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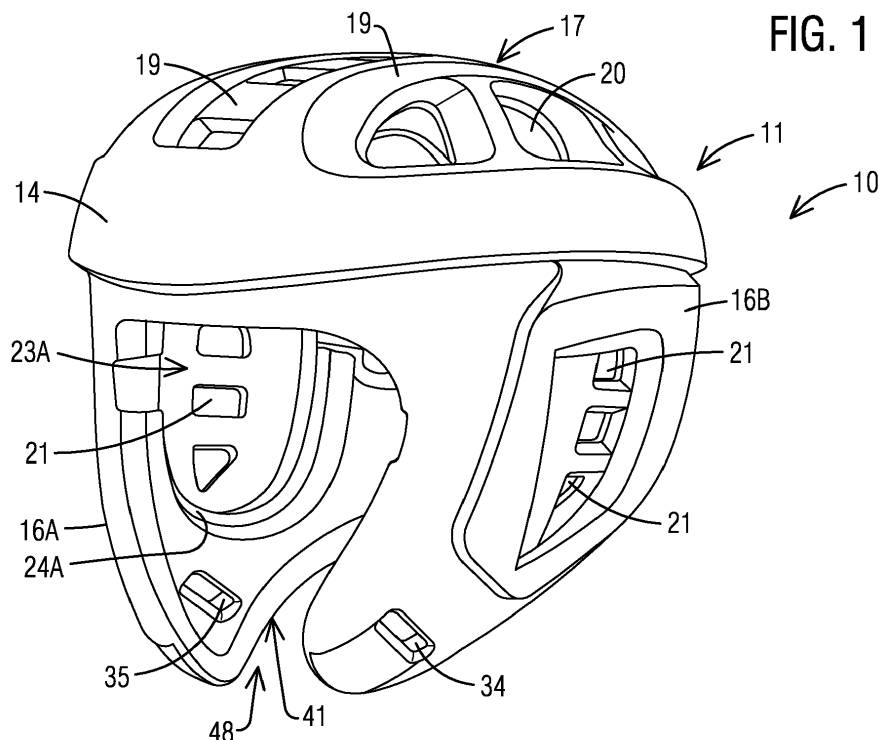
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(54) **A PROTECTIVE HEADGEAR DEVICE**

(57) A protective headgear device (10) comprises a padded circumferential member (11) generally conforming to the shape of a user's head. The circumferential member includes a head section (14), a first side section (16A) depends from the head section and a second side section (16B) opposite the first side section also depends

from the head section. A first recess (23A) is formed in the first side section and a second recess (23B) is formed in the second side section. First and second impact plates (26A, 26B) are disposed within the first and second recesses respectively.



Description

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to provisional application number 62/526,749, filed June 29, 2017 and entitled, "A Protective Headgear Device," and is incorporated herein in its entirety.

FIELD OF THE INVENTION

[0002] The field of this invention pertains to protective headgear used in connection with contact sports such as boxing and martial arts, and self-defense training, which may involve trauma forces to the head.

BACKGROUND OF THE INVENTION

[0003] Participants in contact sports, or self-defense training often require protective wear to minimize injury. Helmets or protective headgear are used in various sports such as football, baseball, ice hockey, field hockey, martial arts, boxing or self-defense training. Protective headgear used in boxing and martial arts may be fabricated from a resilient foam material such as polyurethane foam, which is cut and/or molded to a desired shape to cover sensitive portions of the head for protection. Sections of the headgear may be perforated, or contain openings for ventilation, viewing or hearing. The foam absorbs energy from blows to the head, and is lightweight to minimize stress to the neck and shoulders during use.

SUMMARY OF THE INVENTION

[0004] The inventors have developed a novel headgear device including padded headgear that is preferably fabricated from an injection molding process that includes a pair of recesses, and each respective recess is adjacent to the ears of a user. In addition, a plate and then a pad, both configured to snugly fit in each respective recess are seated and affixed therein to protect a user from blows to the sides of the head.

[0005] In accordance with aspects of the invention, a protective headgear device may comprise a padded circumferential member generally conforming to the shape of a user's head that includes a head section for covering portions of the top, forehead, rear and upper sides of the head. In addition, a first side section depends from the head section covering lower sides (generally the right or left ear and jaw area) of the head of a user and a second side section opposite the first side section also depends from the head section of the circumferential member and covers lower sides (generally the right or left ear and jaw area) of the head of the user.

[0006] The headgear device also comprises a first interior recess in the first side section forming a first lip extending circumferentially about the first recess; and, a

second interior recess formed in the second side section forming a second lip extending circumferentially about the second recess. In a preferred embodiment, a first impact plate having generally the geometric outline as that of the first recess is seated and/or fixed within the first recess; and, a second impact plate having generally the geometric outline of the second recess is seated and/or fixed within the second recess. In addition, a first pad may be disposed within the first recess and covering the first impact plate and a second pad disposed within the second recess and covering the second impact plate. The first and second pads preferable have the same geographic outline as that of the respective first and second recesses and impact.

[0007] In an embodiment there may be a first undercut is between the first lip and a surface of the first recess, the first undercut extends circumferentially about the first recess; and, a second undercut is between the second lip and a surface of the second recess, the second undercut extends circumferentially about the second recess.

[0008] In addition, a first impact plate is disposed within the first recess and has a circumferential edge disposed within the first undercut; and, a second impact plate is disposed within the second recess and has a circumferential edge disposed within the second undercut. According to an aspect of the invention, the headgear device may also comprise a first pad disposed within the first recess and covering the first impact plate and a second pad disposed within the second recess and covering the second impact plate. In a preferred embodiment, the circumferential member includes one or more apertures in the first recess, and the first impact and the first pad each includes one or more apertures, and the one or more apertures in the recess, in the impact plate and in the first pad are all are aligned. In addition, the circumferential member includes one or more apertures in the second recess, and the second impact plate and the second pad each includes one or more apertures, and the one or more apertures in the second recess, in the second impact plate and in the second pad are all are aligned.

[0009] In either of the above-referenced embodiments, the circumferential member, within the recess, the first and second impact plates and first and second pads include aligned apertures for ventilation, hearing and pressure relief.

[0010] In a preferred embodiment, the circumferential member is composed of a thermoplastic elastomer or polyolefin based substance subjected to a foam injection molding process, preferably, a compression injection molding process. To that end, the head section and side sections of the circumferential member are integrally formed as a single unitary part from a compression injection molding process.

[0011] In accordance with a further aspect of the invention, there is provided a protective headgear device, comprising a padded circumferential member generally conforming to the shape of a user's head and including

a forehead section, rear section, a first side section and a second side section opposite the first side section. The protective headgear device further comprises a first interior recess in the first side section forming a first lip extending circumferentially about the first recess and the first lip forming a geometrical outline of the first recess. The protective headgear device further comprises a second interior recess formed in the second side section forming a second lip extending circumferentially about the second recess and the second lip forming a geometrical outline of the second recess. The protective headgear device further comprises a first impact plate disposed within the first recess and having a circumferential edge defining a geometrical outline of the first impact plate that corresponds to the geometric outline of the first recess. The protective headgear device further comprises a second impact plate disposed within the second recess and having a circumferential edge defining a geometrical outline of the first impact plate that corresponds to the geometric outline of the second recess.

[0012] The protective headgear may further comprise a first pad disposed within the first recess and covering the first impact plate. The first pad may include a circumferential edge defining a geometric outline of the first pad that corresponds to the geometric outlines of the first recess and first impact plate. The protective headgear may further comprise a second pad disposed within the second recess and covering the second impact plate. The second pad may include a circumferential edge defining a geometric outline of the second pad that corresponds to the geometric outlines of the second recess and second impact plate.

[0013] The protective headgear device may further comprise one or more apertures through the circumferential member within a circumference of the first recess. The protective headgear device may further comprise one or more apertures through the circumferential member within a circumference of the second recess. The first impact plate may include one or more apertures and each of the one or more apertures may be aligned with a respective aperture within the first recess. The second impact plate may include one or more apertures and each of the one or more apertures may be aligned with a respective aperture within the second recess. The first pad may further include one or more apertures and each of the one or more apertures is aligned with a respective aperture within the first recess and the first impact plate. The first pad may further include one or more apertures and each of the one or more apertures may be aligned with a respective aperture within the first recess and the first impact plate.

[0014] The protective headgear device may further comprise a first pad disposed within the first recess and covering the first impact plate and a second pad disposed within the second recess and covering the second impact plate. The first pad may have apertures aligned with apertures of the first impact plate and the circumferential member. The second pad may have apertures aligned

with apertures of the second impact plate and the circumferential member.

[0015] The circumferential member may be formed using a compression injection molding process.

[0016] Each of the first and second impact plates may include a mid-section that is offset, relative to the circumferential edge, toward an exterior of the circumferential member.

[0017] The protective headgear device may further comprise at least one first air pressure relief channel formed in the circumferential member adjacent to the first recess and at least one second air pressure relief channel formed in the circumferential member adjacent to the second recess.

[0018] The protective headgear device may further comprise at least one air pressure relief channel formed in the circumferential member adjacent to the first recess and at least one air pressure relief channel formed in the circumferential member adjacent to the second recess.

[0019] The protective headgear device may further comprise a first undercut between the first lip and a surface of the first recess, the first undercut extending circumferentially about the first recess. The protective headgear device may further comprise a second undercut between the second lip and a surface of the second recess, the second undercut extending circumferentially about the second recess. The first impact plate may have a circumferential edge disposed within the first undercut. The second impact plate may have a circumferential edge disposed within the second undercut. The protective headgear device may further comprise one or more apertures through the circumferential member within a circumference of the first recess. The first impact plate may include one or more apertures aligned with the one or more apertures within the first recess. The protective headgear device may further comprise one or more apertures through the circumferential member within a circumference of the second recess. The second impact plate may include one or more apertures aligned with the one or more apertures within second recess.

[0020] The protective headgear device may further comprise a first pad disposed within the first recess and covering the first impact plate. The first pad may include a circumferential edge defining a geometric outline of the first pad that corresponds to the geometric outlines of the first recess and first impact plate, wherein the first pad has one or more apertures aligned with respective one or more apertures of the first impact plate and within the first recess. The protective headgear device may further comprise a second pad disposed within the second recess and covering the second impact plate. The second pad may include a circumferential edge defining a geometric outline of the second pad that corresponds to the geometric outlines of the second recess and second impact plate, wherein the second pad has one or more apertures aligned with respective one or more apertures of the second impact plate and within the second recess.

[0021] In accordance with a yet further aspect of the

invention, there is provided a protective headgear device comprising a padded circumferential member generally conforming to the shape of a user's head and including a forehead section, rear section, a first side section and a second side section opposite the first side section. The protective headgear device further comprises a first interior recess in the first side section forming a first lip extending circumferentially about the first recess. The protective headgear device further comprises a second interior recess formed in the second side section forming a second lip extending circumferentially about the second recess. The protective headgear device further comprises a first undercut between the first lip and a surface of the first recess, the first undercut extending circumferentially about the first recess. The protective headgear device further comprises a second undercut between the second lip and a surface of the second recess, the second undercut extending circumferentially about the second recess. The protective headgear device further comprises a first impact plate disposed within the first recess and having a circumferential edge disposed within the first undercut. The protective headgear device further comprises a second impact plate disposed within the second recess and having a circumferential edge disposed within the second undercut. The protective headgear device further comprises a first pad within the first recess and covering the first impact plate. The protective headgear device further comprises a second pad within the second recess and covering the second impact plate. The protective headgear device further comprises one or more apertures through the circumferential member within a circumference of the first recess, and the first impact plate and first pad both include one or more apertures aligned with the one or more apertures within the first recess. The protective headgear device further comprises one or more apertures through the circumferential member within a circumference of the second recess, and the second impact plate and second pad both include one or more apertures aligned with the one or more apertures within second recess.

[0022] The protective headgear device may further comprise a plurality of first air pressure relief channels adjacent to the first recess providing air flow communication between an interior and an exterior of the circumferential member. The protective headgear device may further comprise a plurality of second air pressure relief channels adjacent to the second recess providing air flow communication between the interior and the exterior of the circumferential member.

[0023] The protective headgear device may further comprise a first channel positioned on the first side section of the circumferential member to receive a temple of an eyeglass frame of a user of the headgear device. The protective headgear device may further comprise a second channel positioned on the second side section of the circumferential member to receive a temple of the eyeglass frame of a user of the headgear device.

[0024] The protective headgear device may further

comprise a first undercut between the first lip and a surface of the first recess, the first undercut extending circumferentially about the first recess. The protective headgear device may further comprise a second undercut between the second lip and a surface of the second recess, the second undercut extending circumferentially about the second recess. The first impact plate may be disposed within the first recess and may have a circumferential edge disposed within the first undercut. The second impact plate may be disposed within the second recess and may have a circumferential edge disposed within the second undercut.

[0025] The foregoing paragraphs have been provided by way of general introduction, and are not intended to limit the scope of the following claims. The presently preferred embodiments, together with further advantages, will be best understood by reference to the following detailed description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] The features and advantages of the present invention will become apparent from the following detailed description of the invention when read with the accompanying drawings.

FIG. 1 is a first perspective view of a protective headgear device in accordance with aspects of the invention.

FIG. 2 is a second perspective view of the protective headgear device.

FIG. 3 is a front elevational view of the protective headgear device.

FIG. 4 is rear elevational view of the protective headgear device.

FIG. 5 is a first side elevational view of the protective headgear device.

FIG. 6 is a second side elevational view of the protective headgear device.

FIG. 5 is a top view of the protective headgear device. FIG. 8 is a side sectional exploded view of the protective headgear device taken along line 6-6 of FIG. 6.

FIG. 9 is a front sectional view of the protective headgear device taken along 9-9 of FIG 3.

FIG. 10 is an exploded sectional view of a side section of the protective headgear device with an impact plate and internal pad.

FIG. 11A is a sectional view of a side section of an embodiment of the protective headgear device and without an impact plate and internal pad showing a recess and undercut.

FIG. 11B is a sectional view of a side section of the protective headgear device with an impact plate and internal pad.

FIG. 12A is a sectional view of a side section of the protective headgear device according to an embod-

iment with an undercut in the recess.

FIG. 12B is a sectional view of a side section of the protective headgear device according the embodiment with an undercut in the recess and an impact plate and pad in the recess.

FIG. 13 is a perspective view of an impact plate according to one embodiment of the invention.

FIG. 14 is a perspective view of an impact plate according to another embodiment of the invention.

DETAILED DESCRIPTION OF THE DRAWINGS

[0027] Embodiments are described herein with reference to the attached figures wherein like reference numerals are used throughout the figures to designate similar or equivalent elements. The figures are not drawn to scale and they are provided merely to illustrate aspects disclosed herein. Several disclosed aspects are described below with reference to non-limiting example applications for illustration. It should be understood that numerous specific details, relationships, and methods are set forth to provide a full understanding of the embodiments disclosed herein. One having ordinary skill in the relevant art, however, will readily recognize that the disclosed embodiments can be practiced without one or more of the specific details or with other methods. In other instances, well-known structures or operations are not shown in detail to avoid obscuring aspects disclosed herein. The embodiments are not limited by the illustrated ordering of acts or events, as some acts may occur in different orders and/or concurrently with other acts or events. Furthermore, not all illustrated acts or events are required to implement a methodology in accordance with the embodiments.

[0028] Notwithstanding that the numerical ranges and parameters setting forth the broad scope are approximations, the numerical values set forth in specific non-limiting examples are reported as precisely as possible. Any numerical value, however, inherently contains certain errors necessarily resulting from the standard deviation found in their respective testing measurements. Moreover, all ranges disclosed herein are to be understood to encompass any and all sub-ranges subsumed therein. For example, a range of "less than 10" can include any and all sub-ranges between (and including) the minimum value of zero and the maximum value of 10, that is, any and all sub-ranges having a minimum value of equal to or greater than zero and a maximum value of equal to or less than 10, e.g., 1 to 4.

[0029] The term "foam" as used herein shall include a material in a lightweight cellular form resulting from creation of gas bubbles during manufacture, resulting in a well-defined cellular wall structure. The term "pad" as used herein shall mean a cushion-like mass of soft material used to shield body parts against impact.

[0030] An exemplary embodiment of the present invention for a protective headgear 10 is shown in FIGS. 1-6. The protective headgear device 10 includes a cir-

cumferential member 11, or outer shell, that generally conforms to the shape of one's head and covering portions of one's head for protection. The circumferential member 11 includes a front section 14 (or forehead section) for covering the forehead, a back section 15 for covering the back or crown of the head, and a top section 17 for covering a top of the head. In addition, the circumferential member 11 includes two side sections 16A, 16B for covering the top sides of the head, ears, temples, jaws and sides of the head. The sections 14, 15, 16A, 16B and 17 are arranged to form a first opening 12 (FIGS. 1 and 3) through which a user is capable of viewing, a second opening 48 (FIG. 1 and 3) through which a user's neck extends and an interior or internal volume 49 (FIG. 1 and 3) in which a head is positioned.

[0031] While the above describes aspects of the invention, the invention is not so limited and may not require all the referenced sections. For example, embodiments may include a circumferential member 11 that does not include the top section 17.

[0032] With respect to the embodiment illustrated herein, the back section 15 includes a central section 32 depending from the top section 17, between and spaced apart from backside sections 43, 44. This configuration, which is known to those skilled in the art, enables the headgear 10 to fit on different size heads. The backside sections 43, 44 have strap openings 37, 38 to receive a strap 39 (FIG. 6) to tighten the back section 15 of the circumferential member 11 to a head. However, the invention is not limited to the spaced back section 15 shown in the drawings and may, for example, include a back section that is a single integral section across the back of a user's head or integrally formed with side sections 16A, 16B and top section 17.

[0033] In addition, sections of the headgear 10 may be perforated for ventilation and hearing. For example, openings 20 at the top section 17 provide and apertures 21 adjacent one's ear on the side sections 16A, 16B provide ventilation, and assist in hearing and/or air pressure relief.

[0034] As shown in FIGS. 2 and 6, a chinstrap 18 is secured to each of the side sections 16A, 16B and extends under a user's chin to secure the device 10 on the head. Accordingly, the side sections 16A, 16B include openings 34, 35 for receiving a chin strap. The invention is not limited to the particular strap arrangement shown in the drawings and may include other arrangements. For example, there may be only one opening or a pair of openings on only one side section 16A, 16B and the other side may include a hook and loop substrate attached to an external surface to support a strap or end of strap.

[0035] The circumferential member 11 is preferably fabricated from a suitable foam material that is conformable and resilient, capable of absorbing energy and forces when contacted and deformed by a strike or blow. In an exemplary embodiment, the foam material is a thermoplastic elastomer, or polyolefin based, closed cell foam product that is molded in a foam compression in-

jection molding process. As known to those skilled in the art, such injection processes use a base material in pellet form, which is heated and injected into a mold to form a closed cell foam material.

[0036] The thickness of the headgear 10 may vary at different locations along the circumferential member 11 including the head section 13 and side sections 16A, 16B. Thickness along the circumferential member 11 may range from between about 5 mm to about 30 mm depending on the locations. For example at a forehead area or front section 14 the thickness may be about 40.0 mm, at the back sections 43, 44 the thickness may be about 22.0 mm, and the interconnections 19 between ventilation openings 20 on the top section 17 may have a thickness of about 9.0 mm. Note, these dimensions are provided by way of example only and are not intended to limit the invention to any particular dimension or combination of dimensions.

[0037] As described further, aspects of the invention include a novel configuration of components of ear or side head impact protection. As shown in FIGS. 1, 2, 8, and 10, the headgear 10 and/or circumferential member 11 includes a first internal recess 23A and a second internal recess 23B located on the side sections 16A, 16B respectively. More specifically, the first and second recesses 23A, 23B are positioned to cover a user's ears. The first recess 23A forms a first lip 24A that defines a geometric outline of the recess 23A. In addition, the second recess 23B forms a first lip 24B that defines a geometric outline of the recess 23B.

[0038] In as much as both sides of the headgear 10 are identical, for purposes of conciseness, the description of a one side shall refer to the components of the other side of the headgear 10. To that end, and as shown in FIGS. 10, 11A, 11B, impact plates 26A, 26B are disposed within respective recesses 23A, 23B. The impact plates 26A, 26B each have a shape conforming to that of the headgear 10, circumferential member 11, or sides sections 16A, 16B at the recesses 23A, 23B. More particularly, each plate 26A, 26B has an outwardly curving or domed-like shape as defined by raised mid-section 50 (FIG. 13) to fit within and conform to the curvature of the headgear 10 in the recesses 23A, 23B.

[0039] In addition, each plate 26A, 26B, has a circumferential edge 25A, 25B that defines a geometric outline of the plate 26A, 26B that corresponds to a geometric outline of the respective recess 23A, 23B. In addition, the plates 26A, 26B are dimensioned so the edges 25A, 25B of the plates 26A, 26B abut the lips 24A, 24B of the recesses 23A, 23B. As further shown, the impact plates 26A, 26B may have one or more apertures 36 and preferably have the same number of apertures 21 as that of the side sections 16A, 16B at recesses 23A, 23B. In preferred, aspects of the invention, the apertures 36 and 21 have the same geometric shape and are aligned for purposes of ventilation of air in and out of the headgear 10 during use.

[0040] The impact plates 26A, 26B are comprised of a

rigid plastic material that also has sufficient flexibility or resiliency to conform to the configuration of the interior surface 13 of the circumferential member 11 (or internal surface 13 of the recesses 23A, 23B) and flex upon impact from a blow to the side sections 16A, 16B of the headgear 10.

[0041] In an exemplary embodiment, the impact plates 26A, 26B are constructed from an injection molding process using a plastic nylon material; however, other materials may be used. The thickness of the impact plates 26A, 26B may range from about 1.25 mm to about 5.0 mm, and are preferably about 4.0 mm thick, which provides sufficient rigidity and flexibility to absorb and/or disperse force applied by a blow to the head.

[0042] An adhesive, or other fastening mechanisms, may be used to secure the impact plates 26A, 26B to the internal surfaces 13 of the headgear 10 within the recesses. For example, a polyurethane adhesive may be used with a nylon plastic impact plate for securing or affixing purposes.

[0043] In another aspect of the invention, the headgear 10 may further include pads such as a first pad 27A and second pad 27B inserted into the respective recesses 23A, 23B and covering the impact plates 26A, 26B. Each pad 27A, 27B, has a circumferential edge 29 that defines a geometric outline or shape of the pad 27A, 27B that corresponds to that of the respective recesses 23A, 23B and/or plates 26A, 26B. The pads are preferably composed of the same material as that of the circumferential member 11 and formed using a compression injection molding process; however, other materials and manufacturing processes may be used to fabricate the pads.

[0044] In preferred embodiments, the pads 27A, 27B have one or more apertures 46, and preferably the same number of apertures 21, 36 as that of the recesses 23A, 23B and impact plates 26A, 26B. To that end, each aperture 46 has the same geometric shape as the corresponding aperture 21, 36 with which it is aligned. The pads 27A, 27B, may have a thickness ranging from about 4.0 mm to about 8.0 mm, preferably about 6.0 mm. In preferred embodiments, a combined thickness dimension of the plates 26A, 26B and pads 27A, 27B does not exceed, is less than or is not significantly greater than a thickness dimension of the lips 24A, 24B. An adhesive may be used to affix the pads 27A, 27A to the impact plates 26A, 26B as described above with respect to the attachment of the impact plates 26A, 26B to the circumferential member 11 within recesses 23A, 23B. The pads 27A, 27B are preferably affixed to the impact plates 26A, 26B, but not to surfaces 13 of the circumferential member 11 within the recesses 23A, 23B.

[0045] With respect to FIGS. 12A, 12B, an embodiment is illustrated that includes an adaptation of the circumferential member 11 at the respective recesses 23A, 23B. More specifically, first and second undercuts 28A, 28B extend circumferentially around the respective recesses 21A, 21B between the lips 22A, 22B and surface 13 of the recesses 21A, 21B. The impact plates 26C, 26D are

adapted relative to impact plates 26A, 26B so that portions of the impact plates are disposed within the undercuts.

[0046] With respect to FIG. 14, impact plates 26C and 26D are shown in more detail. As shown, the impact plates 26C, 26D each includes a mid-section 50 that is raised or offset relative to an outer rim 38A, 38A, similar to the impact plates 26A, 26A providing the curvature or domed configuration associated with the circumferential member 11 at the recesses 23A, 23B. Circumferential edges 30 extend along the corresponding outer lips 38; and, in an embodiment the edges 30 and at least portions of the outer rims 38 are insertable into undercuts 28A, 28B to position the impact plates 26C, 26D in the headgear device 10, as shown in FIG. 12B. The impact plates 26C, 26D are otherwise similar in configuration, shape, dimension, materials as that of impact plates 26A, 26B and may be secured with an adhesive to the surface 13 in the recesses 23A, 23B and to the pads 27A, 27B as described above with respect to the first embodiment.

[0047] In any of the above-described embodiments, the headgear 10 and circumferential member 11 include internal one or more pressure relief channels associated with internal volume 49 of the headgear 10. More specifically, as shown in FIGs. 8 and 10, pressure relief channels 42A, 42B, and 42C are positioned adjacent to the recesses 23A, 23B to provide air flow communication between an interior of the headgear 10 and circumferential member 11 and an exterior thereof. The thickness of the circumferential member at the channels 42A, 42B, 42C may vary according to their locations and a depth dimension of each channel 42A, 42B or 42C. For example, the depth of each channel 42A, 42B, 42C may be about 6.0 mm, and the width of the channels may vary and may be from about 15.0 mm to about 25.0 mm wide. For example, channel 42A may be about 25.0 mm wide, and channels 42B, 42C may be about 20.0 mm wide.

[0048] It is noted that channels 42A are disposed on the side sections 16A, 16B at generally an eye level of a user and are capable of receiving eyewear frame members of a user. Accordingly, pressure relief channels 42A may be characterized as eyewear receiving channel

[0049] While various disclosed embodiments have been described above, it should be understood that they have been presented by way of example only, and not limitation. Numerous changes, omissions and/or additions to the subject matter disclosed herein can be made in accordance with the embodiments disclosed herein without departing from the spirit or scope of the embodiments. Also, equivalents may be substituted for elements thereof without departing from the spirit and scope of the embodiments. In addition, while a particular feature may have been disclosed with respect to only one of several implementations, such feature may be combined with one or more other features of the other implementations as may be desired and advantageous for any given or particular application. Furthermore, many modifications may be made to adapt a particular situation or

material to the teachings of the embodiments without departing from the scope thereof.

[0050] Therefore, the breadth and scope of the subject matter provided herein should not be limited by any of the above explicitly described embodiments. Rather, the scope of the embodiments should be defined in accordance with the following claims and their equivalents.

10 Claims

1. A protective headgear device, comprising:

a padded circumferential member generally conforming to the shape of a user's head and including a forehead section, rear section, a first side section and a second side section opposite the first side section;

a first interior recess in the first side section forming a first lip extending circumferentially about the first recess and the first lip forming a geometrical outline of the first recess;

a second interior recess formed in the second side section forming a second lip extending circumferentially about the second recess and the second lip forming a geometrical outline of the second recess;

a first impact plate disposed within the first recess and having a circumferential edge defining a geometrical outline of the first impact plate that corresponds to the geometric outline of the first recess; and,

a second impact plate disposed within the second recess and having a circumferential edge defining a geometrical outline of the first impact plate that corresponds to the geometric outline of the second recess.

2. The protective headgear of claim 1, further comprising:

a first pad disposed within the first recess and covering the first impact plate, and the first pad includes a circumferential edge defining a geometric outline of the first pad that corresponds to the geometric outlines of the first recess and first impact plate; and,

a second pad disposed within the second recess and covering the second impact plate, and the second pad includes a circumferential edge defining a geometric outline of the second pad that corresponds to the geometric outlines of the second recess and second impact plate.

3. The protective headgear device of claim 2, further comprising:

one or more apertures through the circumferen-

- tial member within a circumference of the first recess;
- one or more apertures through the circumferential member within a circumference of the second recess;
- the first impact plate includes one or more apertures and each of the one or more apertures is aligned with a respective aperture within the first recess;
- the second impact plate includes one or more apertures and each of the one or more apertures is aligned with a respective aperture within the second recess;
- the first pad further includes one or more apertures and each of the one or more apertures is aligned with a respective aperture within the first recess and the first impact plate;
- wherein the first pad further includes one or more apertures and each of the one or more apertures is aligned with a respective aperture within the first recess and the first impact plate.
4. The protective headgear device of claim 2 or 3, wherein:
- the first pad has apertures aligned with apertures of the first impact plate and the circumferential member; and
- the second pad has apertures aligned with apertures of the second impact plate and the circumferential member.
5. The protective headgear device of any preceding claim, wherein the circumferential member is formed using a compression injection molding process.
6. The protective headgear device of any preceding claim, wherein each of the first and second impact plates includes a mid-section that is offset, relative to the circumferential edge, toward an exterior of the circumferential member.
7. The protective headgear device of any preceding claim, further comprising at least one first air pressure relief channel formed in the circumferential member adjacent to the first recess and at least one second air pressure relief channel formed in the circumferential member adjacent to the second recess.
8. The protective headgear device of any preceding claim, further comprising:
- a first undercut between the first lip and a surface of the first recess, the first undercut extending circumferentially about the first recess;
- a second undercut between the second lip and a surface of the second recess, the second undercut extending circumferentially about the second recess;
- the first impact plate having a circumferential edge disposed within the first undercut;
- the second impact plate having a circumferential edge disposed within the second undercut;
- one or more apertures through the circumferential member within a circumference of the first recess, and the first impact plate includes one or more apertures aligned with the one or more apertures within the first recess;
- one or more apertures through the circumferential member within a circumference of the second recess, and the second impact plate includes one or more apertures aligned with the one or more apertures within second recess.
9. The protective headgear device of claim 8, further comprising:
- a first pad disposed within the first recess and covering the first impact plate, and the first pad includes a circumferential edge defining a geometric outline of the first pad that corresponds to the geometric outlines of the first recess and first impact plate, wherein the first pad has one or more apertures aligned with respective one or more apertures of the first impact plate and within the first recess; and,
- a second pad disposed within the second recess and covering the second impact plate, and the second pad includes a circumferential edge defining a geometric outline of the second pad that corresponds to the geometric outlines of the second recess and second impact plate, wherein the second pad has one or more apertures aligned with respective one or more apertures of the second impact plate and within the second recess.
10. A protective headgear device, comprising:
- a padded circumferential member generally conforming to the shape of a user's head and including a forehead section, rear section, a first side section and a second side section opposite the first side section;
- a first interior recess in the first side section forming a first lip extending circumferentially about the first recess;
- a second interior recess formed in the second side section forming a second lip extending circumferentially about the second recess;
- a first undercut between the first lip and a surface of the first recess, the first undercut extending circumferentially about the first recess;
- a second undercut between the second lip and a surface of the second recess, the second undercut extending circumferentially about the

second recess;
 a first impact plate disposed within the first recess and having a circumferential edge disposed within the first undercut;
 a second impact plate disposed within the second recess and having a circumferential edge disposed within the second undercut;
 a first pad within the first recess and covering the first impact plate;
 a second pad within the second recess and covering the second impact plate;
 one or more apertures through the circumferential member within a circumference of the first recess, and the first impact plate and first pad both include one or more apertures aligned with the one or more apertures within the first recess;
 and,
 one or more apertures through the circumferential member within a circumference of the second recess, and the second impact plate and second pad both include one or more apertures aligned with the one or more apertures within second recess.

the first impact plate disposed within the first recess and having a circumferential edge disposed within the first undercut; and,
 the second impact plate disposed within the second recess and having a circumferential edge disposed within the second undercut.

11. The protective headgear device of claim 10, further comprising:

a plurality of first air pressure relief channels adjacent to the first recess providing air flow communication between an interior and an exterior of the circumferential member; and,
 a plurality of second air pressure relief channels adjacent to the second recess providing air flow communication between the interior and the exterior of the circumferential member.

12. The protective headgear device of any preceding claim, further comprising:

a first channel positioned on the first side section of the circumferential member to receive a temple of an eyeglass frame of a user of the headgear device; and,
 a second channel positioned on the second side section of the circumferential member to receive a temple of the eyeglass frame of a user of the headgear device.

13. The protective headgear device of any preceding claim, further comprising:

a first undercut between the first lip and a surface of the first recess, the first undercut extending circumferentially about the first recess;
 a second undercut between the second lip and a surface of the second recess, the second undercut extending circumferentially about the second recess;

FIG. 1

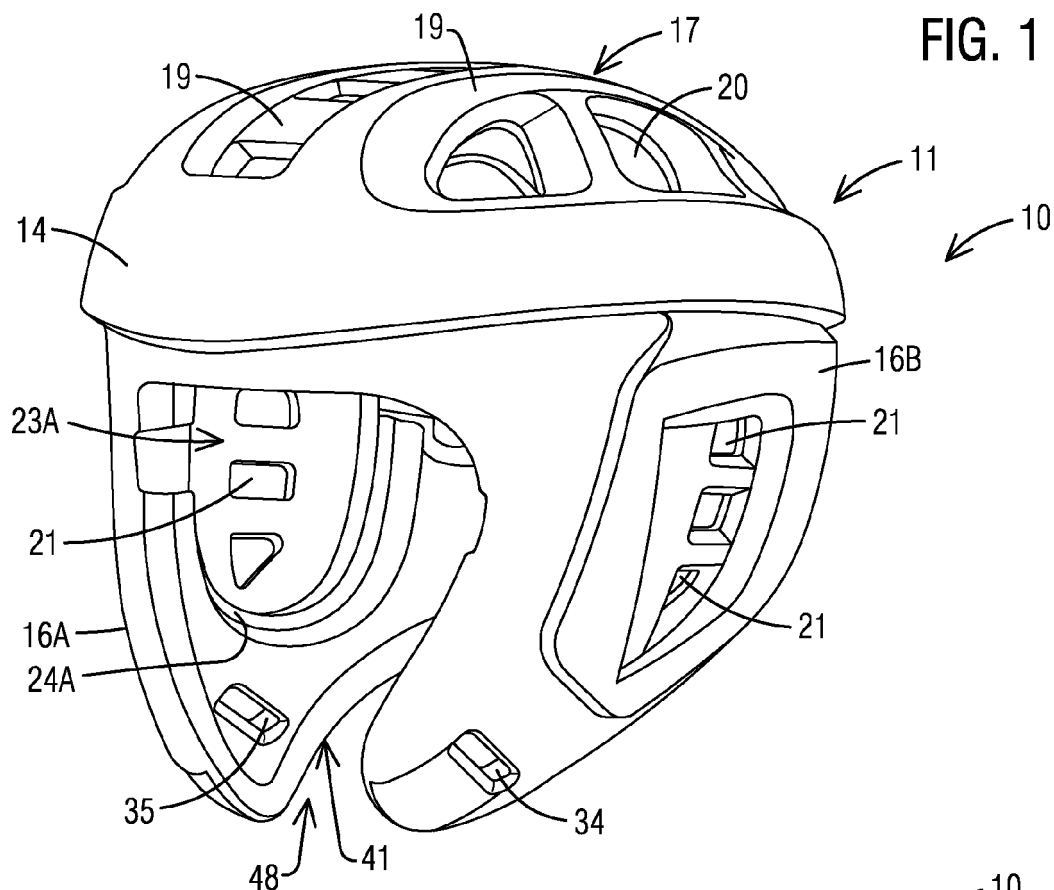


FIG. 2

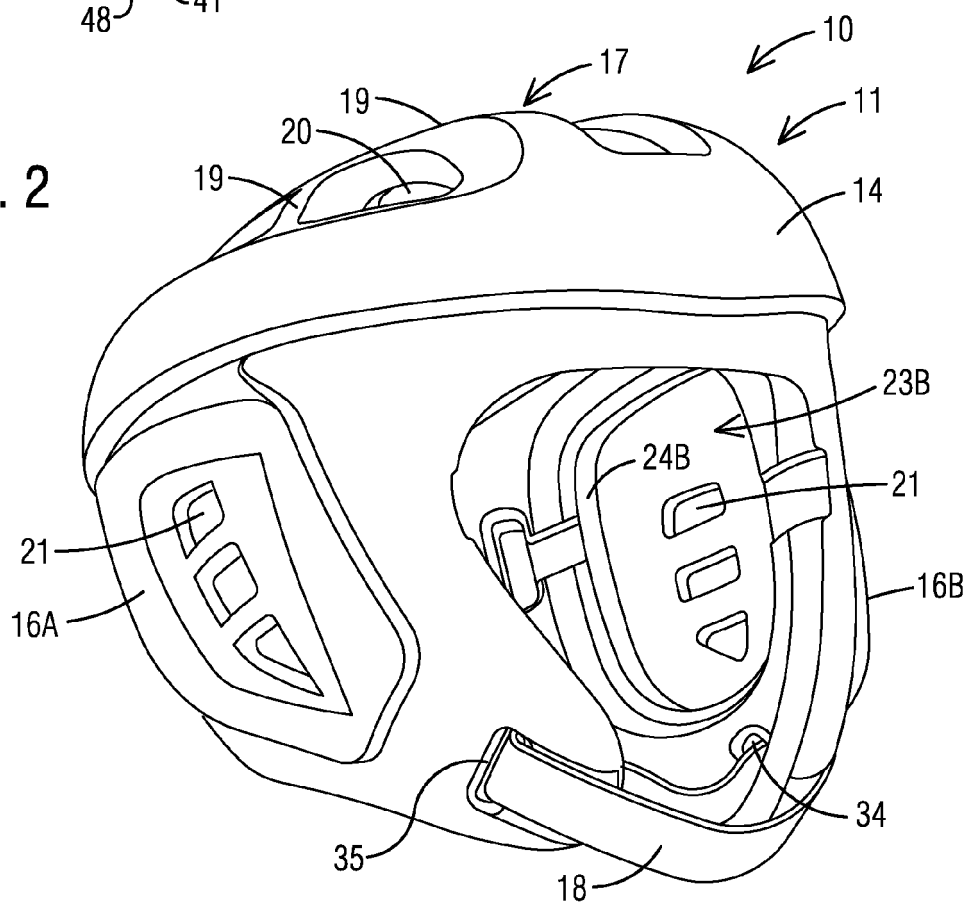


FIG. 3

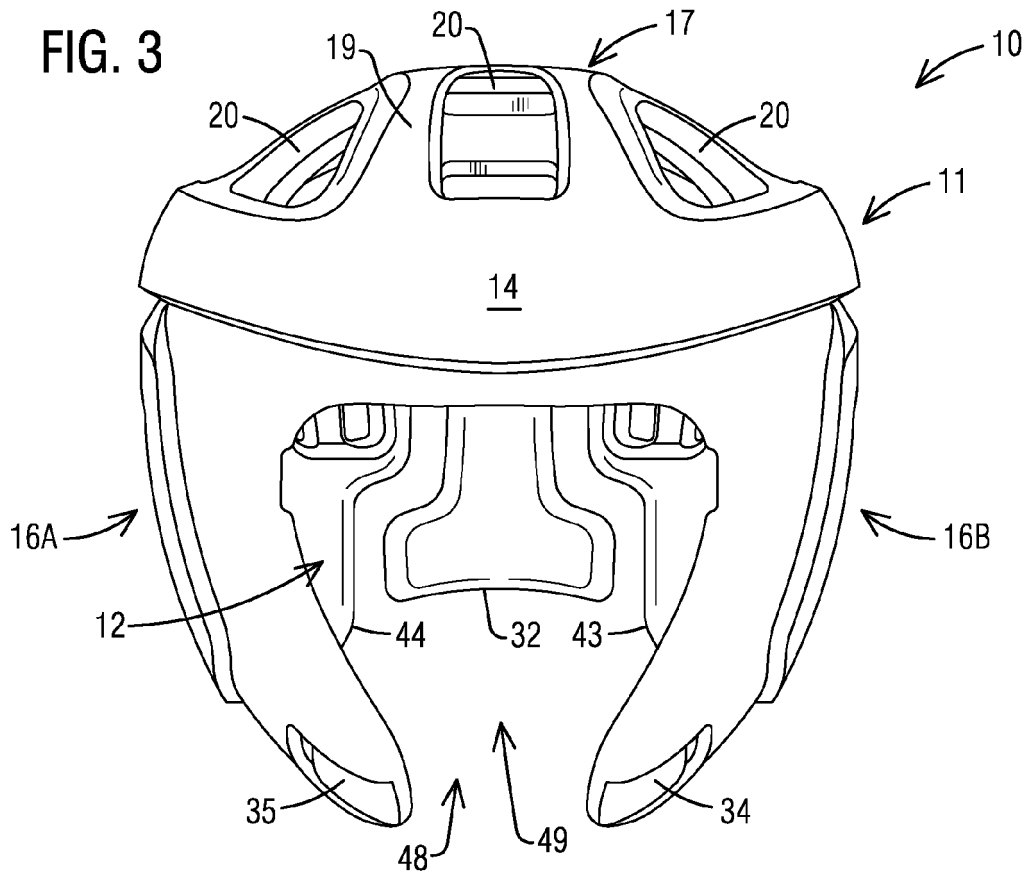


FIG. 4

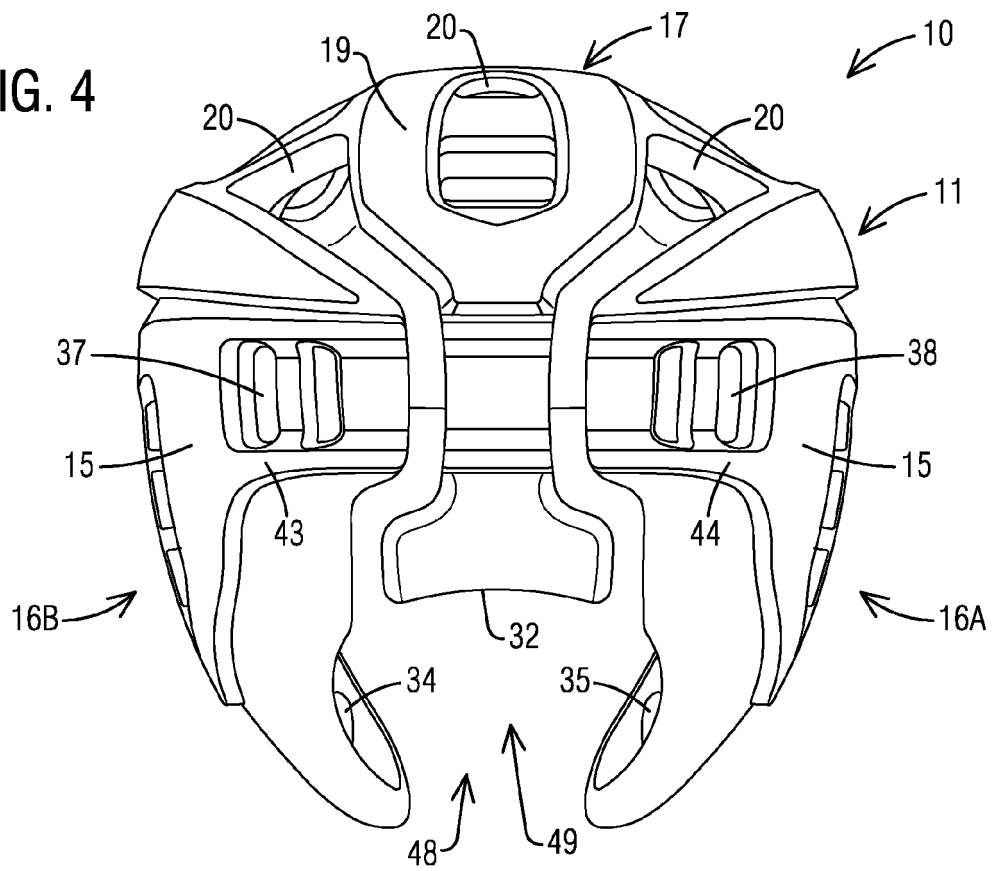


FIG. 5

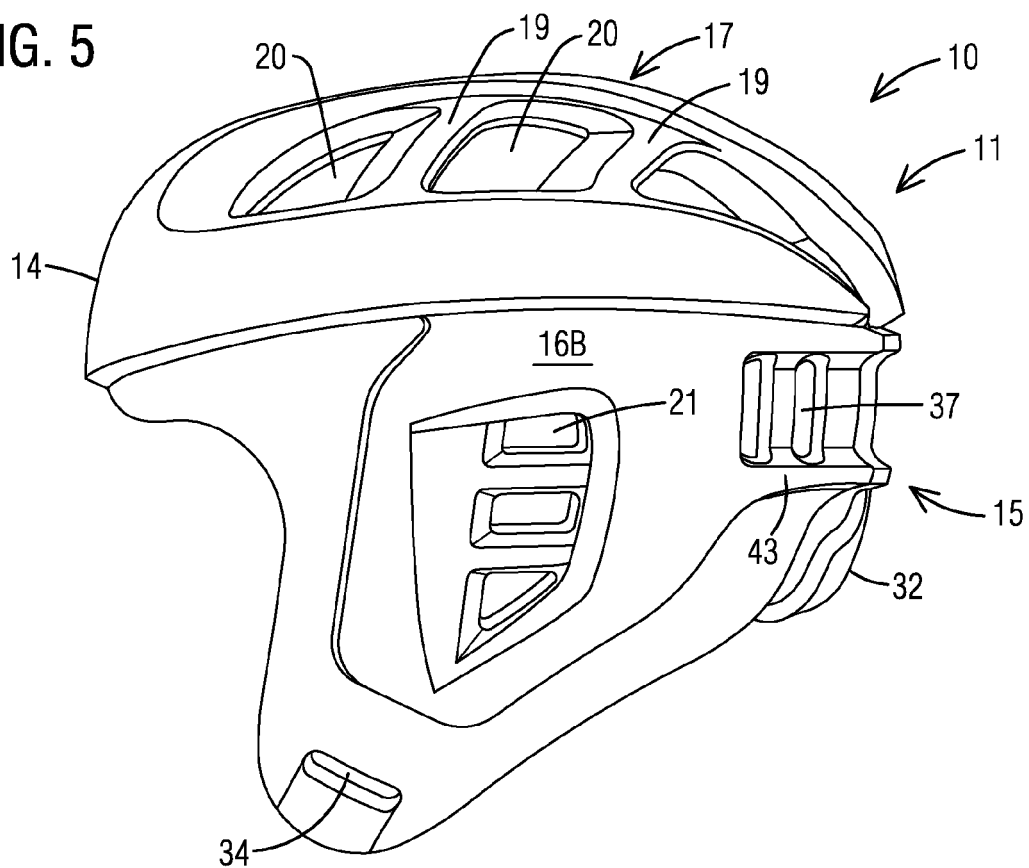


FIG. 6

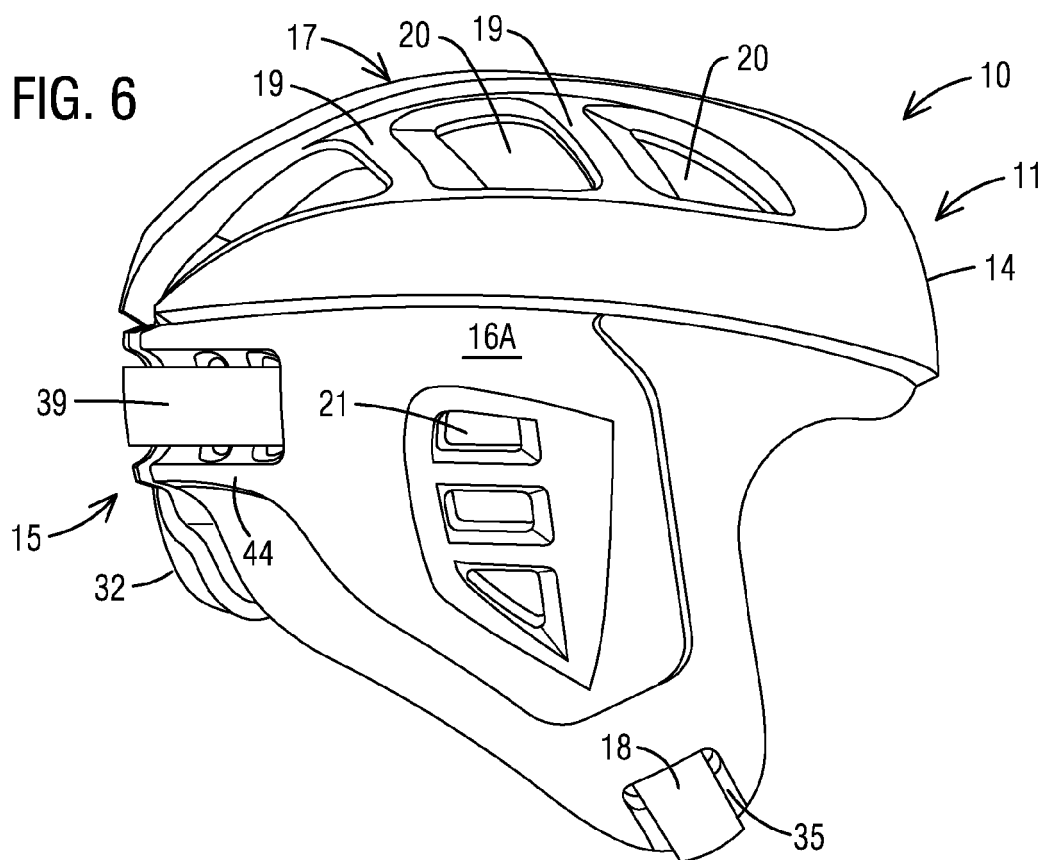


FIG. 7

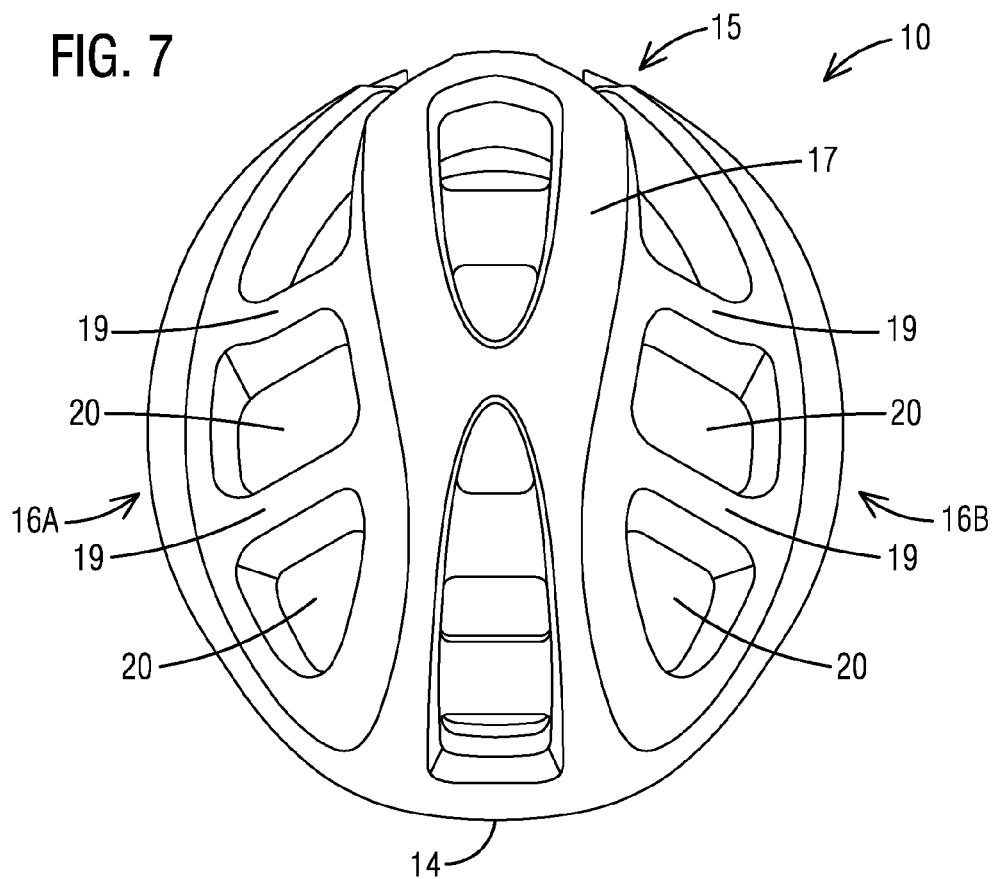


FIG. 8

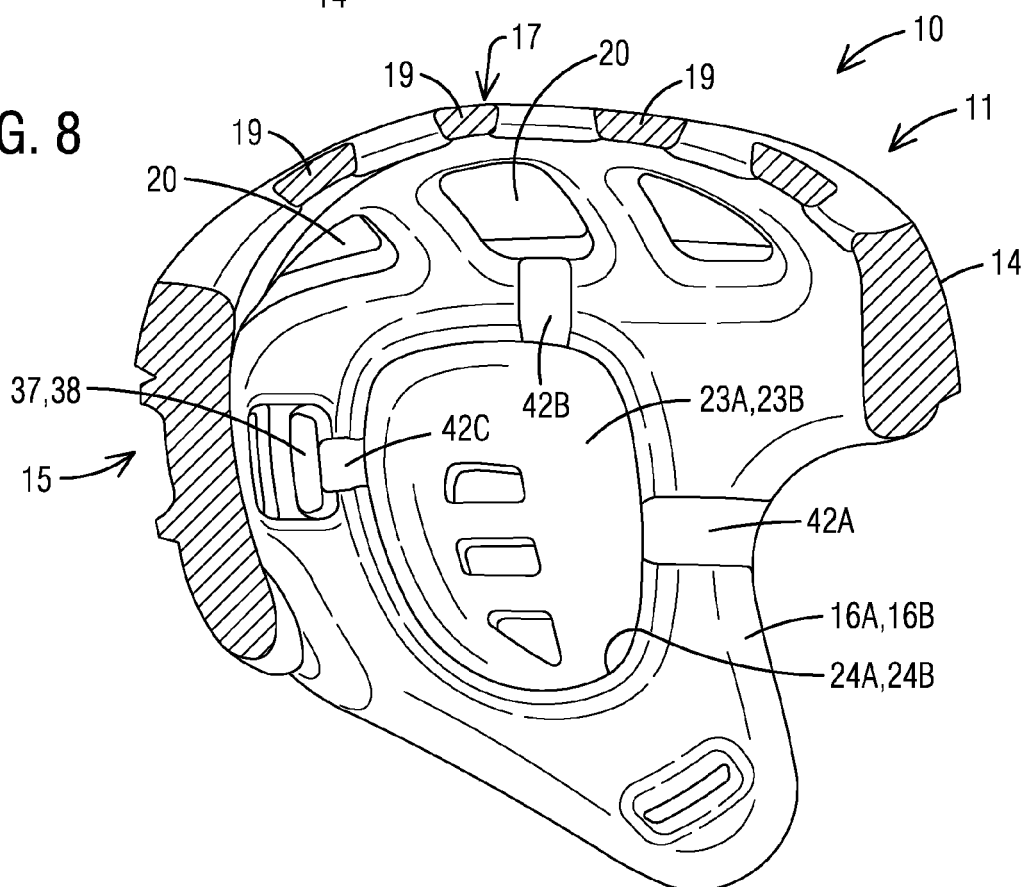


FIG. 9

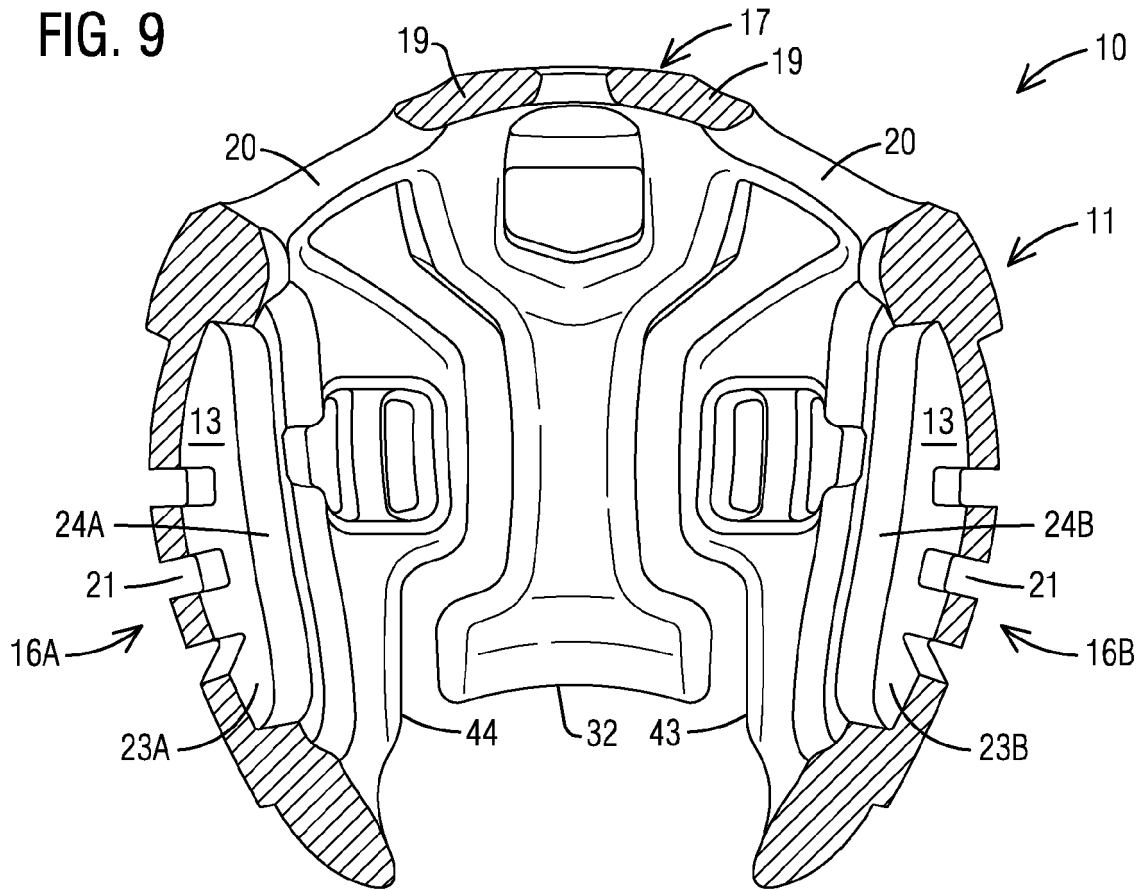


FIG. 10

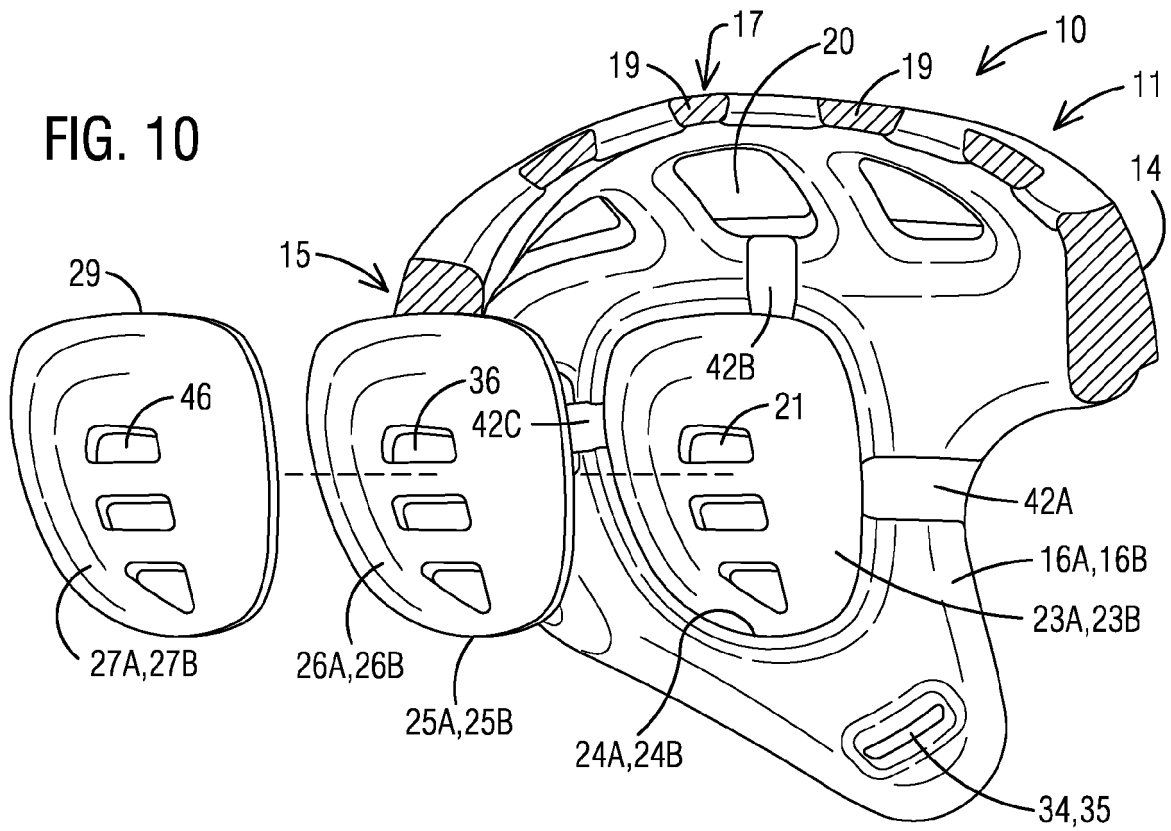


FIG. 11A

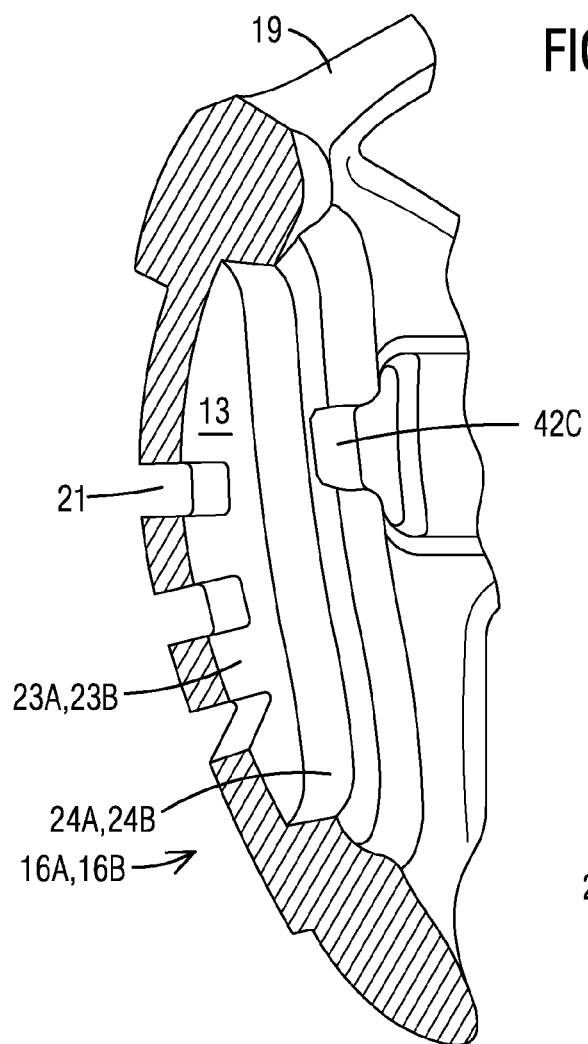


FIG. 11B

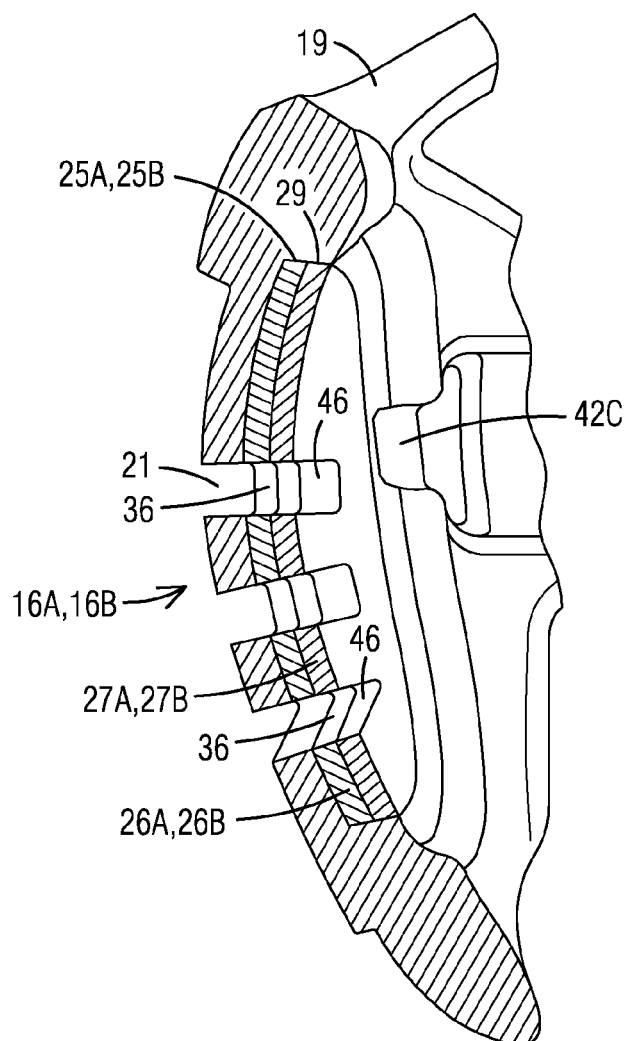


FIG. 12A

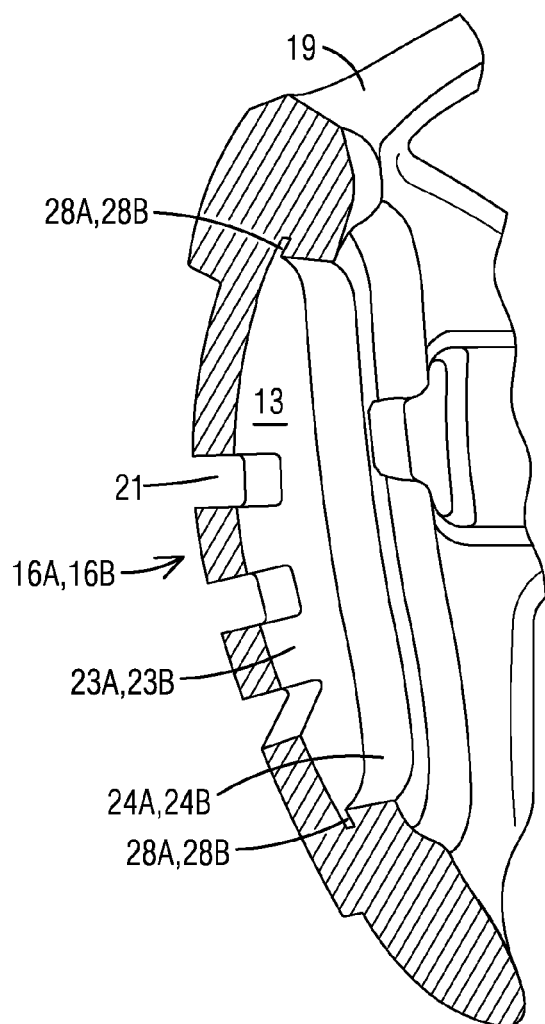


FIG. 12B

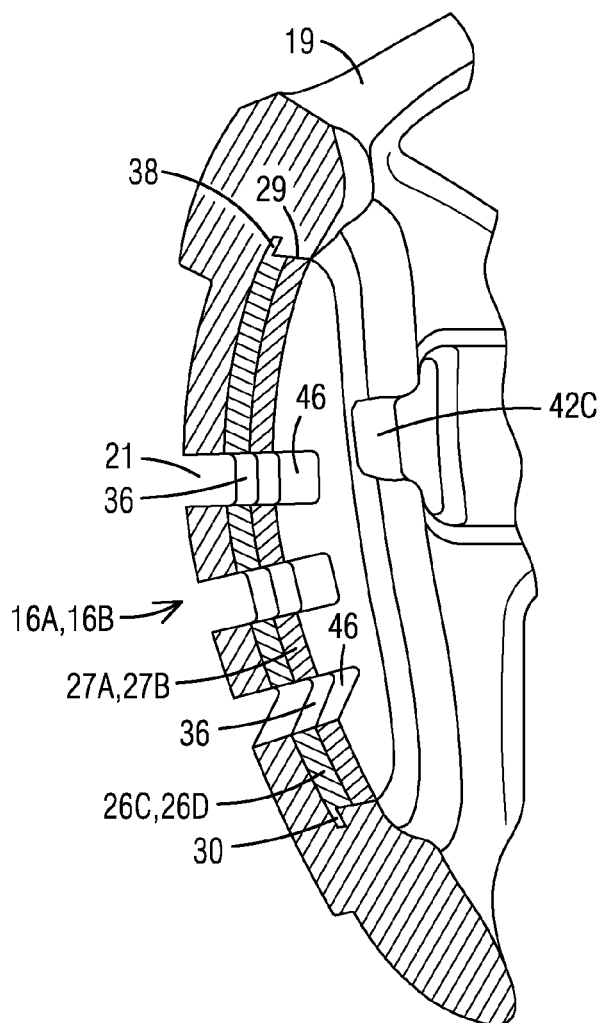


FIG. 13

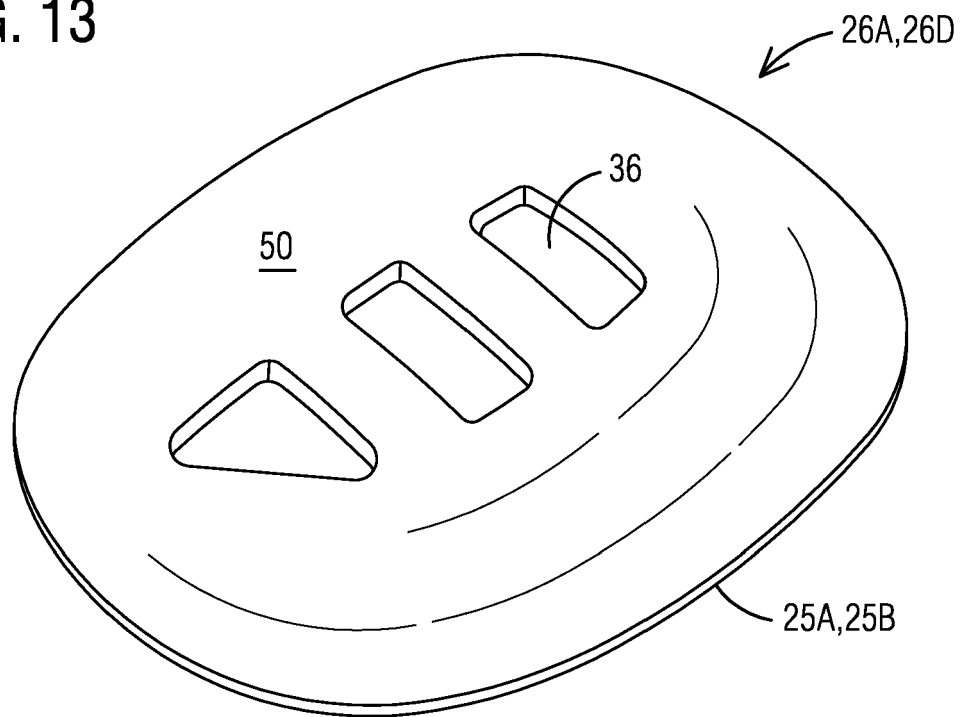
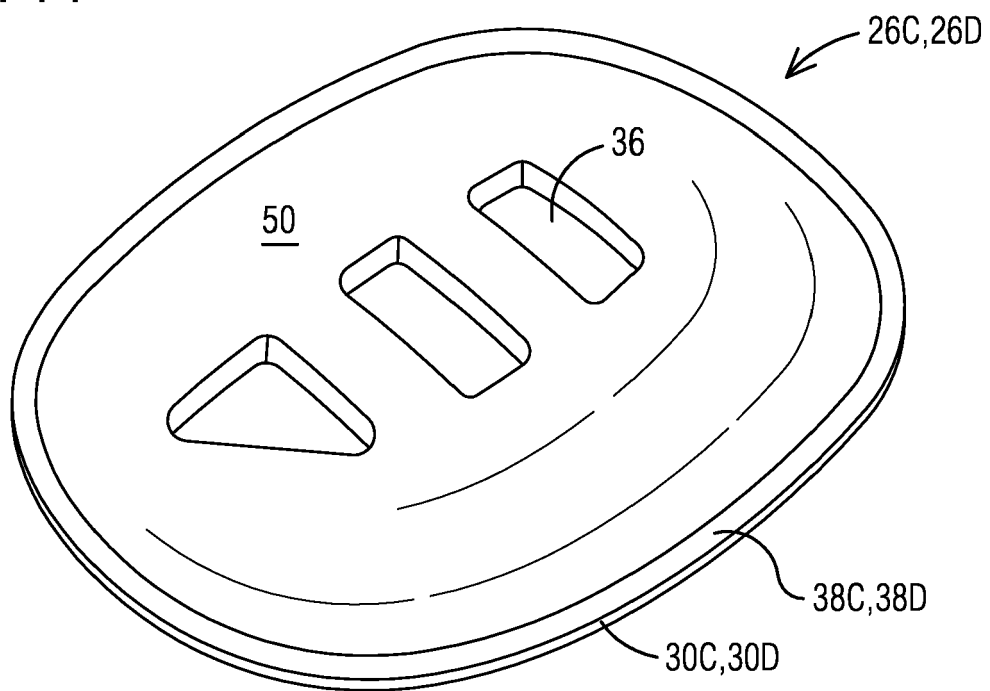


FIG. 14





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Application Number
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Place of search The Hague		Date of completion of the search 25 October 2018	Examiner D'Souza, Jennifer
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