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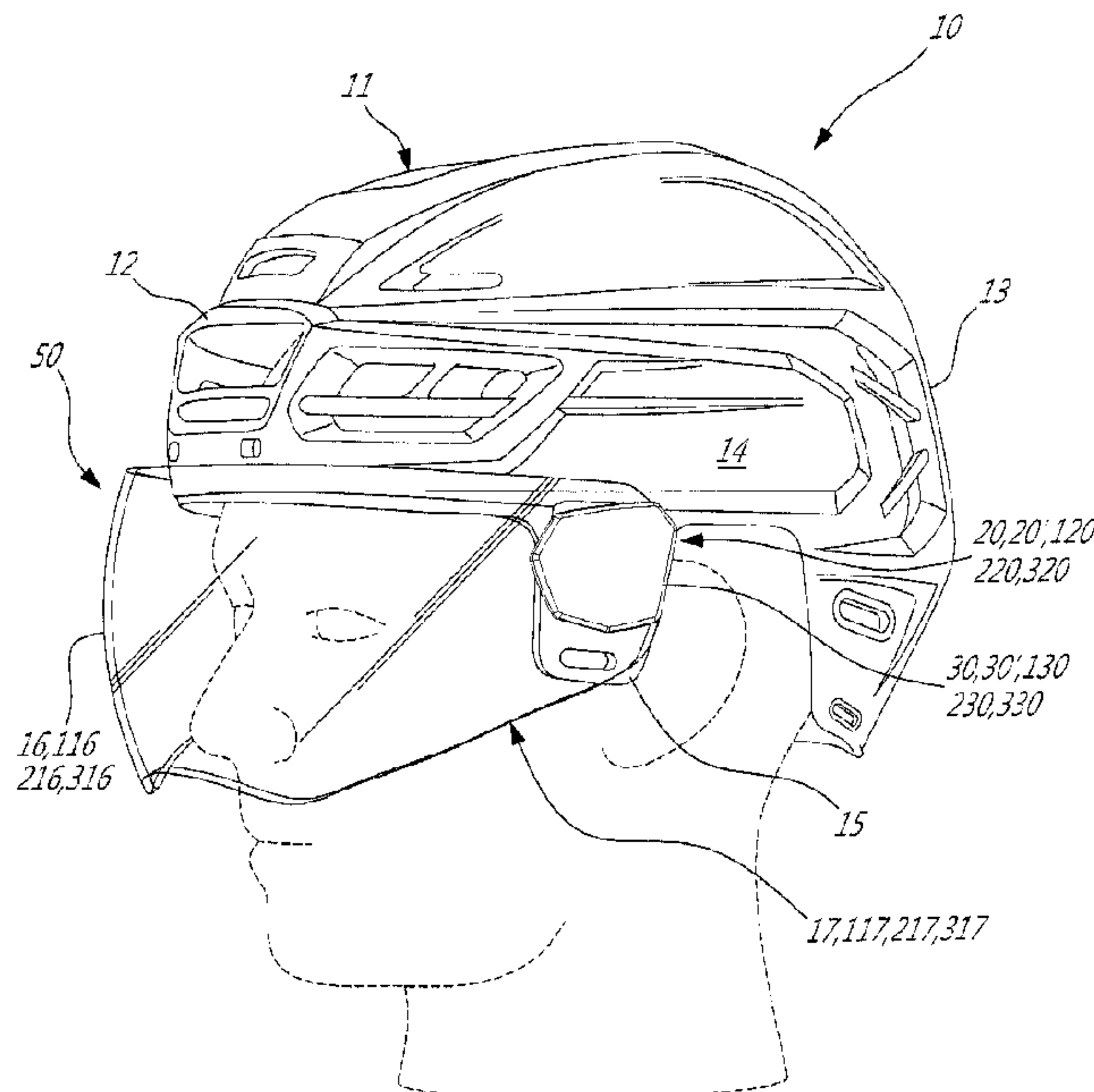
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(57) Abrégé/Abstract:

A visor assembly for a helmet including two adjustment mechanisms each including a base portion connectable to a side portion of the helmet and a cover portion. The base portion has an adjustment aperture and at least one support member. The cover portion of each adjustment mechanism is manually displaceable between a secured position engaged with the base portion and an exposed position. The cover portion allows access to the adjustment aperture(s) in the exposed position. The support member(s) of each adjustment mechanism are removably engaged to the respective side end portion of the visor. In the secured position, the cover portion prevents disengagement of the support member(s) from the visor. A method of adjusting the position of the visor is also disclosed.

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ABSTRACT

A visor assembly for a helmet including two adjustment mechanisms each including a base portion connectable to a side portion of the helmet and a cover portion. The base portion has an adjustment aperture and at least one support member. The cover portion of each adjustment mechanism is manually displaceable between a secured position engaged with the base portion and an exposed position. The cover portion allows access to the adjustment aperture(s) in the exposed position. The support member(s) of each adjustment mechanism are removably engaged to the respective side end portion of the visor. In the secured position, the cover portion prevents disengagement of the support member(s) from the visor. A method of adjusting the position of the visor is also disclosed.

HELMET AND VISOR ASSEMBLY

TECHNICAL FIELD

The application relates generally to protective helmets and, more particularly, to helmets with removable and adjustable visors.

5 BACKGROUND OF THE ART

Some protective helmets are used with a visor for protecting the face of the wearer of the helmet. It is known to adjust the position of the visor with respect to the helmet in order to position the visor to the satisfaction of the wearer.

10 However, some conventional visors need to be removed from the helmet when adjusting the position of helmet members engaging the visor. Furthermore, some conventional helmets require tools to remove the visor from the helmet and/or adjust its position. These encumbrances limit the ability of the wearer to quickly and easily adjust the position of the visor.

SUMMARY

15 In one aspect, there is provided a helmet, comprising: a helmet body adapted to cover at least part of a head of a wearer, the helmet body having a front portion, a rear portion, and two side portions to each cover a respective front, rear, and sides of the head; an adjustment mechanism on each respective one of the two side portions of the helmet body, each adjustment mechanism comprising: a base portion connected to the
20 respective one of the side portions by at least one connection member extending through the base portion and into the respective one of the side portions, the at least one connection member in a first configuration allowing relative motion between the base portion and the respective one of the side portions and in a second configuration fixing a relative position of the base portion with respect to respective one of the side
25 portions, the base portion having at least one support member, and a cover portion manually displaceable between a secured position engaged with the base portion and an exposed position, the cover portion allowing access to the at least one connection member at least in the exposed position; and a visor configured to protect at least part

of a face of the wearer, the visor including opposed side end portions, the at least one support member of each adjustment mechanism being removably engaged with a respective one of the side end portions; wherein in the secured position, at least part of the cover portion of each adjustment mechanism is located outwardly of an outer surface of the visor and prevents disengagement of the at least one support member from the respective one of the side end portions.

In another aspect, there is provided a visor assembly for a helmet, the visor assembly comprising: two adjustment mechanisms each comprising: a base portion connectable to a respective side portion of the helmet and having at least one an adjustment aperture extending therethrough each sized to receive a respective connection member, the base portion having at least one support member, and a cover portion manually displaceable between a secured position engaged with the base portion and an exposed position, the cover portion allowing access to the at least adjustment aperture at least in the exposed position; and a visor to protect at least part of a face of the wearer, the visor including opposed side end portions, the at least one support member of each of the two adjustment mechanisms being removably engaged to a respective one of the side end portions; wherein in the secured position, the cover portion of each of the two adjustment mechanisms prevents disengagement of the at least one support member from the respective one of the side end portions.

In a further aspect, there is provided a method of adjusting a position of a visor relative to a helmet, the method comprising: engaging part of each of two base portions in a respective aperture of the visor, each of the two base portions being adjustably connected to a respective side portion of the helmet; sliding at least one of the two base portions relative to the respective side portion of the helmet while maintaining the part of each of the two base portions engaged in the respective aperture; and fixing a position of said at least one of the two base portions with respect to the respective side portion of the helmet.

DESCRIPTION OF THE DRAWINGS

Reference is now made to the accompanying figures in which:

Fig. 1 is a schematic tridimensional view of a helmet having a visor and an adjustment mechanism according to embodiments of the present disclosure, the adjustment mechanism being shown in a secured position;

Fig. 2 is a schematic tridimensional exploded view of part of a visor and an adjustment mechanism of a helmet such as shown in Fig. 1, according to a particular embodiment of the present disclosure;

Fig. 3 is a schematic tridimensional view of part of the helmet and adjustment mechanism of Fig. 2, the adjustment mechanism being shown in an exposed position;

Fig. 4A is a schematic tridimensional view a cover portion of an adjustment mechanism, according to another embodiment of the present disclosure, the exposed position corresponding to that shown in Fig. 3;

Fig. 4B is a schematic cross-sectional view of an adjustment mechanism including the cover portion of Fig. 4A, the adjustment mechanism being shown in a secured position;

Fig. 4C is a schematic tridimensional view of the adjustment mechanism of Fig. 4B, with the adjustment mechanism in the secured position and part of the cover portion moving toward its unlocked position;

Fig. 5 is a schematic tridimensional view of an adjustment mechanism, according to another embodiment of the present disclosure;

Figs. 6A-6B are schematic tridimensional views of an adjustment mechanism, according to yet another embodiment of the present disclosure; and

Figs. 7A-7B are schematic tridimensional views of an adjustment mechanism, according to yet another embodiment of the present disclosure.

DETAILED DESCRIPTION

Referring to Fig. 1, a protective hockey helmet is generally shown at 10. Although the helmet 10 is shown and described as a hockey helmet, it is understood that the helmet

10 can alternately be any other type of protective helmet 10, including but not limited to a lacrosse helmet, a baseball helmet, a football helmet, and a military helmet.

In the embodiment shown, the helmet 10 has a helmet body 11 which covers some or all of the head of the wearer when the helmet 10 is worn. The helmet body 11 has a front portion 12 configured to cover and protect a corresponding front portion of the head of the wearer, and a rear portion 13 configured to cover and protect a corresponding rear portion of the head. The helmet body 11 also has two side portions 14 configured to cover and protect corresponding side portions of the head. In the embodiment shown, each side portion 14 includes a side flap 15, which extends downwardly to protect an area of the side portion of the head between the temple and the ear. More particularly, the side flap 15 extends downwardly from each side portion 14 in front of the ear while leaving the ear uncovered. Other configurations are also possible.

The helmet 10 includes a visor assembly 50, generally including a transparent or translucent (e.g. tinted) visor 16, 116, 216, 316, as well as first and second adjustment mechanisms 20, 20', 120, 220, 320. Each of the side portions 14 (e.g. side flap 15) of the helmet 10 has apertures or elongated grooves formed therein so that helmet accessories, such as adjustment mechanisms 20, 20', 120, 220, 320, can be mounted to the helmet body 11.

The transparent visor 16, 116, 216, 316 protects some or all of the face of the wearer when the helmet 10 is worn. The visor 16, 116, 216, 316 has an inner surface facing the wearer and an opposed outer surface. The visor 16, 116, 216, 316 is a light-transmitting shield covering at least some of the face. In the embodiment shown, the visor 16, 116, 216, 316 is adapted to substantially protect the top of the face as well as a part of the forehead of the wearer. When the helmet 10 is worn, the visor 16, 116, 216, 316 thus extends from the lower forehead of the wearer to, or below, the nose, and rearwardly on the sides of the head to cover the temple and rear parts of the jaw. It will be appreciated that the visor 16, 116, 216, 316 can take other configurations as well. For example, the visor 16, 116, 216, 316 can cover the entire face of the wearer, or be smaller than the embodiment shown, for example covering only the eyes and region around the eyes of

the wearer without covering the nose. The visor 16, 116, 216, 316 can be made from any suitable type of polymer or glass material, for example capable of withstanding one (or more) impact from an object, such as a hockey puck or a ball. The visor 16, 116, 216, 316 is typically a curved body contouring the face of the wearer. The visor 16, 116, 216, 316 extends between two side end portions 17, 117, 217, 317 located at opposite extremities of the visor 16, 116, 216, 316.

The visor 16, 116, 216, 316 is mounted and secured to the helmet body 11 via adjustment mechanisms 20, 20', 120, 220, 320. Each adjustment mechanism 20, 20', 120, 220, 320 allows the position of the visor 16, 116, 216, 316 relative to the helmet body to be adjusted by the wearer without having to remove the visor 16, 116, 216, 316 from the helmet body.

Figs. 2-3 show an adjustment mechanism 20 in accordance with a particular embodiment. Each of the side end portions 17 of the visor 16 has a visor aperture 18 defined therethrough, allowing the visor 16 to be secured to the helmet body 11. In this embodiment, each visor aperture 18 is a relatively large opening extending through the visor 16 between its inner and outer surfaces. It will, however, be appreciated that the visor aperture 18 is not limited to the shape or size disclosed herein, and can take different shapes and sizes; for example, multiple apertures may be provided on the same side end portion 17.

The adjustment mechanism 20 on each side portion of the helmet body can engage the corresponding side end portions 17, in the embodiment shown through engagement with the visor aperture 18, in order to mount the visor 16 to the helmet body, and secure it in position. Each adjustment mechanism 20 is secured to, removable from, and displaceable with respect to, a respective one of the side portions 14 of the helmet body. Each adjustment mechanism 20 includes a base portion 22, one or more connection members 27 which secures the base portion 22 to the helmet body and allows it to be selectively displaced, and a cover portion 30 which engages the base portion 22 to secure the visor 16 to the helmet body.

Referring to Fig. 3, each adjustment mechanism 20 is mounted to a corresponding side portion 14 of the helmet body 11. In the embodiment shown, the base portion 22

connects to, and is removable from, the side portion 14 of the helmet body 11 such that it can be displaced with respect to that side portion, and thus with respect to the helmet body 11. In the embodiment shown, the base portion 22 is mounted to the side flap 15, but it can be mounted elsewhere on the side portion 14 or helmet body 11. The base portion 22 therefore allows the adjustment mechanism 20 to be secured to the helmet body 11, and for the position of the adjustment mechanism 20 to be selectively adjusted. The base portion 22 is typically a planar bracket or other body having a first surface in contact with the side portion 14 of the helmet body 11, and an opposite second surface facing away from the helmet body 11. The base portion 22 has one or more adjustment apertures 23 which extend through the body of the base portion 22 between the first and second surfaces.

Each connection member 27 in a first configuration allows relative sliding motion between the base portion 22 and the side portion 14, and in a second configuration fixes the position of the base portion 22 with respect to the side portions 14. In the embodiment shown, each connection member 27 is inserted through a corresponding adjustment aperture 23 and into a corresponding side portion 14 of the helmet body 11 to secure the base portion 22 to the helmet body 11. Each adjustment aperture 23 is an elongated slot, and the connection member 27, for example a screw, is slidably received within that elongated slot. In the first configuration, when the connection member 27 loosely connects the base portion 22 to the helmet body 11 through the slot 23, the connection member 27 is slidable within the slot 23, and the position of the base portion 22 with respect to the helmet body 11 can therefore be adjusted. In the second configuration, once the connection member 27 tightly connects the base portion 22 to the helmet body 11 through the slot 23, friction between contacting surfaces of the base portion 22 and of the helmet body 11 prevents relative movement therebetween.

Other types of engagement members and/or adjustment apertures are also possible. For example, multiple adjustment apertures 23 can be provided for a same connection member 27, each sized to snugly receive the connection member 27, and the position of the base portion 22 with respect to the helmet body 11 is adjusted by selecting one of the apertures 23 for engagement with the connection member 27; or, a slot may be provided in the helmet body 11 to slidably receive the engagement member, in

combination with the adjustment apertures 23 being defined as snug holes or as elongated slots. Other types of attachment are also possible.

It can thus be appreciated that each connection member 27 allows the base portion 22 to be selectively displaced relative to the side portion 14 of the helmet body 11. In
5 displacing the base portion 22 of the adjustment mechanism 20, the wearer is thereby able to also displace the visor 16 mounted to the base portions 22 with respect to the helmet body 11, so that the position of the visor 16 can be moved closer or further away from the face of the wearer.

In the embodiment shown, the displacement of the base portion 22, and thus of the
10 visor 16, relative to the helmet body 11 is a translational sliding movement. More particularly, the connection member 27 allows the base portion 22 to be moved toward the front portion of the helmet body 11 along forward direction D1, and toward the rear portion of the helmet body 11 along rearward direction D2. The orientation of the base portion 22 with respect to the helmet body 11 can remain unchanged by moving the two
15 connection members 27 simultaneously, or by changing the relative positions of the connection members 27, the base 22 can be rotated about an axis transverse to the base 22 such as to change its orientation. This allows the wearer to lengthen or shorten the distance of the mounted visor 16 from her/his face and/or to change the orientation of the visor 16. Vertical displacement of the base portion 22 with respect to the helmet
20 body 11, as well as displacement along other directions, is also within the scope of the present disclosure. It can thus be appreciated that the connection member 27 can be any device suitable for achieving such functionality, and is not limited to being a screw, as shown in the embodiment of Fig. 3.

The visor 16 is mounted to the helmet body 11 via each base portion 22. More
25 particularly, in the embodiment shown the visor aperture 18 is removably engaged with the base portion 22. The base portion 22 thereby supports the weight of each side end portion 17 of the visor 16. In the embodiment shown, each visor aperture 18 is at least partially disposed over one or more of the adjustment apertures 23. Each visor aperture 18 is therefore aligned with the connection members 27. This allows a person to access
30 the connection members 27 via the visor aperture 18, thereby allowing the position of

the base portion 22 to be adjusted without having to remove the visor 16. The base portions 22 support the visor 16 even while the position of the base portions 22 is being adjusted with respect to the helmet body 11. Therefore, the base portions 22 allow the wearer to select the desired position of the visor 16 without having to first remove the visor 16 from the helmet body 11, which may facilitate selection of the proper position for the visor 16.

Still referring to Fig. 3, each base portion 22 of the adjustment mechanism 20 has one or more support members 24 which are received through the visor aperture 18. Each support member 24 extends away from any suitable surface of the base portion 22 in order to provide a structure which can be engaged in the visor aperture 18. In the embodiment shown, the visor aperture 18 hangs on one of the support members 24 such that weight of each side end portion 17 of the visor 16 is supported. Each visor aperture 18, and thus the visor 16, can be mounted to, and removed from, the support members 24. Each support member 24 in Fig. 3 is a protrusion from the second surface of the base portion 22. The distal extremity of the protrusion forms a flange which extends transversely to the protrusion. Each visor aperture 18 defines a peripheral aperture edge 19, which is the edge of the visor aperture 18 along its perimeter. The peripheral aperture edge 19 of the visor aperture 18 is mountable to the protrusion between the base portion 22 and the flange. The protrusion supports the weight of the side end portion 17 of the visor 16 while the flange restricts the movement of the side end portion 17 when the cover portion 30 is in the exposed position.

Other configurations for the support members 24 are also possible. For example, in an alternate embodiment, the apertures 18 are omitted, and the support members 24 engage or of more outer edges of the side end portion 17 of the visor 16.

In the exposed position of Fig. 3, the visor 16 mounted to the base portions 22 is supported by the support members 24 but remains unsecured until the cover portion 30 is closed over the support member 24 and engaged with the base portion 22, securing the visor 16 between the cover portion 30 and the base member 22. The cover portions 30 are therefore provided to each engage the respective base portion 22 to secure the visor 16 to the helmet body 11.

Each cover portion 30 is manually displaceable to engage and disengage a corresponding base portion 22. The expression "manually displaceable" refers to the ability of the wearer or some other person to move each cover portion 30 using only their fingers or hands. No tools are therefore required to displace the cover portion 30 of each adjustment mechanism 20. The cover portion 30 can be displaced in numerous ways to engage and disengage the base portion 22, some of which are discussed in greater detail below. The cover portion 30 is manually displaced between the exposed position (such as Fig. 3) and a secured position.

In the exposed position, the cover portion 30 does not obstruct the connection member 27 or the adjustment aperture 23. The connection member 27 is therefore exposed, and can be accessed by the wearer or another person in order to adjust the position of the base portion 22. Since the visor 16 is mounted to the base portions 22 in the exposed position, its position can be adjusted simultaneously while adjusting the position of the base portions 22. The position of the visor 16 therefore can be adjusted without having to remove the visor 16 from the base portions 22. Furthermore, the visor 16 in the exposed position is unsecured, and can thus be removed by the wearer from the base portions 22 without having to use tools.

In the adjustment mechanism 20 shown in Fig. 3, the base portion 22 and the cover portion 30 are connected to one another via a hinge 33. The hinge 33 defines a hinge axis 34 which is parallel to a plane defined by the substantially planar base portion 22. In operation, the cover portion 30 is manually manipulated to rotate about the hinge axis 34 toward the base portion 22 in order to engage the base portion 22 in the secured position. The cover portion 30 can also be manually manipulated to rotate about the hinge axis 34 away from the base portion 22 in order to expose the connection member 27 and the adjustment apertures 23 in the exposed position. In Fig. 3, the hinge axis 34 has a substantially vertical orientation (i.e. towards the top and bottom of the helmet body 11. This orientation of the hinge axis 34 allows the cover portion 30 to pivot towards the front and back portions of the helmet body 11. In some embodiments, the hinge axis 34 has a substantially horizontal orientation.

In the secured position, the cover portion 30 rests against or close to the support members 24. The cover portion 30 and base portion 22 cooperate to engage part of the side end portion 17 of the visor 16. At least part of the cover portion 30 is located outwardly of the outer surface of the side end portion 17 and maintains the engagement
 5 of the support members 24 with the end portion 17 of the visor 16 (e.g. in the aperture 18).

The cover portion 30 has a locking mechanism 36 for securing the cover portion 30 in the secured position, including a resilient retention finger 37 which extends from the cover portion 30 toward the base portion 22 when in the secured position. The retention
 10 finger 37 can be elastically manipulated to engage the base 22 through a complementarily shaped recess 38 formed in the visor end portion 17 adjacent to the aperture 18, to lock the cover portion 30 in the secured position. To manually displace the cover portion 30 to the exposed position, the retention finger 37 is elastically deformed manually by the wearer to be disengaged from the recess 38.

15 In the secured position and in accordance with a particular embodiment (Fig.1 showing an example of a secured position), each cover portion 30 engages the corresponding base portion 22 to cover the adjustment aperture and the one or more connection members 27 (Figs. 2-3) securing the base portion 22 to the helmet body 11. This shielding of the connection member 27 and the adjustment aperture 23 prevents access
 20 to the connection members 27. The connection members 27 therefore cannot be moved, and the base portion 22 is thus prevented from being displaced relative to the side portion 14 of the helmet body 11. The cover portion 30 may also engage some part of the visor 16, such as the side end portion 17 or the peripheral aperture edge 19, while engaging the base portion 22. This engagement prevents displacement of the
 25 visor aperture 18, thereby securing the visor 16 to the helmet body 11. It is understood that in other embodiments, the connection members 27 may remain accessible in the secured position.

In use, each base portion 22 is mounted to the respective side portion 14 of the helmet body 11 using one or more of the connection members 27. More particularly, each
 30 connection member 27 is inserted through the adjustment aperture 23 of each base

portion 22 and into a corresponding opening in the side portion 14 of the helmet body 11.

Each side end portion 17 of the visor 16 can then be engaged to the support members 24 of the base portion 22. In the embodiment shown, the support members 24 of each
 5 base portion 22 are engaged in each visor aperture 18. The cover portions 30 can then be displaced by the wearer's hands to the secured position, where the cover portions 30 engage the base portions 22 and secure the visor 16 to the helmet body 11. If the wearer wishes to remove the visor 16 or adjust its position, the wearer can manually displace the cover portions 30 to the exposed position. The wearer can then remove the
 10 visor 16 from the base portions 22 by disengaging the visor apertures 18 from the base portions 22. Or, the wearer can adjust the position of the visor 16 by accessing the exposed connection members 27 and removing or loosening them to displace the base portions 22, and the visor 16, toward the front portion or the rear portion of the helmet body 11. Once in the desired position, the connection members 27 can be tightened or
 15 inserted into the adjustment apertures 23 to secure the base portions 22 in their new positions. The cover portion 30 can then be manually displaced to the secured position, thereby securing the newly positioned visor 16 to the helmet body 11.

Figs. 4A-4C show an adjustment mechanism 20' according to another embodiment. The adjustment mechanism 20' is similar to the adjustment mechanism 20 of Figs. 2-3, and common elements will not be described again herein; in the exposed position, the
 20 adjustment mechanism 20' is as shown in Fig. 3. The adjustment mechanism 20' differs mainly from that shown in Figs. 2-3 in the configuration of the locking mechanism 36' for securing the cover portion 30' in the secured position.

The cover portion 30' includes three elements which are movable relative to one another: a main body 31 hinged to the base portion 22, a sliding member 40 and a
 25 locking member 35. The locking member 35 has one end including legs 35a extending from its inner surface, into corresponding openings defined through the main body; the legs include slots engaging the hinges 33 (see Fig. 3) of the adjustment mechanism 20', so that the locking member 35 is engaged to the base 22 together with the main body
 30 31. The locking member 35 has a T-shaped protrusion 28 extending from its inner

surface at the opposed end, defined by a neck 28a extending from the inner surface and an enlarged head 28b connected to the neck 28a. The head 28b of the protrusion 28 is receivable through a complementary opening 29 defined through a plate of the main body 31.

5 The sliding member 40 includes a plate received against the outer surface of the plate of the main body 31. The plate of the sliding member 40 has an elongated slot 39 defined therethrough, sized to receive the neck 28a of the protrusion 28 but smaller in width than its enlarged head 28b so that it cannot pass therethrough. The sliding member 40 is slidable with respect to the main body 31 and locking member 35
10 between a locked position (Fig. 4B) and an unlocked position (Fig. 4A), along a path defined by the length of the elongated slot 39, guided by the engagement of the neck 28a within the elongated slot 39. The elongated slot 39 has an enlarged portion 39a at its end closest to the hinge 33, sized such that the head 28b of the protrusion can be inserted therethrough. The plate of the sliding member 40 includes a recess 32 on its
15 inner surface at the end of the elongated slot 39 furthest from the hinge 33. The sliding member 40 includes a retention finger 37' extending inwardly from its plate, and defining the end of the cover portion 30' furthest from the hinge 33. The retention finger 37' is curved and in the locked position of the sliding member 40, with the cover portion 30' in the secured position, curves or hooks around the end 22' of the base 22 (see Fig. 4B) through the complementary shaped recess 38 formed adjacent the aperture 18 of the visor 16 (see Fig. 3) to lock the cover portion 30' in the secured position.

In the locked position, the head 28b of the protrusion 28 is located inwardly of the sliding member 40, received in the recess 32 on its inner surface, and biased outwardly, for example through the action of a spring (not shown) or through elastic deformation of
25 the locking member 40. The engagement of the head 28b of the protrusion 28 in the recess 32 of the sliding member 40 prevents movement of the sliding member 40 relative to the main body 31 and locking member 35.

As shown in Fig. 4C, to move the cover portion 30' from the secured position, the sliding member 40 must be moved to the unlocked position. To that end, the locking member 35 is pressed inwardly, i.e. toward the helmet (arrow A), as the sliding member
30

40 is pulled in a direction away from the hinge 33 (arrow B). The inward movement disengages the head 28b of the protrusion 28 from the recess 32, allowing the head 28b to slide along the inner surface of the sliding member 40 as the sliding member 40 is moved away from the hinge, the neck 28b of the protrusion 28 sliding in the elongated slot 39. This movement of the sliding member 40 disengages the retention finger 37' from the base 22, allowing the cover portion 30' to be pivoted away from the base 22 to the exposed position (Fig. 3).

The sliding movement of the sliding member 40 is stopped before the head 28b of the protrusion 28 moves into the enlarged end 39a of the slot 39; the enlarged area 39a is provided to enable assembly of the elements of the cover portion 30'. A bump at the end of the sliding member 40 engages a corresponding surface of the main body 31 to stop its movement in the unlocked position, preventing further movement of the sliding portion 40 in the direction away from the hinges 33.

When the cover portion 30' is moved back to the secured position, the sliding member 40 is moved toward the hinge 33; the head 28b of the protrusion 28 slides along the inner surface of the sliding member 40 as the sliding member 40 is moved toward the hinge 33, the neck 28a of the protrusion 28 sliding in the elongated slot 39. This retention finger 37' is engaged with the base 22 to lock the cover portion 30' in place. At this position, the outward bias of the locking member 35 brings the head 28b of the protrusion 28 within the recess 32 of the sliding member 40, thus locking the cover portion 30' in the secured position.

Fig. 5 shows another embodiment of an adjustment mechanism 120. The support member 124 in this embodiment includes a ridge 125 which projects away from the surface of the base portion 122. In this embodiment, the ridge 125 defines a closed perimeter, forming an enclosure. It will be appreciated, however, that the orientation and extent of the ridge 125 can vary. For example, the ridge 125 can be a horizontal protrusion extending only along an upper segment of the base portion 122.

In the embodiment shown, the ridge 125 is snugly receivable within the perimeter of the visor aperture 118. The peripheral aperture edge 119 of the visor aperture 118 engages the ridge 125, or some part thereof, and is supported by the ridge 125. More

particularly, the side end portion 117 of the visor 116 is mounted to the base portion 122, and thus to the helmet body 11, when the ridge 125 is received in the visor aperture 118 such that the peripheral aperture edge 119 engages some or all of the ridge 125. The ridge 125 supports the weight of the side end portion 117 of the visor 116, and prevents the visor 116 from being displaced relative to the base portion 122. The wearer can easily remove the visor 116 from the base portion 122 by disengaging the ridge 125 from the visor aperture 118.

The cover portion 130 of the adjustment mechanism 120 includes a cover piece 131. The cover piece 131 can be mounted to the base portion 122, and removed completely from the base portion 122. In the embodiment of Fig. 5, the ridge 125 has aligned ridge slots 126 defined as elongated apertures through two opposed vertical walls of the ridge 125, in a portion of the ridge 125 extending out of the visor opening 118 when the ridge 125 is engaged therein. When the cover piece 131 is manually displaced to the secured position, a first end 132 of the cover piece 131 is inserted through first one, and then the other, ridge slot 126 until the second end 132 of the cover piece 131 abuts against the ridge 125. The cover portion 130 and base portion 122 cooperate to engage part of the side end portion 117 of the visor 116. At least part of the cover portion 130 is located outwardly of the outer surface of the side end portion 117 and maintains the engagement of the ridge 125 in the aperture 118.

It is understood that the cover piece 131 is not limited to the embodiment shown. For example, the cover piece 131 can be a cap that is secured over the ridge 125 of the base portion 122 in the secured position, and which is removed from the ridge 125 in the exposed position. Other configurations are also possible.

The cover portion 130 has a locking mechanism for securing the cover portion 130 in the secured position, including a resilient member 135 which is depressed by the walls of a first one of the ridge slots 126 as the cover piece 131 is inserted, and expands once it passes through this first ridge slot 126. The expanded resilient member 135 prevents the ends 132 of the cover piece 131 from being pulled out of the ridge slots 126, and thus prevents the visor 116 from being easily removed. In order to manually

displace the cover piece 131 to the exposed position, the resilient member 135 must be depressed and the cover piece 131 withdrawn through the ridge slots 126.

Figs. 6A and 6B show another embodiment of the adjustment mechanism 220, where the cover portion 230 is pivotally engaged to the base portion 222. More particularly, the base portion 222 and the cover portion 230 are connected to one another via a pivot 233. The pivot 233 defines a pivot axis 234 which extends perpendicularly to the plane defined by the substantially planar base portion 222. In operation, the cover portion 230 is manually manipulated to pivot about the pivot axis 234 by rotating in the direction D3 toward the connection members 27 in order to engage the base portion 222 in the secured position. The cover portion 230 can also be manually manipulated to pivot about the pivot axis 234 by rotating in the direction D4 away from the connection members 27 in order to expose the connection members 27 and the adjustment apertures 23 in the exposed position. The cover portion 230 has a slot 229 defined therein which in the secured position, the side end portion 217 of the visor 216 is received in the slot 229.

The visor 216 shown in Figs. 6A and 6B includes an aperture 218 in the form of an elongated slot defined through the side end portion 217. The visor aperture 218 is mounted to the base portion 222 by receiving a support member 224 in the form of a vertical wall extending from the base portion 222. The side end portion 217 penetrates through an opening 223 of the base portion 222 partly bordered by the support member 224, and the visor 216 is further secured to the base portion 222 through a mating groove/tongue configuration. More particularly, the visor has an indentation or groove 221 which engages a correspondingly shaped tongue 228 on the base portion 222, extending within the opening 223.

In this embodiment, the aperture 218 is not aligned with the connection members 27. The side end portion 217 is sized and configured such that when the side end portion 217 is engaged to the base portion 222 with the support member 224 received in the aperture 218, the end 217a of the side end portion 217 is located forwardly of the connection members 27, such that the connection members 27 remain accessible.

The operation of the adjustment mechanism 220 is as follows. Each base portion 222 is mounted to the respective side portion of the helmet body using one or more of the connection members 27. Since the cover portions 230 are already connected to the base portions 222, they are also mounted to the helmet body. Each side end portion 217 of the visor 216 can then be mounted to the base portion 222 by engaging the visor aperture 218 with the support member 224 and the end of the visor 216 in the opening 223. The cover portion 230 can then be displaced by the wearer's fingers to the secured position along direction D3, where the cover portion 230 engages the base portion 222 and receives the side end portion 217 of the visor 216 in its slot 229, thereby securing the visor 216 to the helmet body. If the wearer wishes to adjust the position of the visor 216 or remove it, the wearer can manually displace the cover portion 230 to the exposed position by pivoting it along direction D4. The wearer or someone else can then access the exposed connection members 27 and remove or loosen them to displace the base portion 222, and the visor 216, toward the front portion or the rear portion of the helmet body. Once in the desired position, the connection members 27 can be tightened or inserted into the adjustment apertures 23 to secure the base portions 222 in their new positions. The cover portion 230 can then be manually displaced to the secured position, thereby securing the newly positioned visor 216 to the helmet body. The cover portion 230 closes the open end of the aperture 218 defined in the end 217a of the side end portion 217, and maintains the engagement of the support member 224 in the aperture 218.

In an alternate embodiment, the aperture 218 is omitted, and the opening 223 of the base portion 222 is sized to receive the end portion 217 of the visor 216 with the support member 224 abutting an edge of the end portion 217. The tongue 228 of the base portion is engaged in the visor groove 221, which may be defined as an open slot extending through the entire thickness of the end portion 217, or as a closed recess extending only through part of the thickness of the end portion 217.

Figs. 7A and 7B show another embodiment of the adjustment mechanism 320 where the base portion 322 and the cover portion 330 are connected to one another via a hinge 333. The hinge 333 defines a horizontal hinge axis 334 which is parallel to a plane defined by the substantially planar base portion 322. In operation, the cover

portion 330 is manually manipulated to rotate about the hinge axis 334 toward the base portion 322 in order to engage the base portion 322 in the secured position. The cover portion 330 can also be manually manipulated to rotate about the hinge axis 334 away from the base portion 322 in order to expose the connection members 27 and the adjustment apertures 23 in the exposed position. The horizontal orientation of the hinge axis 334 allows the cover portion 330 to pivot up and down (i.e. toward the top and bottom of the helmet body).

The base portion 322 in this embodiment includes a ridge 325 which projects away from the surface of the base portion 322. The ridge 325 forms a partial perimeter (U-shape). The peripheral aperture edge 319 of the visor aperture 318 (or alternately, an outer edge of the side end portion 317) engages the ridge 325 along all of its length. More particularly, the side end portion 317 of the visor 316 is mounted to the base portion 322, and thus to the helmet body, when the ridge 325 is received in the visor aperture 318 such that the peripheral aperture edge 319 engages the ridge 325. The ridge 325 therefore supports the weight of the side end portion 317 of the visor 316, and prevents the visor aperture 318 from being displaced. The wearer can easily remove the visor 316 from the base portion 322 by disengaging the visor aperture 318 from the ridge 325. In the secured position, at least part of the cover portion 330 is located outwardly of the outer surface of the side end portion 317 and maintains the engagement of the ridge 325 in the aperture 218.

Figs. 7A and 7B also show a locking mechanism 336 for securing the cover portion 330 in the secured position. The locking mechanism 336 has one or more resilient retention fingers 337 extending from a surface of the base portion 322. Each retention finger 337 is a projection from the base portion 322 that can be elastically manipulated to engage a complementarily shaped retention aperture 338 in the cover portion 330. More particularly, as the cover portion 330 is pivoted toward the base portion 322, each retention figure 337 is inserted through a corresponding retention aperture 338. The walls of each retention aperture 338 may exert a force or pressure on the retention finger 337 to elastically deform it. This secures the cover portion 330 to the base portion 322 in the secured position, as shown in Fig. 7B. To manually displace the cover portion 330 to the exposed position, each retention finger 337 is elastically deformed

manually by the wearer to be removed from its retention aperture 338, thereby unlocking the cover portion 330 and allowing it to be pivoted away from the base portion 322, as shown in Fig. 7A.

5 An additional cover member 340 is also hingedly connected to the cover portion 330 and/or base portion 322, and is pivotable over the cover portion 330 to prevent access to the retention fingers 337. The cover member 340 includes a resilient retention finger 341 engaging a complementary opening 342 of the cover portion 330.

10 Accordingly, the position of the visor 16, 116, 216, 316 can be adjusted through the following method. The opposed side end apertures of the visor are engaged to the respective adjustable base portion which are each connected to a corresponding side portion 14 of the helmet. The mounting of the opposed side end apertures of the visor may include positioning each side end aperture at least partially over one of the base portions to allow access thereto.

15 The base portions are displaced relative to respective side portions 14 of the helmet. As explained above, this can involve displacing the base portions along directions D1 and D2 toward a front or a back of the helmet, respectively. This displacement of the base portions may be performed while maintaining the mounting of the visor to these base portions. As they are being displaced, the base portions may simultaneously support a weight of the visor, allowing the position of the visor to be adjusted while the visor is
20 mounted on the helmet.

Once they are in the desired position, the displaced base portions are fixed in position on the respective side portions 14 of the helmet. This can include covering the displaced base portions to prevent access thereto, such as by using the cover portions. The covering of the base portions can be done in several different ways. For example,
25 the base portions can be covered with a removable cover portion (such as shown in Fig. 5), covered with a pivotable cover portion (such as shown in Figs. 6A-6B), or covered with a hinged cover portion (such as shown in Figs. 2-3, 4A-4B-4C, and 7A-7B).

30 In light of the preceding, it can be appreciated that the visor assembly disclosed herein allow for the position of a visor to be adjusted with relative ease. More particularly, no

tools are required by the wearer to remove the visor from the helmet. Furthermore, the visor does not need to be removed while it is being adjusted, thereby allowing the wearer to quickly choose the desired position of the visor with respect to their face. Some conventional visors have to be removed completely before one can access the
5 adjustment screws and adjust the base portion, which causes inconveniences.

The above description is meant to be exemplary only, and one skilled in the art will recognize that changes may be made to the embodiments described without departing from the scope of the invention disclosed. For example, the visor may be movable
10 respective to the adjustment mechanism, for example slidable with respect to the base when engaged therewith, for example through engagement of complementary rail features. The base portion of the adjustment mechanism can be permanently attached to the side end portion of the visor, for example integrally molded therewith. Retaining member(s) of the adjustment mechanism can be provided on another portion of the adjustment mechanism, for example on the cover portion along a hinged connection
15 with the base, for example with a surface or element of the base acting as retaining member cooperating with the retaining member(s) of the cover portion to engage the side end portion of the visor therebetween. Any combination of elements from different embodiments is considered to be within the scope of this disclosure. Other modifications which fall within the scope of the present invention will be apparent to
20 those skilled in the art, in light of a review of this disclosure, and such modifications are intended to fall within the appended claims.

CLAIMS

1. A helmet, comprising:

a helmet body adapted to cover at least part of a head of a wearer, the helmet body having a front portion, a rear portion, and two side portions to each cover a respective front, rear, and sides of the head;

an adjustment mechanism on each respective one of the two side portions of the helmet body, each adjustment mechanism comprising:

a base portion connected to the respective one of the side portions by at least one connection member extending through the base portion and into the respective one of the side portions, the at least one connection member in a first configuration allowing relative motion between the base portion and the respective one of the side portions and in a second configuration fixing a relative position of the base portion with respect to respective one of the side portions, the base portion having at least one support member, and

a cover portion manually displaceable between a secured position engaged with the base portion and an exposed position, the cover portion allowing access to the at least one connection member at least in the exposed position; and

a visor configured to protect at least part of a face of the wearer, the visor including opposed side end portions, the at least one support member of each adjustment mechanism being removably engaged with a respective one of the side end portions;

wherein in the secured position, at least part of the cover portion of each adjustment mechanism is located outwardly of an outer surface of the visor and prevents disengagement of the at least one support member from the respective one of the side end portions.

2. The helmet of claim 1, wherein each of the side end portions has a visor aperture defined therethrough, the at least one support member of each adjustment mechanism being removably received through the visor aperture of the respective one of the side end portions, and wherein in the secured position, the cover portion of each adjustment mechanism prevents removal of the at least one support member from the visor aperture of the respective one of the side end portions.
3. The helmet of claim 2, wherein each connection member is located within a perimeter defined by the visor aperture of the respective one of the side end portions such that in the exposed position, each connection member is accessible through the visor aperture of the respective one of the side end portions.
4. The helmet of claim 3, wherein for each adjustment mechanism, the cover portion in the secured position closes the visor aperture of the respective one of the side end portions and prevents access to the at least one connection member.
5. The helmet of any one of claims 2 to 4, wherein the at least one support member of each adjustment mechanism includes a ridge projecting away from the surface of the base portion and defining at least part of a perimeter receivable in a perimeter of the visor aperture of the respective one of the side end portions.
6. The helmet of claim 5, wherein the ridge has at least one elongated ridge slot extending through a portion of the ridge extending out of the visor aperture of the respective one of the side end portions, the cover portion engaging the base portion in the secured position upon being inserted through the at least one ridge slot.
7. The helmet of any one of claims 1 to 6, wherein for each adjustment mechanism, each of the at least one connection member is slidably received through a respective elongated adjustment aperture defined in the base portion,

the at least one connection member in the second configuration engaging a surface of the base portion with a surface of the respective one of the side portions to prevent the relative sliding motion by friction.

8. The helmet of any one of claims 1 to 6, wherein the base portion and the cover portion are connected by a hinge, the cover portion rotating about the hinge between the secured and exposed positions.
9. The helmet of any one of claims 1 to 6, wherein the base portion and the cover portion are connected by a pivot defining a pivot axis extending perpendicularly to a plane of the base portion, the cover portion pivoting about the pivot axis between the secured and exposed positions.
10. The helmet of any one of claims 1 to 9, further comprising a locking mechanism securing the cover portion to the base portion in the secured position.
11. The helmet of any one of claims 1 to 9, wherein the cover portion of each adjustment mechanism includes a main body hingedly connected to the base portion, a sliding portion and a locking portion, the sliding portion slidable with respect to the main body and locking portion between a locked position where the sliding portion secures the cover portion to the base portion and an unlocked position where the cover portion is free to move from the secured position to the exposed position, the locking portion including a protrusion removably received and biased in a recess of the sliding portion to prevent movement from the locked position to the unlocked position, the locking portion manually displaceable to remove the protrusion from the recess.
12. A visor assembly for a helmet, the visor assembly comprising:
 - two adjustment mechanisms each comprising:
 - a base portion connectable to a respective side portion of the helmet and having at least one adjustment aperture extending therethrough each sized to receive a respective connection member, the base portion having at least one support member, and

- a cover portion manually displaceable between a secured position engaged with the base portion and an exposed position, the cover portion allowing access to the at least one adjustment aperture at least in the exposed position; and
- a visor to protect at least part of a face of the wearer, the visor including opposed side end portions, the at least one support member of each of the two adjustment mechanisms being removably engaged to a respective one of the side end portions;
- wherein in the secured position, the cover portion of each of the two adjustment mechanisms prevents disengagement of the at least one support member from the respective one of the side end portions.
13. The visor assembly of claim 12, wherein the opposed side end portions of the visor each have a visor aperture defined therethrough, the at least one support member of each of the two adjustment mechanisms being removably received through the visor aperture of the respective one of the side end portions, wherein in the secured position, at least part of the cover portion of each of the two adjustment mechanisms is located outwardly of an outer surface of the visor and prevents removal of the at least one support member from the visor aperture of the respective one of the side end portions.
14. The visor assembly of claim 13, wherein each of the at least one adjustment aperture is located within a perimeter defined by the visor aperture of the respective one of the side end portions such in the exposed position, each of the at least one adjustment aperture is accessible through the visor aperture of the respective one of the side end portions.
15. The visor assembly of claim 14, wherein for each of the two adjustment mechanisms, the cover portion in the secured position closes the visor aperture of the respective one of the side end portions and prevents access to the at least one adjustment aperture.

16. The visor assembly of any one of claims 13 to 15, wherein the at least one support member of each of the two adjustment mechanisms includes a ridge projecting away from the surface of the base portion and defining at least part of a perimeter receivable in a perimeter of the visor aperture of the respective one of the side end portions.
17. The visor assembly of claim 16, wherein the ridge has at least one elongated ridge slot extending through a portion of the ridge extending out of the visor aperture of the respective one of the side end portions, the cover portion engaging the base portion in the secured position upon being inserted through the at least one ridge slot.
18. The visor assembly of any one of claims 12 to 17, wherein the base portion and the cover portion are connected by a hinge, the cover portion rotating about the hinge between the secured and exposed positions.
19. The visor assembly of any one of claims 12 to 17, wherein the base portion and the cover portion are connected by a pivot defining a pivot axis extending perpendicularly to a plane of the base portion, the cover portion pivoting about the pivot axis between the secured and exposed positions.
20. The visor assembly of any one of claims 12 to 19, further comprising a locking mechanism securing the cover portion to at least one of the base portion and the visor in the secured position.
21. The visor assembly of any one of claims 12 to 19, wherein the cover portion of each adjustment mechanism includes a main body hingedly connected to the base portion, a sliding portion and a locking portion, the sliding portion slidable with respect to the main body and locking portion between a locked position where the sliding portion secures the cover portion to the base portion and an unlocked position where the cover portion is free to move from the secured position to the exposed position, the locking portion including a protrusion removably received and biased in a recess of the sliding portion to prevent

movement from the locked position to the unlocked position, the locking portion manually displaceable to remove the protrusion from the recess.

22. A method of adjusting a position of a visor relative to a helmet, the method comprising:

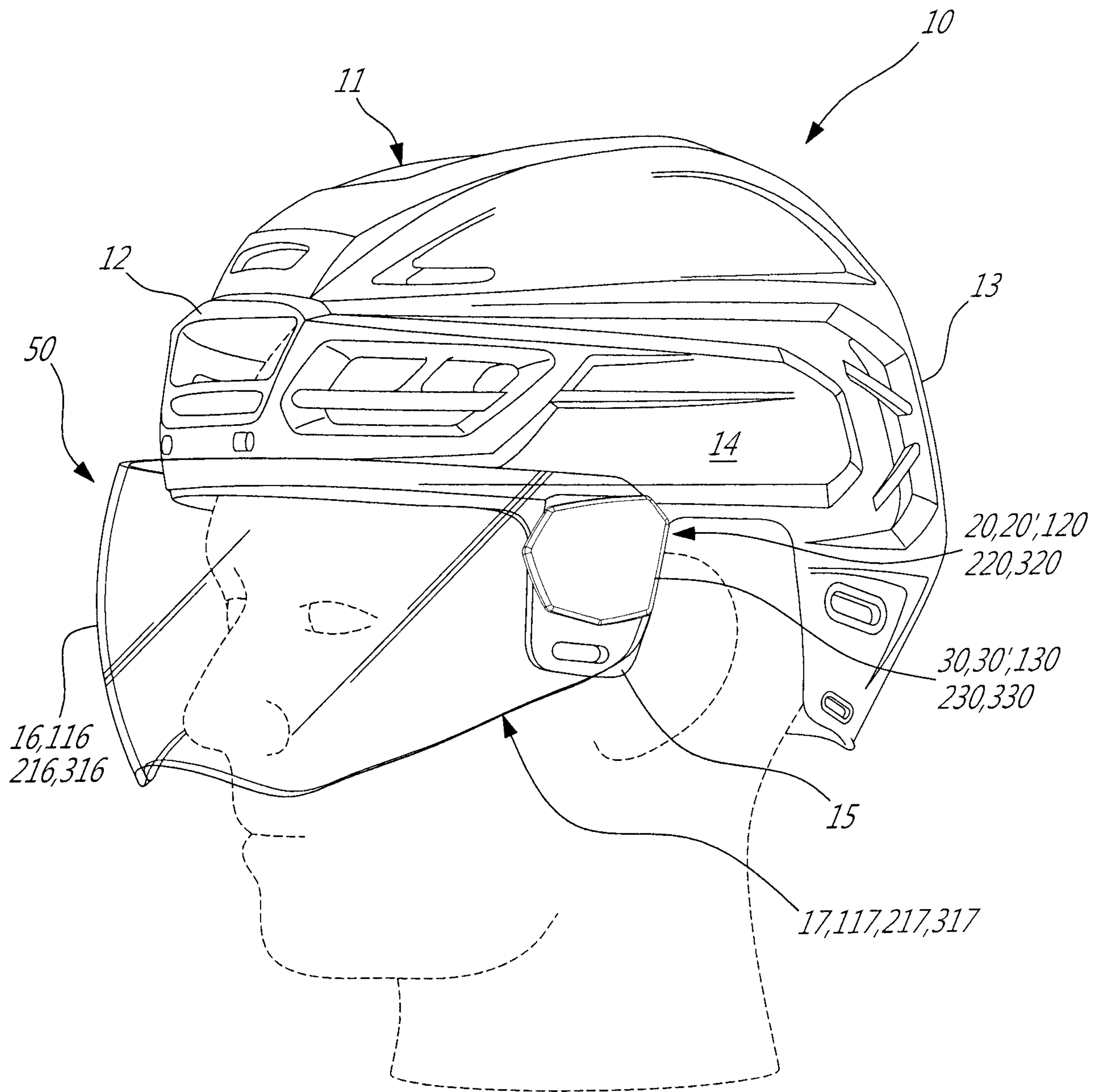
engaging part of each of two base portions in a respective aperture of the visor, each of the two base portions being adjustably connected to a respective side portion of the helmet;

sliding at least one of the two base portions relative to the respective side portion of the helmet while maintaining the part of each of the two base portions engaged in the respective aperture; and

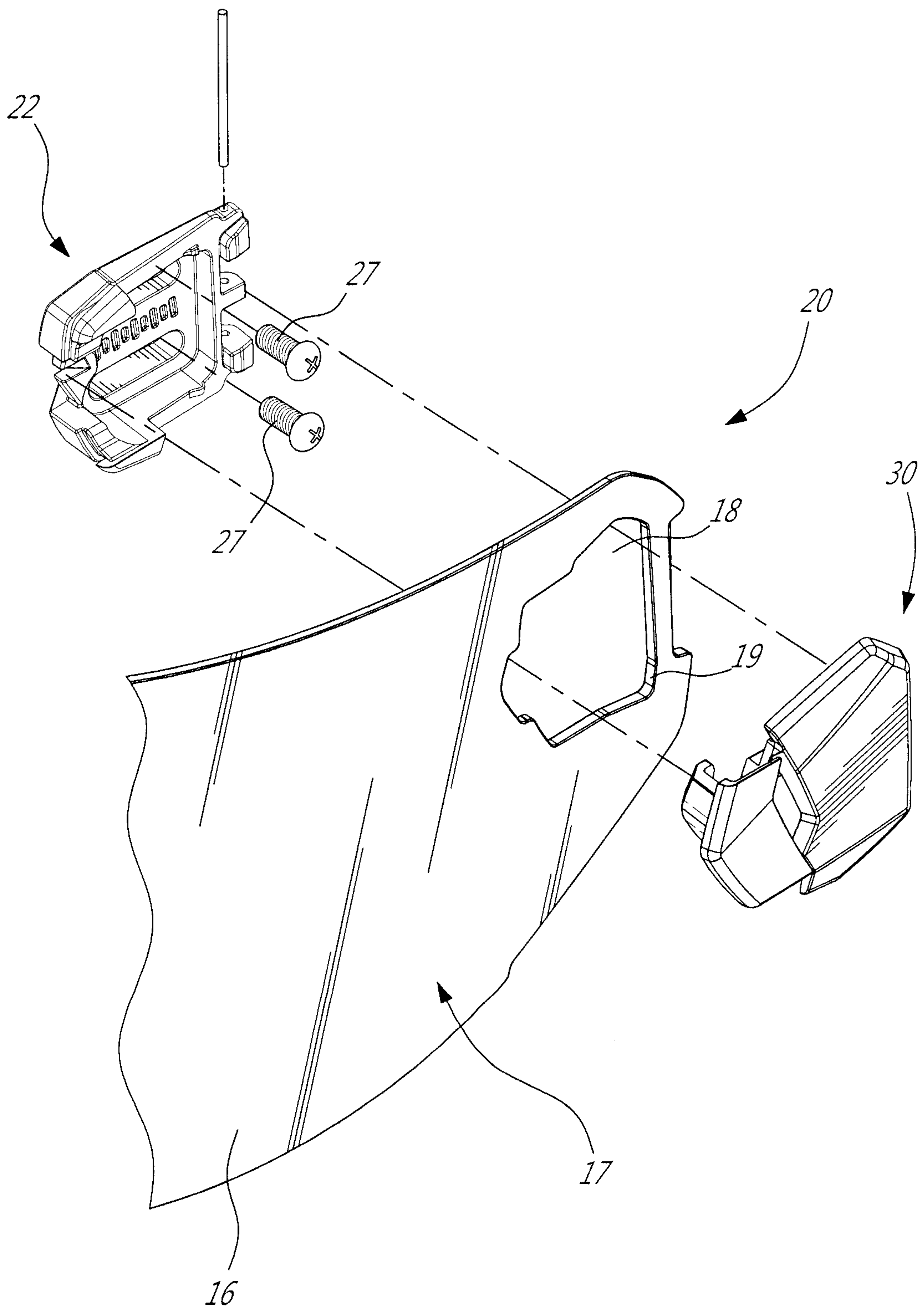
fixing a position of said at least one of the two base portions with respect to the respective side portion of the helmet.

23. The method of claim 22, wherein sliding said at least one of the two base portions and fixing the position of said at least one of the two base portions both include changing a configuration of at least one connection member extending between said at least one of the two base portions and the respective side portion of the helmet, the method further comprising, after fixing the position, covering the at least one connection member to prevent access thereto.

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**FIG-1**

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**Fig. 2**

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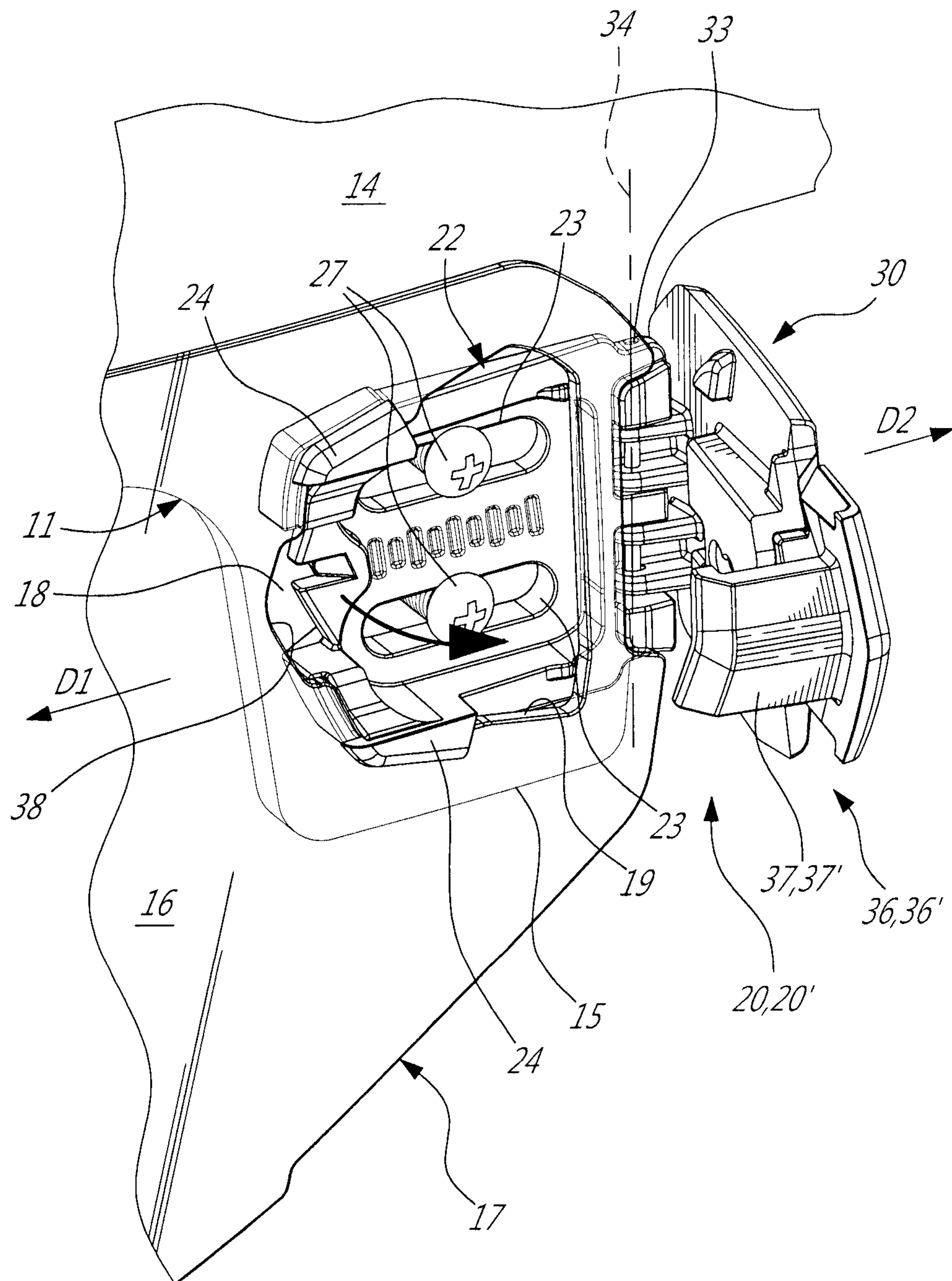
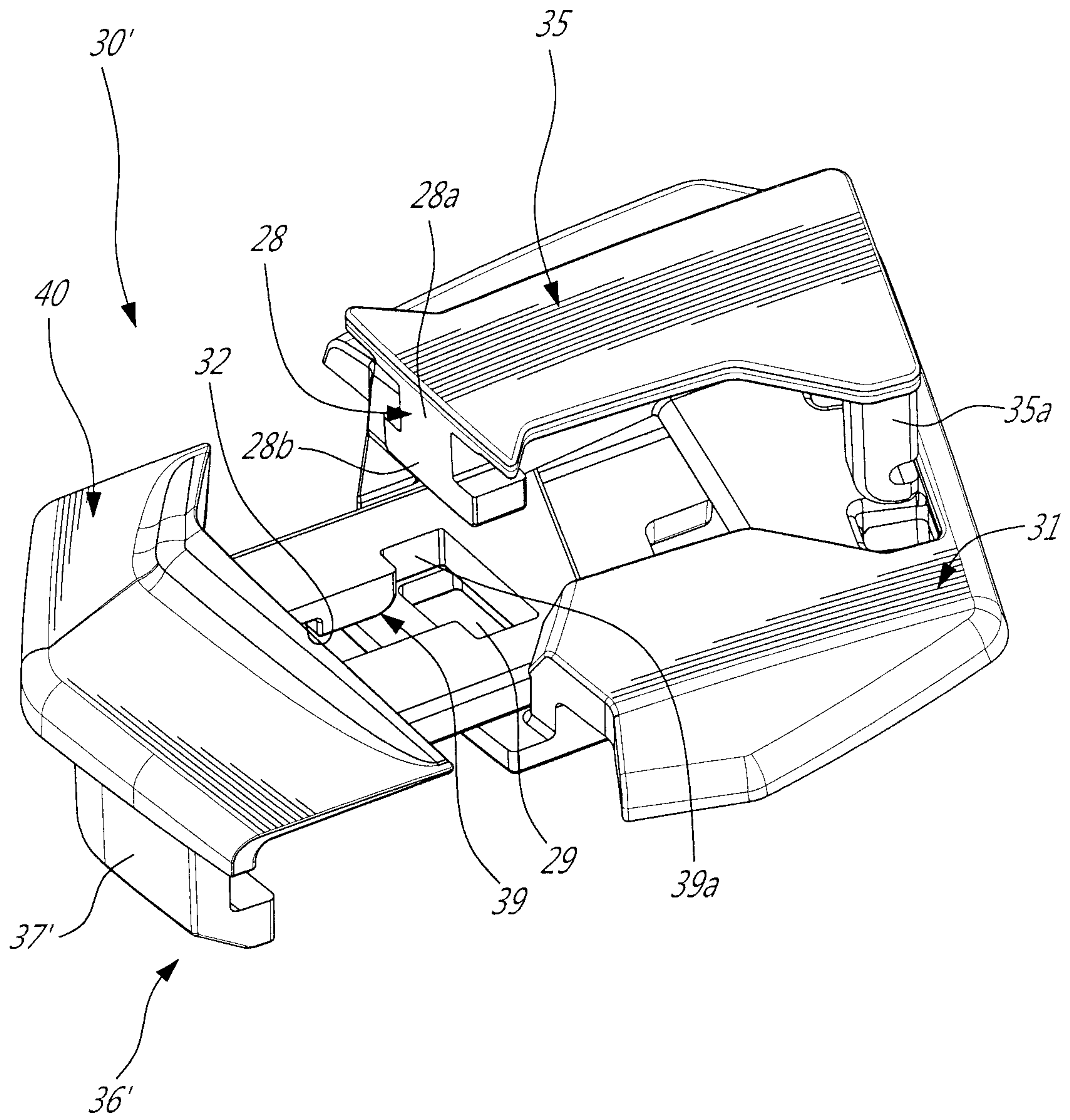


Fig. 3

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Fig-4A

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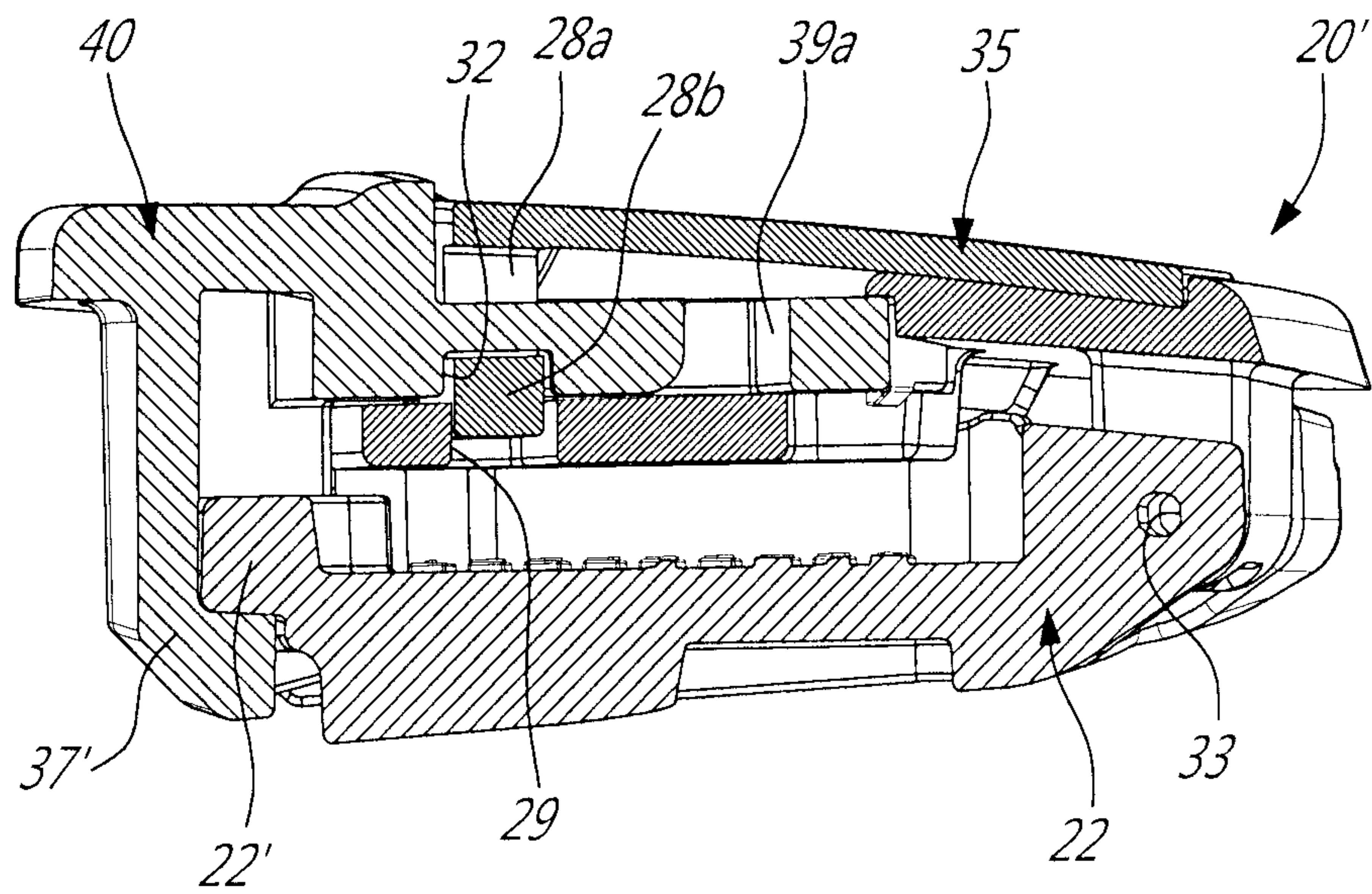


Fig-4B

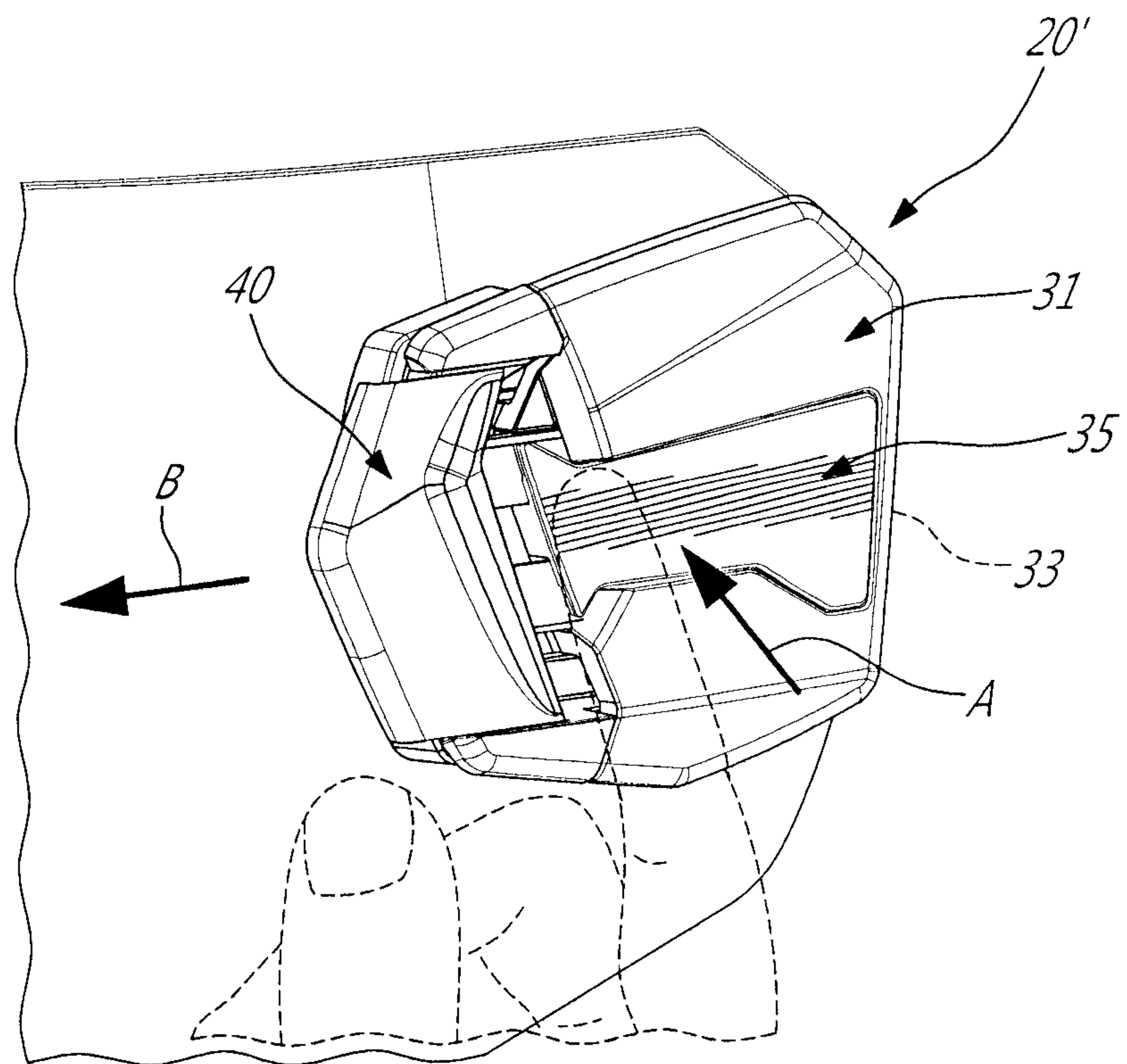
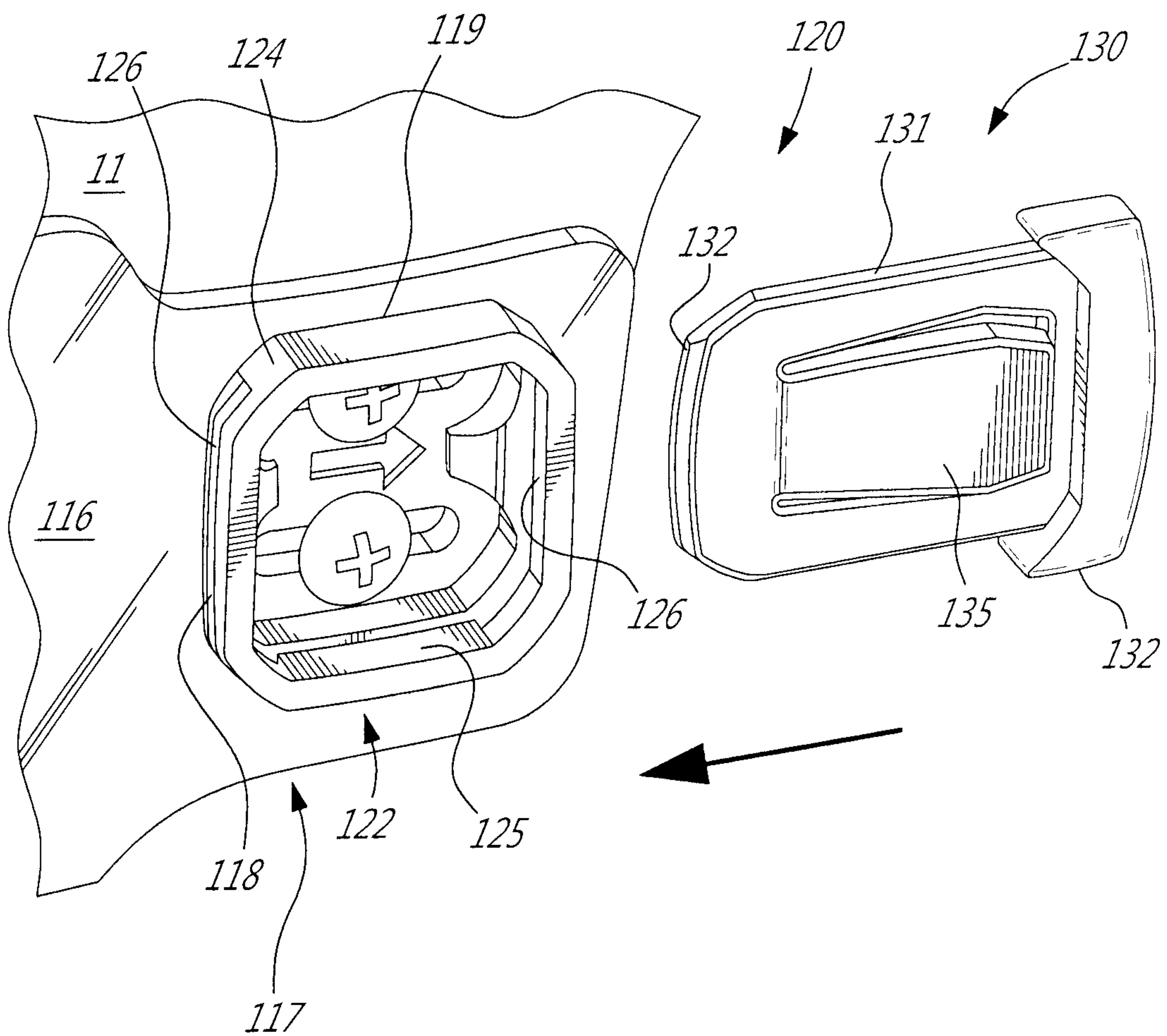


FIG-4C

**Fig. 5**

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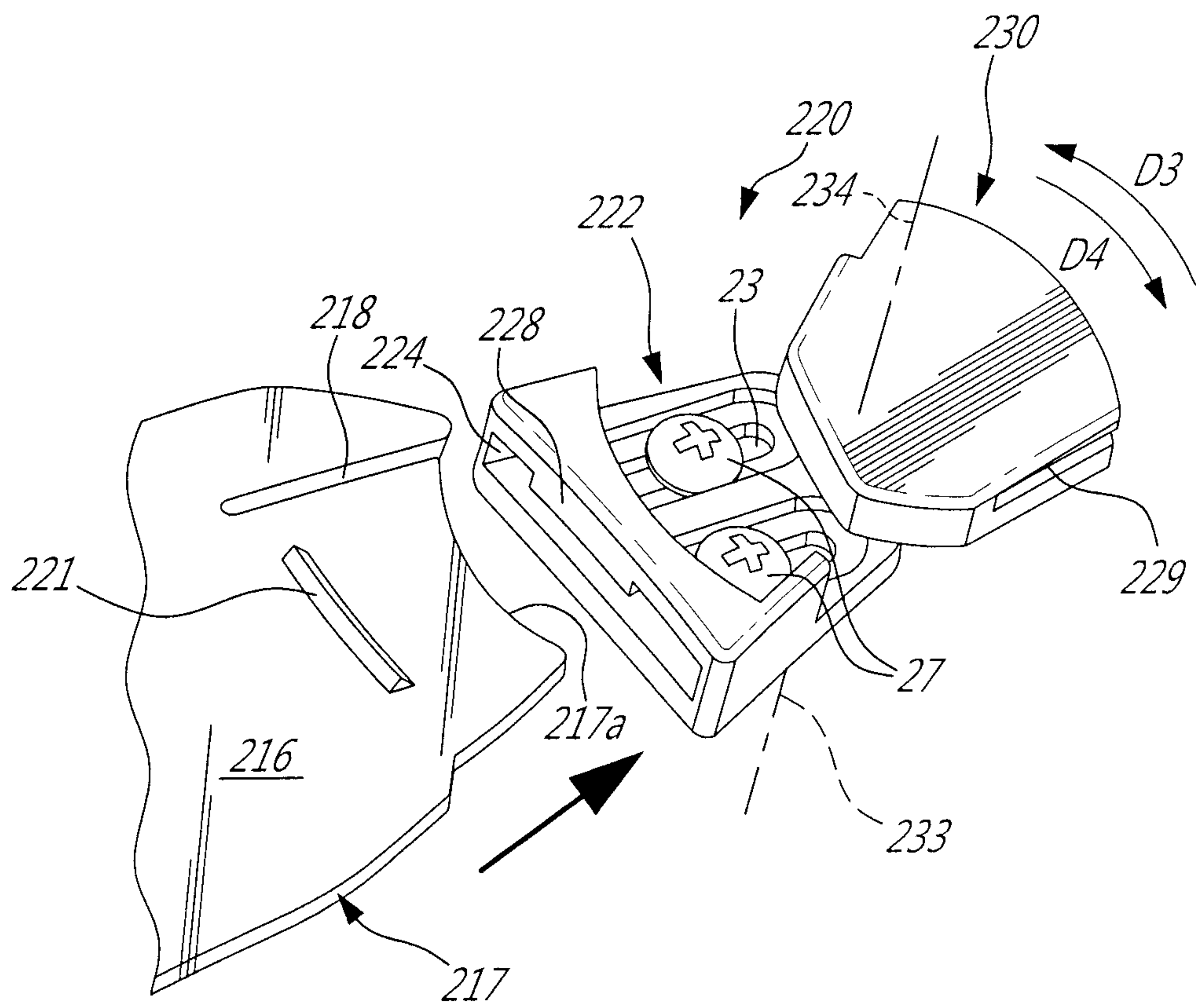


FIG. 6A

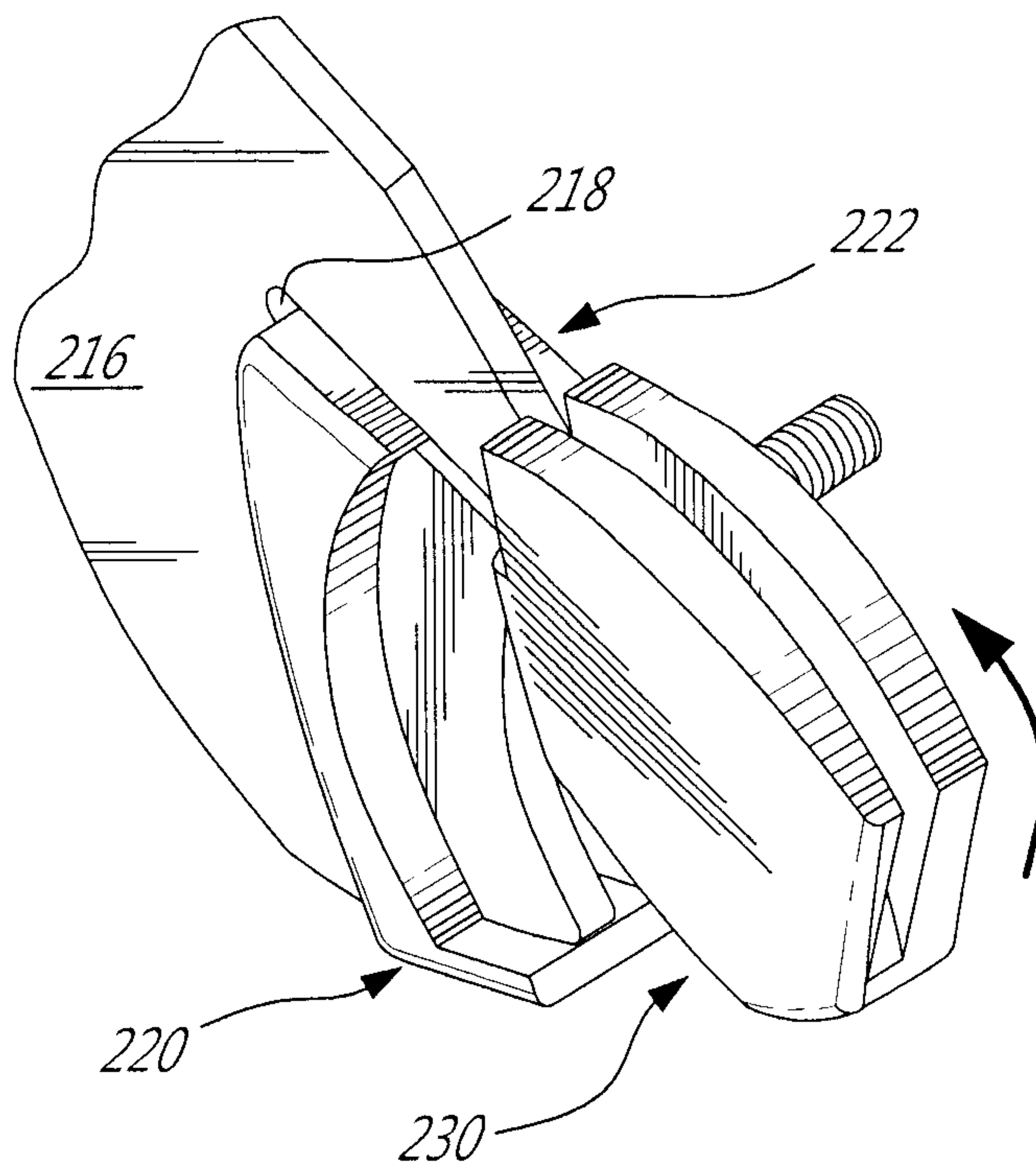


FIG. 6B

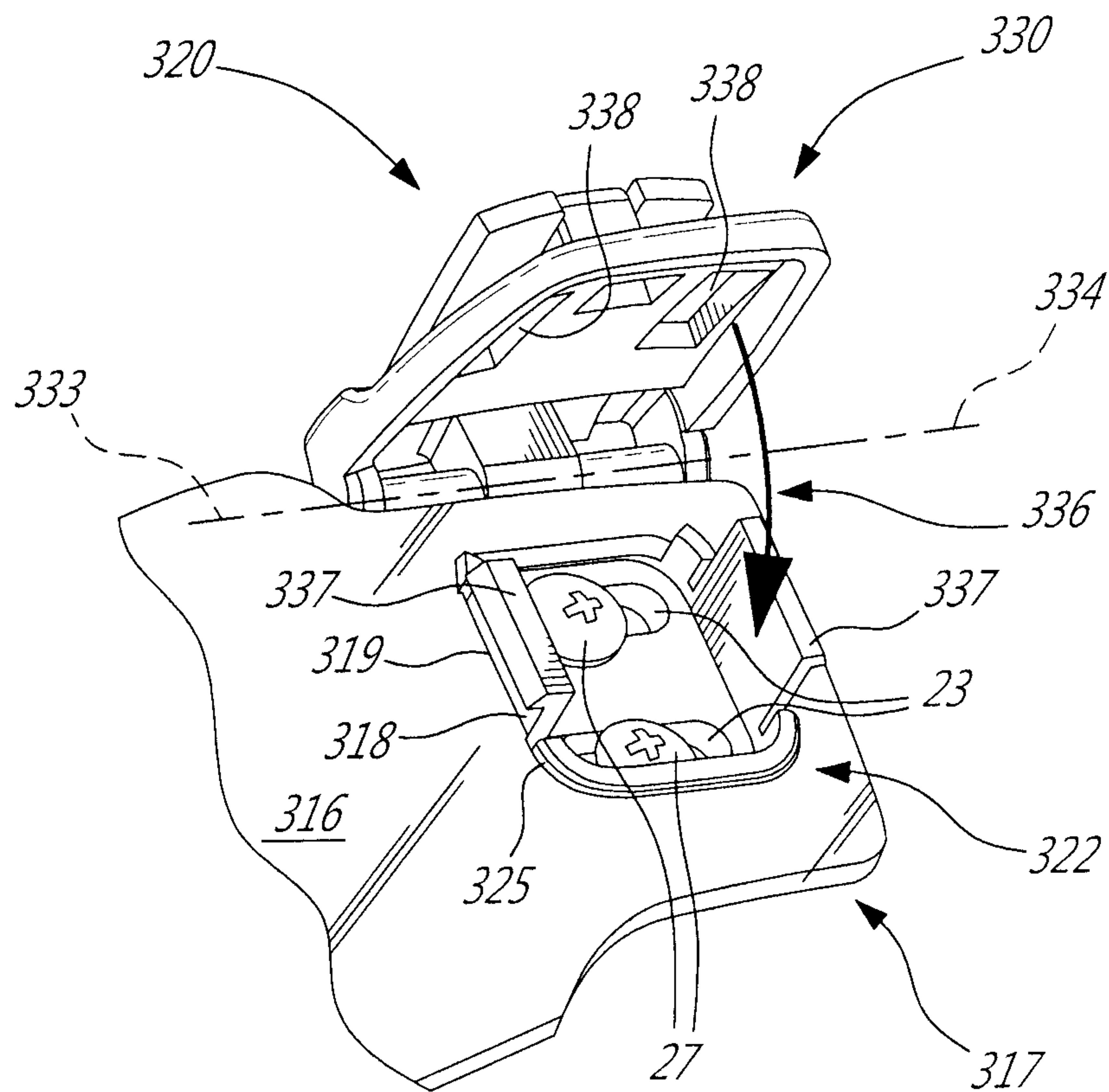


Fig. 7A

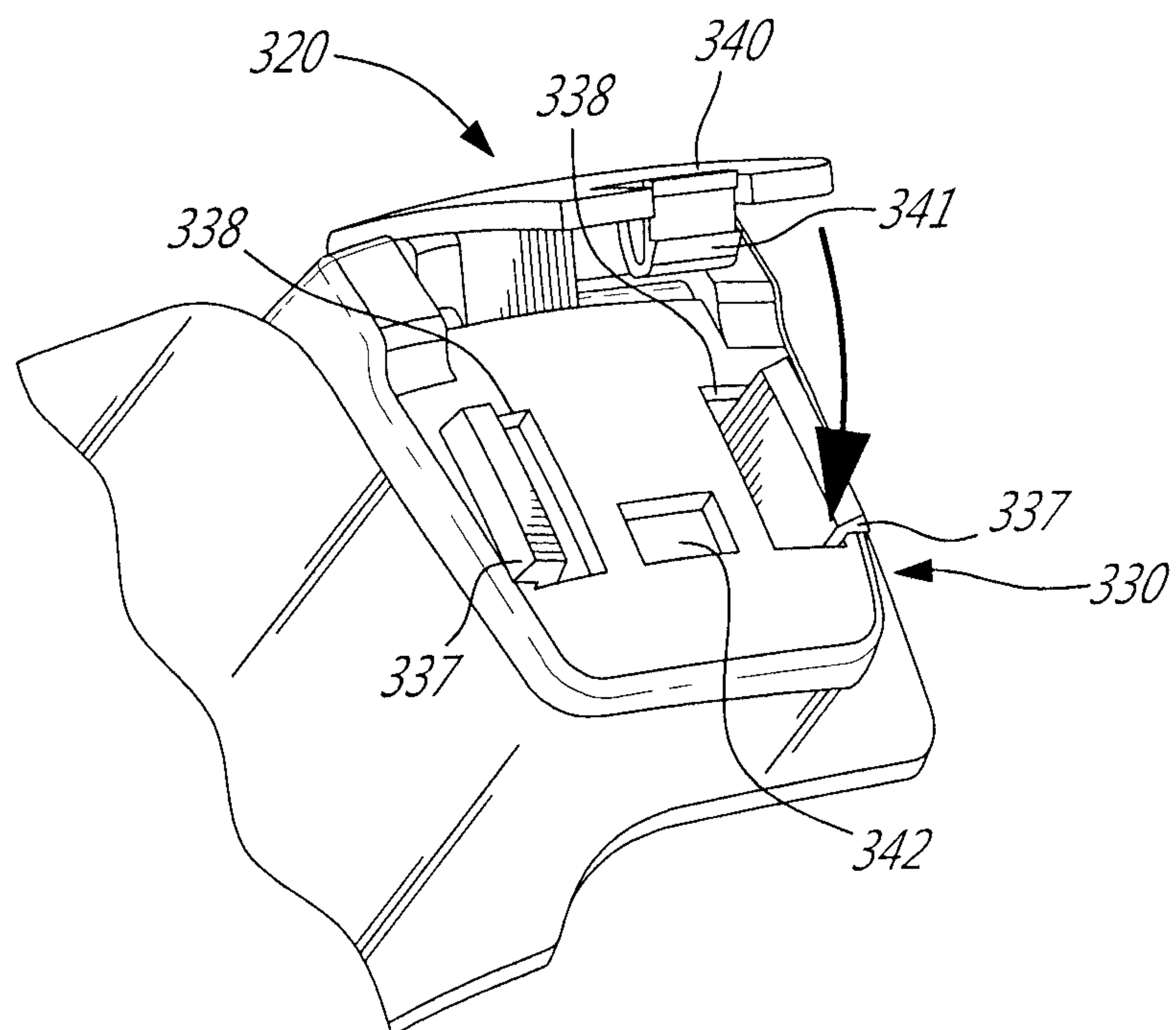


Fig. 7B

