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(54) **Strap divider**

(57) A strap divider (10) has a base plate (11) with an exterior surface and an interior surface, a post mounted to the interior surface of the base plate and running parallel to the interior surface of the base plate, and a cover plate (12) having an interior surface and an exterior surface, a front end and a rear end. The rear end of the

cover plate has a post-receiving cavity that is adapted to snap onto the post to rotatably connect the base plate to the cover plate, with the interior surfaces of the base plate and cover plate facing each other.

## Description

### 1. Field of the Invention

[0001] The present invention relates to a strap divider for bicycle helmets. In particular, the invention relates to a device for securing and dividing a chin strap on a bicycle helmet.

### 2. The Prior Art

[0002] Strap dividers are used on bicycle helmets to guide and separate the chin strap so that it may be secured on the helmet in two different locations. Examples of such dividers can be found in United States Patent No. 6,108,875 to Anscher and 7,203,972 to Pietrzak.

[0003] Since bicycle helmet straps can often come under a lot of stress, it is desirable to have parts for the helmet that can withstand significant force without bending or breaking. In addition, it would be desirable to provide a strap divider that allows a wide angle for dividing the strap. This allows for more flexibility in attaching the strap to the helmet, as more spaced-apart strap arrangements are now possible.

### SUMMARY OF THE INVENTION

[0004] It is therefore an object of the invention to provide a strap divider that allows for wide angle strap division, while maintaining sufficient strength of the parts.

[0005] These and other objects are accomplished by a strap divider having a base plate with an exterior surface and an interior surface, a post mounted to the interior surface of the base plate and running parallel to the interior surface of the base plate, and a cover plate having an interior surface and an exterior surface, a front end and a rear end. The rear end of the cover plate has a post-receiving cavity that is adapted to snap onto the post to rotatably connect the base plate to the cover plate, with the interior surfaces of the base plate and cover plate facing each other.

[0006] In use, a strap is fed between the base plate and the cover plate, and the cover plate is pressed downward to keep the strap in position. On one side of the post, the strap is fed in as a double layer strap, which then divides as the strap exits the post. The double layer portion is used as a chin strap on a bicycle helmet, while the divided portion is attached the helmet in two different locations.

[0007] In one embodiment, the rear end of the base plate is equipped with strap-retaining elements that grip a strap when a strap is threaded between the base plate and the cover plate and the front end of the cover plate is pressed toward the base plate. These elements can be teeth, protrusions, etc.

[0008] The post receiving cavity can be disposed on the exterior surface of the cover plate or on the interior. When it is disposed on the exterior of the plate, the cover

plate is placed underneath the post and snapped into place by pressing upward on the post. When the cavity is on the interior of the cover plate, the cover plate is secured by placing the cover plate on top of the post and pressing downward on the cover plate until it snaps onto the post.

[0009] In order to mount the post on the base plate, the base plate has two side walls extending upward from the interior surface and the post is mounted between the two side walls. This also provides a space through which the strap is fed in use. The post can be mounted on the side walls at one end of the base plate, or can be mounted in the center of the base plate. When the post is mounted across the center of the base plate, the base plate is symmetrical from front to back and the cover plate can be mounted facing in either direction.

[0010] In another embodiment, the base plate has a strap slot disposed along one end thereof. The strap is fed in between the cover plate and the base plate and can then be fed through the slot before dividing, to further secure the strap to the strap divider.

[0011] For further securing of the strap, the base plate can have strap retaining elements disposed on its interior face, near the strap slot. These strap retaining elements grip the strap and prevent it from slipping once the strap is in the proper position. The strap retaining elements can be protrusions, teeth, a serrated ridge, etc.

[0012] There can also be an additional strap securing slot located at an opposite end of the base plate from the first strap securing bar. This way, the strap is fed through this additional strap slot, through the space between the cover plate and base plate, and out through the first strap slot. The strap divides at the point where it passes the two side walls, which keeps the strap in an overlapping configuration.

[0013] In one embodiment, the base plate has a wider end and a narrower end. The front of the cover plate is disposed adjacent the narrower end and the strap is fed through this narrower end and exits out the wider end in a split configuration. The wider end of the base plate can accommodate a wide division between the straps, so that they can be secured to the helmet spaced far apart.

[0014] In an alternative embodiment, the strap divider has a base plate having a wider end, a narrower end, and two side edges, and a cover plate having a wider end, a narrower end, and two side edges. The cover plate is pivotally connected at the narrower end to the narrower end of the base plate so as to pivot in a plane that is parallel to the plane of the cover plate and base plate. The cover plate has a series of curved transverse slots therethrough and the base plate has at least one transverse ridge. This ridge extends through a middle one of the slots and grips a strap that is threaded through the other slots on either side of the middle slot. This keeps the strap from sliding around while it is inserted in the strap divider. The ridge can have strap gripping teeth or protrusions located along its top edge to increase its effectiveness.

**[0015]** In this embodiment the base plate preferably has an overhanging lip extending around the wider end, and the wider end of the cover plate fits beneath the lip when the base plate and cover plate are pivoted to overlap each other.

**[0016]** The cover plate can be connected to the base plate via a button on the base plate or cover plate, and an aperture on the other one of the base plate and cover plate. The button is snapped into the aperture to secure the cover plate and base plate together, while allowing them to pivot relative to each other.

**[0017]** The transverse ridge can have a transverse slit cut therethrough to increase its flexibility when the strap is threaded through the slots. The parts of the ridge can flex in and out based on the pressure from the strap, while still gripping the strap. This also allows for straps of different thicknesses to be used with the strap divider of this embodiment.

**[0018]** The strap divider according to the invention can be made of any suitable molded material, such as acetal resin, polyethylene or any other suitable molded plastic. The invention could also be formed from metal.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

**[0019]** Other objects and features of the present invention will become apparent from the following detailed description considered in connection with the accompanying drawings. It is to be understood, however, that the drawings are designed as an illustration only and not as a definition of the limits of the invention.

**[0020]** In the drawings, wherein similar reference characters denote similar elements throughout the several views:

FIG. 1 shows a top and front perspective view of a first embodiment of the strap divider according to the invention;

FIG. 2 shows a rear view of the embodiment of FIG. 1;

FIG. 3 shows a side view of the embodiment of FIG. 1;

FIG. 4 shows a perspective view of the base plate of the embodiment of FIG. 1;

FIG. 5 shows a perspective view of the cover plate of the embodiment of FIG. 1;

FIG. 6 shows a side view of the embodiment of FIG. 1 with a strap threaded therethrough;

FIG. 7 shows a side view of an alternative embodiment of the strap divider according to the invention;

FIG. 8 shows a perspective view of a strap threaded through the embodiment of FIG. 7;

FIG. 9 shows a side view of the embodiment of FIGS. 7 and 8 with a strap threaded therethrough;

FIG. 10 shows a top view of another embodiment of the strap divider according to the invention;

FIG. 11 shows a side view of the embodiment of FIG. 10;

FIG. 12 shows a top view of the embodiment of FIG. 10 with a strap threaded therethrough;

FIG. 13 shows a top view of a base plate of a further embodiment of a strap divider according to the invention;

FIG. 14 shows a top view of a cover plate for use with the base plate of FIG. 13;

FIG. 15 shows a top view of the base plate and cover plates of FIGS. 13 and 14 assembled;

FIG. 16 shows a side cross-sectional view of the embodiments of FIG. 15;

FIG. 17 shows a rear view of the embodiment of FIG. 15 with a strap threaded therethrough; and

FIG. 18 shows a rear view as shown in FIG. 17 but with the base plate and cover plate pivoted away from each other.

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

**[0021]** Referring now in detail to the drawings and, in particular, FIGS. 1-6 show a first embodiment of a strap divider 10 according to the invention. Strap divider 10 consists of a base plate 11 and a cover plate 12. Base plate 11 includes a base 14, and side walls 13 onto which a horizontal bar 18 is connected. Cover plate 12 has a groove 19 on one end, which snaps onto horizontal bar 18 to attach cover plate 12 to base plate 11. Beneath groove 19 is a lower part 16 with teeth 17 for gripping straps 60 that is threaded in between base plate 11 and cover plate 12. Cover plate 12 is pivotally mounted onto base plate 11 so that when a strap is threaded in between cover plate 11 and base plate 12, as shown in FIG. 6, cover plate 12 can be pushed downward toward straps 60 until teeth 17 grip into straps 60. Cover plate 12 is formed to be slightly concave to facilitate pressing it downward without slipping.

**[0022]** As shown in FIG. 6, straps threaded through from the front of strap divider 10 to the rear, can be divided to extend in separate directions as they exit from strap divider 10. The thin side walls 13 do not constrain straps 60 to exit in a parallel configuration, so that straps 60 can be attached at wider points along a helmet.

**[0023]** FIGS. 7-9 show a strap divider 20 that is a slightly different variation of strap divider 10. Here, the base plate has a symmetrical base 24, so that side walls 13 are attached directly in the middle of base 24. This allows cover plate 12 to be attached facing in either direction, because base 24 is symmetrical from front to back. The cover plate 12 in this variation has a convex lip, which facilitates the lifting of cover plate 12 to release straps that are secured in strap divider 20.

**[0024]** FIGS. 10-12 show an alternative embodiment of the invention. Here, strap divider 30 comprises a base plate 31 with a cover plate 32 snapped on top of horizontal bar 38 which is attached to base plate 31 via side walls 33. In this embodiment, base plate 31 has a strap bar 34 through which strap 60 is threaded after it is placed in between base plate 31 and cover plate 32. In addition, spikes 37 disposed along base plate 31 adjacent slot 36 further acts to secure strap 60 and prevent sliding after the straps are positioned and cover plate 32 is pressed into a closed position. As in the first embodiment, cover plate 32 has teeth 35 positioned along a lower ridge to grip strap 60 when cover plate 32 is lowered over strap 60. There is also an additional strap securing bar 39 located at the front of base plate 31, for additional securing of strap 60, if desired. In FIG. 12, strap 60 is not shown threaded around this bar, but if the straps need additional securing against slippage, strap 60 could be placed under the front of base plate 31, then over bar 39 and then under cover plate 32.

**[0025]** The wider rear end of base plate 31 with strap securing bar 34 allows for a particularly wide spread of straps 60 as they exit out from underneath cover plate 32.

**[0026]** FIGS. 13-18 show a fourth embodiment of the strap divider according to the invention. In this embodiment, strap divider 40 is comprised of base plate 41 and cover plate 42. Base plate 41 and cover plate 42 are pivotally connected to each other via a snap-in protrusion 43 on base plate 41 that snaps into aperture 44 on cover plate 42. Once connected, cover plate 42 pivots in a plane parallel to the base plate 41, as shown in FIG. 18.

**[0027]** Cover plate 42 has a series of laterally extending curved slots 45, 46, 47. Base plate 41 has a laterally extending curved ridge 48 with teeth 51 that extends through slot 46 when cover plate 42 is pivoted to overlap base plate 41, as shown in FIGS. 15 and 16. Ridge 48 is bisected longitudinally by a slot 49 that allows ridge 48 to be compressed by straps 60 when straps 60 are threaded through slot 45, over ridge 48 and back through slot 47 (see FIGS. 16-18) where the straps then diverge for connection to a helmet. The combination of slots 45, 46, 47 and ridge 48 secures straps 60 to strap divider 40 and prevents them from sliding around once they are in position. Straps 60 are first threaded through cover plate 42 when it is pivoted away from base plate 41, as shown in FIG. 18, and then cover plate 42 is pivoted back onto base plate 41 and held in position by lip 52. At this point, ridge 48 presses straps 60 against slot 46 and teeth 51 to prevent any further slippage of strap 60 while strap

divider 40 is assembled.

**[0028]** To further secure cover plate 42 to base plate 41, an overhanging lip 52 is arranged along the wider end of base plate 41. Thus, when cover plate 42 is pivoted so as to be directly over base plate 41, cover plate 42 is secured under lip 52. Lip 52 can be arranged so that it exerts a downward pressure on cover plate 42 to prevent it from sliding out unless a user presses down on cover plate 42 and intentionally pivots it.

**[0029]** Accordingly, while only a few embodiments of the present invention have been shown and described, it is obvious that many changes and modifications may be made thereunto without departing from the spirit and scope of the invention.

## Claims

1. A strap divider (10, 20, 30) comprising:

a base plate (11, 31) having an exterior surface and an interior surface;  
a post mounted to the interior surface of the base plate and running parallel to the interior surface of the base plate (11, 31); and  
a cover plate (12, 32) having an interior surface and an exterior surface, a front end and a rear end, said rear end having a post receiving cavity that is adapted to snap onto the post to rotatably connect the base plate (11, 31) to the cover plate (12, 32), with the interior surfaces of the base plate (11, 31) and cover plate (12, 32) facing each other.

2. The strap divider according to claim 1, wherein the rear end of the base plate (11, 31) is equipped with strap-retaining elements that grip a strap (60) when a strap (60) is threaded between the base plate (11, 31) and the cover plate (12, 32) and the front end of the cover plate (12, 32) is pressed toward the base plate (11, 31), wherein the strap retaining elements are preferably formed from a serrated ridge that faces the interior surface of the base plate (11, 31).

3. The strap divider according to claim 1, wherein the post receiving cavity is disposed on the exterior surface of the cover plate (12, 32).

4. The strap divider according to claim 1, wherein the base plate (11, 31) has two side walls (13, 33) extending upward from the interior surface, and wherein the post is mounted between the two side walls (13, 33).

5. The strap divider according to claim 3, wherein the base plate (11, 31) has two opposite ends, and wherein the post is mounted to the side walls (33) equidistant between the two ends.

6. The strap divider according to claim 1, wherein the base plate (11, 31) has a strap securing bar disposed along one end thereof, wherein the strap divider preferably comprises an additional strap securing bar located at an opposite end of the base plate (11, 31) from said strap securing bar. 5
7. The strap divider according to claim 1, wherein the base plate (11, 31) has strap retaining elements disposed on the interior face thereof. 10
8. The strap divider according to claim 1, wherein the base plate (11, 31) has a wider end and a narrower end that is narrower than the wider end and wherein the front of the cover plate (12, 32) is disposed adjacent the narrower end. 15
9. The strap divider according to claim 1, wherein the post receiving cavity is disposed on the interior surface of the cover plate (12, 32). 20
10. A strap divider (40) comprising:
- a base plate (41) having a wider end, a narrower end that is narrower than the wider end, and two side edges; and 25
- a cover plate (42) having a wider end, a narrower end that is narrower than the wider end, and two side edges, wherein the cover plate (42) is pivotally connected at the narrower end to the narrower end of the base plate (41) so as to pivot in a plane that is parallel to the plane of the cover plate (42) and base plate (41); 30
- wherein said cover plate (42) has a series of, preferably three, transverse slots (45, 46, 47) therethrough and wherein said base plate (41) has at least one transverse ridge (48), such that said ridge (48) extends through one of the slots (45, 46, 47) and grips a strap (60) that is threaded through other ones of the slots (45, 46, 47). 35 40
11. The strap divider according to claim 10, wherein the base plate (41) has an overhanging lip extending around the wider end, and wherein the wider end of the cover plate (42) fits beneath the lip when the base plate (41) and cover plate are pivoted to overlap each other. 45
12. The strap divider according to claim 10, wherein the transverse ridges are equipped with strap-gripping teeth. 50
13. The strap divider according to claim 10, wherein the cover plate is connected to the base plate (41) via a button on one of the base plate (41) and cover plate (42), and an aperture on the other one of the base plate (41) and cover plate (42), said button being snapped into said aperture to secure the cover plate (42) and base plate (41) together. 55
14. The strap divider according to claim 10, wherein the transverse ridge (48) has a transverse slit cut there-through.
15. The strap divider according to claim 10, wherein the transverse slots (45, 46, 47) and the transverse ridge (48) are curved.

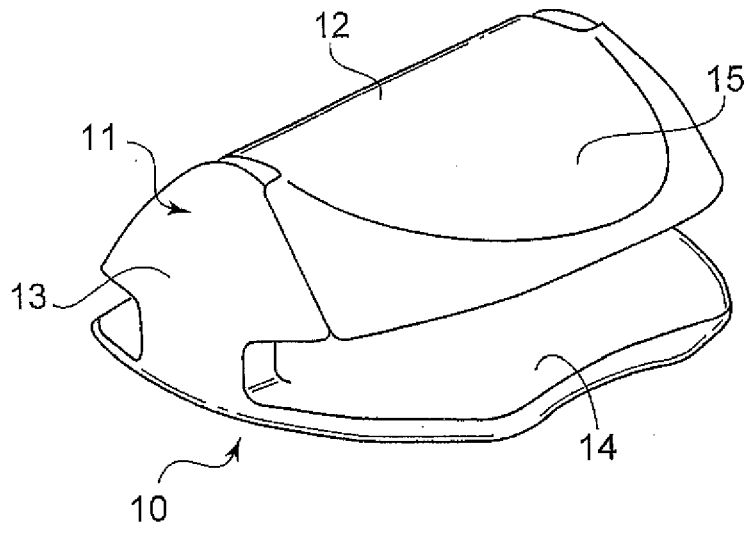


FIG. 1

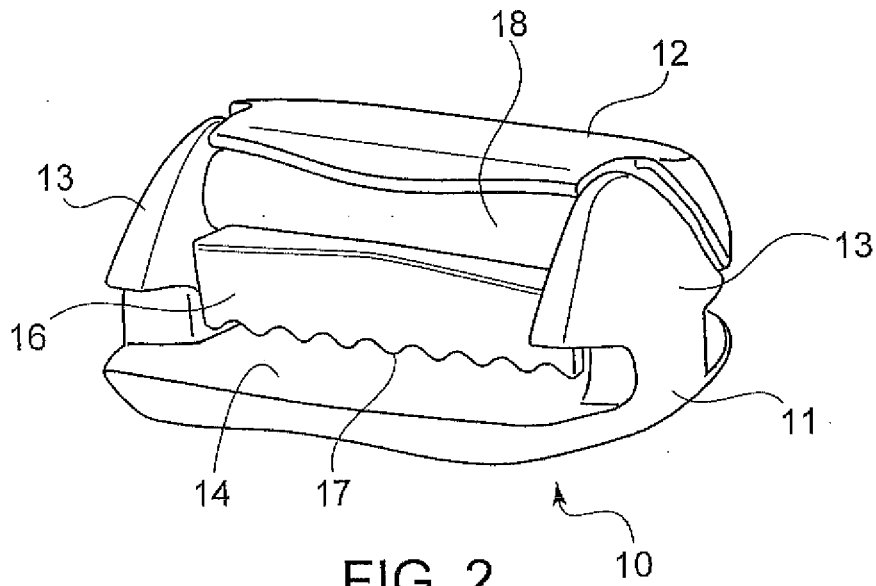


FIG. 2

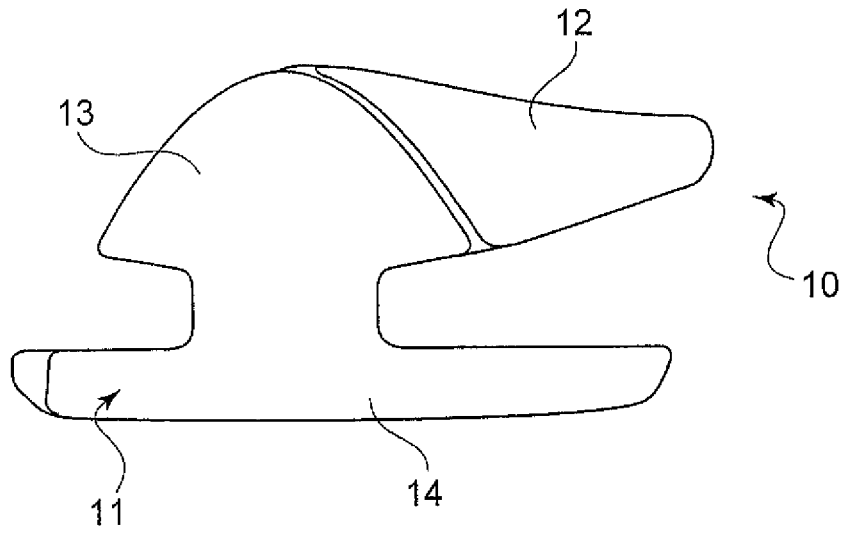


FIG. 3

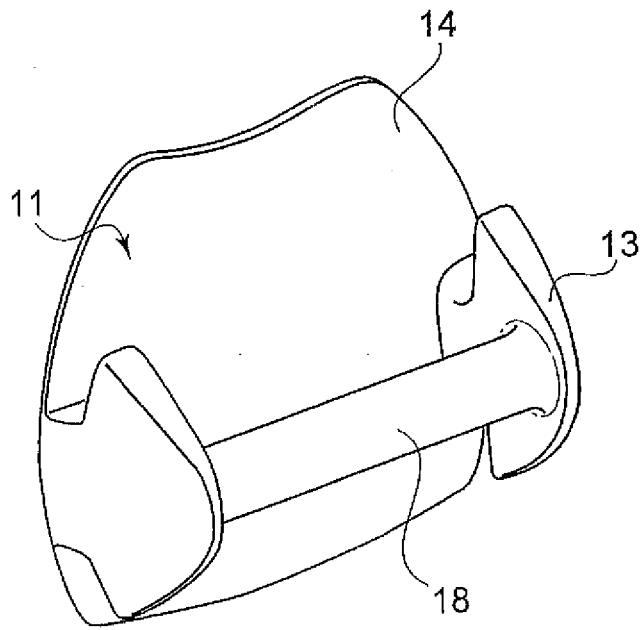


FIG. 4

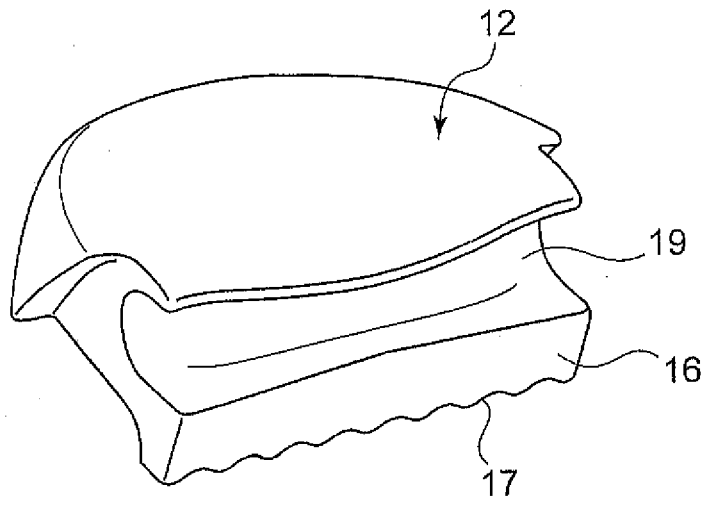


FIG. 5

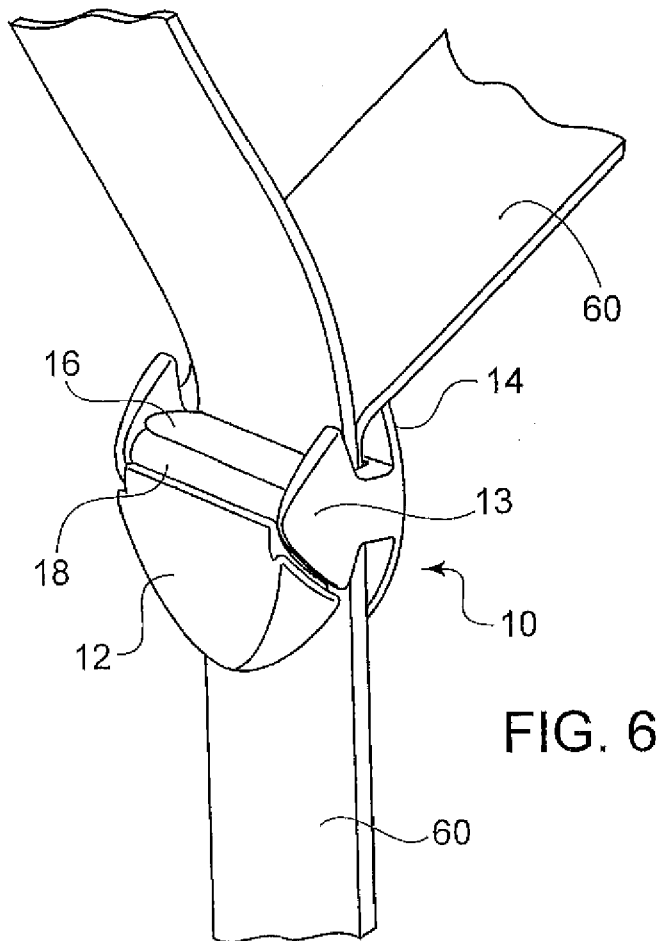


FIG. 6



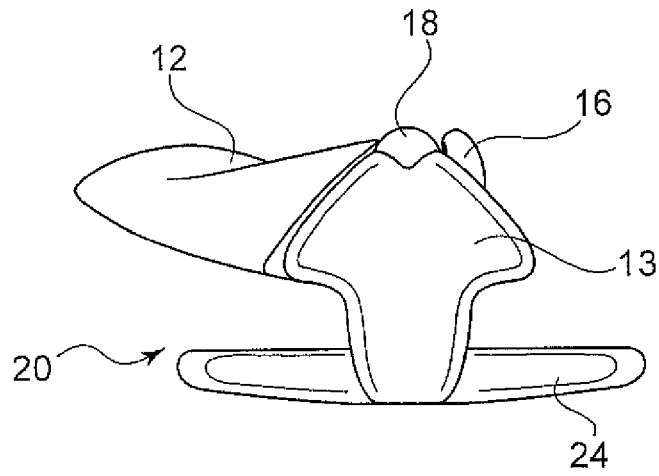


FIG. 7

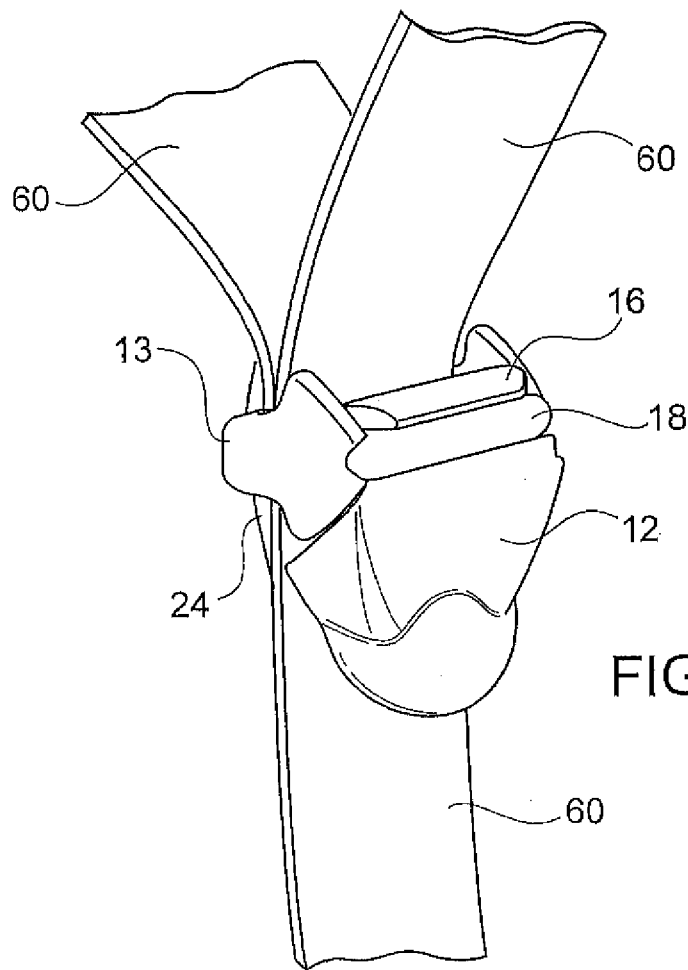
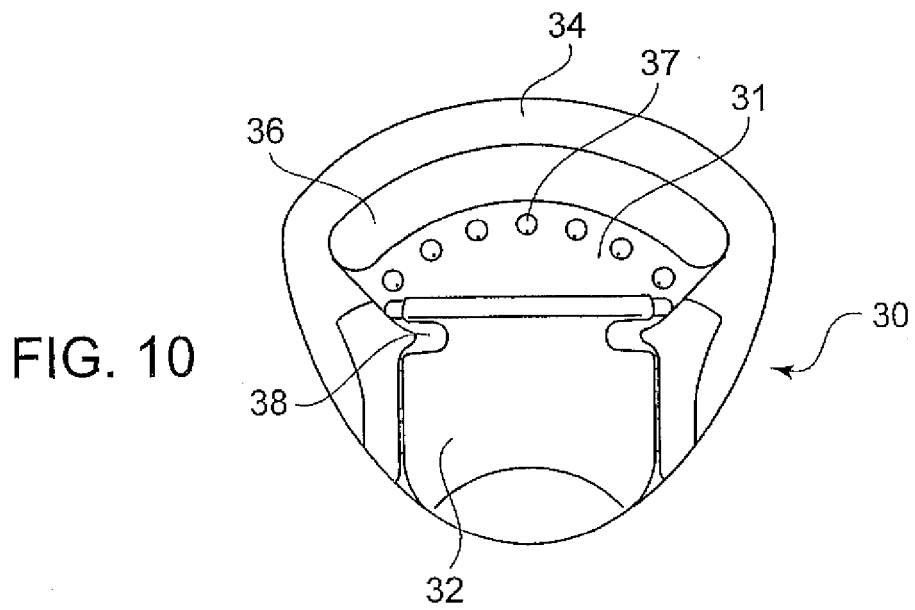
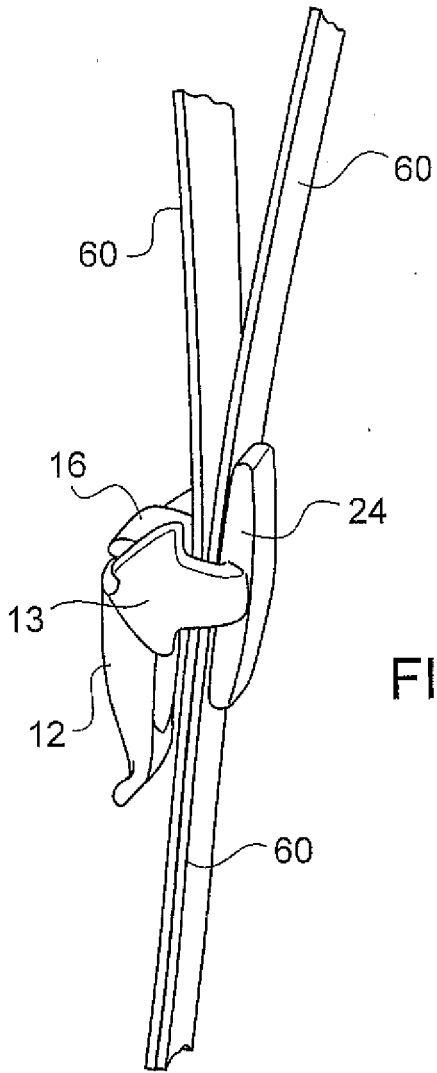
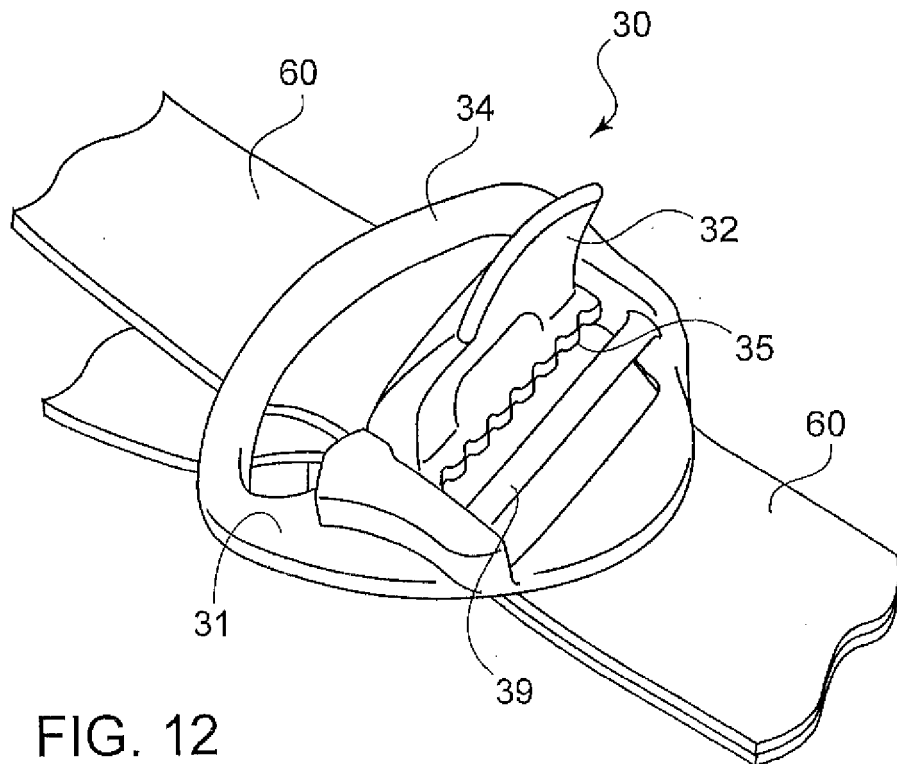
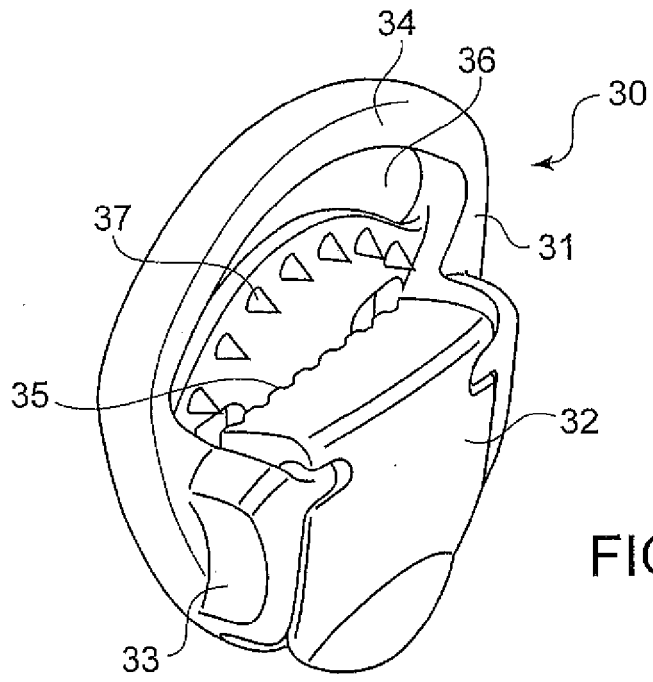


FIG. 8





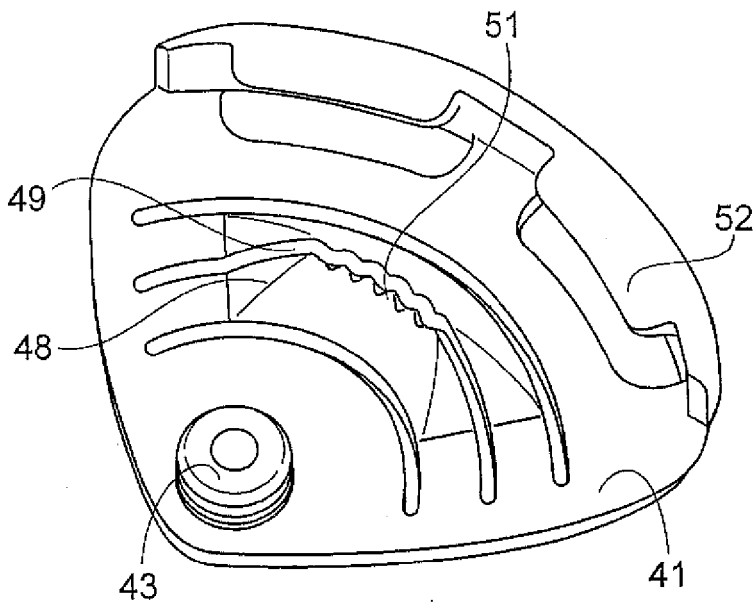


FIG. 13

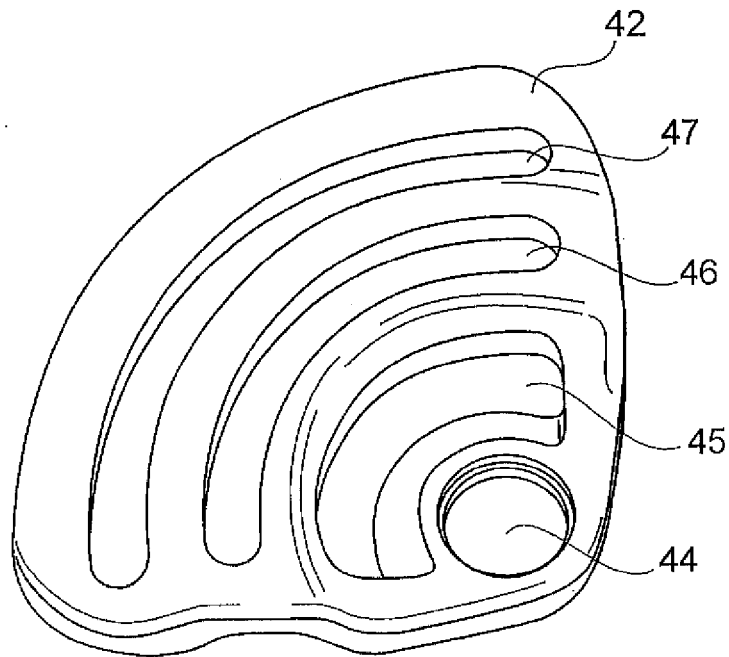


FIG. 14

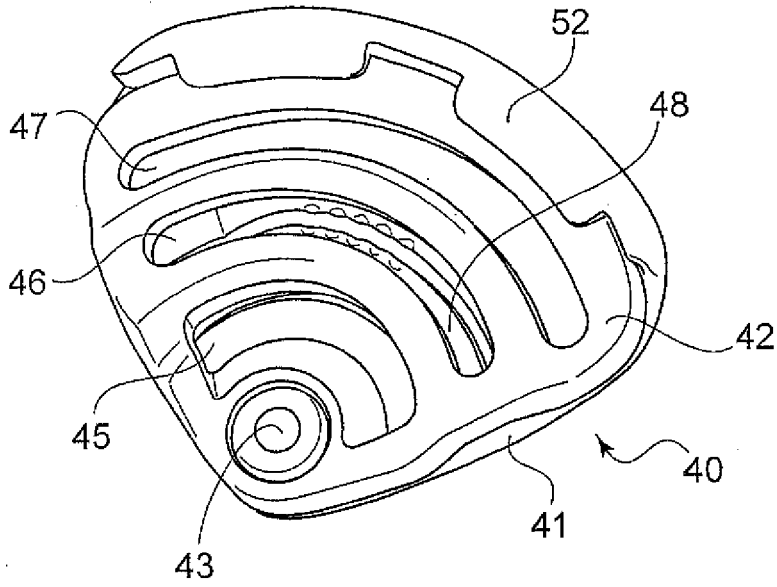


FIG. 15

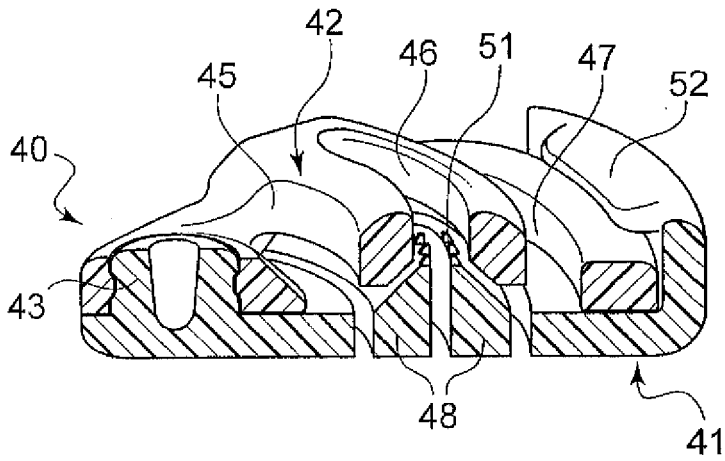


FIG. 16

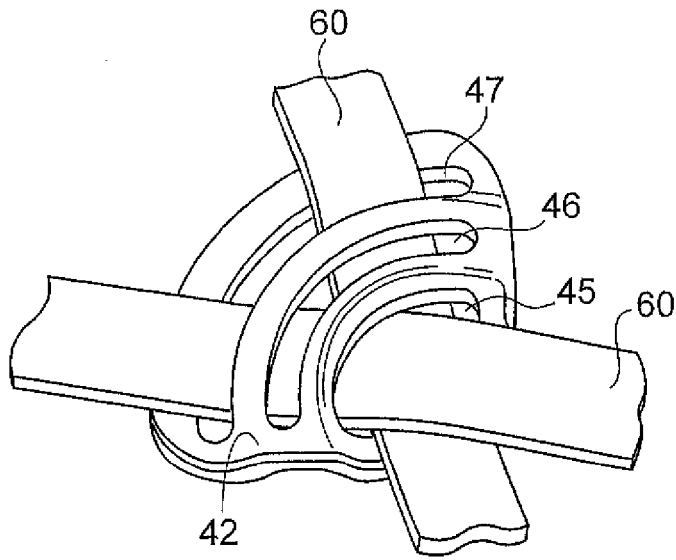


FIG. 17

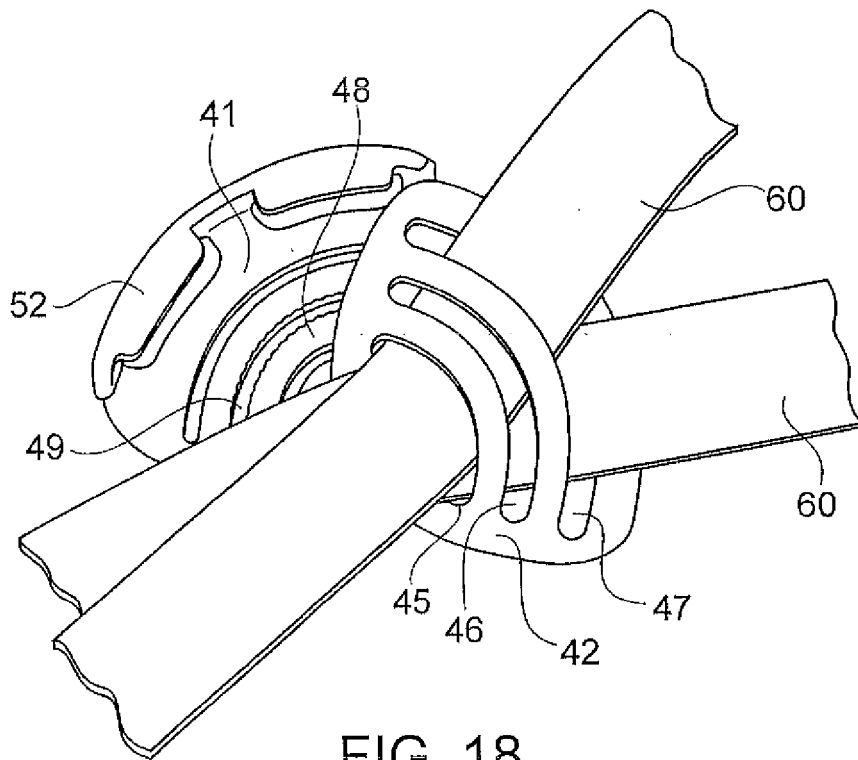


FIG. 18

**REFERENCES CITED IN THE DESCRIPTION**

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