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(54) **Helmet adjustment system**

(57) An adjustment system for a helmet includes a stabilizer plate configured to be movably attached to an underside of the helmet, at least one adjustment member movably retained by the stabilizer plate, and a locking member that securely retains the adjustment member. The locking member is configured to be selectively engaged to move the adjustment member relative to the stabilizer plate so that the stabilizer plate is configured to move relative to the helmet.

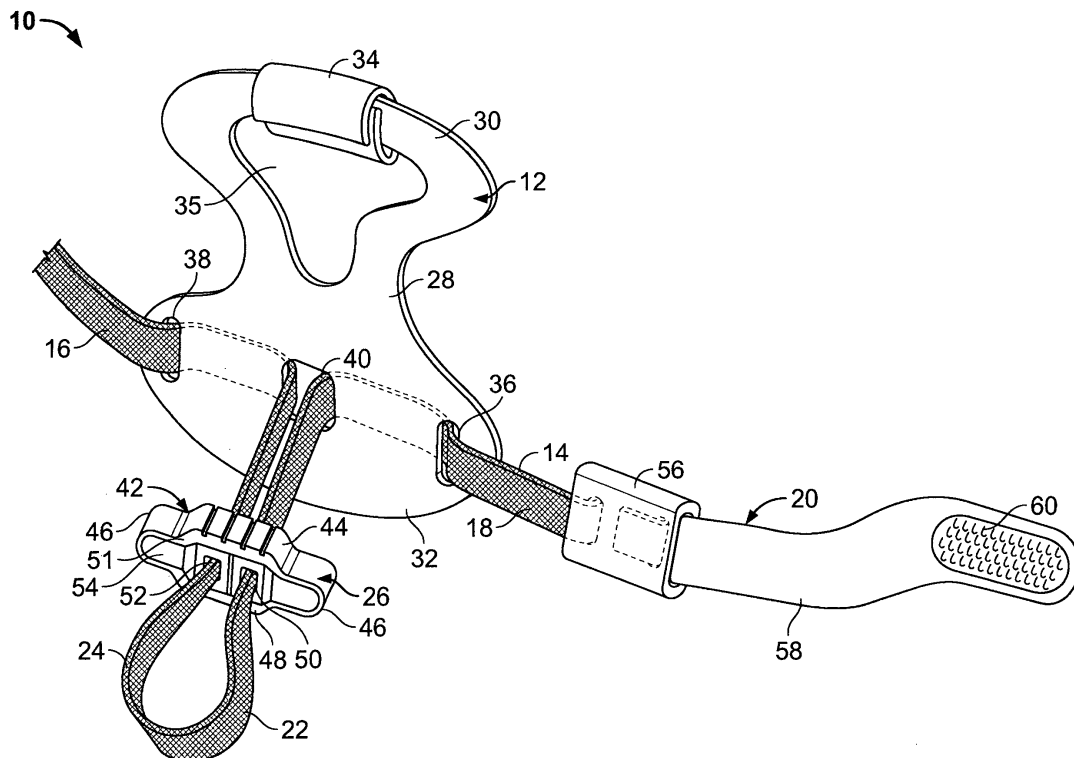


FIG. 1

Description

RELATED APPLICATIONS

5 [0001] This application relates to and claims priority benefits from U.S. Provisional Patent Application 60/658,684 entitled "Helmet Adjustment System," filed March 4, 2005, which is hereby incorporated by reference in its entirety.

FIELD OF THE INVENTION

10 [0002] Embodiments of the present invention generally relate to an adjustment system for a helmet, such as a sports, construction, safety helmet, and the like. In particular, embodiments of the present invention generally relate to a simple helmet adjustment system that can easily be fit to existing helmets.

BACKGROUND OF THE INVENTION

15 [0003] Conventional helmets, such as bicycle helmets, are configured to fit to a head through interior padding and/or a fixed stabilization system positioned at the rear of the helmet. Typically, the interior padding is not formed to a wearer's head, and does not sufficiently secure the helmet to the head. The stabilization system, however, is used to assist in securing the helmet to the head. The stabilization system includes a plate that is secured to an underside of the rear of the helmet. A user may adjust straps secured to the plate, but the plate itself is generally immovable. Some wearers, however, may find that the position of the plate with respect to the head is uncomfortable.

[0004] Additionally, the stabilization system typically includes a plurality of components that are separately formed. Thus, manufacturing the stabilization system may prove time-consuming and costly.

20 [0005] Thus, a need exists for a system and method of tailoring the fit of a helmet to a head. A need also exists for a system and method of retrofitting existing helmets so that they may be tailor fit to a head. Additionally, a need exists for a helmet adjustment system that is easier to manufacture and operate than conventional systems.

SUMMARY OF THE INVENTION

30 [0006] Embodiments of the present invention provide a helmet assembly that includes a base helmet portion and an adjustment system. The base helmet portion includes a top surface integrally formed with lateral, front and rear surfaces. The top, lateral, front and rear surfaces define a head cavity therebetween. A cover may be secured over the base helmet portion.

35 [0007] The adjustment system comprises a main stabilizer or stabilizer plate, lateral adjustment stabilizers, at least one adjustment member (such as a strap or cord), and a locking member. The stabilizer plate is movably attached to the rear surface of the base helmet within the head cavity. The lateral adjustment stabilizers are attached to the lateral surfaces of the base helmet within the head cavity. The adjustment member(s) is movably retained by the stabilizer plate and the lateral adjustment devices. The locking member securely retains the adjustment member(s), and is configured to be selectively engaged to move the adjustment member(s) relative to the stabilizer plate so that the stabilizer plate may move relative to the base helmet.

40 [0008] The stabilizer plate may include a securing area integrally formed with an adjustment-receiving area. The securing area is configured to be movably attached within the head cavity, and the adjustment-receiving area may include at least one slot that slidably retains the at least one adjustment member. The securing area may be a beam that extends from the adjustment-receiving area.

BRIEF DESCRIPTION OF SEVERAL VIEWS OF THE DRAWINGS

[0009] Figure 1 illustrates an isometric view of a helmet adjustment system according to an embodiment of the present invention.

50 [0010] Figure 2 illustrates an isometric view of a strap securing member according to an embodiment of the present invention.

[0011] Figure 3 illustrates a helmet assembly according to an embodiment of the present invention.

[0012] Figure 4 illustrates a helmet adjustment system according to an embodiment of the present invention.

55 [0013] Figure 5 illustrates an isometric view of an underside of a stabilizer plate according to an embodiment of the present invention.

[0014] Figure 6 illustrates an isometric view of a helmet adjustment system according to an embodiment of the present invention.

[0015] Figure 7 illustrates an isometric lateral view of a helmet base according to an embodiment of the present invention.

invention.

[0016] Figure 8 illustrates an isometric lateral view of a side of a helmet base according to an embodiment of the present invention.

[0017] Figure 9 illustrates a bottom view of a helmet base according to an embodiment of the present invention.

[0018] Figure 10 illustrates an isometric view of a helmet cover being secured to a helmet base according to an embodiment of the present invention.

[0019] Before the embodiments of the invention are explained in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangement of the components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced or being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein are for the purpose of description and should not be regarded as limiting. The use of "including" and "comprising" and variations thereof is meant to encompass the items listed thereafter and equivalents thereof as well as additional items and equivalents thereof.

DETAILED DESCRIPTION OF THE INVENTION

[0020] Figure 1 illustrates an isometric view of a helmet adjustment system 10 according to an embodiment of the present invention. The system 10 includes a stabilizer plate 12 that adjustably engages adjustable members, such as straps 14 and 16. The adjustable members may be cord, webbing, semi-rigid cord, flexible plastic, or the like. The strap 14 includes a distal end 18 secured to a lateral helmet adjustment stabilizer 20. The strap 16 also includes a distal end (not shown) secured to an additional lateral helmet adjustment stabilizer 20 (only one stabilizer 20 is shown in Figure 1). The proximal ends 22 and 24 of each strap 14 and 16, respectively, are joined together. Optionally, instead of two separate straps 14 and 16, one single contiguous strap may be used. An engageable locking member 26 securely retains the straps 14 and 16, proximate the proximal ends 22 and 24, respectively.

[0021] The stabilizer plate 12 may be formed of various materials, such as fabric, plastic, rubber, or the like. The stabilizer plate 12 includes a main body 28 having a helmet securing area or portion 30 integrally formed with a strap-receiving area or portion 32. The helmet securing portion 30 includes a securing area 34 that is configured to secure the stabilizer plate 12 to a structure within a helmet (not shown in Figure 1). The securing area 34 may be a loop or button configured to be secured to or around a reciprocal structure within the helmet, an adhesive, a wire tie, a Velcro® strap, or the like, configured to secure to a corresponding area or feature within the helmet. Thus, the stabilizer plate 12 may be pivoted, rotated, or otherwise securably moved with respect to the helmet by way of the securing area 34. At least one opening 35 may be formed through the stabilizer plate 12 to provide a more comfortable fit with respect to a wearer's head.

[0022] The strap-receiving portion 32 includes lateral slots 36 and 38 and a central opening 40. The strap 14 passes through the slot 36 to the underside of the engagement portion 32, and through the central opening 40. Similarly, the strap 16 passes through the slot 38 to the undersides of the strap-receiving portion 32, and through the central opening 40.

[0023] As mentioned above, the locking member 26 securely retains the straps 14 and 16. The locking member 26 includes a housing 42 defined by an upper wall 44 integrally formed with lateral and lower walls 46 and 48, respectively. Two strap passages 50 and 52 are formed through a central portion 54 of the locking member 26. The proximal end 22 of the strap 14 is retained within the strap passage 50, while the proximal end 24 of the strap 16 is retained within the strap passage 52. The locking member 26 may be engaged by a user to open the strap passages 50 and 52 wider, so that the straps 14 and 16 may move therethrough. For example, a user may pinch, or push portions of the locking member 26, such as the lateral walls 46 in order to operatively actuate the strap passages 50 and 52 into an open position. Optionally, a user may slide the upper and lower walls 44 and 48, respectively, relative to one another in order to operatively actuate the strap passages 50 and 52 into an open position. Once a user disengages the locking member 26, the strap passages 50 and 52 may return to their closed, or clamping positions, in which the straps 14 and 16 are securely retained within the strap passages 50 and 52, respectively. Alternatively, a user may re-engage the locking member 26 in order to move the strap passages 50 back into their closed, or clamping positions.

[0024] The helmet adjustment stabilizer 20 includes a strap securing clamp 56 integrally connected to a flexible strap 58 having a helmet securing member 60. The helmet securing member 60 may be a loop or button configured to be secured to or around a reciprocal structure within the helmet, an adhesive, a wire tie, a Velcro® strap, or the like, that may secure to a corresponding area of feature within the helmet.

[0025] Figure 2 illustrates an isometric view of the strap securing clamp 56. The strap securing clamp 56 includes an interior strap receiving area 62 covered by a swingable door 64. The strap receiving area 62 includes a passage 66 through which the distal end 18 of the strap 14 is securely retained by a band 68. The distal end 18 may also be fed through an opening 70 and tucked underneath the strap securing member 56. The door 64 includes an interior surface 72 having a plurality of protuberances 74, such as barbs, spikes, or the like, that are configured to dig into the distal end 18 of the strap 14. The door 64 pivots toward the distal end 18 of the strap 14 in the direction of arc A about pivot axis

76. The door 64 may snapably, latchably, or otherwise removably secure over the distal end 18, thereby securing the distal end 18 of the strap 14 therein.

[0026] Figure 3 illustrates a helmet assembly 78 according to an embodiment of the present invention. The helmet assembly 78 includes a helmet 80 having the helmet adjustment system 10 and a standard lateral retention system 82. The lateral retention system 82 includes securing members 84 proximate a wearer's ears secured to a locking member 86, that is also secured to a chin strap 88.

[0027] In order to tighten the helmet assembly 78 around the head, a wearer engages the locking member 26 so that at least one of the proximal ends 22 and 24 of the straps 14 and 16, respectively, may slide through the locking member 26, as discussed above with respect to Figure 1. The wearer may then adjust the stabilizer plate 12 and the straps 14 and 16 to a desired fit. When the wearer decides on a particular fit, he/she disengages the locking member 26 (or re-engages the locking member 26), as discussed above with respect to Figure 1, in order to secure the helmet adjustment system 10 in place. As such, the stabilizer plate 12 may be adjusted or otherwise moved to different positions on the back of the wearer's head. The system 10 allows the stabilizer plate 12 to rest at different positions to tailor fit the position of the helmet assembly 78 in order to accommodate different head sizes and shapes.

[0028] In order to achieve a snug fit, the user engages the locking member 26, and pulls on either proximal end 22 or 24 of the straps 14 or 16, respectively. Once the desired fit is achieved, the user disengages (or engages) the locking member 26, as noted above, to secure the stabilizer plate 12 with respect to the straps 14 and 16. In order to loosen the fit of the helmet, the user engages the locking member 26, and pulls out the stabilizer plate 12 with respect to the straps 14 and 16. Because the stabilizer plate 12 is movably secured to an underside of the helmet 80, the stabilizer plate 12 may be moved with respect to the helmet 80 and the wearer's head. For example, the stabilizer plate 12 may be moved in directions noted by arrows B and C.

[0029] Because the straps 14 and 16 may be joined together, the straps 14 and 16 may be simultaneously pulled from a single point, such as loop 90. Optionally, the straps 14 and 16 may be adjusted individually. Also, alternatively, the straps 14 and 16 may not be joined together, but, instead, separately and distinctly extend outwardly from the locking member 26.

[0030] Figure 4 illustrates a helmet adjustment system 92 according to an embodiment of the present invention. The system 92 include includes a stabilizer plate 94 connected to two stabilizers 96 and 98. Each stabilizer 96 and 98 may include a lateral strap member 102 secured to an upper helmet securing member 100. Optionally, the stabilizers 96 and 98 may be unitary pieces of material, such as plastic, strap or rubber, in which the lateral strap members 102 are integrally connected to the upper helmet securing members 100. Cords 106 join the lateral helmet securing members 102 to the stabilizer plate 94, and may be adjusted as noted above. An adjustment member 108, such as a cord locking device, is integrally formed with the stabilizer plate 94, which, according to one embodiment, includes a legend 110 having instructions regarding operating the adjustment member.

[0031] Figure 5 illustrates an isometric view of an underside of a stabilizer plate 112 according to an embodiment of the present invention. The stabilizer plate 112 includes a helmet securing beam 114 integrally formed with a cord-receiving body 116. An opening 118 may be formed through a central portion of the stabilizer plate 112 to provide a more comfortable fit for a wearer. Cord passages 120 are formed through lateral portions of the cord-receiving body 116 and allow cords 122 to pass therethrough. The cords 122 pass under the cord-receiving body 116 and through a central passage 126 to the outside of the stabilizer plate 112, where the cords 122 are movably retained by a locking member 128, such as a button based locking member.

[0032] Figure 6 illustrates an isometric view of a helmet adjustment system 130 according to an embodiment of the present invention. The system 130 includes a stabilizer plate 132 that movably retains cords 134. Each cord 134 includes a proximal end 136 movably secured within a locking member 138. As shown, the proximal ends 136 of the cords 134 are not joined together. Stops 140 are clamped, tied, or otherwise secured to distal ends 142 of the cords 134. Instead of separate and distinct stops 140, the distal ends 142 may each be tied into a knot to form an expanded area. A plastic wire tie, or tie strip 144 is positioned within a hole 146 formed through helmet securing beam 148, such that one end of the strip 144 is on one side of the beam 148, while the other end of the strip 144 is on the other side of the beam 148. Alternatively, the plastic tie strip 144 may be a strap, cord, string, or the like.

[0033] Figure 7 illustrates an isometric lateral view of a helmet base 150 according to an embodiment of the present invention. In order to attach the helmet adjustment system 130 (shown in Figure 6) to the base 150, two holes 152 and 154 are formed through a rear 156 of the base 150. Additionally, a lateral hole 158 is formed through each side 160 and 162 of the base 150 proximate a mid section of the base 150. Only the lateral hole 158 on the side 160 is shown in Figure 7. The ends of the tie strip 144 of the system 130 (shown in Figure 6) are passed through the holes 152 and 154 from underneath the base 150 and secured together and cinched down to the base 150. Thus, the helmet securing beam 148 is secured to the base 150.

[0034] Figure 8 illustrates an isometric lateral view of the side 160 or 162 of the helmet base 150. After the helmet securing beam 148 is secured to the base 150, as discussed above with respect to Figure 7, the proximal end 136 of the cord 134 (hidden from view) is passed through the lateral hole 158. The cord 134 is then pulled through the underside

of the base 150 until the stop 140 abuts against the side 160. Because the stop 140 is larger than the hole 158, the stop 140 cannot pass through the hole 158.

[0035] Figure 9 illustrates a bottom view of the helmet base 150. Once the free proximal ends 136 are passed through the lateral holes 158 into the interior of the base 150, the proximal ends 136 of the cords 134 are passed through the lateral holes 164 of the stabilization plate 132, and movably secured by the locking member 166 as discussed above.

[0036] Figure 10 illustrates an isometric view of a helmet cover 170 being secured over the helmet base 150. Once the cords 134 (shown in Figure 9) are secured within the locking member 166 (shown in Figure 9) and the stabilization plate 132 (shown in Figure 9), the helmet cover 170 is snapably, latchably, or otherwise secured over the base 150. Thus, the cover 170 serves to cover the tie strap 144, and provide an aesthetically pleasant appearance. As described above with respect to Figures 6-10, a helmet adjustment system, such as any of the helmet adjustment systems 10, 92, or 130, may be manufactured as part of a new helmet, or secured to a pre-existing helmet.

[0037] Thus, embodiments of the present invention provide a system and method of tailoring the fit of a helmet to a head. Additionally, embodiments of the present invention provide a system and method of retrofitting existing helmets so that they may be tailor fit to a head. Further, embodiments of the present invention provide a helmet adjustment system that is relatively easy to manufacture and operate.

[0038] Variations and modifications of the foregoing are within the scope of the present invention. It is understood that the invention disclosed and defined herein extends to all alternative combinations of two or more of the individual features mentioned or evident from the text and/or drawings. All of these different combinations constitute various alternative aspects of the present invention. The embodiments described herein explain the best modes known for practicing the invention and will enable others skilled in the art to utilize the invention. The claims are to be construed to include alternative embodiments to the extent permitted by the prior art.

[0039] Various features of the invention are set forth in the following claims.

Claims

1. An adjustment system for a helmet, the system comprising:

a stabilizer plate configured to be movably attached to an underside of the helmet;
at least one adjustment member movably retained by said stabilizer plate; and
a locking member that securely retains said at least one adjustment member, said locking member configured to be selectively engaged to move said at least one adjustment member relative to said stabilizer plate so that said stabilizer plate is configured to move relative to the helmet.

2. The system of claim 1, wherein said stabilizer plate comprises a securing area integrally formed with an adjustment-receiving area, said securing area being configured to be movably attached to the underside of the helmet, and said adjustment-receiving area comprising at least one slot that slidably retains said at least one adjustment member.

3. The system of claim 1, wherein said securing area comprises a beam that extends from said adjustment-receiving area.

4. The system of claim 1, wherein said at least one adjustment member is at least one strap.

5. The system of claim 1, wherein said at least one adjustment member is at least one cord.

6. The system of claim 1, wherein said at least one adjustment member comprises a first adjustment member having first and second ends, and a second adjustment member having third and fourth ends.

7. The system of claim 6, wherein said first end is joined to said third end proximate said locking member.

8. The system of claim 6, further comprising a first stop secured to said second end, and a second stop secured to said fourth end.

9. The system of claim 8, wherein said first and second stops comprise knots.

10. The system of claim 1, wherein said at least one adjustment member extends outwardly from said locking member.

11. The system of claim 1, wherein said at least one adjustment member extends outwardly from said locking member

as a loop.

12. A helmet assembly comprising:

a base helmet comprising a top surface integrally formed with lateral, front and rear surfaces, said top, lateral, front and rear surfaces defining a head cavity therebetween;
a stabilizer plate movably attached to said rear surface of said base helmet within said head cavity;
lateral adjustment stabilizers attached to said lateral surfaces of said base helmet within said head cavity;
at least one adjustment member movably retained by said stabilizer plate and said lateral adjustment devices; and
a locking member that securely retains said at least one adjustment member, said locking member configured to be selectively engaged to move said at least one adjustment member relative to said stabilizer plate so that said stabilizer plate is configured to move relative to said base helmet.

13. The helmet assembly of claim 12, wherein said stabilizer plate comprises at least one flexible tie, and wherein at least one hole is formed through said rear surface of said base helmet, said stabilizer plate securing to said base helmet by said at least one flexible tie affixing to said base helmet through said at least one hole.

14. The helmet assembly of claim 12, wherein said stabilizer plate comprises a securing area integrally formed with an adjustment-receiving area, said securing area configured to be movably attached within said head cavity, and said adjustment-receiving area comprising at least one slot that slidably retains said at least one adjustment member.

15. The helmet assembly of claim 12, wherein said securing area comprises a beam that extends from said adjustment-receiving area.

16. The helmet assembly of claim 12, wherein said at least one adjustment member is at least one of a strap and cord.

17. The helmet assembly of claim 12, wherein said at least one adjustment member comprises a first adjustment member having first and second ends, and a second adjustment member having third and fourth ends, wherein said first end is joined to said third end proximate said locking member.

18. The helmet assembly of claim 12, wherein said at least one adjustment member extends outwardly from said locking member as a loop.

19. The helmet assembly of claim 12, further comprising a cover secured over said base helmet.

20. An adjustment system for a helmet, the system comprising:

a main stabilizer configured to be movably attached to the helmet, said main stabilizer comprising a securing area integrally formed with an adjustment-receiving area, said securing area configured to be movably attached to the helmet, said adjustment-receiving area comprising at least one slot;
at least one adjustment member movably retained by said stabilizer plate, wherein said at least one adjustment member is at least one of a strap and cord, said slot slidably retaining said at least one adjustment member; and
a locking member that securely retains said at least one adjustment member, said locking member configured to be selectively engaged to move said at least one adjustment member relative to said stabilizer plate so that said main stabilizer is configured to move relative to the helmet.

21. The system of claim 20, wherein said securing area comprises a beam that extends from said adjustment-receiving area.

22. The system of claim 20, wherein said at least one adjustment member comprises a first adjustment member having first and second ends, and a second adjustment member having third and fourth ends.

23. The system of claim 22, wherein said first end is joined to said third end proximate said locking member.

24. The system of claim 22, further comprising a first stop secured to said second end, and a second stop secured to said fourth end.

25. The system of claim 24, wherein said first and second stops comprise knots.

- 26.** The system of claim 20, wherein said at least one adjustment member extends outwardly from said locking member.
- 27.** The system of claim 20, wherein said at least one adjustment member extends outwardly from said locking member as a loop.

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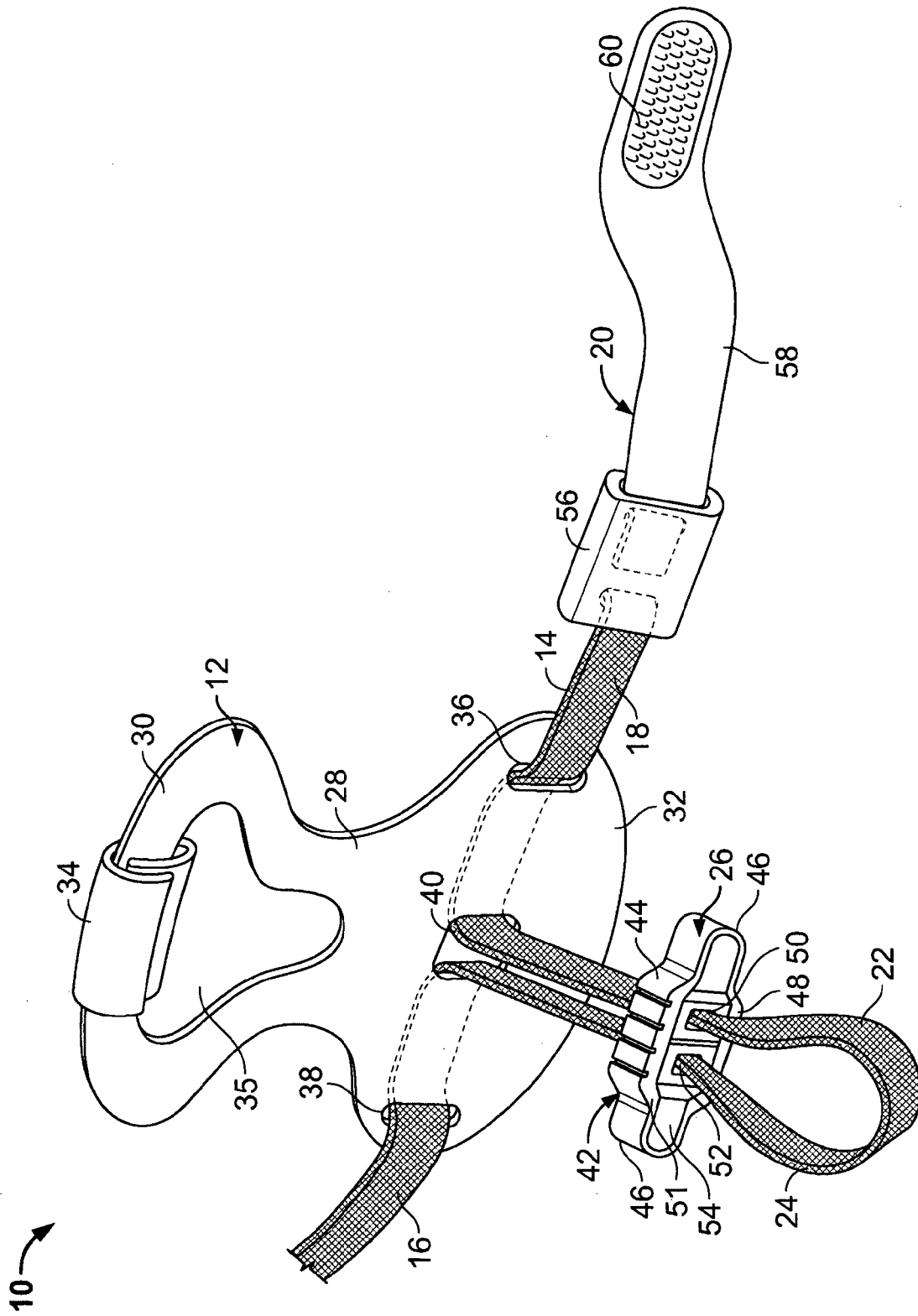
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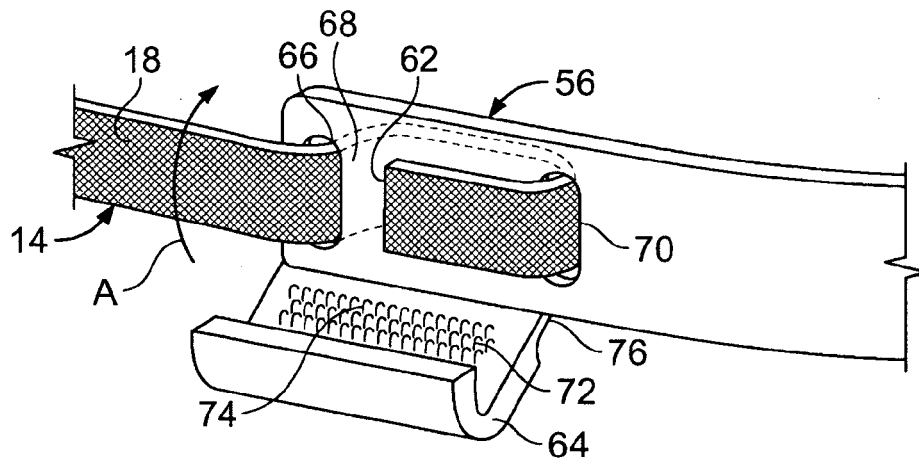


FIG. 2

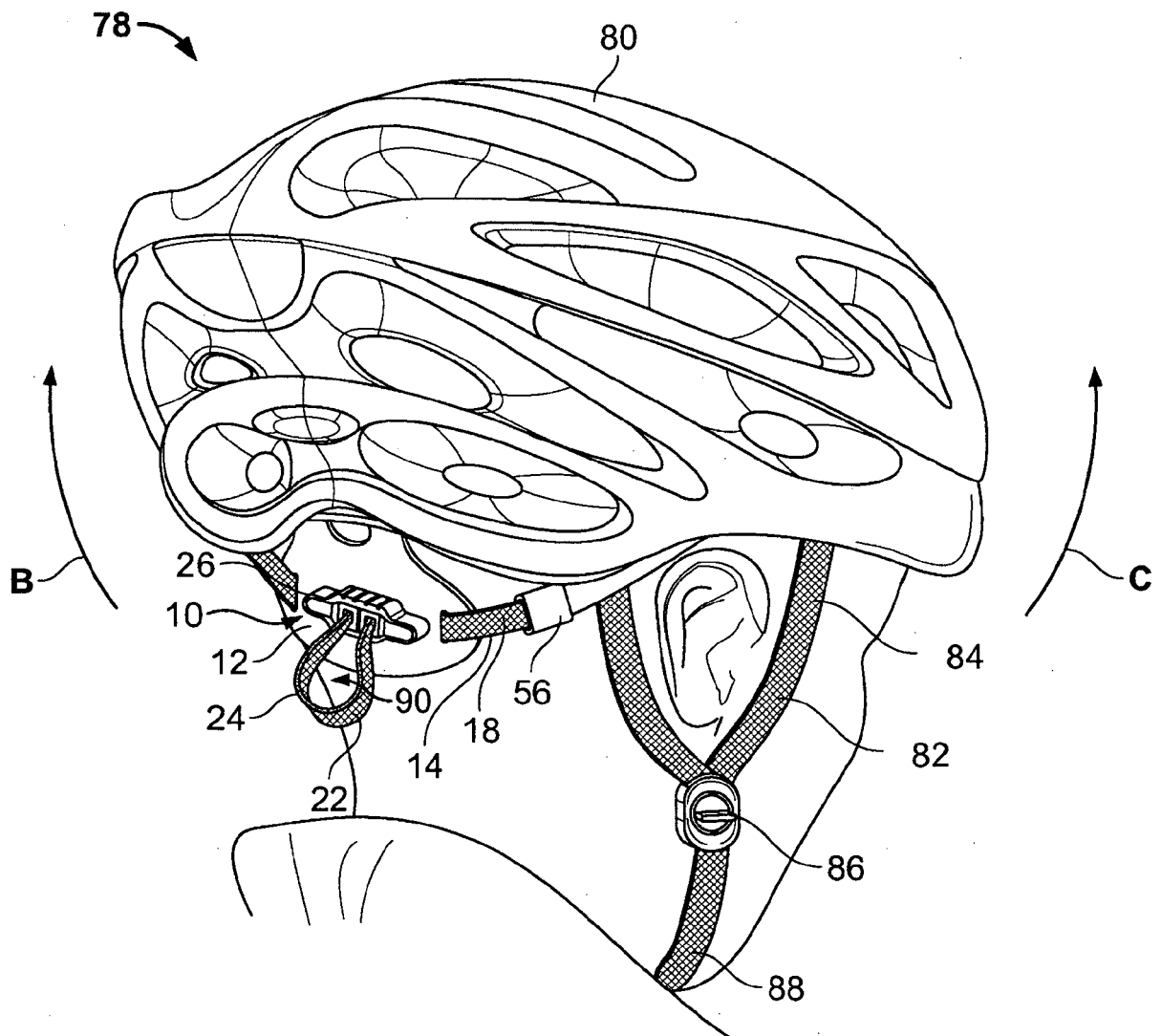


FIG. 3

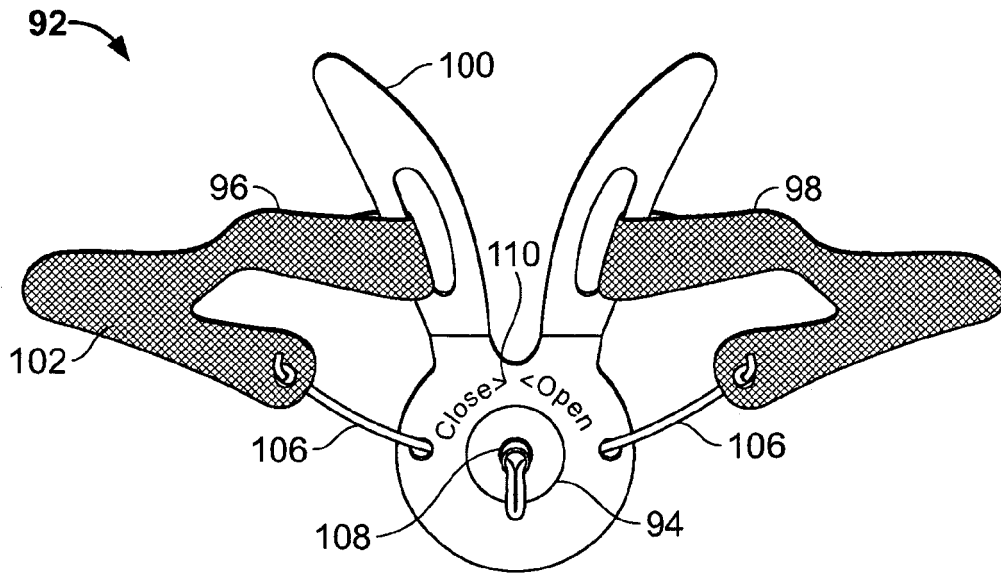


FIG. 4

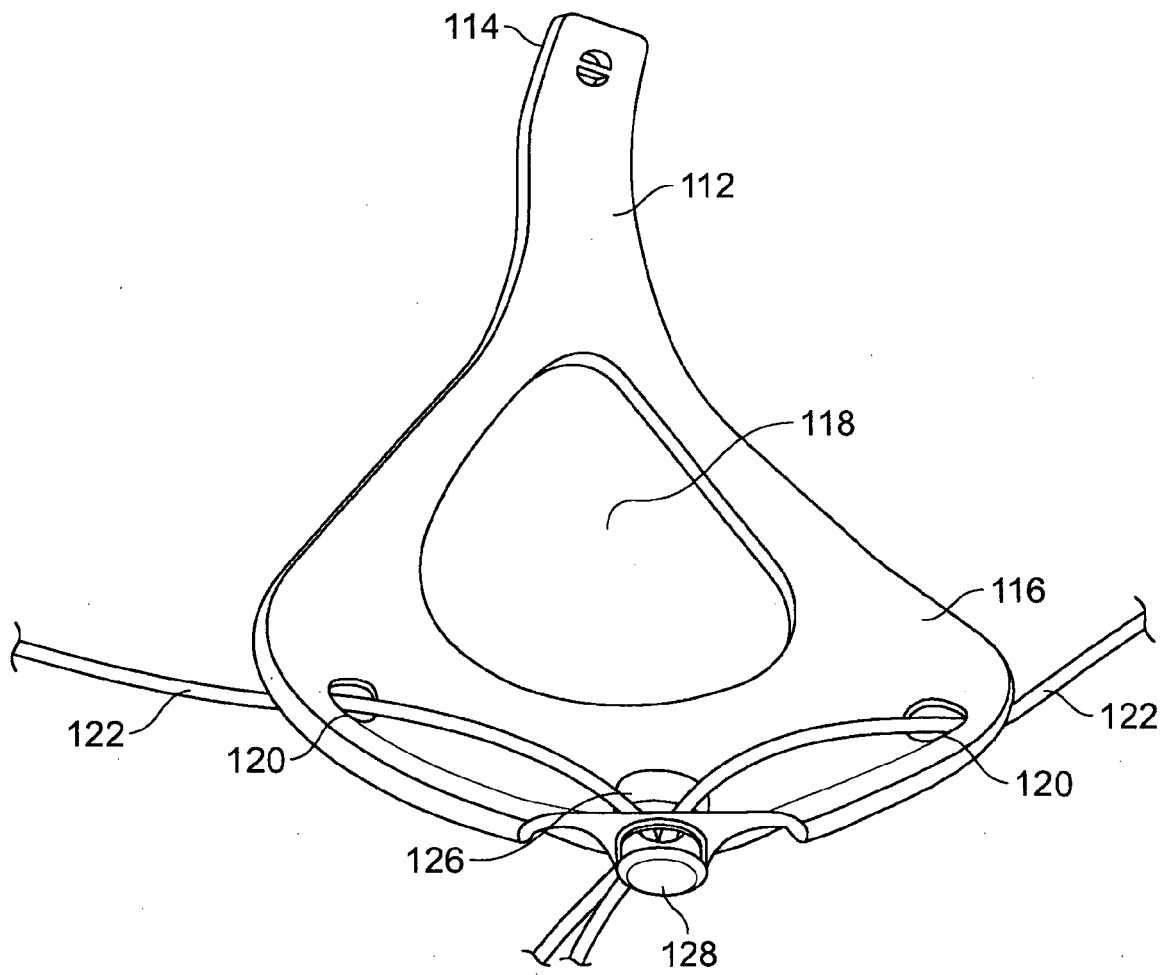


FIG. 5

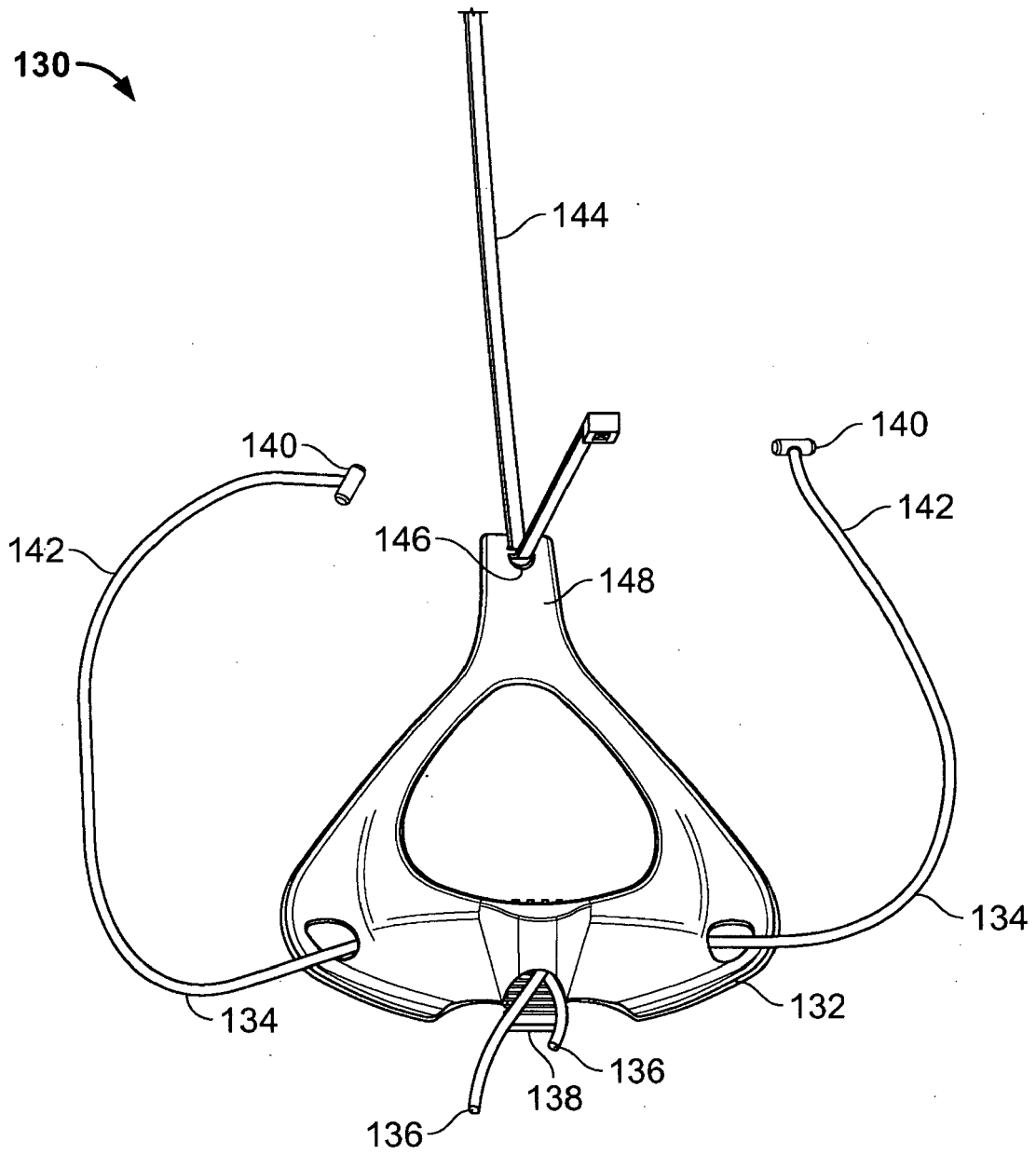


FIG. 6

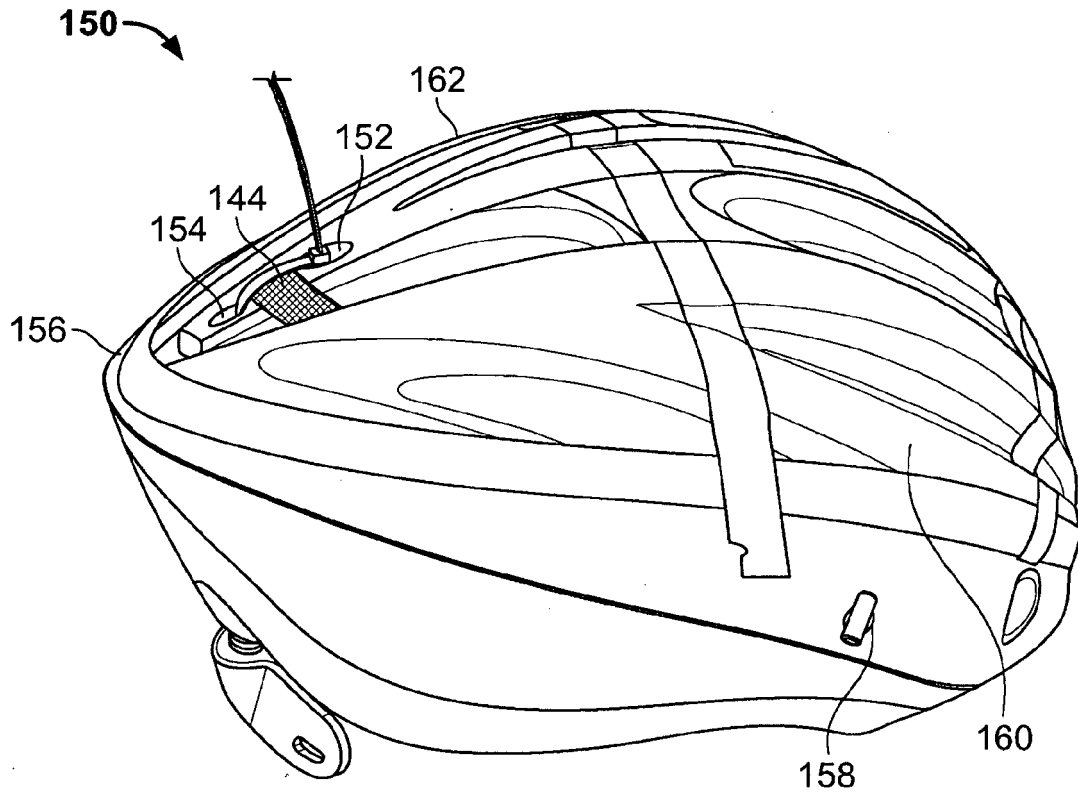


FIG. 7

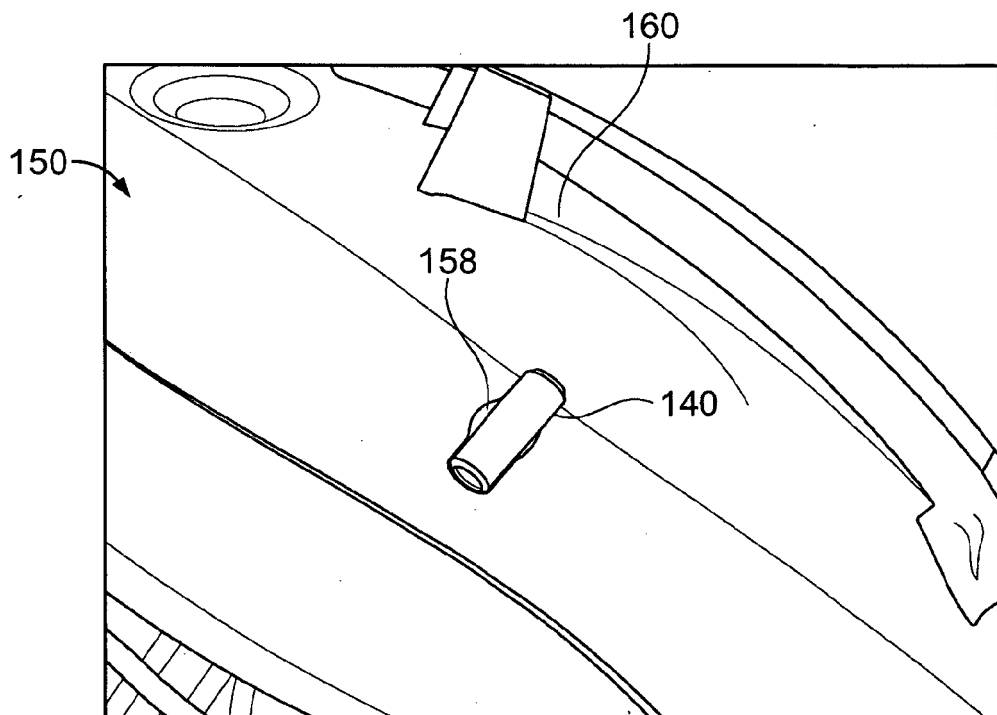


FIG. 8

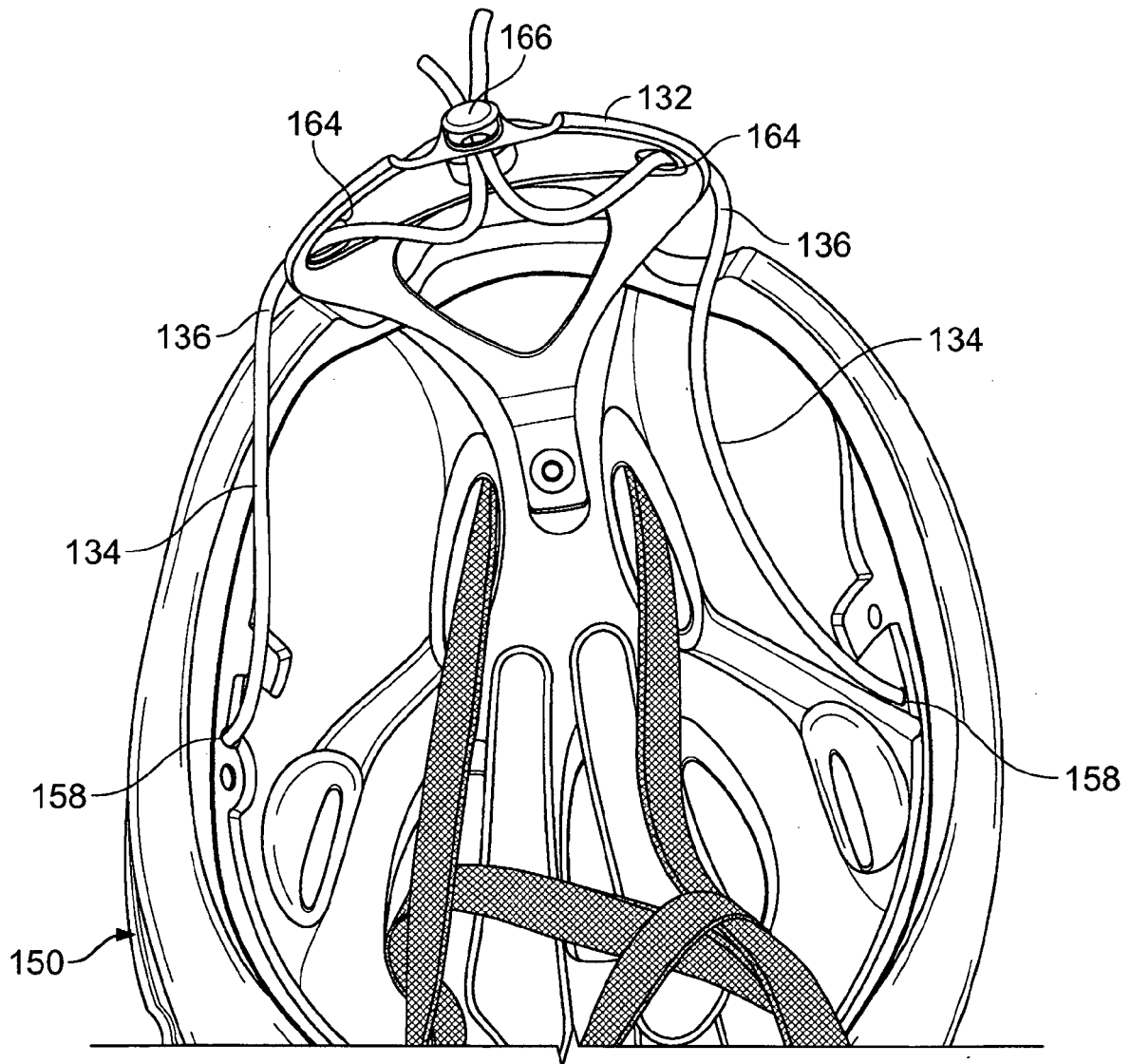


FIG. 9

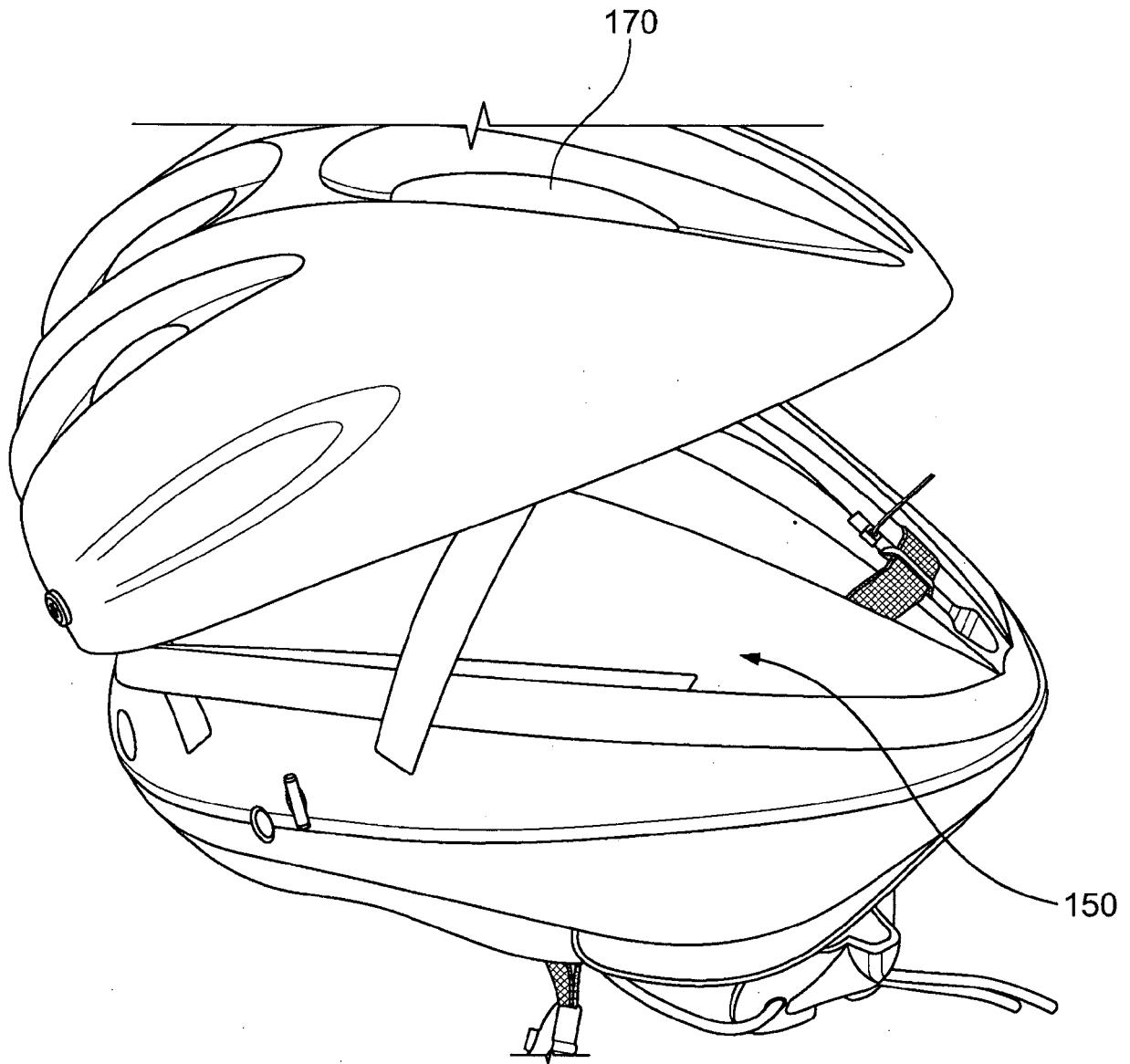


FIG. 10