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(54) **BUMP CAP**

ANSTOSSKAPPE

CASQUE ANTICHOCS

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(56) References cited:  
**WO-A1-2017/006078 WO-A1-2017/006078**  
**US-A- 5 887 289 US-A1- 2004 181 854**  
**US-A1- 2006 168 712 US-A1- 2015 305 423**  
**US-A1- 2017 105 461 US-S- D 671 271**

- **SKULLERZ: "Skullerz 8945 Universal Bump Cap Insert", Ergodyne, 5 January 2018 (2018-01-05), XP055586975, Retrieved from the Internet: URL:https://web.archive.org/web/20180105062244/https://www.ergodyne.com/head-protection/bump-caps/skullerz-8945-universal-bump-cap-insert.html [retrieved on 2018-09-25]**
- **ERGODYNE: "How To Turn Any Hat or Cap into Head Protection", Ergodyne: Safety Work Gear Manufacturer, 21 February 2018 (2018-02-21), XP054979377, Retrieved from the Internet: URL:https://www.youtube.com/watch?v=A7qduYrchL4 [retrieved on 2018-09-26]**

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## Description

### BACKGROUND

**[0001]** Bump Caps are useful for protecting the wearer's head from bumps, cuts and bruises as a result of contact with objects such as overhead pipes, low ceilings and other objects. They are most often worn under a personal hat, uniform cap, baseball hat or other non-protective headwear.

**[0002]** There are many different types of non-protective headwear, such as the so-called trucker's hat, which tends to be of a taller dimension, and a variety of baseball type hats that can be structured, unstructured, low profile and higher profile. There are also a variety of other personal hats, such as Trilby, Fedora, bucket, cowboy and stocking hats. Because of the variable dimensions of these hats there is a current and unfulfilled need for a Bump Cap that can be adjusted to accommodate the various hat dimensions.

**[0003]** WO 2017/006078 A1 discloses a Bump Cap with the features of the preamble of claim 1.

### SUMMARY

**[0004]** The invention is defined in claim 1. Further developments are given in the dependent claims. The invention provides a Bump Cap to be worn under a variety of hats that can be flexible to allow for horizontal variations in hat dimensions, and trimable to allow for variation in the vertical variations in hat dimensions.

**[0005]** This summary is not intended to limit the invention, or describe each embodiment, implementation, feature or advantage of the invention.

### BRIEF DESCRIPTION OF THE DRAWINGS

#### [0006]

Figure 1 is a front perspective view of a preferred embodiment of the invention.

Figure 2 is a rear perspective view of a preferred embodiment of the invention.

Figure 3 is a front elevation of a preferred embodiment of the invention.

Figure 4 is a rear elevation of a preferred embodiment of the invention.

Figure 5 is right side elevation view of a preferred embodiment of the invention.

Figure 6 is a left side elevation view of a preferred embodiment of the invention.

Figure 7 is a top plan view of a preferred embodiment of the invention.

### DESCRIPTION OF THE PREFERRED EMBODIMENTS

**[0007]** It will be apparent to those skilled in the art, that is, to those who have knowledge or experience in this

area of technology, which many uses and design variations are possible for the adjustable Bump Cap disclosed herein. The following detailed discussion of the preferred embodiment will illustrate the general principles of the invention with reference to the disclosed Bump Cap. Other embodiments suitable for other applications will be apparent to those skilled in the art given the benefit of this disclosure.

**[0008]** The Bump Cap is preferably injection molded from a thermoplastic polymer such as polypropylene. Those skilled in the art will recognize that other rigid materials that have at least some flexibility may also be used.

**[0009]** With reference to Figures 1-7, the various features of Bump Cap 90 are shown. Bump Cap 90 is comprised of crown 92 right side portion 94, left side portion 96, visor portion 98 and rear flap portion 100. Vents 114, 116 and 118 provide left side portion 96 ventilation, whereas vents 122, 124 and 126 provide right side portion 94 ventilation. Vents 110 and 99 provide crown 92 ventilation. One skilled in the art will understand that more or fewer vents may be required, and placement may be varied, according to environmental conditions or users' requirements.

**[0010]** Flex joints 138, 112, 128 and 130 allow Bump Cap 90 to flex when inserted into a hat to allow for variations in the hat's horizontal dimensions and to aide it securing Bump Cap 90 in place. Flex joints 138, 112, 128 and 130 also may supply additional ventilation.

**[0011]** Trim grooves 120 and 132 are located on the lower perimeter 121 of left side portion 96 and lower perimeter 123 on right side portion 94. Trim groove 120 runs horizontally along lower perimeter 121 on the left side portion 96. Trim groove 132 runs horizontally along lower perimeter 123 on right side portion 94. Trim grooves 120 and 132 allow sections of Bump Cap 90 to be removed by hand, box knife, scissors or other means. Removal of sections of Bump Cap 90 via trim grooves 120 and 132 allow the vertical dimensions of Bump Cap 90 to be adjusted so as to remain secure and hidden under a user's hat. One skilled in the art will appreciate that more than one trim groove may be incorporated into Bump Cap 90 to allow for greater vertical dimension adjustment.

**[0012]** Trim notches 134 and 136 assist the user in removing a portion of Bump Cap 90 at the trim grooves 120 and 132. More trim notches may be used to accommodate a greater number of trim grooves. Trim grooves and respective trim notches may also be incorporated into leading edge 140 of visor portion 98 to allow for the vertical adjustment of visor portion 98 (grooves not shown).

**[0013]** While the invention has been described in connection with what is presently considered to be the most practical and preferred embodiments, it will be apparent to those of ordinary skill in the art that the invention is not to be limited to the disclosed embodiments. It will be readily apparent to those of ordinary skill in the art that many modifications and equivalent arrangements can be made

thereof without departing from the scope of protection as defined by the appended claims

## Claims

### 1. A Bump Cap to be worn under a hat, comprising:

a rigid skull shaped shell having a right side portion (94), a left side portion (96), a crown portion (92), a visor portion (98) and a rear flap portion (100);

a vent (122, 124, 126) located in the right side portion (94);

a vent (114, 116, 118) located in the left side portion (96);

a vent (99, 110) located in the crown portion (92); a flexible joint (112) located between the visor portion (98) and the left side portion (96);

a flexible joint (138) located between the visor portion (98) and the right side portion (94);

a flexible joint (128) located between the right side portion (94) and the rear flap portion (100);

a flexible joint (130) located between the left side portion (96) and the rear flap portion (100);

#### characterized by

a horizontal trim groove (120), to allow for removal of a portion of the shell, located on a lower perimeter (121) of the left side portion (96); and,

a horizontal trim groove (132) located on a lower perimeter (123) of the right side portion (94), and,

wherein a vertical dimension of the shell maybe adjusted by removing a portion of the shell at the horizontal trim grooves (120, 132).

2. The Bump Cap of claim 1 wherein the vents (114, 116, 118, 122, 124, 126) located in the left and right side portions (94, 96) are elongated and configured horizontally.

3. The Bump Cap of claim 1 wherein the trim grooves (120, 132) have adjacent trim notches (134, 136).

## Patentansprüche

1. Stoßschutzkappe, die unter einer Kopfbedeckung zu tragen ist, umfassend:

eine starre schädelförmige Schale mit einem rechtsseitigen Abschnitt (94), einem linksseitigen Abschnitt (96), einem Scheitelabschnitt (92), einem Visierabschnitt (98) und einem hinteren Klappenabschnitt (100),

eine Lüftungsöffnung (122, 124, 126), die im rechtsseitigen Abschnitt (94) angeordnet ist,

eine Lüftungsöffnung (114, 116, 118), die im linksseitigen Abschnitt (96) angeordnet ist, eine Lüftungsöffnung (99, 110), die im Scheitelabschnitt (92) angeordnet ist,

ein flexibles Gelenk (112), das zwischen dem Visierabschnitt (98) und dem linksseitigen Abschnitt (96) angeordnet ist,

ein flexibles Gelenk (138), das zwischen dem Visierabschnitt (98) und dem rechtsseitigen Abschnitt (94) angeordnet ist,

ein flexibles Gelenk (128), das zwischen dem rechtsseitigen Abschnitt (94) und dem hinteren Klappenabschnitt (100) angeordnet ist,

ein flexibles Gelenk (130), das zwischen dem linksseitigen Abschnitt (96) und dem hinteren Klappenabschnitt (100) angeordnet ist,

#### gekennzeichnet durch

eine an einem unteren Umfang (121) des linksseitigen Abschnitts (96) angeordnete horizontale Trimmnut (120), um das Entfernen eines Abschnitts der Schale zu gestatten, und

eine an einem unteren Umfang (123) des rechtsseitigen Abschnitts (94) angeordnete horizontale Trimmnut (132), und

wobei eine vertikale Abmessung der Schale verstellt werden kann, indem ein Abschnitt der Schale an den horizontalen Trimmnuten (120, 132) entfernt wird.

2. Stoßschutzkappe nach Anspruch 1, wobei die in dem linken und dem rechten Seitenabschnitt (94, 96) angeordneten Lüftungsöffnungen (114, 116, 118, 122, 124, 126) länglich und horizontal ausgestaltet sind.

3. Stoßschutzkappe nach Anspruch 1, wobei die Trimmnuten (120, 132) benachbarte Trimmkerben (134, 136) haben.

## Revendications

1. Casque antichoc à porter sous un chapeau, comprenant :

une coque rigide en forme de crâne comportant une partie latérale droite (94), une partie latérale gauche (96), une partie voûte (92), une partie visière (98) et une partie pan arrière (100) ;

une ouverture de ventilation (122, 124, 126) située dans la partie latérale droite (94) ;

une ouverture de ventilation (114, 116, 118) située dans la partie latérale gauche (96) ;

une ouverture de ventilation (99, 110) située dans la partie voûte (92) ;

un raccord flexible (112) situé entre la partie visière (98) et la partie latérale gauche (96) ;

un raccord flexible (138) situé entre la partie vi-

sière (98) et la partie latérale droite (94) ;  
un raccord flexible (128) situé entre la partie latérale droite (94) et la partie pan arrière (100) ;  
un raccord flexible (130) situé entre la partie latérale gauche (96) et la partie pan arrière (100) ; 5

**caractérisé par**

une rainure de découpe horizontale (120), pour permettre d'enlever une partie de la coque, située sur un périmètre inférieur (121) de la partie latérale gauche (96) ; et 10

une rainure de découpe horizontale (132) située sur un périmètre inférieur (123) de la partie latérale droite (94), et

une dimension verticale de la coque pouvant être ajustée en enlevant une partie de la coque au niveau des rainures de découpe horizontales (120, 132). 15

2. Casque antichoc selon la revendication 1, dans lequel les ouvertures de ventilation (114, 116, 118, 122, 124, 126) situées dans les parties latérales gauche et droite (96, 94) sont allongées et formées horizontalement. 20

3. Casque antichoc selon la revendication 1, dans lequel les rainures de découpe (120, 132) comportent des encoches de découpe (134, 136) adjacentes. 25

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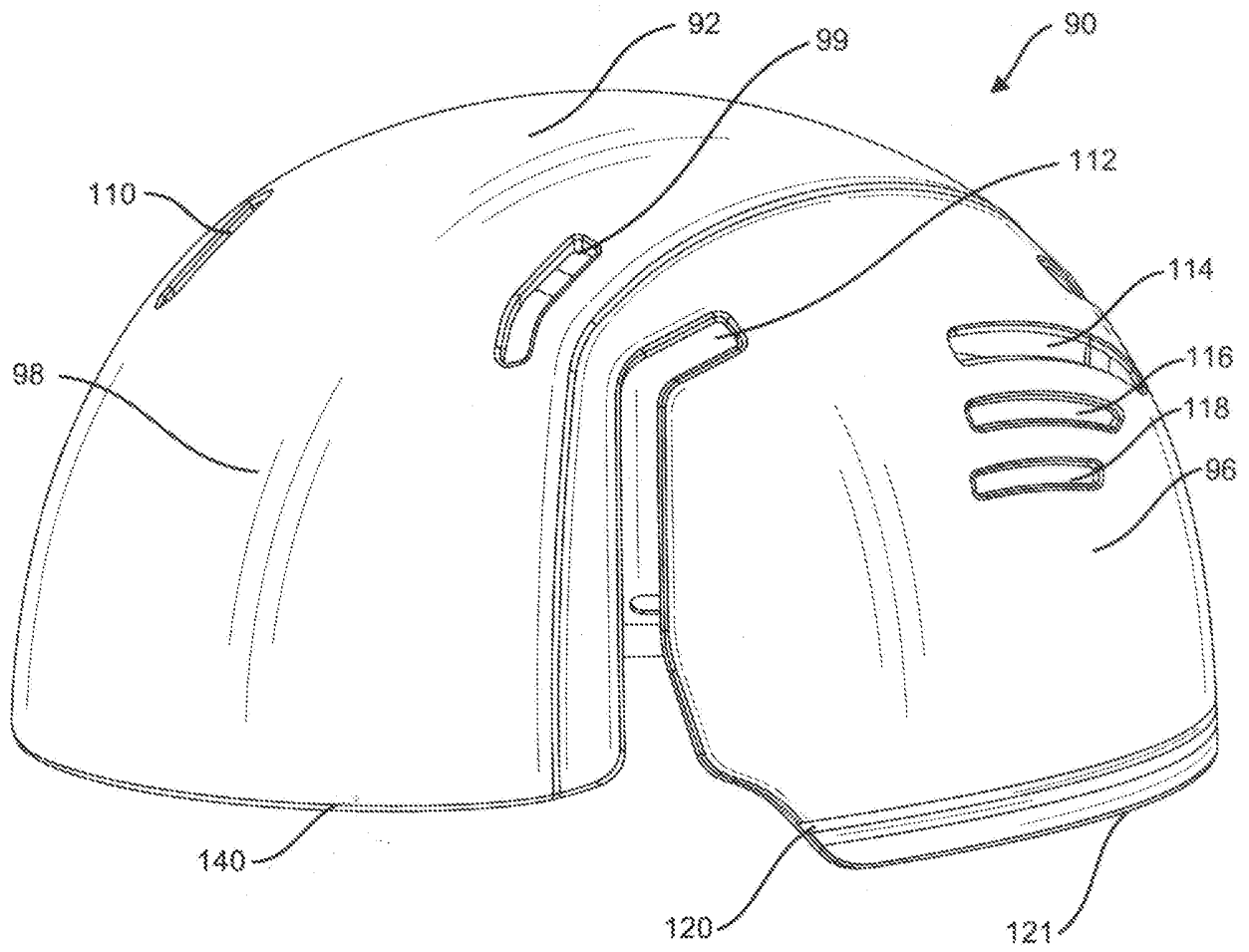


FIG. 1

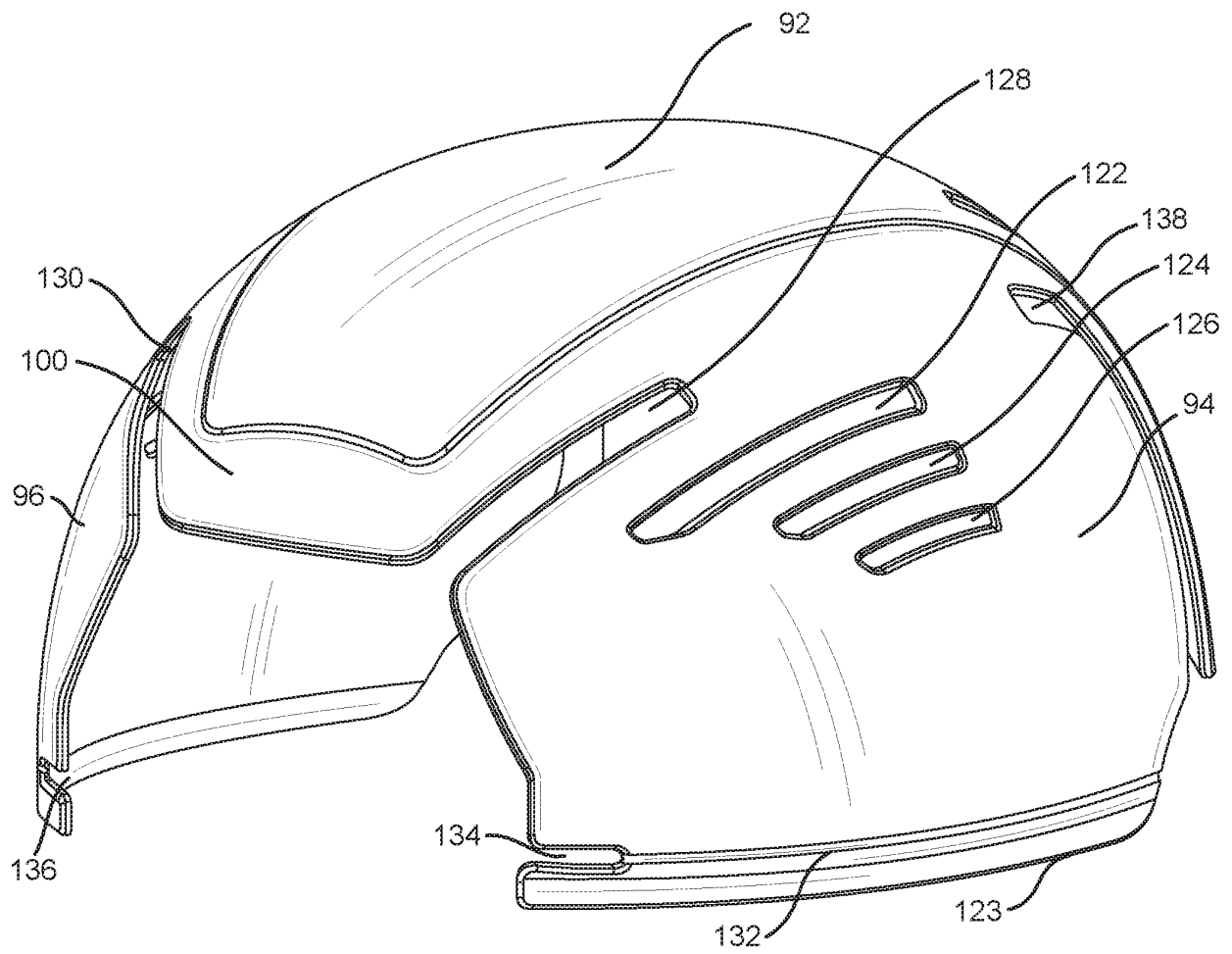


FIG. 2

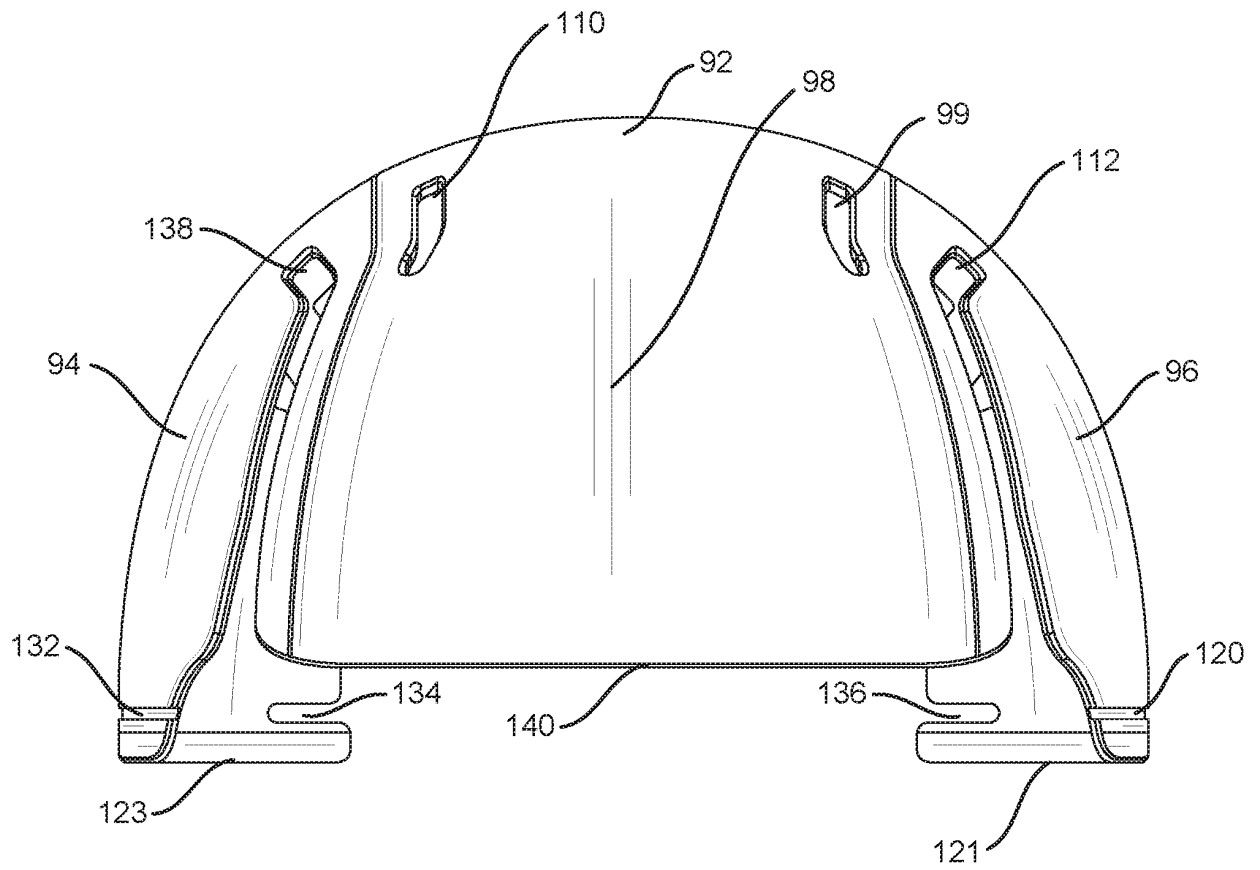


FIG. 3

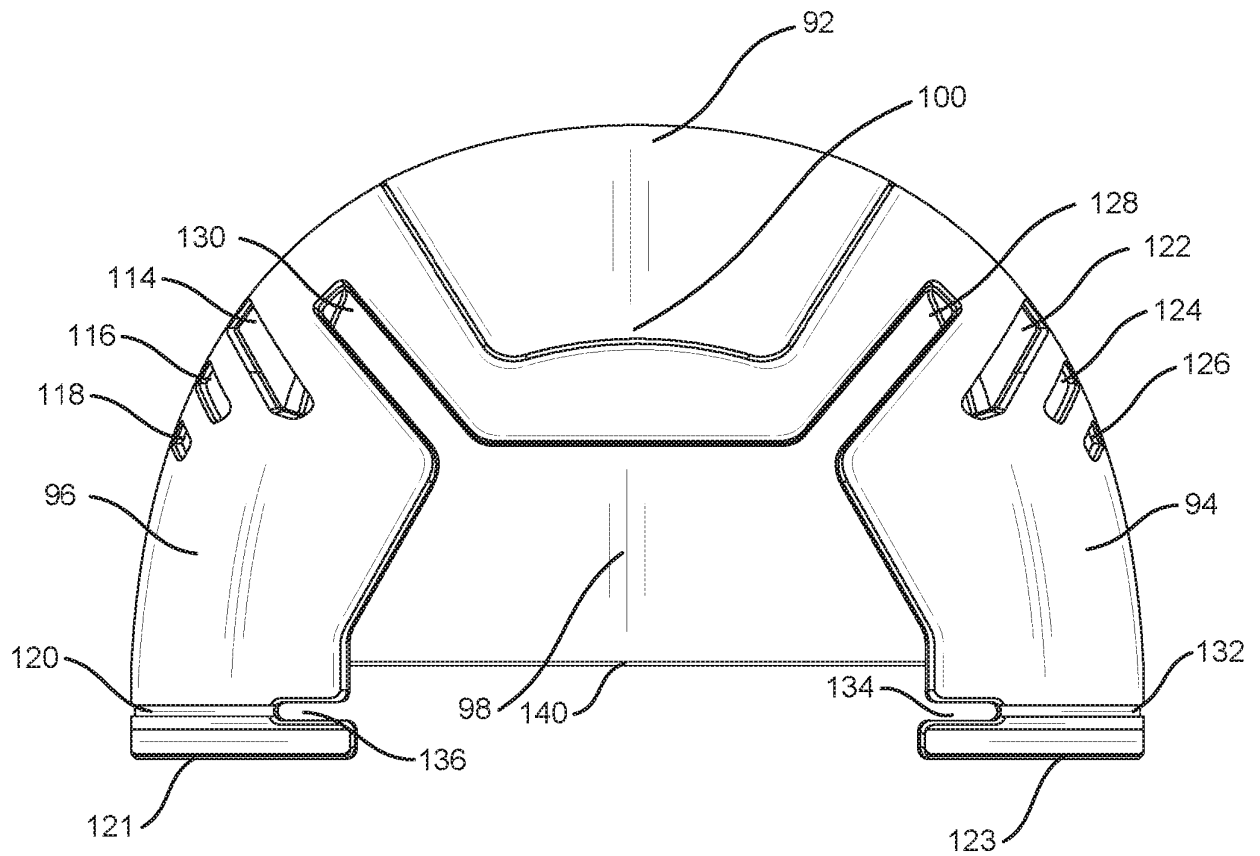


FIG. 4



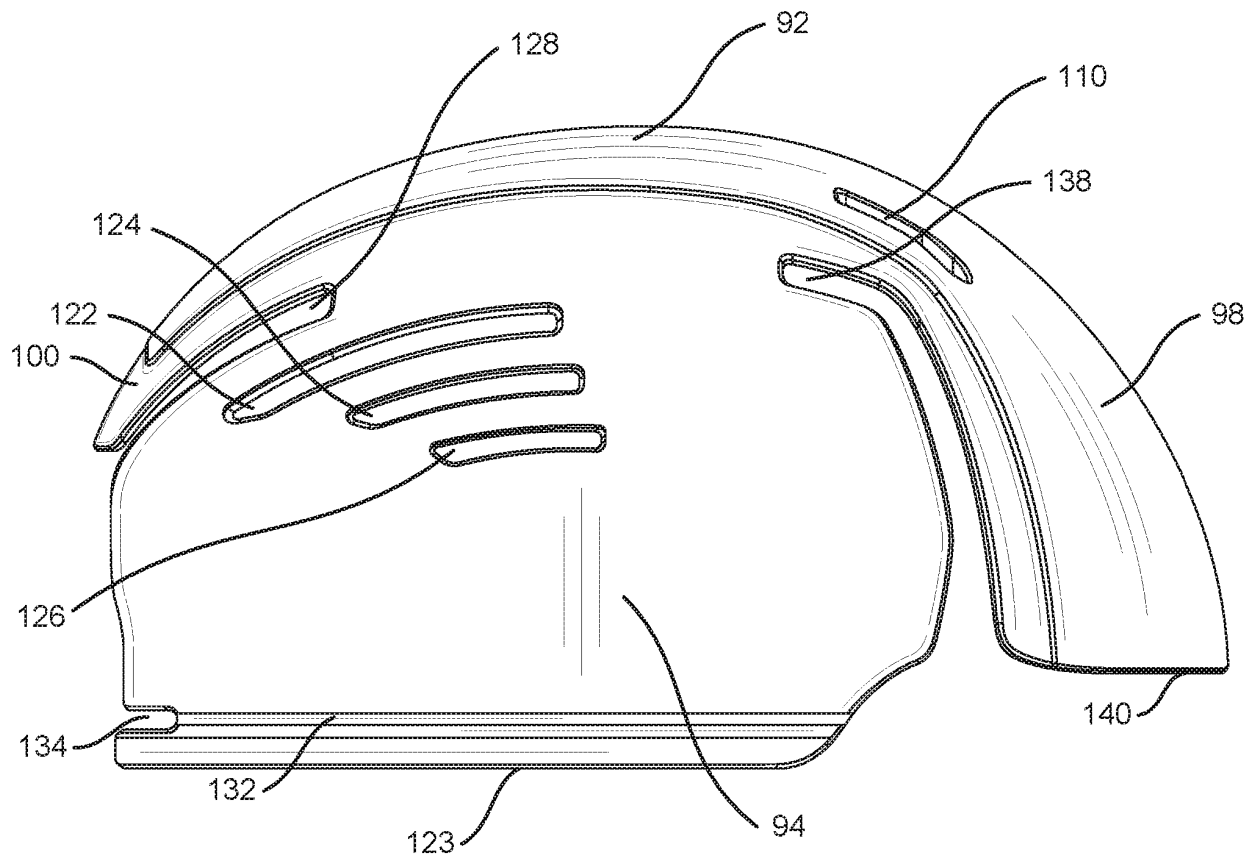


FIG. 5

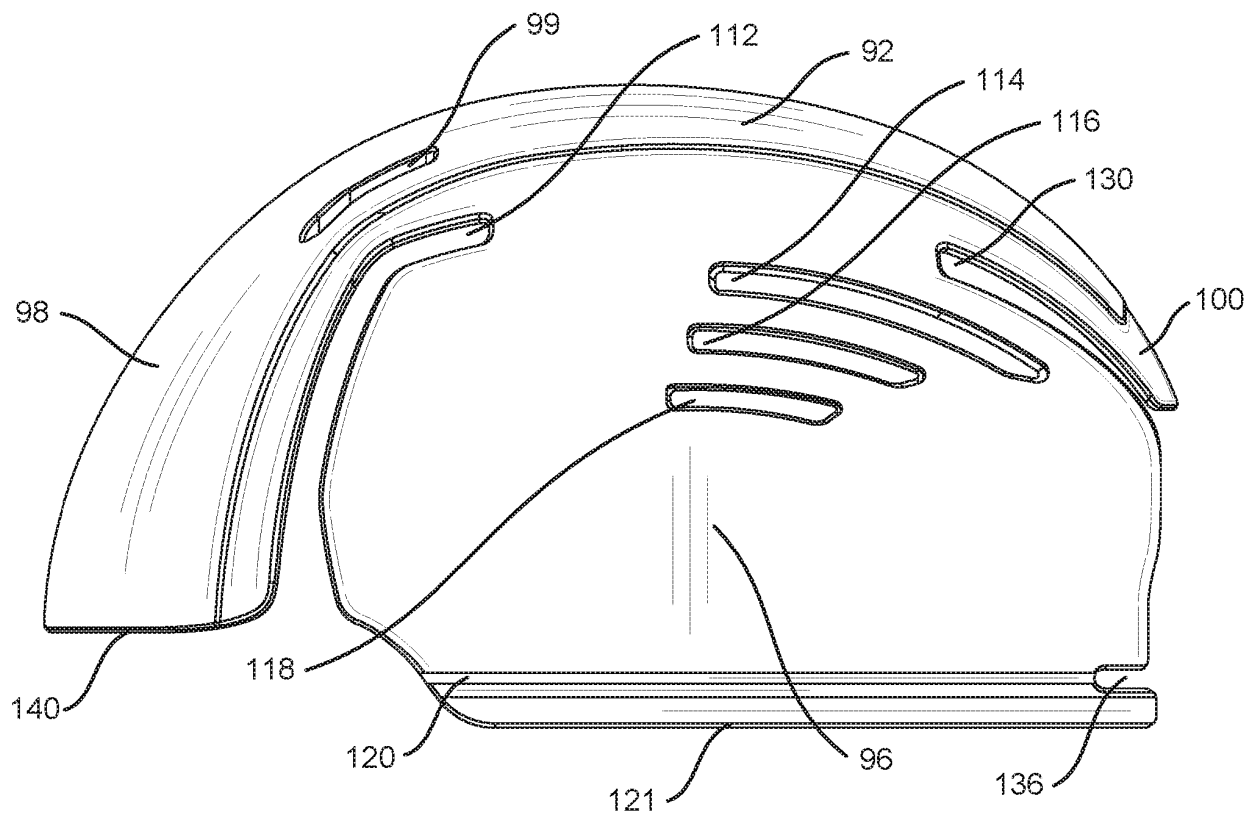


FIG. 6

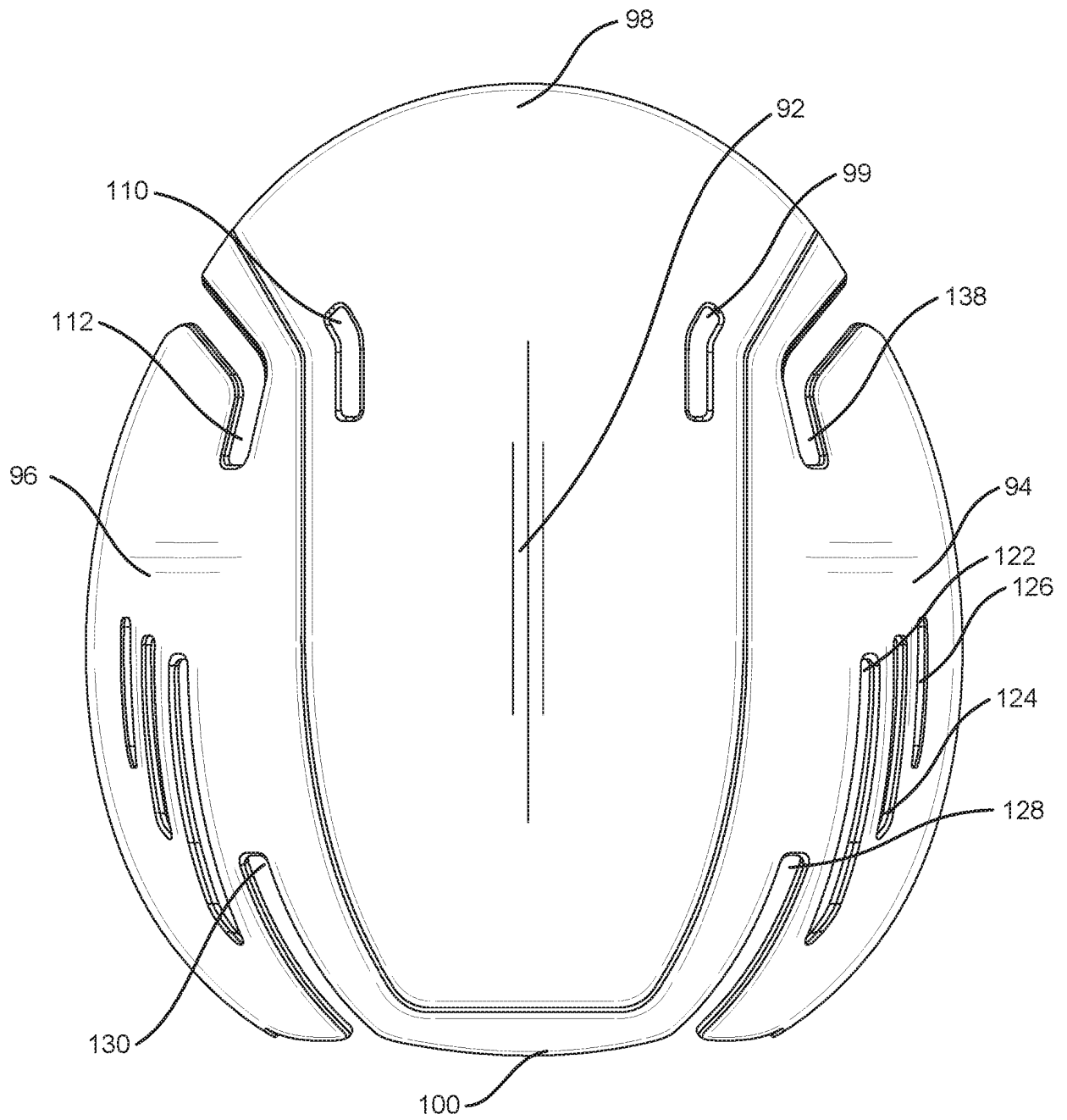


FIG. 7

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- WO 2017006078 A1 [0003]