is inserted into the fixing part 110, the pushing portion 171 remains outside the fixing part 110, and the locking portion 172 is inserted into the fixing part 110 and is snapped on the inner side of the edge of the fixing part 110. Therefore, the release button 170 can hold the

inserting part 130 in the fixing part 110. When the user intends to release the fixing part 110, the inserting part 130 can be easily separated from the fixing part 110 only by pushing the pushing portion 171 toward the inserting part 130.

In the embodiment in which the release button 170 is provided, it is unnecessary to arrange the protruding part 132 and the slot 133 on the inserting part 130.

As above described, the present disclosure provides a joint structure 100, which can easily engage the seat body 300 of the child safety seat with the canopy 200, and in which significant holes are not presented when the canopy 200 is removed. According to the joint structure 100 of the present disclosure, regardless of installing the canopy 200, the child safety seat can be provided with a generally neat appearance. Moreover, the joint structure 100 of the present disclosure is not limiting portioned to be applied to a child safety seat, and can also be used to join any two objects.

As the present disclosure may be embodied in a variety of forms without departing from the spirit or scope of the present disclosure, it should be understood that the above-described embodiments are not limiting portioned to any foregoing details. All changes and modifications within the scope of the claims or their equivalents are intended to be embraced by the appended claims.

In this specification, the terms ‘comprises’, ‘comprising’, ‘includes’, ‘including’, or similar terms are intended to mean a non-exclusive inclusion, such that a method, system or apparatus that comprises a list of elements does not include those elements solely, but may well include other elements not listed.

WHAT IS CLAIMED IS:

1. A joint structure, comprising:
an inserting part;
5 a fixing part having an open end for the inserting part to be inserted into the fixing part; and
a closing member accommodated in the fixing part and movable within the fixing part;
wherein when the inserting part is not inserted into the fixing part, the
10 closing member closes the open end;
wherein when the inserting part is inserted into and connected to the fixing part, the closing member moves away from the open end and is positioned between the fixing part and the inserting part.

2. The joint structure according to claim 1, wherein:
the fixing part has a stopper protruding inwardly;
wherein when the inserting part is not inserted into the fixing part, the
closing member abuts against the stopper from a side thereof away from the open
end; and
20 wherein when the inserting part is inserted into and connected to the fixing part, the inserting part abuts against the stopper from the side away from the open end.

3. The joint structure according to claim 1 or claim 2, further comprising a
25 release button, wherein:
the fixing part has a stopper protruding inwardly;
the release button extends through the inserting part and protrudes outwardly,
and is movably connected to the inserting part to selectively lock the inserting part to the fixing part or release the inserting part from the fixing part;
30 wherein when the inserting part is not inserted into the fixing part, the

closing member abuts against the stopper from a side thereof away from the open end; and

wherein when the inserting part is inserted into and connected to the fixing part, the release button abuts against the stopper from the side away from the open end.

4. The joint structure according to claim 2, or claim 3 when appended to claim 2, wherein in an insertion direction of the inserting part, the stopper is spaced apart from the open end, and a distance between the stopper and the open end is approximately $1/2$ to $1/3$ of a total length of the fixing part.

5. The joint structure according to any one of claims 1-4, further comprising a first elastic member;

wherein the first elastic member is accommodated in the fixing part and positioned between the fixing part and the closing member, the first elastic member exerting a biasing force on the closing member towards the open end.

6. A joint structure, comprising:

a fixing part;

an inserting part inserted into and connected to the fixing part;

a closing member positioned between the fixing part and the inserting part and movably connected to the fixing part; and

a first elastic member positioned between the fixing part and the closing member, the first elastic member exerting a force that biases the closing member toward the inserting part.

7. The joint structure according to claim 6, wherein:

the fixing part has at least one stopper protruding inwardly and spaced apart from the closing member;

the inserting part has at least one protruding part protruding outwardly; and

the at least one protruding part abuts against the at least one stopper from a side thereof adjacent to the closing member.

8. The joint structure according to claim 7, wherein the inserting part is provided with slots parallel to an insertion direction of the inserting part, the slots being located at opposite ends of each of the at least one protruding part.

9. The joint structure according to claim 7 or claim 8, wherein:

the at least one stopper is formed in a circle along an inner circumference of the fixing part, or the at least one stopper is a plurality of protruding parts, the plurality of protruding parts are symmetrically provided on the inner circumference in a discrete manner; and

the at least one protruding part is a plurality of protruding parts, the plurality of protruding parts are provided on the inserting part at intervals, each of the protruding parts abutting against the at least one stopper from a side thereof adjacent to the closing member.

10. The joint structure according to any one of claims 6-9, wherein a cross-section of the fixing part in a direction perpendicular to an insertion direction of the inserting part and a corresponding cross-section of the inserting part are both non-circular structures and correspond to each other.

11. The joint structure according to any one of claims 6-10, further comprising a release button, wherein:

the fixing part is provided with a stopper protruding inwardly, the stopper being spaced apart from the closing member; and

the release button extends through the inserting part and protrudes outwardly, and is movably connected to the inserting part to selectively lock the inserting part to the fixing part or release the inserting part from the fixing part, and abuts against the stopper from a side thereof adjacent to the closing member.

12. The joint structure according to claim 11, wherein the release button is slidable relative to the inserting part in a direction intersecting with an insertion direction of the inserting part, so as to selectively abut against or not abut against the stopper.

13. The joint structure according to claim 11 or claim 12, wherein the release button comprises:

a pushing portion protruding outwardly from the inserting part and located outside the fixing part; and

a locking portion protruding outwardly from the inserting part, located inside the fixing part, and abutting against the stopper from a side thereof adjacent to the closing member.

14. A child safety seat, comprising:

a seat body;

a canopy; and

the joint structure according to any one of claims 6-13, wherein the fixing part is connected to the seat body, and the inserting part is connected to the canopy.

15. The child safety seat according to claim 14, wherein:

the canopy comprises a first canopy rod and a second canopy rod;

the joint structure further comprises a first canopy rod fixing member and a second canopy rod fixing member, wherein the first canopy rod fixing member is fixed on the inserting part, and the second canopy rod fixing member is pivotally connected to the first canopy rod fixing member;

the first canopy rod is connected to the first canopy rod fixing member;

the second canopy rod is connected to the second canopy rod fixing member,

such that the second canopy rod is rotatable relative to the first canopy rod.

16. The child safety seat according to claim 14 or claim 15, wherein:
wherein the fixing part has an open end for the inserting part to be inserted into the fixing part;

the fixing part further has a fixing part edge extending from the open end towards the seat body and abutting against the seat body.

17. A joint structure, comprising:
a fixing part having an open end;
a closing member closing the open end and movably connected to the fixing part; and

a first elastic member positioned between the fixing part and the closing member, the first elastic member exerting a biasing force on the closing member towards the open end.

18. The joint structure according to claim 17, wherein:
the fixing part further has a receiving end opposite to the open end;
the closing member is movable between the open end and the receiving end relative to the fixing part; and

the first elastic member is positioned between the receiving end and the closing member.

19. The joint structure according to claim 17 or claim 18, wherein:
the fixing part is provided with a stopper protruding inwardly;
the closing member is provided with a barb extending away from the open end, the barb having a hook portion protruding toward the fixing part at its distal end; and

the hook portion abuts against the stopper from a side thereof away from the open end.

20. The joint structure according to any one of claims 17-19, wherein:
the closing member is provided with a closing plate, and the closing plate is substantially flush with the open end.

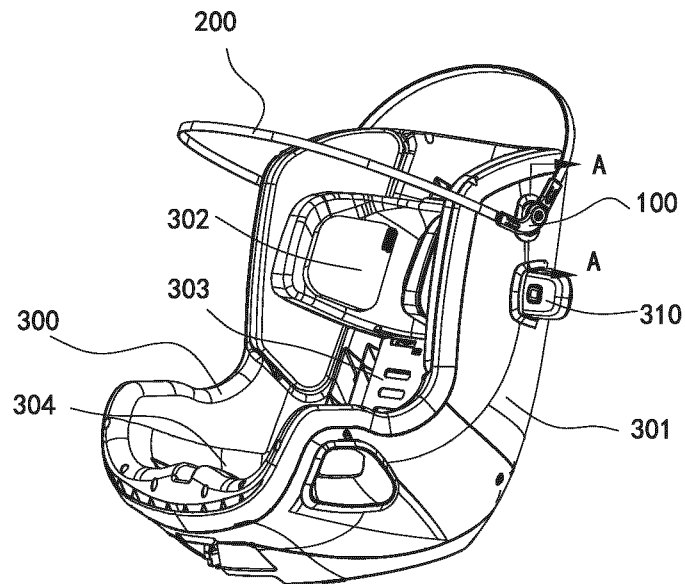


FIG. 1

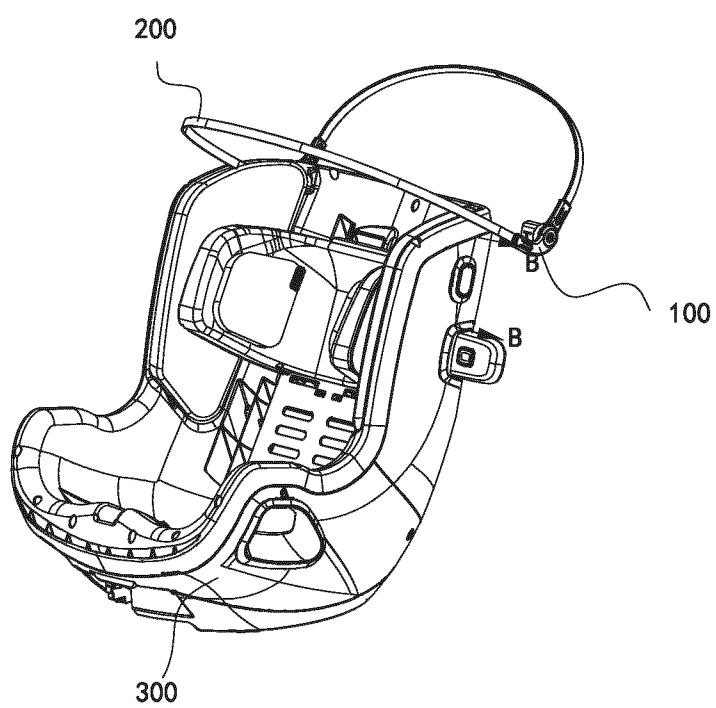


FIG. 2

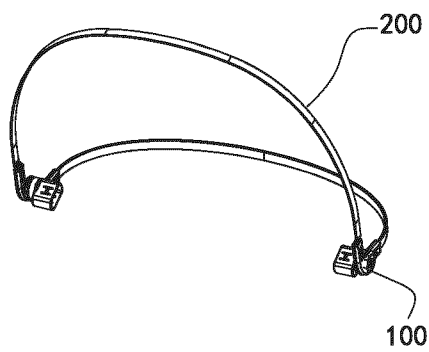


FIG. 3

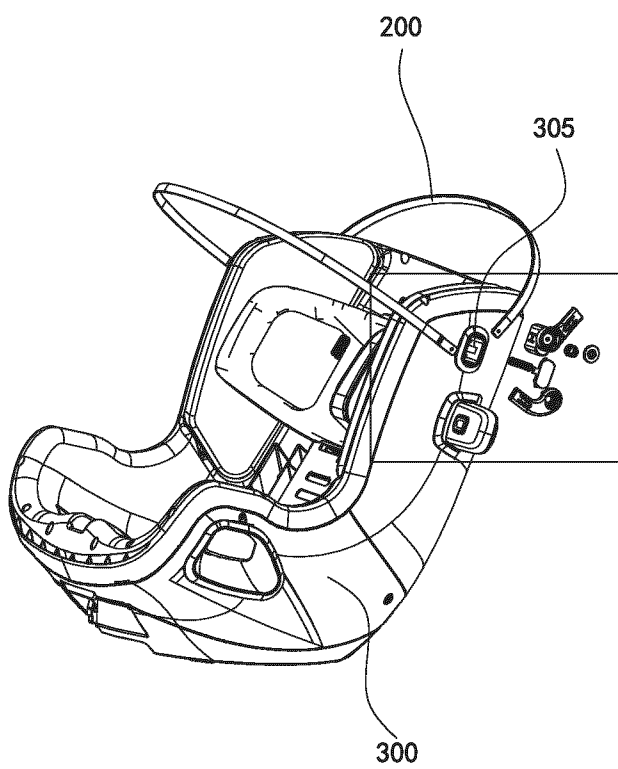


FIG. 4A

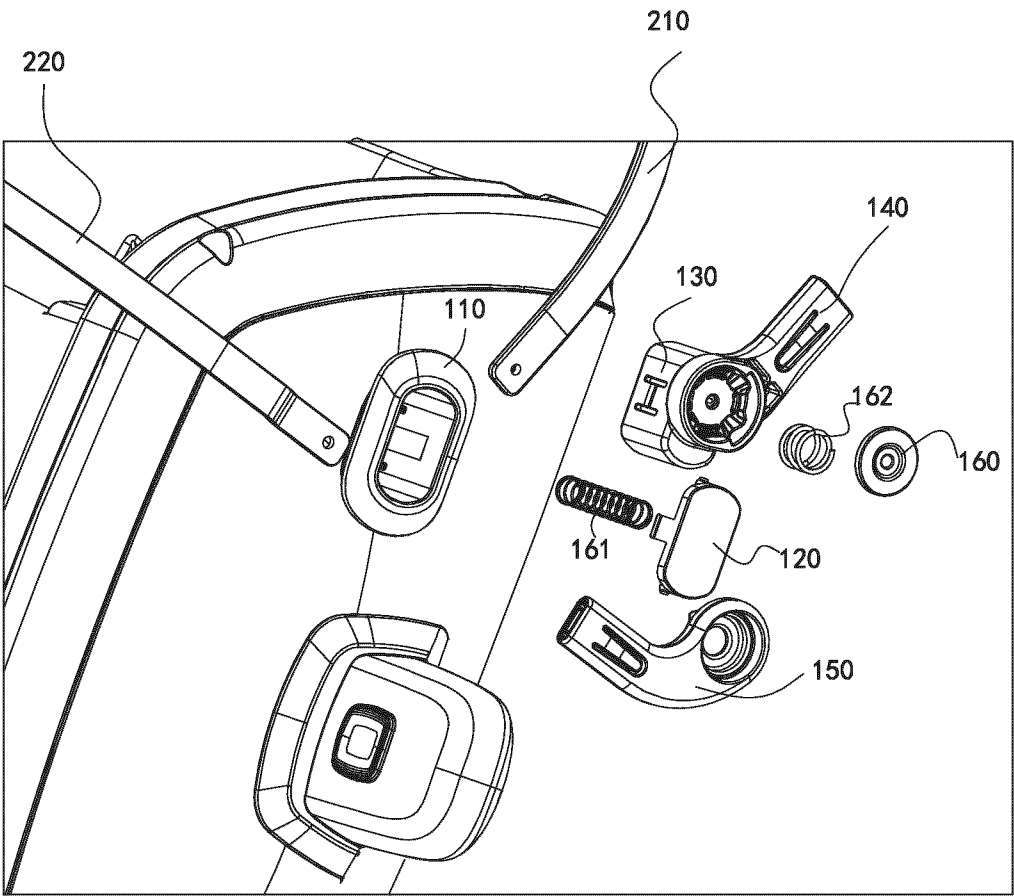


FIG. 4B

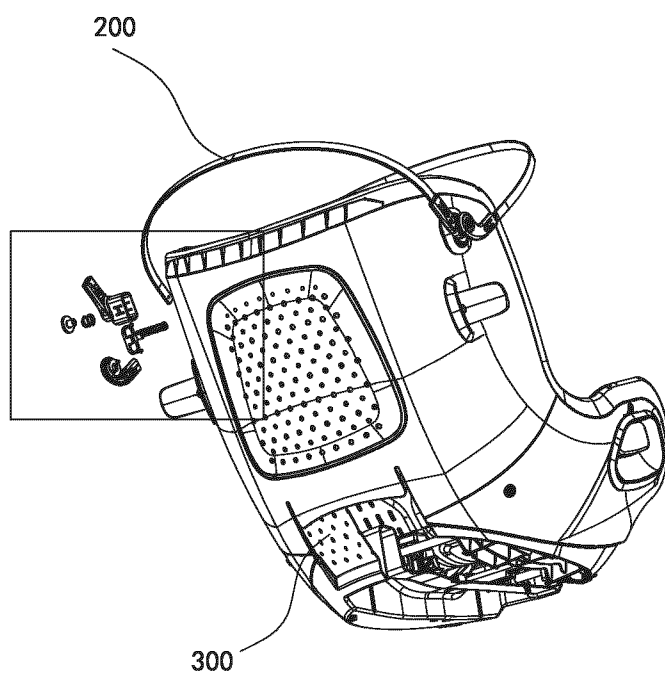


FIG. 5A

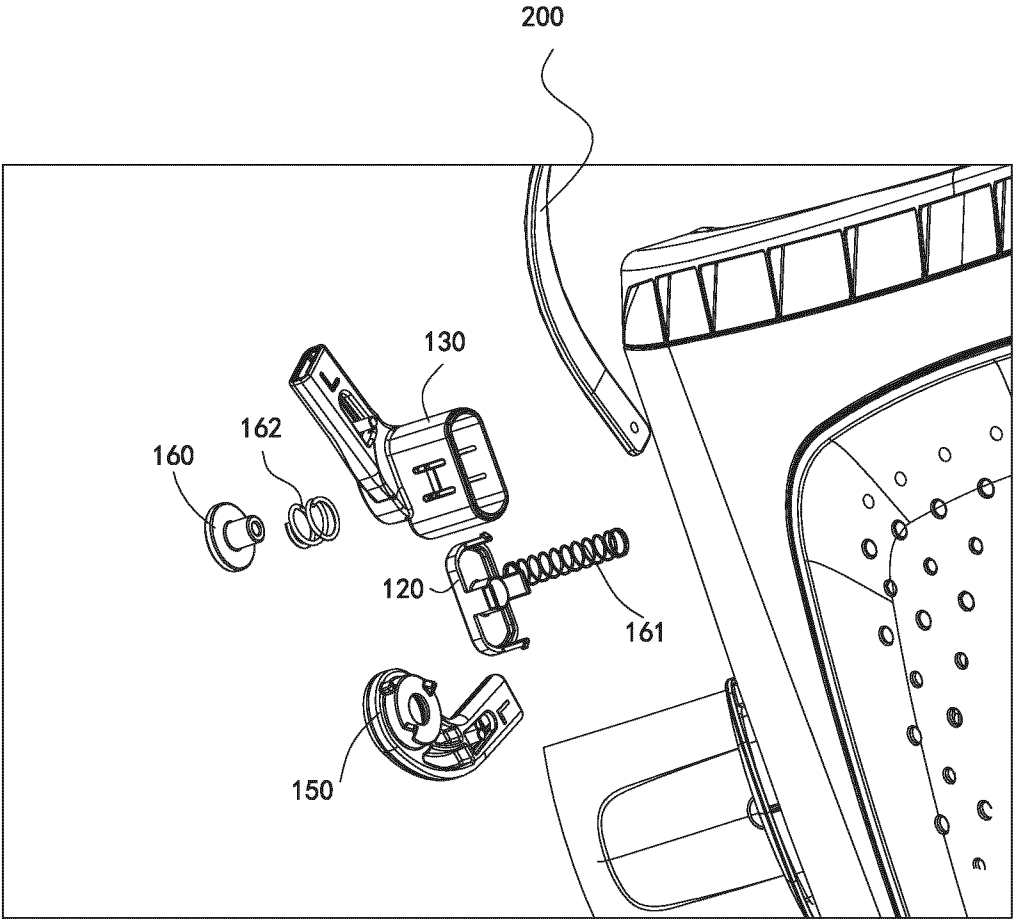


FIG. 5B

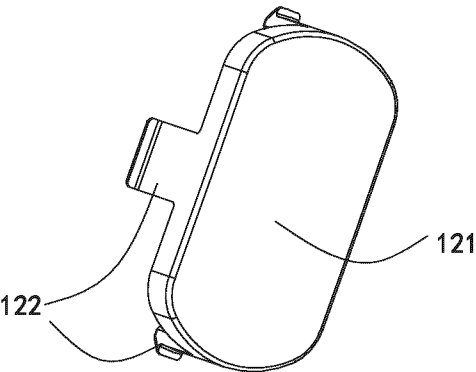


FIG. 6A

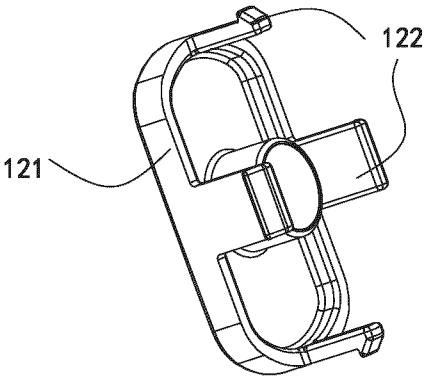


FIG. 6B

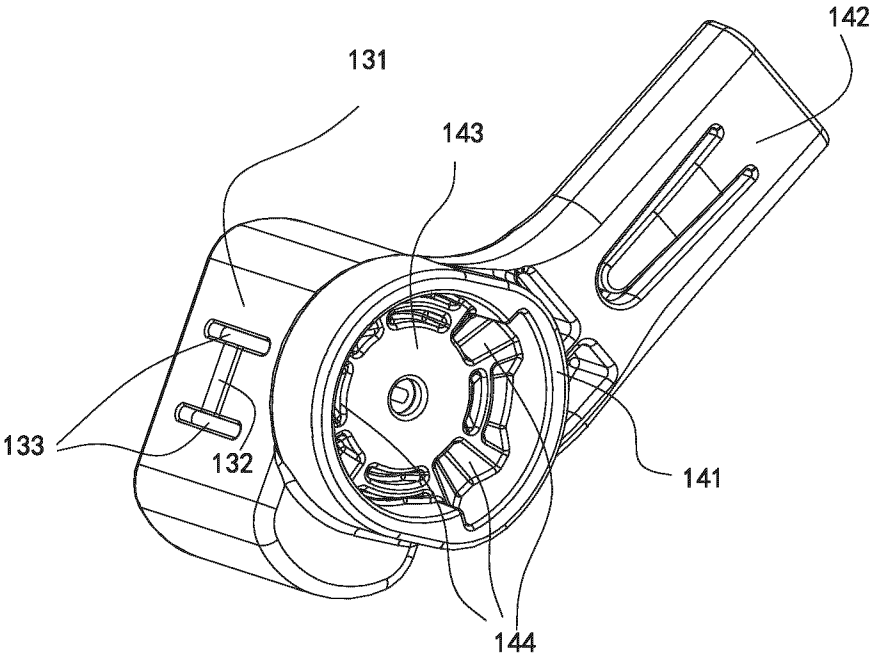


FIG. 7A

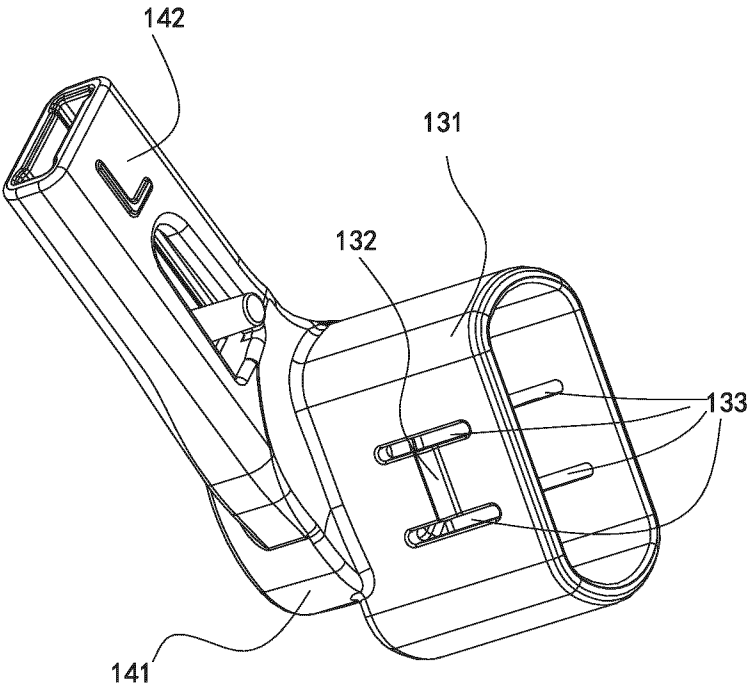


FIG. 7B

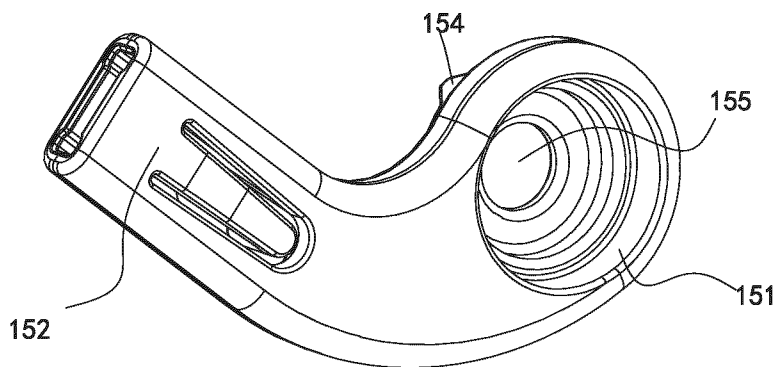


FIG. 8A

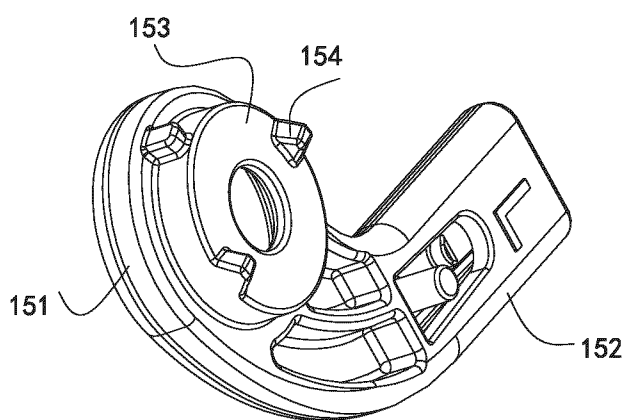


FIG. 8B

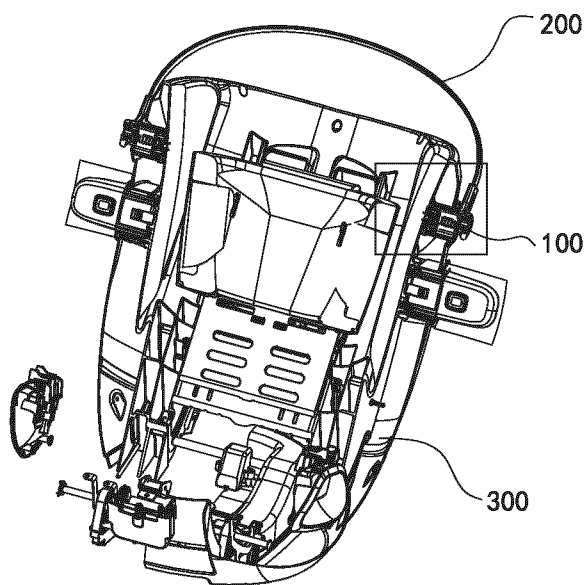


FIG. 9A

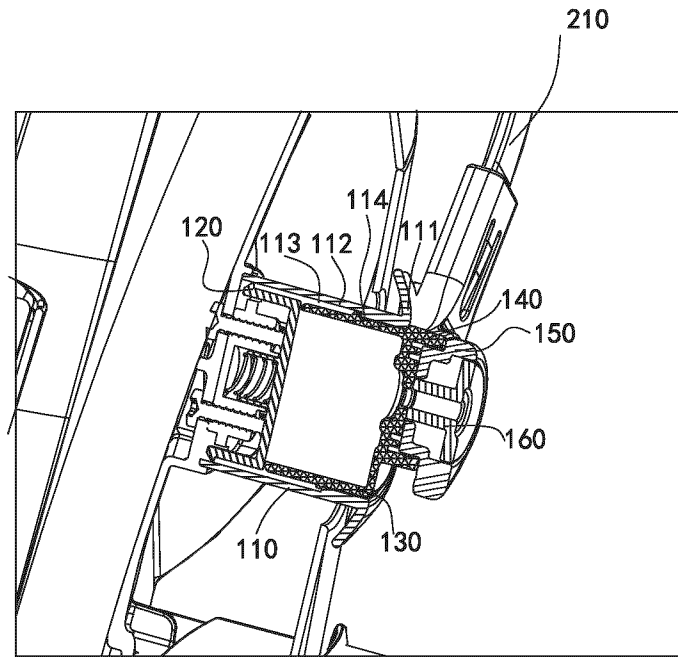


FIG. 9B

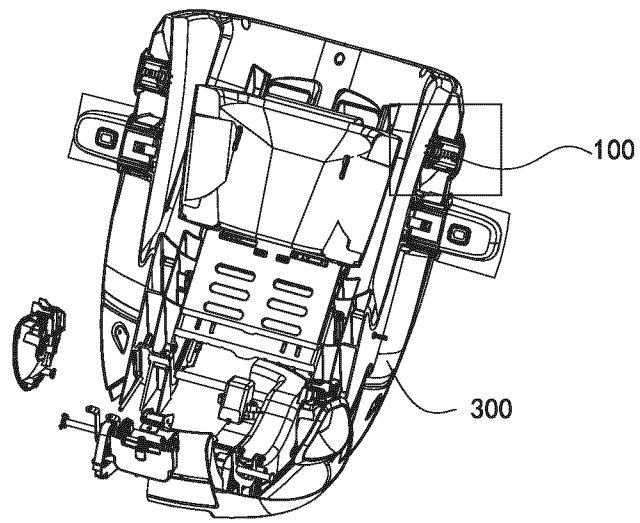


FIG. 10A

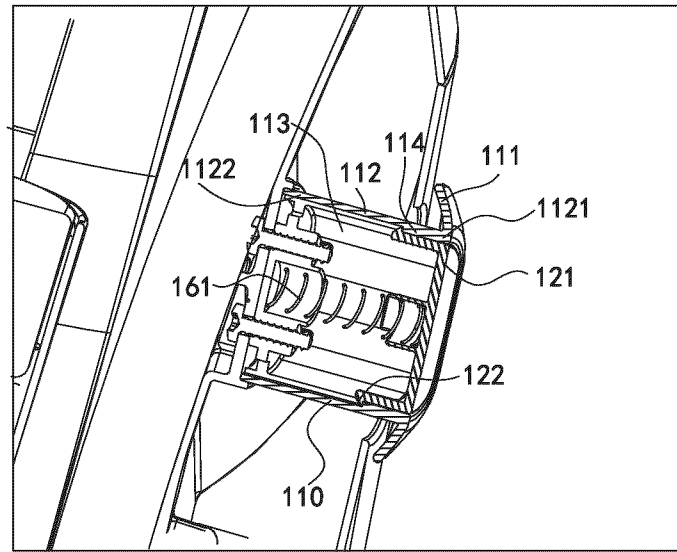


FIG. 10B

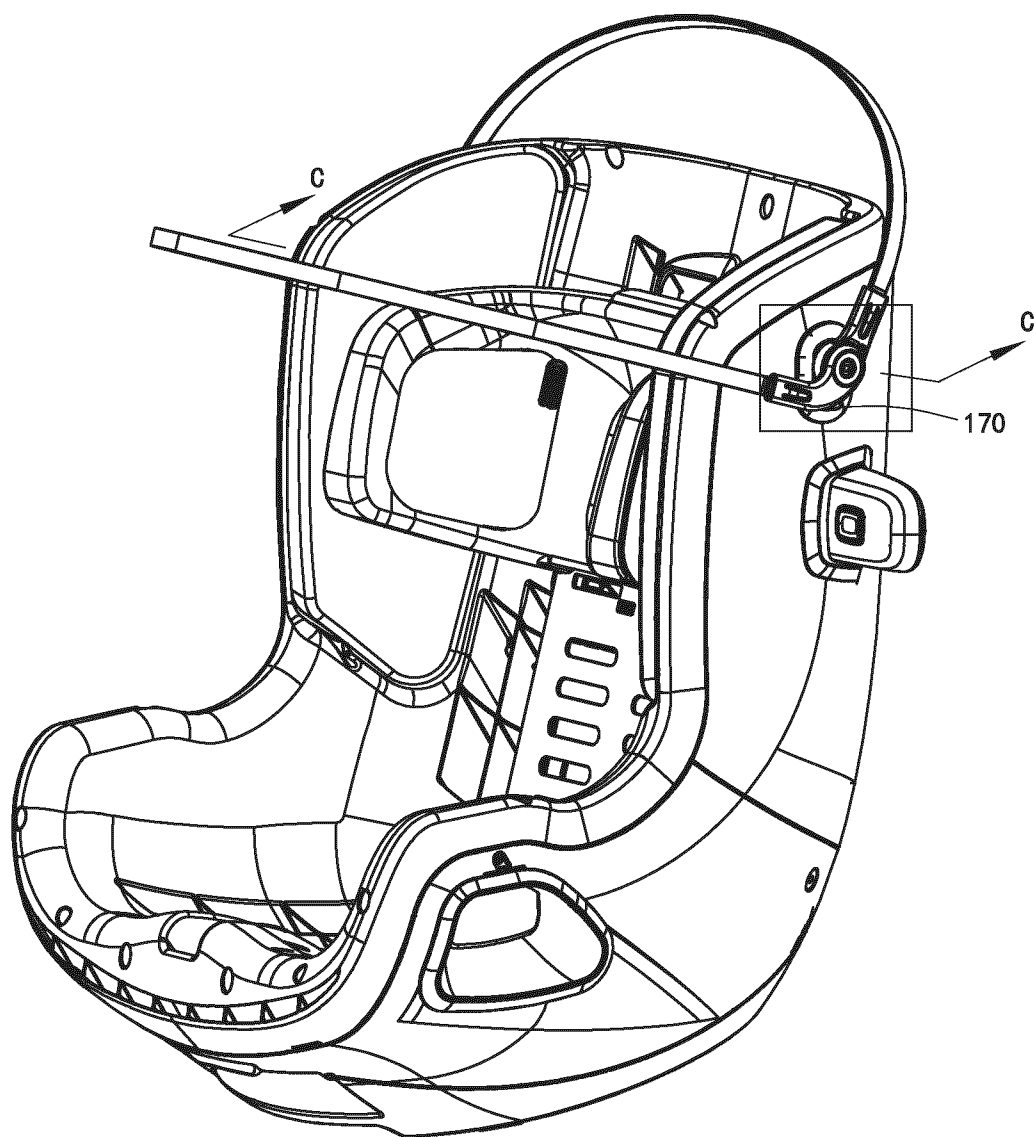


FIG. 11A

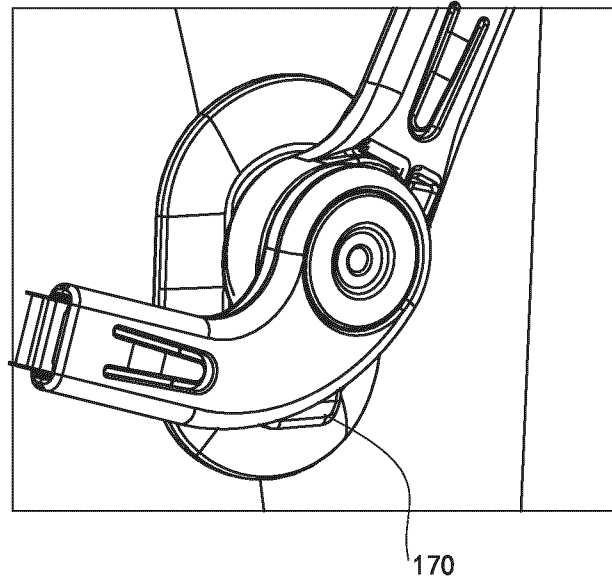


FIG. 11B

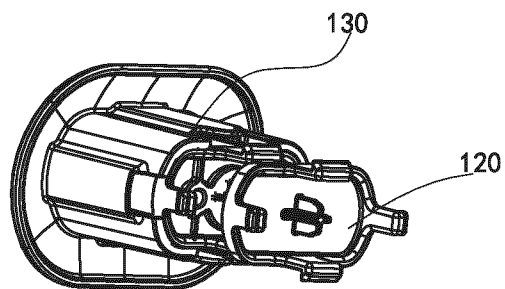


FIG. 11C

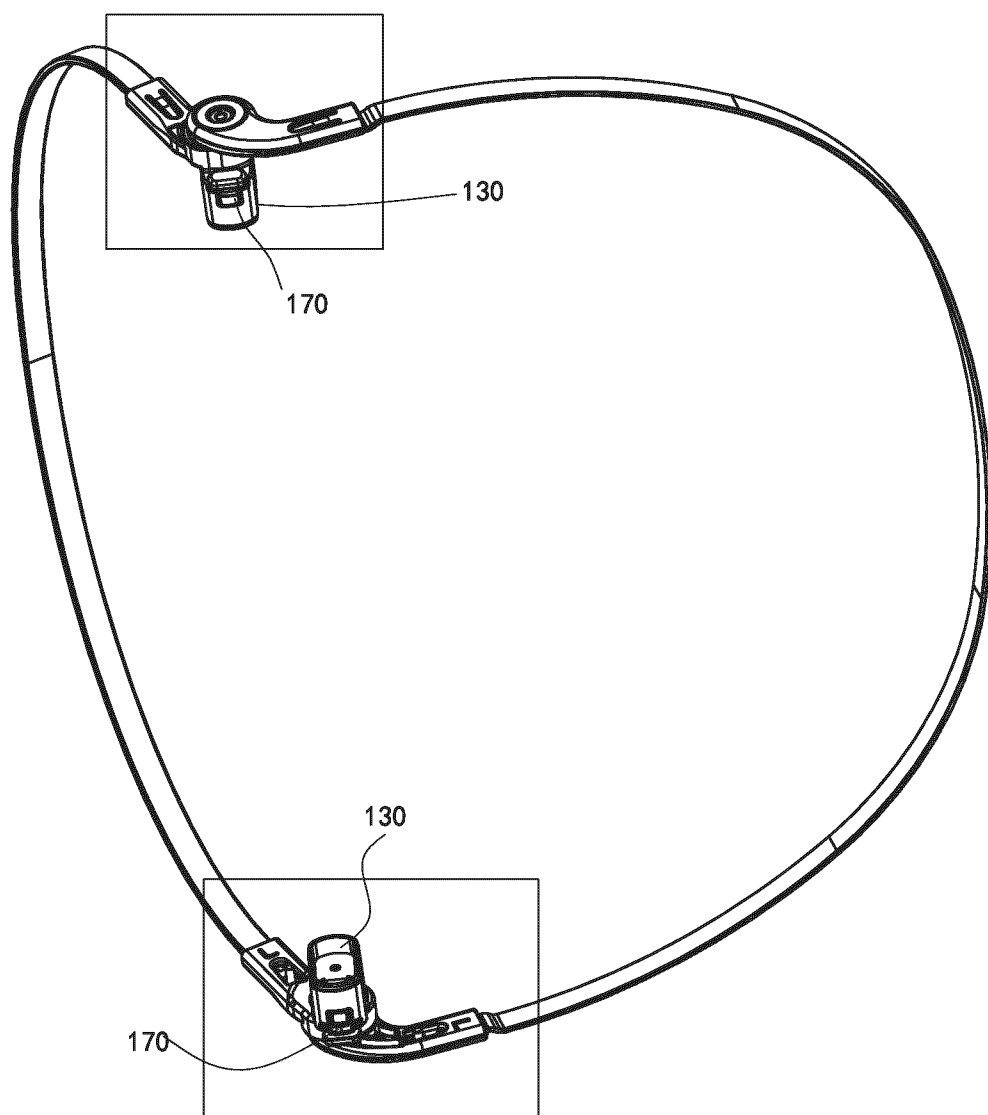


FIG. 12A

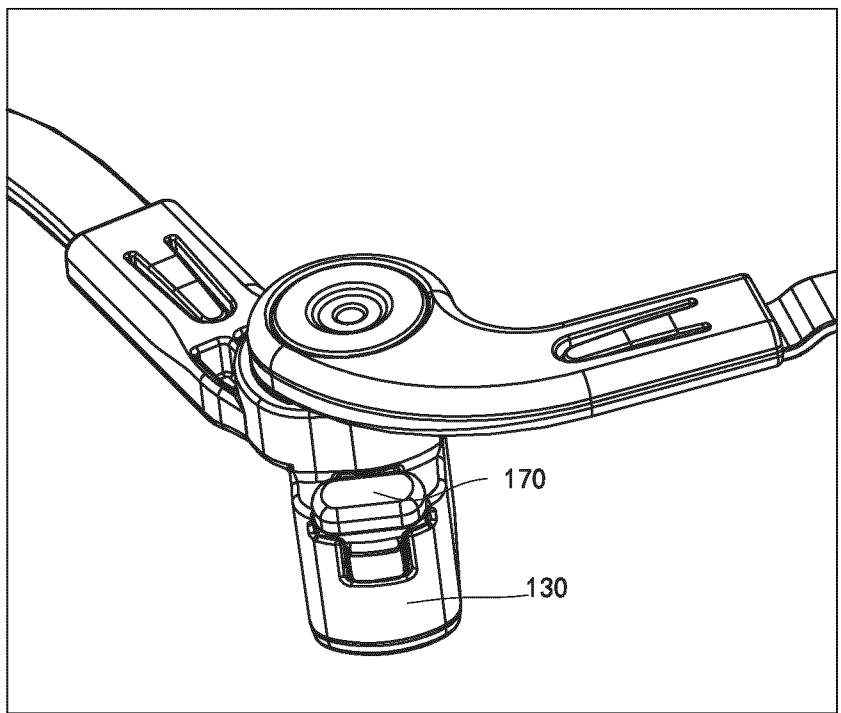


FIG. 12B

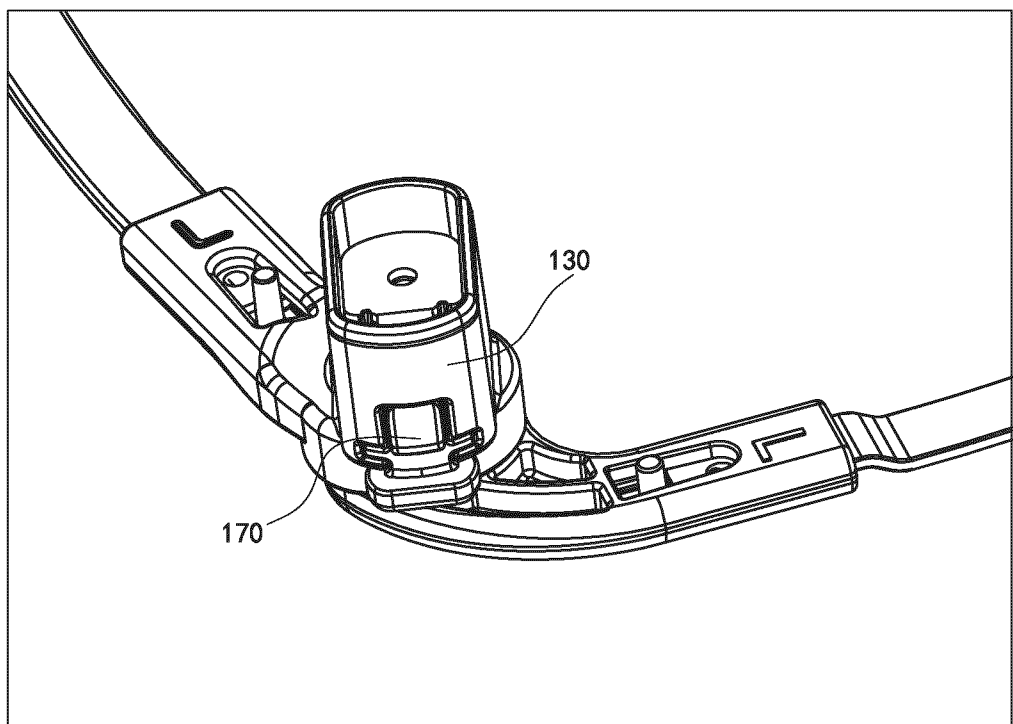


FIG. 12C

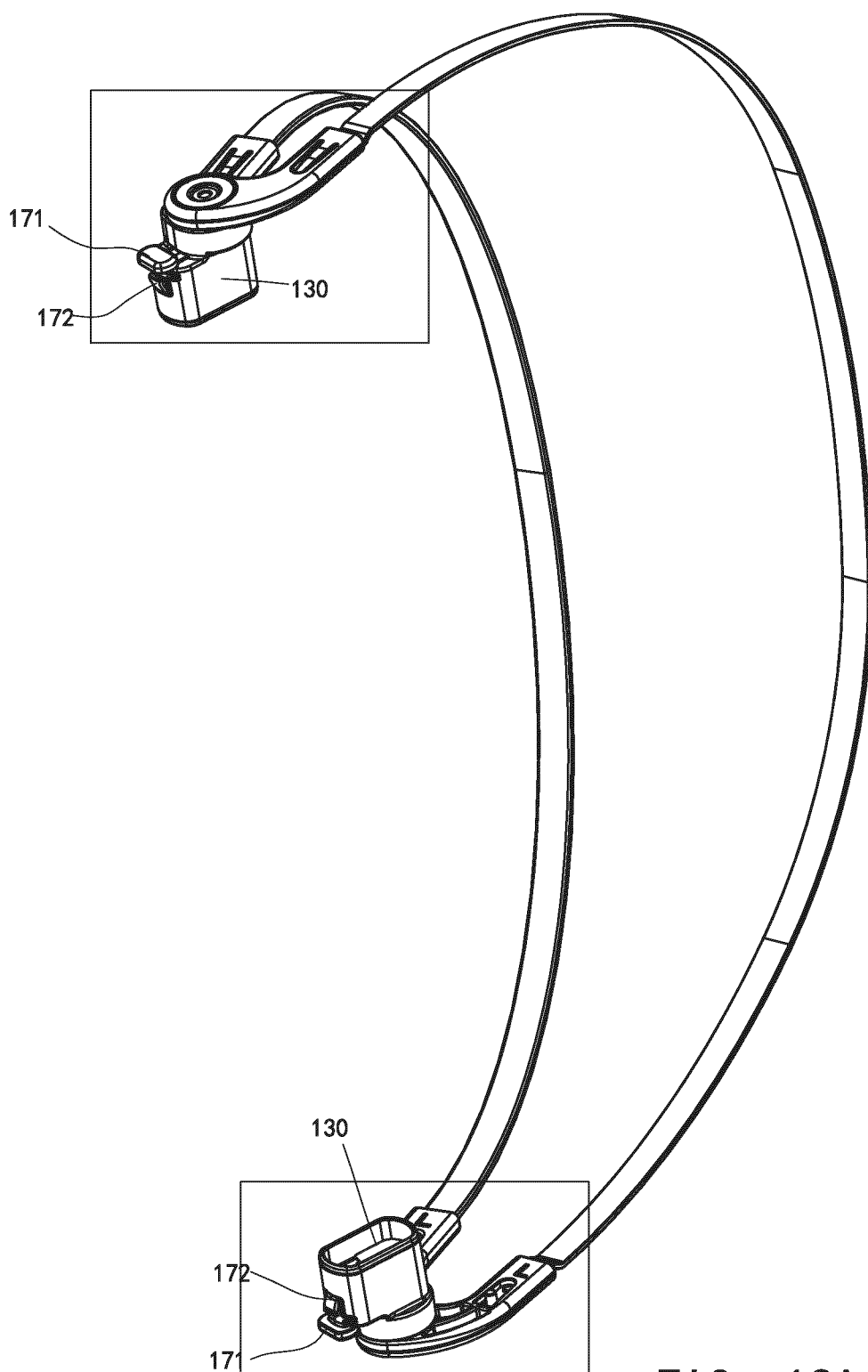


FIG. 13A

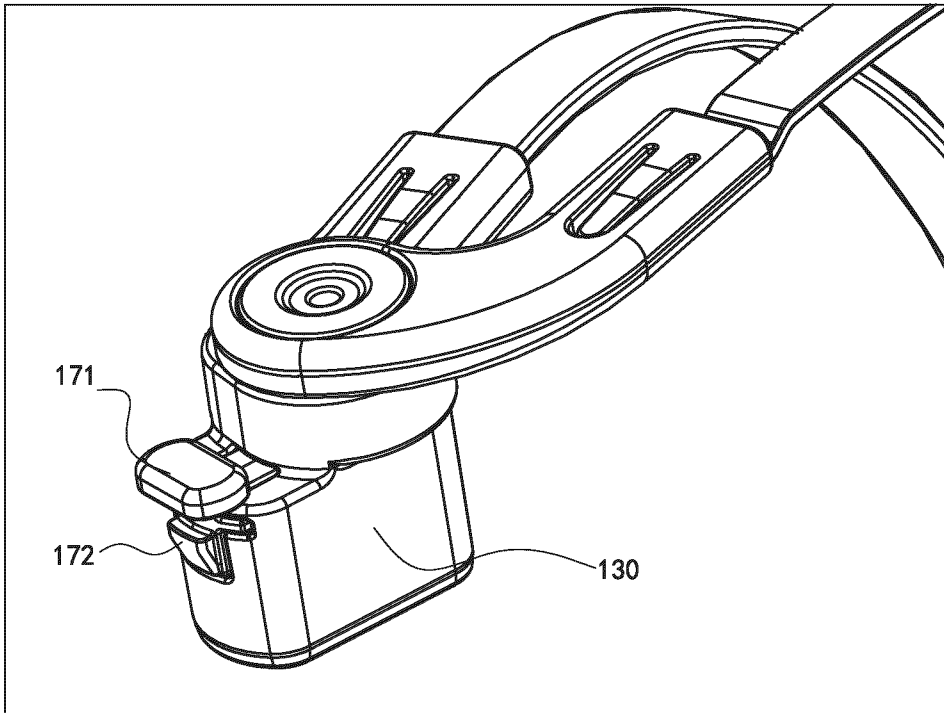


FIG. 13B

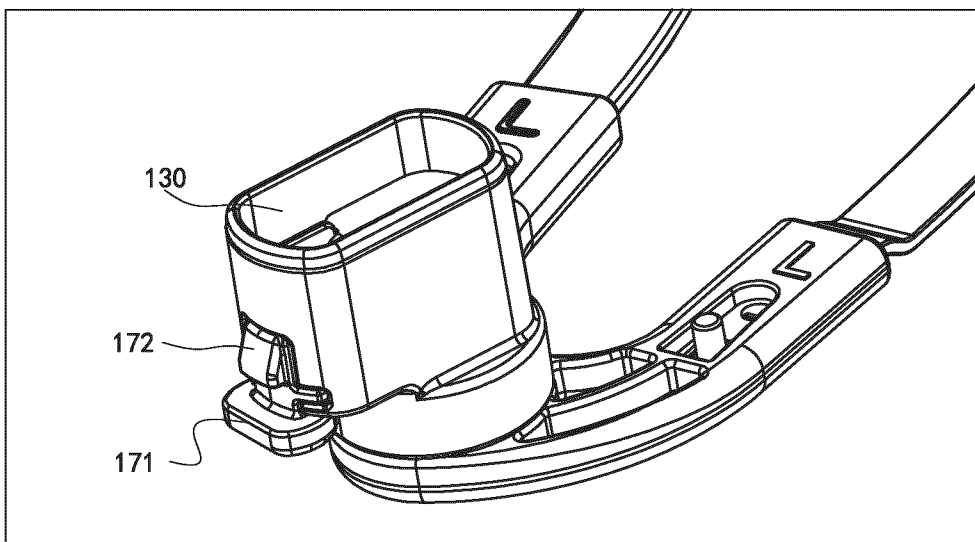


FIG. 13C



FIG. 14A

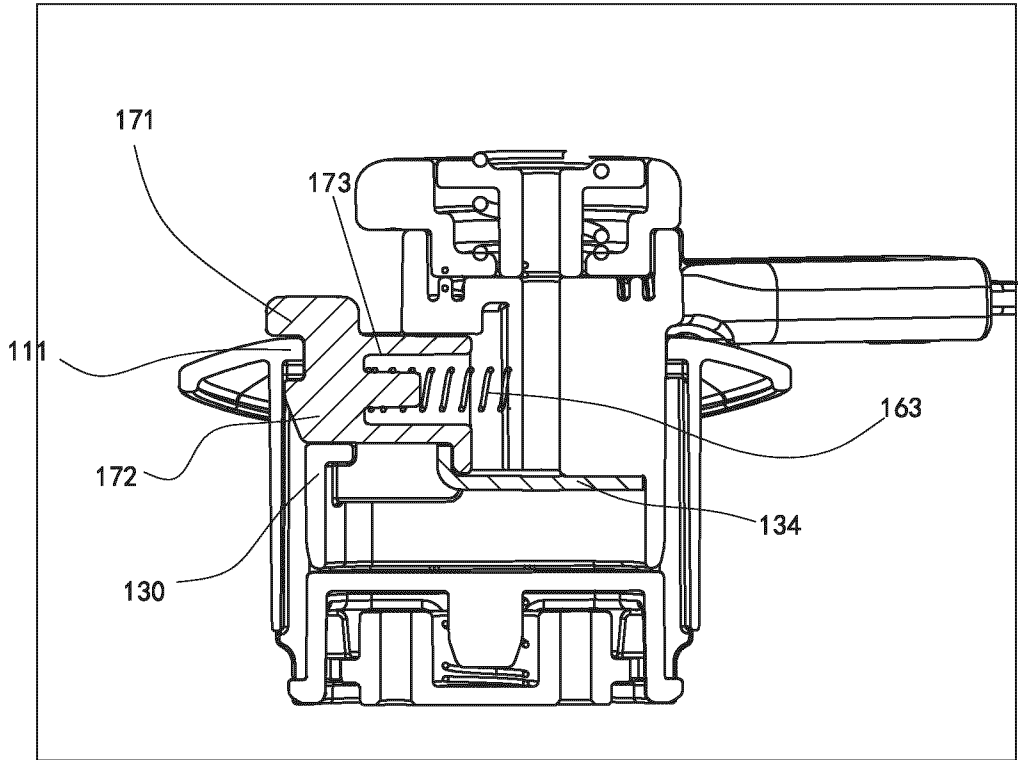


FIG. 14B

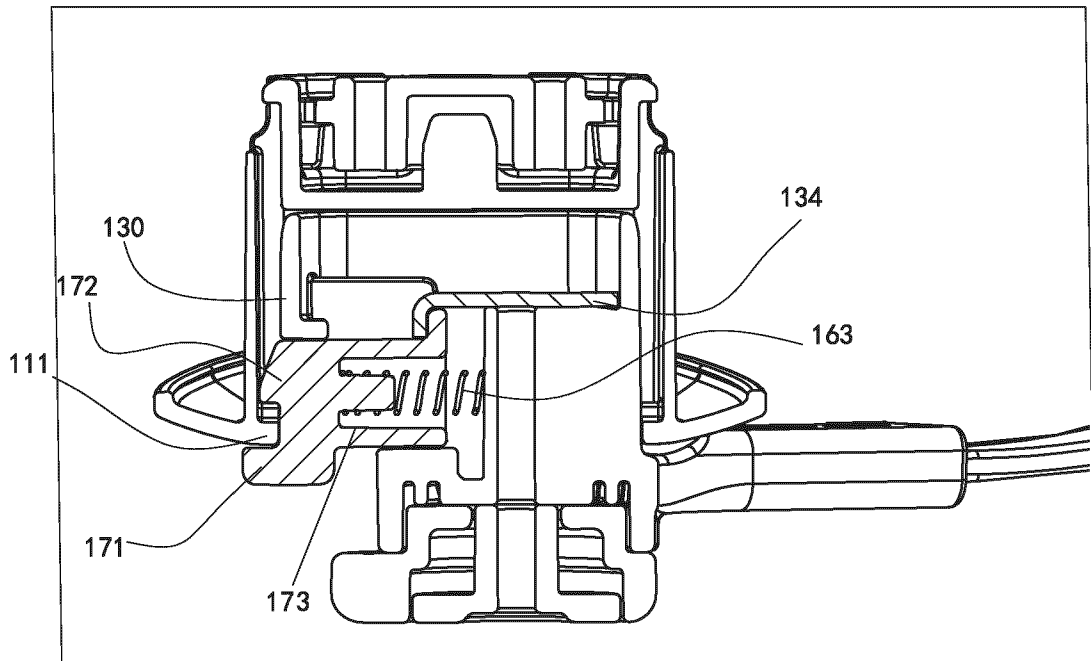


FIG. 14C