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(54) Titre : DISPOSITIF ET PROCEDE POUR DISSUADER DE PRENDRE UNE POSTURE DE RONFLEMENT COUCHEE SUR LE DOS

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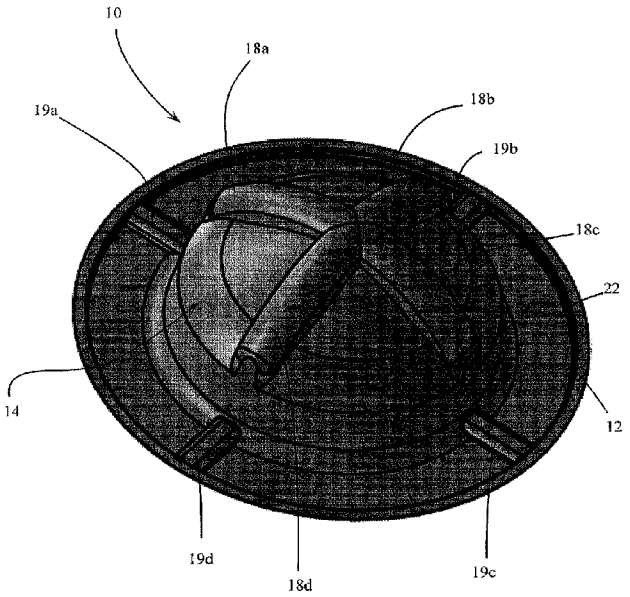

(57) Abrégé/Abstract:
Domed articles are disclosed with reinforcements and adaptations for adhesively-applying them to a person's back while sleeping, to deter against the person sleeping supinely on their back, a posture that is commonly associated with louder and more dangerous snoring. The dome-like articles (1) are typically shaped like a campaign hat in that they have a central dome (or crown region) surrounded by a concentric, relatively-flat annular perimeter (or brim region), (2) have a hypoallergenic adhesive on a flat side of the brim - the side facing the person's back - for removably securing the domed article to the person's back, (3) are typically formed from a unitary plastic sheet with complex shapes and surface features that reinforce the strength of the dome to resist collapse when the person rolls onto it, such shapes and features including stress distributors and structural reinforcements such as intersecting arcuate ridges and/or troughs, and (4) have holes or other surface features to allow for ventilation of the space enclosed between the dome and the person's back.

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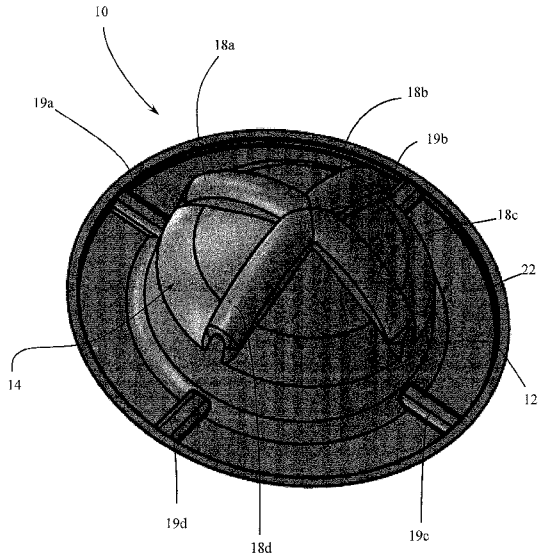

Fig. 1

(57) Abstract: Domed articles are disclosed with reinforcements and adaptations for adhesively-applying them to a person's back while sleeping, to deter against the person sleeping supinely on their back, a posture that is commonly associated with louder and more dangerous snoring. The dome-like articles (1) are typically shaped like a campaign hat in that they have a central dome (or crown region) surrounded by a concentric, relatively-flat annular perimeter (or brim region), (2) have a hypoallergenic adhesive on a flat side of the brim - the side facing the person's back - for removably securing the domed article to the person's back, (3) are typically formed from a unitary plastic sheet with complex shapes and surface features that reinforce the strength of the dome to resist collapse when the person rolls onto it, such shapes and features including stress distributors and structural reinforcements such as intersecting arcuate ridges and/or troughs, and (4) have holes or other surface features to allow for ventilation of the space enclosed between the dome and the person's back.

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DEVICE & METHOD FOR DETERRING BACK-LYING SNORING POSTURE

INVENTOR: JENNIFER SPARR

CLAIM OF PRIORITY TO PRIOR APPLICATIONS

[0001] The present application claims the benefit of previously filed U.S. Provisional Application, Serial Number 62/002,258, filed May 23, 2014, as well as U.S. Non-Provisional Patent Application, Serial Number 14/325,473, filed July 8, 2014.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] The present invention relates to the field of body positioning aids for encouraging the human body to assume a safe and healthy posture while sleeping and, more particularly, for encouraging a posture that tends to minimize snoring for people who tend to snore.

2. Description of Related Art

[0003] Snoring, needless to say, can be annoying to others in the same bed, to others in the same house, and occasionally even to others living next door. The health of those who snore can also be at serious risk – not just when they get kicked, shoved or smothered by their sleeping companions – but often due to sleep apnea and/or reduced blood-oxygen levels that may be associated with snoring.

[0004] It has long been known that many people snore more commonly or more loudly and dangerously when they sleep lying on their backs. People who snore and/or have obstructive sleep apnea are at much greater risk when they sleep on their backs, largely because the tongue and the muscles and surrounding tissue in the throat typically relax during sleep. When people are in a relaxed sleep state, if they are already on their back or if they roll or move onto their back, the relaxed tongue and throat tissue tends to slump backwards to partially block the airway to their lungs. The air they are breathing necessarily speeds up as it moves through the smaller, blocked opening of the airway, and the fast-moving air then causes the

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loose surrounding tissue to vibrate, which causes the noise that we call snoring. As a result, those who live with loud snorers quickly learn to nudge the snorer into another position in order to stop or reduce the snoring.

[0005] Likewise, numerous innovative problem solvers have developed devices and methods for keeping people from sleeping on their backs and from rolling or moving into a back-lying position while they sleep. Perhaps most famous, many know about the approach of sewing a tennis ball into the pocket of a T-shirt and having a snorer wear the tennis ball shirt backwards when the snorer sleeps, which keeps the snorer off the snorer's back because it's not comfortable to sleep on a tennis ball. US Patent No. 5,893,365.

[0006] Unfortunately, despite that the problem of snoring has been common since the dawn of time, few have succeeded in developing an affordable solution that works well on a consistent basis.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] **Fig. 1** is a perspective view of a preferred embodiment **10** of the device of the present invention.

[0008] **Fig. 2** is a top plan view of a preferred embodiment **10** of the device of the present invention showing the exterior structures of the device.

[0009] **Fig. 3** is a side elevation view of a preferred embodiment **10** of the device of the present invention.

[0010] **Figs. 4A** and **4B** are perspective views of a preferred embodiment **10** of the device of the present invention showing the adhesive system.

[0011] **Fig. 5** is a perspective view of an alternative embodiment **10'** of the device of the present invention.

[0012] **Fig. 6** is a top plan view of a preferred embodiment **10** of the device as positioned on the back of a sleeping subject **100**.

[0013] **Figs. 7A** and **7B** are elevation side views of an individual using the device of the present invention on a sleep support surface (mattress).

[0014] **Fig. 8** is a top plan view of an alternative embodiment **10'** of the device of the present invention showing the exterior structures of the device.

[0015] **Fig. 9** is a long axis side elevation view of an alternative embodiment **10'** of the device of the present invention.

[0016] **Fig. 10** is a short axis side elevation view of an alternative embodiment **10'** of the device of the present invention.

[0017] **Fig. 11** is a bottom plan view of an alternative embodiment **10'** of the device of the present invention showing the interior structures of the device.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0018] Reference is made first to **Fig. 1** which provides a perspective view of a preferred embodiment of the device of the present invention constructed from a unitary molded plastic material. In the perspective view of **Fig. 1,** the various external features of the device are disclosed. Supine-deterrent **10** is generally seen to be a hat-shaped device, shaped similar to a campaign hat, sized and configured to be removably placed on the back of the person.

[0019] As described above, the basic purpose of the device is to consciously or subconsciously deter the person from sleeping on the person's back, a position which tends to increase the incidence and severity of snoring. Because snoring while sleeping is frequently associated with the orientation of the sleeper on the sleeper's back, the device of the present invention serves as a manner of reducing the incidence of snoring while sleeping. The structure of supine-deterrent **10** provides just enough of a conscious or subconscious distraction or discomfort as to cause the person to move into a position where such discomfort no longer exists or occurs. In general, this means moving from a position where the person's back is against the relatively firm surface of the sleeping platform (mattress) to a position where such contact is not being made. Further details regarding this functionality are described in conjunction with **Figs. 7A** and **7B** below.

[0020] **Fig. 1** shows in detail the various exterior structural features of supine-deterrent **10** that provide its rigidity, comfort, and ease of positioning and placement for use of the device. The overall hat-shaped configuration, similar to the shape of a campaign hat, of supine-deterrent **10** includes contact annulus **12** which is a relatively flat ring perimeter region that, on an underside surface (not shown), provides the contact point between the device and the skin surface of the person's back. Although **Fig. 1** shows contact region **12** as a ring-shaped annulus **12**, those skilled in the art will recognize that such contact region could be comprised of other shapes, including, but not limited to, a rectangle, an oval (such as represented by the embodiment of **Figs. 5** and **8-11)**, a square or an irregular shape. As best evident in

Fig. 3, contact annulus **12** has a substantially planar lower surface **12a**. The lower surface of contact annulus **12**, shown in an unflexed position in **Fig. 3**, is completely planar; however, when the device of the present invention is in use on the back of a person, contact annulus **12** will flex along the surface of the person's back. Thus, when the device is operatively positioned on the back of a person, contact annulus **12** is slightly less than planar so that contact annulus **12** may conform to the surface of the person's back which results in contact annulus **12** having a substantially planar lower surface **12a**. The manner of adhesively attaching the device of the present invention to the person's back is described in more detail below.

[0021] Extending concentrically within contact annulus **12** is reinforced dome region **14** of supine-deterrent **10.** The dome region **14** in **Fig. 1** is a generally spherical section, whereby the walls converge such that the space defined by the walls reduces at further distance from the relatively larger opening near the base of the dome **14**. Those skilled in the art will recognize that the dome **14** may not just be a spherical section but may also have other non-spherical shapes whereby the walls converge in an analogous manner. In an alternative embodiment shown in **Figs. 5 and 8-11**, the dome may generally be shaped as an ovoid surface such that its walls **826** and **828** generally converge toward one another at distances further from its base **512**. In still another alternative embodiment (not shown), the dome may be shaped as, or may include, a frustoconical shape wherein the walls of the dome analogously converge toward one another in linear relationship to the distance from the dome's base. A rectangular pyramid shape is used in further alternatives whereby the walls analogously converge toward one another in linear relationship to the distance from the dome's base and define a rectangular shape. Still other alternatives use other irregular shapes such that all the walls of the irregular shape analogously converge toward each other in linear relationship to the distance from the base of the dome structure.

[0022] For structural reinforcement of the dome shape, positioned near the center of reinforced dome region **14,** are arcuate ridges **18a – 18d.** In the preferred embodiment of the present invention, arcuate ridges **18a – 18d** comprise long cylindrical convex elevations that together form a cross-shaped eminence centered on the apex of reinforced dome region **14** of the device. These arcuate ridges **18a – 18d** primarily provide structural strength to the dome shape of the device. Without such changes in the plane of the surface orientation, and therefore the wall structure

of the dome-shaped device, there would be a tendency for the dome shape to collapse when a direct force might be exerted on the apex of the dome. Arcuate ridges **18a – 18d**, structured as shown, provide multi-directional structural support to what otherwise would be a flat or simple curved wall structure.

[0023] Flat ridges **19a – 19d** are orthogonally arranged around the upper surface of contact annulus **12**. These flat ridges **19a – 19d** provide further structural support for reinforced dome region **14.** Flat ridges **19a – 19d** are generally rectangular in shape and their raised character form airflow apertures **360** (shown in **Fig. 3**), positioned along the lower surface of contact annulus **12** and described in further detail below.

[0024] **Fig. 2** is a top plan view of the preferred embodiment of the device of the present invention highlighting in greater detail the structures and contours of the various external features of the device as briefly described in conjunction with **Fig. 1.** In **Fig. 2,** supine-deterrent **10** is shown to be constructed from a generally circular-shaped device having contact annulus **12** as well as reinforced dome region **14** as described above. Along the peripheral edge of contact annulus **12** is perimeter flange **22.** Forming reinforced dome region **14** are dome base walls **26** and dome top wall **28.** Arcuate ridges **18a – 18d** are shown as they are positioned and configured within dome top wall **28.**

[0025] Dome base walls **26** are shown below dome top wall **28** forming reinforced dome region **14.** These dome base walls **26** provide the person with the ability to grasp the device using (for example) the thumb of the hand on one of the dome base walls, and the forefinger or two fingers of the same hand in the opposing dome base wall, in a manner similar to grip indentations **16a** and **16b** as shown in **Figs. 5, 8, 9** and **10**. In this manner the person may slightly squeeze the device to grip it firmly for orientation positioning and placement on the person's back.

[0026] The device of the present invention is preferably molded from a lightweight but resilient plastic material. More particularly, some embodiments are die-stamped on a punch press from sheet stock of amorphous polyethylene terephthalate (APET) with a thickness of .0175 inches. Examples of other suitable plastics include high-density polyethylene (HDPE), polyvinyl chloride (PVC), low density polyethylene (LDPE), polypropylene (PP), high impact polystyrene (HIPS), acrylonitrile butadiene styrene (ABS), polycarbonate (PC), and polycarbonate/ acrylonitrile butadiene styrene (PC/ABS). The important aspects of the material for purposes of the present

invention are its weight and rigidity. The material should also have enough bending plasticity (i.e. not be brittle) to prevent the formation of sharp edges or cracking even under excessive crushing force. Additionally, the material should be resilient such that, in the event of collapse under force, the dome shape tends to flex back.

[0027] Reference is next made to **Fig. 3** which provides a side elevation view of a preferred embodiment of the device of the present invention showing in profile the elevational configuration of the device and the various sections of its domed structure as described above. Supine-deterrent **10** is seen to comprise contact annulus **12** (with substantially planar lower surface **12a**) and reinforced dome region **14.** Reinforced dome region **14** is made up primarily of dome base walls **26,** dome top wall **28** and dome intermediate wall **30.** Dome intermediate wall **30** presents a more convex surface than dome top wall **28**. It is recognized that each of these various regions and sections of the overall hat-shaped domed structure provide some particular function with regard to rigidity and durability.

[0028] Associated with contact annulus **12** is perimeter flange **22** which extends beyond the edge of contact annulus **12**. Perimeter flange **22** provides a benefit when removing supine-deterrent **10** by presenting a lip for the person to grasp. In conjunction with contact annulus **12**, perimeter flange **22** provides strength and presents a relatively flat bottom surface that is more favorable for skin contact, thereby separating the thin edge of the perimeter from the skin.

[0029] Although not shown well in **Fig. 3**, the transitions between perimeter flange **22** and contact annulus **12**, as well between contact annulus **12** and the inside of dome base wall **26**, include a smooth radius to minimize pressure concentration on the person's skin.

[0030] Airflow aperture **360** is shown in this view positioned on the lower edge of supine-deterrent **10** between adhesive layer **40** and the device of the present invention. When, as described in detail below, the device of the present invention is adhered to the back of the person, some airflow between the interior enclosure defined by the device and the open air exterior of the device may be desirable in order to prevent the person from sweating and the resultant discomfort that is typically brought about by the absence of any such airflow. Although the location of airflow aperture **360** results in an opening that tends to partially collapse when operatively positioned on the back of a person, its effective location between the polyethylene dome portion and adhesive layer **40** allows for cost saving in

production. With added expense, alternative vent holes may be positioned in other locations such as the peripheral ends of arcuate ridges **18a – 18d** or dome top wall **28**. In other alternative embodiments, there may be no vent holes or airflow apertures whatsoever in the device. Without the flow of air from the interior of the device to the exterior surroundings, a vacuum or suction may be created when the device is adhered to the skin. Such vacuum or suction effect would serve to aid in holding the device in place on a person's skin, in addition to the use of adhesives on the contact area of the device as described in more detail below.

[0031] Referring again to **Fig. 3**, angle **380** is shown as the angle between the person's back with supine-deterrent **10** attached and dome base wall **26**. Angle **380** is an obtuse angle which provides further support for the dome shape of supine-deterrent **10**. The converging character (i.e. its conical nature) enhances structural stability such as with heavier subjects and subjects who move frequently during sleep. This converging character also provides benefits that ease manufacturing.

[0032] **Fig. 3** also discloses adhesive layer **40** positioned on the underside of contact annulus **12.** Adhesive layer **40** represents one of a number of different methods for adhering the supine-deterrent device of the present invention to the back of the person. Adhesive layer **40** may preferably be constructed of double-coated medical tape with a medical skin adhesive compound such as that utilized on bandages and the like, that provides sufficient adhesion to prevent movement or removal of the device from the skin unless a specific and direct force is exerted on the device. The tape comprises hypoallergenic pressure-sensitive adhesives with a high initial adhesion to a very wide range of substrates. In a preferred embodiment, it is important that the device not slide sideways across the skin of the person and remain positioned both in a given location on the person's back and preferably in a given orientation (described in more detail below). The character of adhesive layer **40** must, however, be such as to not cause great discomfort in and of itself when the device is removed when the person finally awakes and no longer has need of the device.

[0033] **Figs. 4A** and **4B** disclose adhesive layer **40. Fig. 4A** discloses adhesive protective layer **42** which, when removed by peeling from adhesive layer **40**, exposes the double-sided medical tape so that a subject can attach supine-deterrent **10** to the subject's back. Pull-tab **46** is a flap-like extension on adhesive protective layer **42**, providing a grasp point for a person to remove adhesive protective layer **42**.

Fig. 4B provides a perspective view of the sequence of attachment of adhesive protective layer **42**, adhesive layer **40** and plastic sheet material **44**. During assembly, adhesive layer **40**, with the attached adhesive protective layer **42**, is applied to the mold of plastic sheet material **44**.

[0034] Some appropriate adhesive compounds may provide the ability for re-use of the device with the same adhesive layer without the need for the constant replacement of the adhesive material. Some such medical adhesives are known in the art that allow for the temporary removal of a bandage or the like and its replacement after examination of the skin surface beneath the bandage. Such adhesive materials may be utilized in conjunction with the device of the present invention, up to a period of re-use where adhesive layer **40** might preferably be replaced. Various protective steps may be taken to extend the life of the adhesive material, such as the use of storage sheets that may be placed over the adhesive surface when the device is not in use and removed when the device is to be placed into use.

[0035] The device of the present invention may preferably be manufactured and sold in packages of two with each device re-usable for as many as 5 – 10 days without the need to renew the adhesive. Additional double-sided adhesive foam circular rings may be provided within the package so as to allow the person to renew the adhesive layer and further extend the usable life of the device. Various other methods for renewing the adhesive on the underside of the device are anticipated. Although the device may preferably have a complete circular ring of adhesive on the base, this is not essential and an appropriate level of adhesion may be obtained by a number of adhesive patches spaced about the circular perimeter underside of the device.

[0036] Reference is made to **Fig. 5** which provides a perspective view of an alternative embodiment of the device of the present invention constructed from a unitary molded plastic material. In the perspective view of **Fig. 5,** the various external features of the device are disclosed. Supine-deterrent **10'** is generally seen to be a helmet-shaped device sized and configured to be removably placed on the back of the person. As described above, the purpose of the device is to consciously or subconsciously deter the person from sleeping on the person's back. Because snoring while sleeping is frequently associated with the orientation of the sleeper on the sleeper's back, the device of the present invention serves as a manner of

reducing the incidence of snoring while sleeping. The structure of supine-deterrent **10'** provides just enough of a conscious or subconscious distraction or discomfort as to cause the person to move into a position where such discomfort no longer exists or occurs. In general, this means moving from a position where the person's back is against the relatively firm surface of the sleeping platform (mattress) to a position where such contact is not being made. Further details regarding this functionality are described in conjunction with **Figs. 7A** and **7B** below.

[0037] **Fig. 5** shows in detail the various exterior structural features of supine-deterrent **10'** that provide its rigidity, comfort, and ease of positioning and placement for use of the device. The overall helmet-shaped configuration of supine-deterrent **10'** includes contact edge region **512** which is a relatively flat ring perimeter region that, on an underside surface (not shown), provides the contact point between the device and the skin surface of the person's back. The manner of adhesively attaching the device of the present invention to the person's back is described in more detail below.

[0038] Extending concentrically within contact edge region **512** is reinforced dome region **514** of supine-deterrent **10'.** On either side of reinforced dome region **514** are positioned grip indentations **516a** and **516b.** Positioned near the center of reinforced dome region **514** are rigidity cross-channels **518** and airflow apertures **520.** In an alternative embodiment of the present invention, rigidity cross-channels **518** comprise a long cylindrical indentation channel crossed by a short cylindrical indentation channel that together form a cross-shaped recess centered on the apex of reinforced dome region **514** of the device. These rigidity cross-channels **518** primarily provide structural strength to the dome shape of the device. Without such changes in the plane of the surface orientation, and therefore the wall structure of the dome-shaped device, there would be a tendency for the dome shape to collapse when a direct force might be exerted on the apex of the dome. The channels, structured as shown, provide multi-directional structural support to what otherwise would be a flat or simple curved wall structure.

[0039] Airflow apertures **520**, four orthogonally arranged holes in the alternative embodiment shown in **Fig. 5**, provide airflow between the interior and exterior of supine-deterrent **10'**. When, as described in detail below, the device of the present invention is adhered to the back of the person, some airflow between the interior enclosure defined by the device and the open air exterior of the device is desirable in

order to prevent the person from sweating and the resultant discomfort that is typically brought about by the absence of any such airflow. Despite the benefits of airflow apertures **520**, some alternative embodiments adhere to the skin without such apertures being present in the device. Without the flow of air from the interior of the device to the exterior surroundings, a vacuum or suction effect may be created when the device is adhered to the skin. Such vacuum or suction would serve to aid in holding the device in place on a person's skin, in addition to the use of adhesives on the contact area of the device as previously described.

[0040] Grip indentations **516a** and **516b** are provided on either side of reinforced dome region **514** and serve both the purpose of providing additional structural rigidity to reinforced dome region **514** and providing an easy means for the person to grasp the device, position it and place it appropriately on the person's back. While the exact placement of the device is not so critical (see discussion below), there is a preference for positioning and placing the device within a region that will most likely encounter the mattress surface when the person turns during sleep into a position that might result in a back-sleeping state. Grip indentations **516a** and **516b** therefore provide an easy means for handling supine-deterrent **10'** while the proper positioning and placement of the device by the person is being carried out.

[0041] **Fig. 8** is a top plan view of an alternative embodiment of the device of the present invention highlighting in greater detail the structures and contours of the various external features of the device as briefly described in conjunction with **Fig. 5.** In **Fig. 8,** supine-deterrent **10'** is shown to be constructed from a generally oval-shaped device having contact edge region **512** as well as reinforced dome region **514** as described above. Forming contact edge region **512** are perimeter base **822** and perimeter riser **824.** Forming reinforced dome region **514** are dome base walls **826** and dome top wall **828.** Rigidity cross-channels **518** are shown as they are positioned and configured within dome top wall **828.** Rigidity long channel **830** extends partially across the long axis diameter of oval-shaped supine-deterrent **10'** while rigidity short channel **832** extends along the short axis diameter of the oval.

[0042] Grip indentations **516a** and **516b** are shown on either side of dome top wall **828** formed within reinforced dome region **514**, primarily within dome base walls **826** and extending to a degree into dome top wall **828.** Each grip indentation **516a** and **516b** comprises a grip wall **836a** and **836b** and a grip base **834a** and **834b**, respectively. These grip indentations **516a** and **516b** comprising the walls and

bases as described, provide the person with the ability to grasp the device using (for example) the thumb of the hand in one of the grip indentations, **516a** for example, and the forefinger or two fingers of the same hand in the opposing grip indentation, **516b** for example. In this manner the person may slightly squeeze the device to grip it firmly for orientation positioning and placement on the person's back.

[0043] Referring once again to **Fig. 8**, airflow apertures **520,** numbering four in an alternative embodiment, are positioned on dome top wall **828** in an equally spaced orthogonal manner that optimizes airflow through the device. This airflow results from the apertures **520** being positioned near the apex of the device (away from the skin surface of the person) in a sufficient number as to allow for ordinary (unforced) airflow from the inside of the device to the outside ambient air.

[0044] Reference is next made to **Fig. 9** which provides a long axis side elevation view of an alternative embodiment of the device of the present invention showing in profile the elevational configuration of the device and the various sections of its domed structure as described above. Supine-deterrent **10'** is seen to comprise contact edge region **512** and reinforced dome region **514.** Contact edge region **512** is made up of perimeter base **822** and perimeter riser **824.** Reinforced dome region **514** is made up primarily of dome base walls **826** and dome top wall **828.** It is recognized that each of these various regions and sections of the overall helmet-shaped domed structure provide some particular function with regard to rigidity and durability.

[0045] **Fig. 9** also discloses from the side view, the configuration of grip indentation **516a** with grip base **834a** and grip wall **836a**. Two of airflow apertures **520** are shown in this view extending across dome top wall **828** to a point where a matched pair of airflow apertures **520** allows for a similar influx and outflow of air from the interior of the device.

[0046] Rigidity short channel **832** is visible in this orientation view along the long axis of the oval-shaped supine-deterrent **10'. Fig. 9** also discloses adhesive pad **940** positioned on the underside of perimeter base **822** of contact edge region **512.** Adhesive pad **940** represents one of a number of different methods for adhering the supine-deterrent device of the present invention to the back of the person. Adhesive pad **940** may preferably be constructed of a medical skin adhesive compound such as that utilized on bandages and the like, that provides sufficient adhesion to prevent movement or removal of the device from the skin unless a specific and direct force is

exerted on the device. In the preferred and alternative embodiments, it is important that the device not slide sideways across the skin of the person and remain positioned both in a given location on the person's back and preferably in a given orientation (described in more detail below). The character of adhesive pad **940** must, however, be such as to not cause great discomfort in and of itself when the device is removed when the person finally awakes and no longer has need of the device.

[0047] Some appropriate adhesive compounds may provide the ability for re-use of the device with the same adhesive pad without the need for the constant replacement of the adhesive material. Some such medical adhesives are known in the art that allow for the temporary removal of a bandage or the like and its replacement after examination of the skin surface beneath the bandage. Such adhesive materials may be utilized in conjunction with the device of the present invention, up to a period of re-use where adhesive pad **940** might preferably be replaced. Various protective steps may be taken to extend the life of the adhesive material, such as the use of storage sheets that may be placed over the adhesive surface when the device is not in use and removed when the device is to be placed into use.

[0048] The device of the present invention may preferably be manufactured and sold in packages of two with each device re-usable for as many as 5 – 10 days without the need to renew the adhesive. Additional double-sided adhesive foam oval rings may be provided within the package so as to allow the person to renew the adhesive layer and further extend the usable life of the device. Various other methods for renewing the adhesive on the underside of the device are anticipated. Although the device may preferably have a complete oval ring of adhesive on the base, this is not essential and an appropriate level of adhesion may be obtained by a number of adhesive patches spaced about the oval perimeter underside of the device.

[0049] Reference is next made to **Fig. 10** which is a view similar to that shown in **Fig. 9,** but oriented orthogonally (90°). In this view, contact edge region **512** is again shown to comprise perimeter base **822** and perimeter riser **824.** Reinforced dome region **514** is again shown to comprise dome base walls **826** and dome top wall **828.** Positioned on dome top wall **828** are rigidity cross-channels **518** with rigidity long channel **830** primarily visible in this view.

[0050] Grip wall edges **836a** and **836b** of grip indentations **516a** and **516b** are also seen in this view. The view of **Fig. 10** shows that the grip indentations **516a** and **516b** are primarily established near their base and actually extend outward from dome base walls **826** near their top portions. This again provides an appropriately oriented pair of surfaces for the person to grip the device and position it accurately on the person's back. Perhaps even more importantly, these grip surfaces provide an easy means for the person to grasp and remove the device after use.

[0051] The remaining features discussed with regard to **Fig. 9** are likewise shown in **Fig. 10** and include airflow apertures **520** as well as adhesive pad **940** positioned on the underside of perimeter base **822.**

[0052] Reference is next made to **Fig. 11** which is a bottom plan view of an alternative embodiment of the device of the present invention showing the interior structures of the device. From this view it can be seen that the interior structures do not necessarily directly correspond to the configuration of the exterior features, as if the device were simply a formed and shaped thin-walled structure. Supine-deterrent **10'** in this view of **Fig. 11** is shown to again comprise perimeter base **822** on which is positioned adhesive pad **940.** Extending interior to perimeter base **822** are dome base walls **826** which generally do coordinate and correspond with the exterior appearances of these same structures.

[0053] In a similar manner, dome top wall **828** reflects a portion of its structure as viewed from the exterior of the device, albeit with fewer contours that reflect variations in the thickness of the walled structure (from dome base walls **826** up to dome top wall **828**) that are provided, again so as to improve the overall rigidity of the device. In this same manner, rigidity long channel **830** is seen as a cylindrical ridge extending into the interior of the device with rigidity short channel **832** likewise forming a crossing ridge to again structure the apex of the device with greater strength.

[0054] Airflow apertures **520** are shown as they extend into the interior of supine-deterrent **10'** in order to allow the flow of air from the interior to the exterior ambient air when the device has been placed on the person's back and adhesive pad **940** adheres to the skin of the person's back. Absent airflow apertures **520**, adhesive pad **940** would seal off the interior from the exterior ambient air in a way that could confine and contain the natural sweat of the person thereby could cause eventual discomfort and possibly the release of the adhesive material from the person's back.

[0055] Referring now to **Fig. 6**, there is shown a top plan view of supine-deterrent **10** operatively placed on the back of an individual **100** on sleep support platform **50**, individual 100 being shown in a side-sleeping position. Orientation and placement of supine-deterrent **10** on the back of individual **100** is variable based on factors as discussed in more detail below.

[0056] Reference is finally made to **Figs. 7A** and **7B** which provide elevation side views of an individual using the device of the present invention on a sleep support surface, such as a mattress. Those skilled in the art will recognize that, in addition to the preferred embodiment shown in **Figs. 7A** and **7B**, other alternative embodiments could also be shown being used in a similar manner. **Fig. 7A** shows supine-deterrent **10** of the present invention positioned on an individual **54** sleeping on sleep support platform **50** using headrest or pillow **52.** Supine-deterrent **10** is preferably placed within a target placement region **56** on the person's back. This target region **56** is defined as that area of the person's back where skeletal support would cause contact between the supine-deterrent **10** and sleep support platform **50** in a manner that would be uncomfortable enough to alert the person, consciously or subconsciously, of the need to turn away from a back sleeping position. In other words, placement of supine-deterrent **10** too far to one side or the other, for example on the shoulders of the person, may not provide enough direct contact between the device and the mattress to give rise to the necessary level of discomfort to deter the person from remaining in the back- sleeping position.

[0057] **Fig. 7B** shows what would occur when the person turns into a back sleeping position wherein direct contact between supine-deterrent **10** and sleep support platform **50** is made. As long as the sleep platform (the mattress) is sufficiently firm, there will be enough force upward on supine-deterrent **10**, and therefore upward on the back of the individual **54**, to create just enough discomfort to deter the person from sleeping on the person's back. Experience has shown that this level of discomfort is sufficient to re-direct the sleep position of the person without necessarily awakening the person for such purpose. In other words, the subconscious or sleep-conditioning effect of the device is more than sufficient to deter the person from turning to or remaining in a back sleep position for any length of time.

[0058] A person using a device of the present invention may position and adhere the device on the person's back prior to laying down on the sleep surface and falling

asleep. When its adhesive surface is adhered to the body, the device serves to passively deter the individual from moving into a position that puts weight on the dome of the device, such that it can be adhered in a position to passively deter the individual from moving into an undesired position while sleeping. By adhering the device to corresponding regions of the body, this serves to prevent and minimize nocturnal repositioning and/or unintended weight loading of body parts for subjects who need to avoid as much.

[0059] Generally, the device of the present invention can be used as a sleep positioner, which when positioned and adhered on a region of a person's body, serves to encourage or discourage particular sleeping postures. In addition to use of the device to deter snoring, alternative uses are also contemplated. For example, experts tend to advise pregnant women not to sleep on their backs later in pregnancy because lying on the back can restrict blood flow. The device of the present invention may be used to deter pregnant women from sleeping on their backs which can thereby encourage a side-lying posture in order to maximize blood flow.

[0060] Moreover, alternative uses for the device can include positioning the device on a region of the body other than the back of a person for reasons other than to deter snoring. As one non-limiting example, in a scenario in which a person has surgery on, or suffers injury to, the person's right hip such that the injury or site of the surgical procedure may be compromised if the person lies on the person's right hip, the device of the present invention may be positioned on the skin in the vicinity of the right hip. When positioned in this manner, the person will be deterred from turning to lie on the site of the injury or surgical procedure thereby preventing possible further damage or injury. Furthermore, for those people who suffer back pain, the device may be operatively positioned on a region of a person's body to encourage or discourage sleeping postures, which in turn can help to minimize or reduce the severity of back pain. As another example, the device of the present invention may be used to deter sleeping postures which can aggravate conditions such as acid reflux or gastroesophageal reflux disease (GERD), as well as heartburn.

[0061] Likewise, in the case of those people who are prone to snore when lying or sleeping on their backs, the device of the present invention serves to prevent, minimize and deter snoring. Hence, as described above, by adhering the device to a subject's back, it is preferably used to deter an individual from turning onto the

individual's back during sleep and thereby deter snoring that often results from a back-sleeping orientation. When the person wakes after sleep and exits the sleep surface, the person may simply reach around to grasp the device (again as described above) and remove it from the person's back. A preferred reusable adhesive material may then be temporarily covered by a thin flexible sheet of plastic to prevent the accumulation of dirt and dust on the adhesive surface during non-use.

[0062] Although the present invention has been described in conjunction with the above preferred embodiments, those skilled in the art will recognize that certain modifications to the size, structure, and geometric configuration of the device may be made without departing from the spirit and scope of the invention. Although the various features of the device have been described with regard to their function and therefore some manner of their configuration, variations on these configurations are anticipated. While the circular shape of the device, for example, lends itself to greater ease of handling and placement, the shape may just as readily take on an ovoid configuration with little degradation in the functionality of the device. In a similar manner, greater elongation of the device along the long axis of the oval may occur as long as the entire device may still be positioned firmly and flatly against the contours of the person's back.

[0063] The size of the device is, of course, variable, but must be large enough to provide the necessary minimal discomfort to deter sleeping on the device and yet must be small enough to adhere to the back securely despite the various contours of the back that naturally occur. The diameter of a preferred embodiment of the device of the present invention is approximately five inches, the diameter at the base of reinforced dome region **14** is approximately three and one-half inches, and the height of a preferred embodiment is approximately two inches. However, those skilled in the art will recognize that such modifications as to geometries and structures are natural variations that still produce a device that achieves the desired function and purpose.

CLAIMS

1. A device for deterring an undesirable sleeping posture in human subjects, said device comprising:

an article of manufacture, said article having a dome;

a flexible annulus positioned at a base of said dome, said annulus having a substantially planar lower surface positionable in proximity with a human subject's skin in a region of the human subject's body which will deter the human subject from maintaining the undesirable sleeping posture, said annulus being flexible to enable conformity relative to a contour of that skin;

a contact adhesive on said substantially planar lower surface of said annulus for adhering said annulus to the skin of the human subject in the region of the human subject's body which will deter the human subject from maintaining the undesirable sleeping posture.

said dome further comprises a dome base wall, a dome intermediate wall and a dome top wall, and wherein said dome top wall forms an apex of said dome and wherein said dome intermediate wall is more convex than at least one of the dome base wall and the dome top wall and provides a generally smooth transition between said dome top wall and said dome base wall.

2. The device as defined in Claim 1, wherein said article is formed from a sheet material.

3. The device as defined in Claim 2, wherein said article is molded from a resilient lightweight plastic material, being die-stamped on a punch press from sheet stock of amorphous polyethylene terephthalate with a thickness of 0.0175 inches.

4. The device as defined in Claim 1, wherein said dome has a shape including a general shape of a spherical section.

5. The device as defined in Claim 1, wherein said dome further comprises a plurality of arcuate ridges positioned orthogonally along an upper portion of an outer surface of said dome as structural reinforcement for said dome.

6. The device as defined in Claim 1, wherein the lower surface of said annulus comprises a plurality of surface recesses that depart from a generally planar shape of that lower surface such that when operatively positioned on the skin of the human subject in the region of the human subject's body which will deter the human subject from maintaining the undesirable sleeping posture, said surface recesses tend to form an opening defining airflow apertures which allow for air exchange between said annulus and the skin.

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7. The device as defined in Claim 6, wherein said plurality of surface recesses are formed by a plurality of surface ridges positioned on an upper surface of said annulus, and wherein said plurality of surface ridges structurally reinforce said annulus.

8. The device as defined in Claim 1, wherein said annulus further comprises a flange positioned above said annulus at its radially outer edge circular perimeter and extending horizontally beyond the outer edge of said annulus, said flange being integral with said annulus, presenting a projection to aid in removal of said device.

9. The device as defined in Claim 1, wherein said dome has a shape including a general shape of an ovoid section, and wherein said dome further comprises the dome top wall of a generally ovoid shape.

10. The device as defined in Claim 9, wherein said dome top wall comprises at least two surface recesses positioned at the apex of said dome, and wherein said at least two surface recesses comprise a long cylindrical indentation positioned along a long axis of said dome crossed by a short cylindrical indentation positioned along a short axis of said dome, said at least two surface recesses providing structural support for said dome.

11. The device as defined in Claim 9, wherein said dome further comprises a plurality of airflow apertures, said plurality of airflow apertures allowing unforced airflow between an interior and exterior areas of said dome and away from the human subject's skin.

12. The device as defined in Claim 1, wherein said contact adhesive further comprises double-coated medical tape, said double-coated medical tape comprising hypoallergenic pressure-sensitive adhesives with high initial adhesion to a wide variety of substrates.

13. The device as defined in Claim 8, wherein said contact adhesive further comprises an adhesive protective layer, wherein said adhesive protective layer comprises a peel-off backing.

14. A device for deterring snoring posture in human subjects, said device comprising:

an article of manufacture, said article having a dome;

a flexible annulus positioned at a base of said dome, said annulus having a substantially planar lower surface positionable in proximity with a human subject's skin on the human subject's back, said annulus being flexible to enable conformity relative to a contour of that skin;

a contact adhesive on the substantially planar lower surface of said annulus for adhering said annulus to the skin of the human subject's back; said article formed from a sheet material, and said article

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being molded from a resilient lightweight plastic material, being die-stamped on a punch press from sheet stock of amorphous polyethylene terephthalate with a thickness of 0.0175 inches;

said dome having a shape including a general shape of a spherical section, said dome further comprising a plurality of arcuate ridges positioned orthogonally along an upper portion of an outer surface of said dome as structural reinforcement for said dome;

said dome further comprising a dome base wall, a dome intermediate wall and a dome top wall, wherein said dome top wall forms an apex of said dome, and said dome intermediate wall provides a generally smooth transition between said dome top wall and said dome base wall;

a plurality of surface recesses positioned on the lower surface of said annulus, said plurality of surface recesses departing from a generally planar shape of that lower surface such that when operatively positioned on the skin of the back, wherein said surface recesses tend to form an opening defining airflow apertures which allow for air exchange between said annulus and the skin, and wherein said plurality of surface recesses are formed by a plurality of surface ridges positioned on an upper surface of said annulus, and wherein said plurality of surface ridges structurally reinforce said annulus, said annulus further comprising a flange positioned above said annulus at its radially outer edge circular perimeter and extending horizontally beyond the outer edge of said annulus, said flange being integral with said annulus, presenting a projection to aid in removal of said device; and said contact adhesive further comprising double-coated medical tape, said double-coated medical tape comprising hypoallergenic pressure-sensitive adhesives with high initial adhesion to a wide variety of substrates, and said contact adhesive further having an adhesive protective layer, wherein said adhesive protective layer has a peel-off backing.

15. A device for deterring an undesirable sleeping posture in human subjects, said device comprising:

an article of manufacture, said article having a dome;

a flexible annulus positioned at a base of said dome, said annulus having a substantially planar lower surface positionable in proximity with the human subject's skin in a region of the human subject's body which will deter the human subject from maintaining the undesirable sleeping posture, said annulus being flexible to enable conformity relative to a contour of that skin;

a flange positioned above said annulus at its radially outer edge circular perimeter and extending horizontally beyond the outer edge of said annulus, said flange being integral with said annulus, presenting a projection to aid in removal of said device; and

a contact adhesive on said substantially planar lower surface of said annulus for adhering said annulus to the skin of the human subject in the region of the human subject's body which will deter the human subject from maintaining the undesirable sleeping posture.

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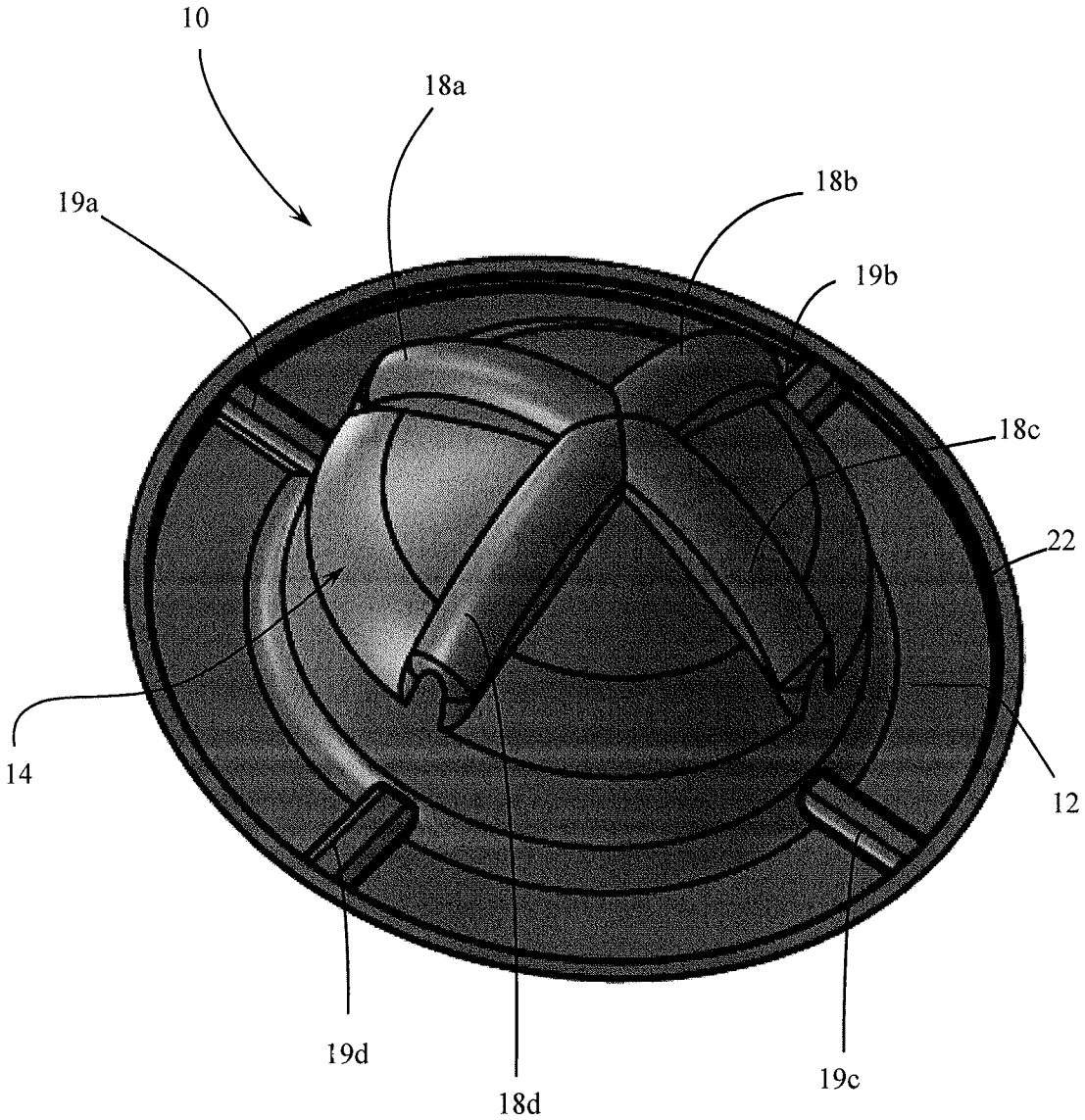


Fig. 1

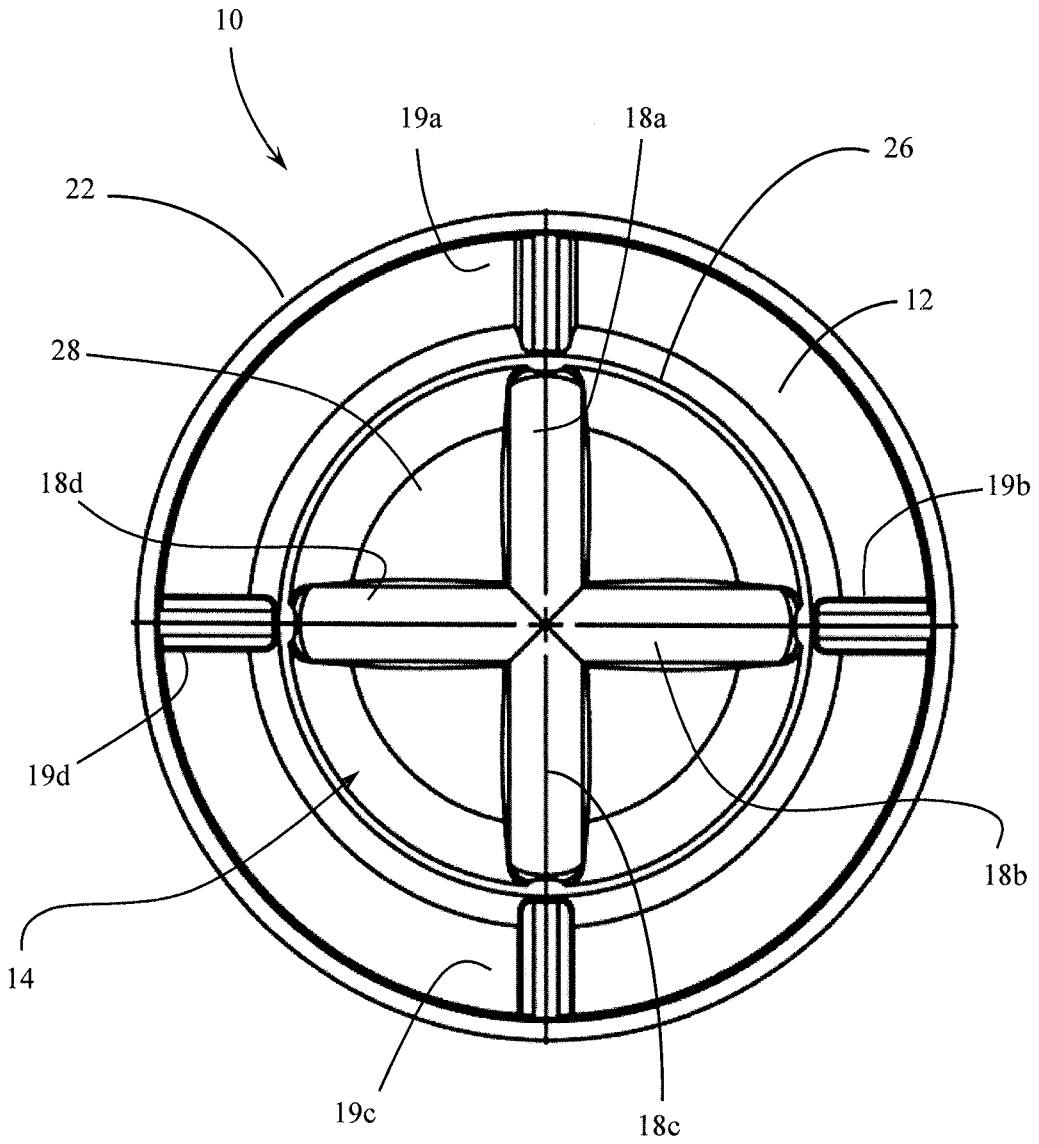


Fig. 2

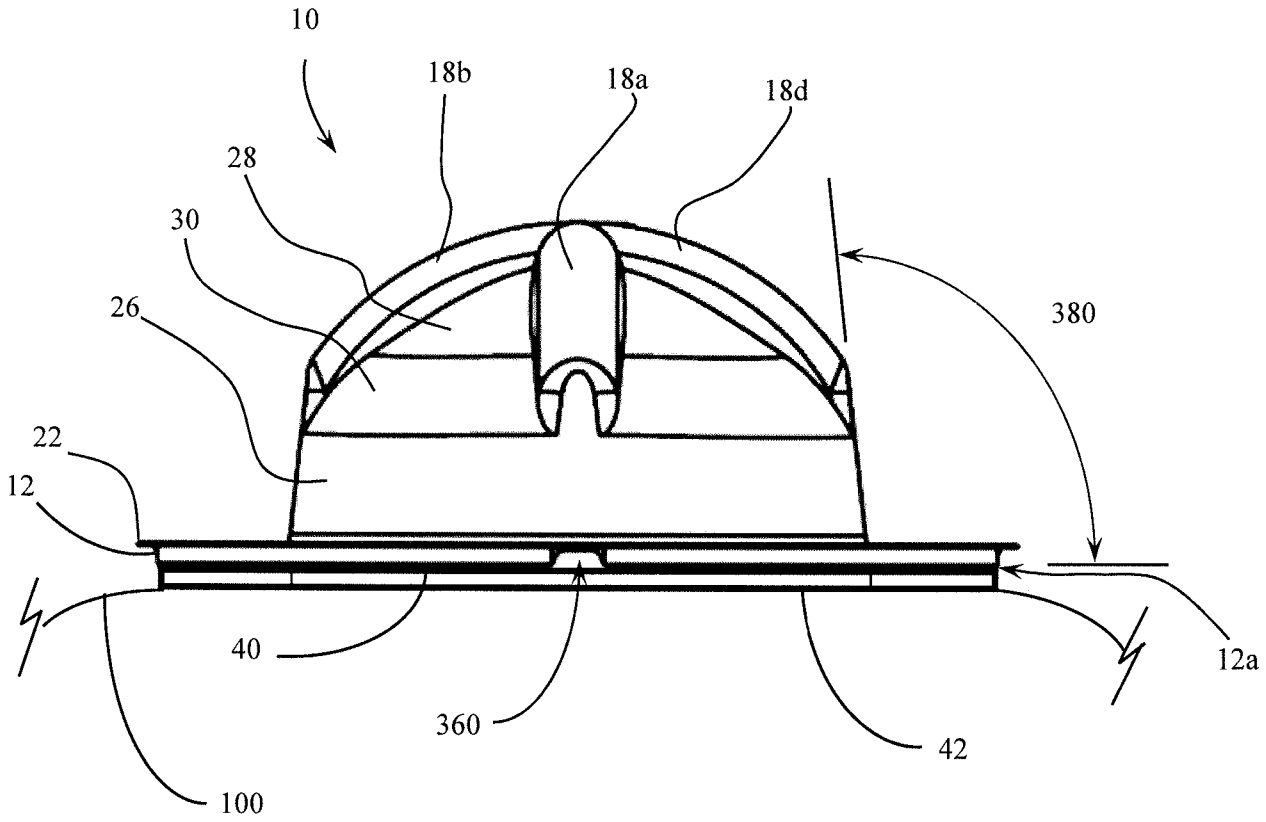


Fig. 3

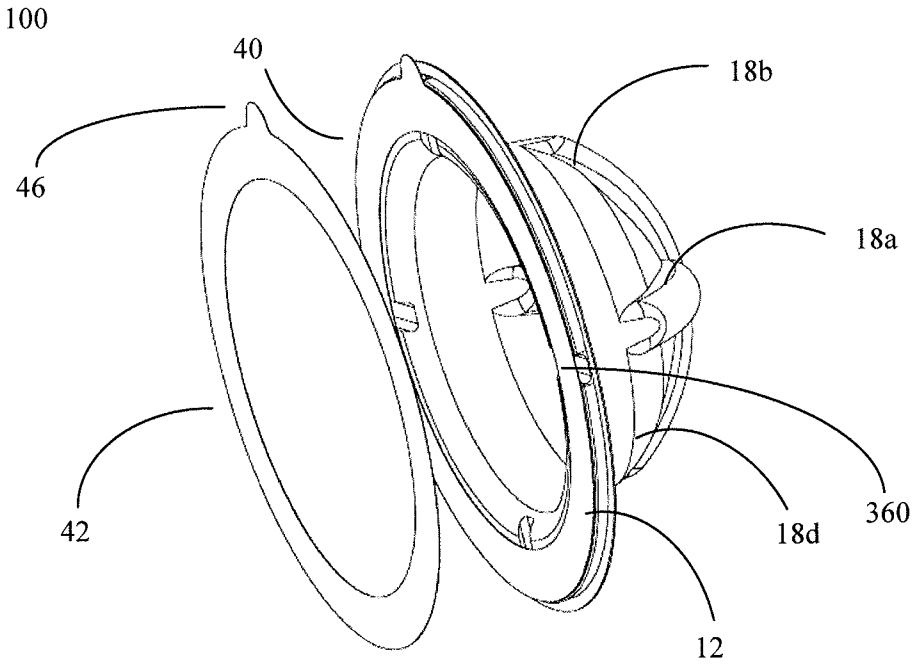


Fig. 4A

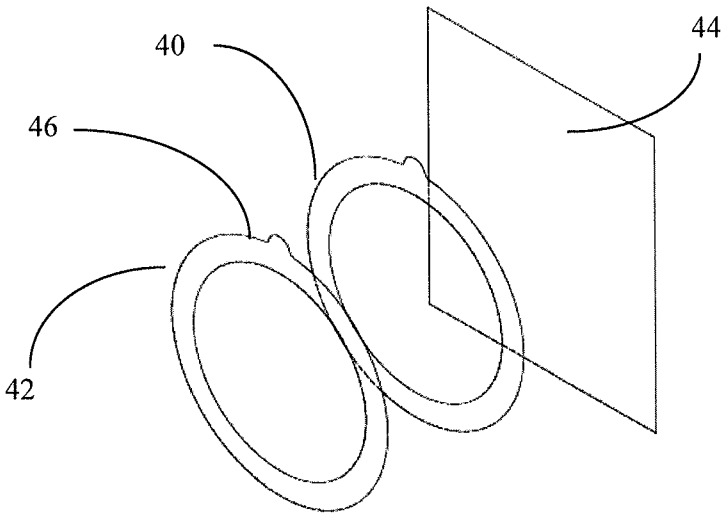


Fig. 4B

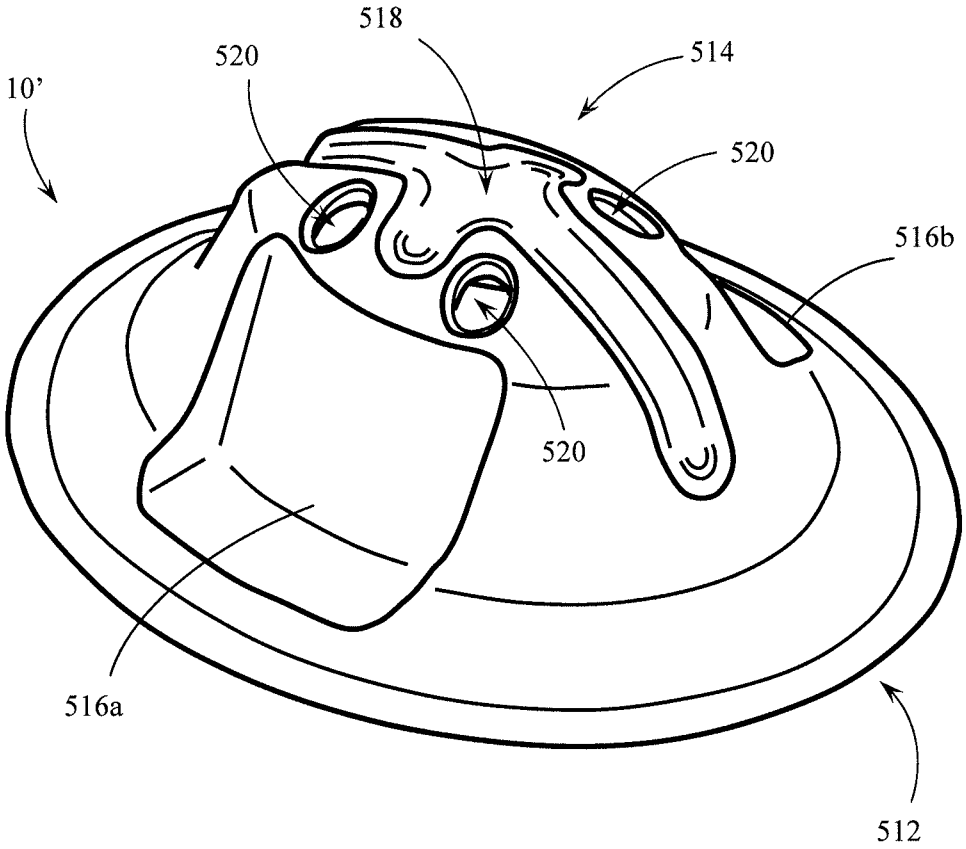


Fig. 5

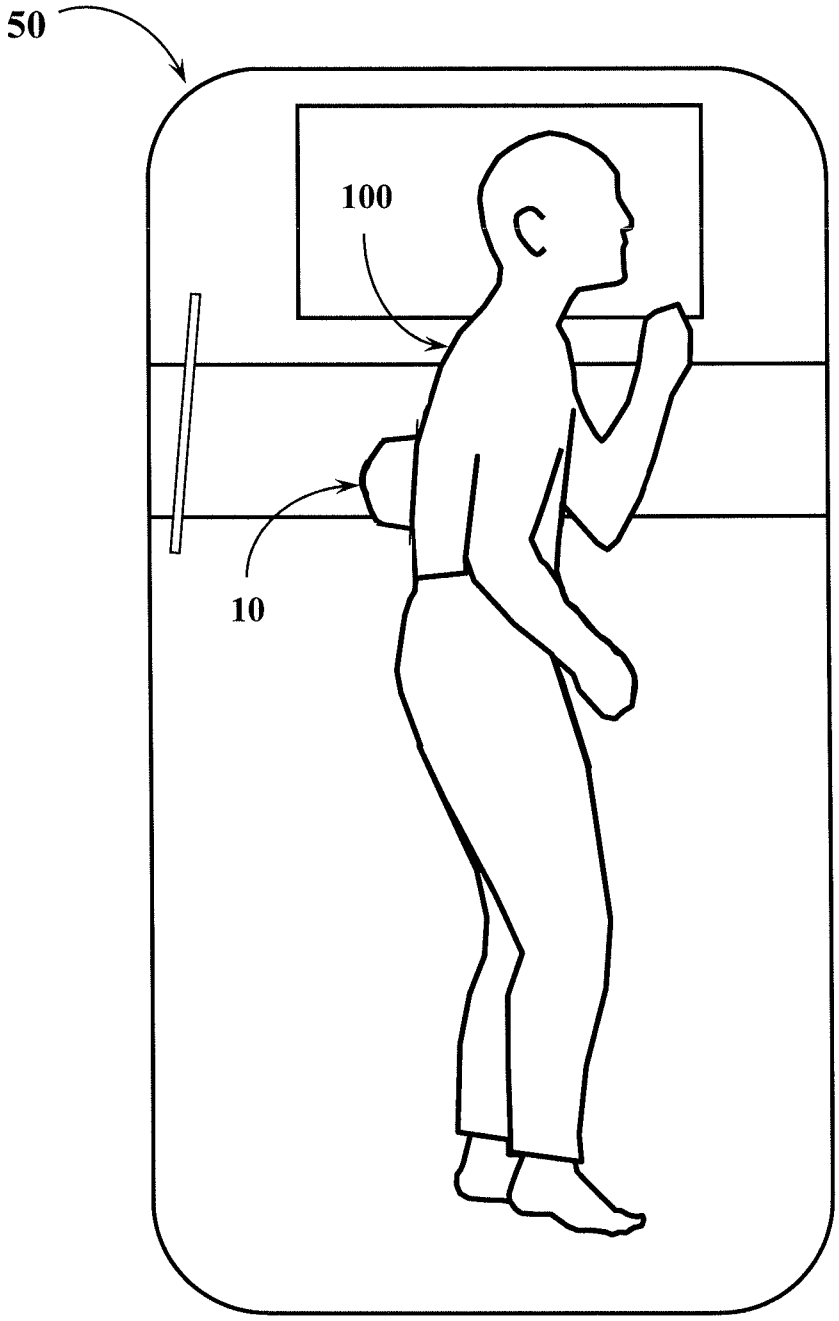


Fig. 6

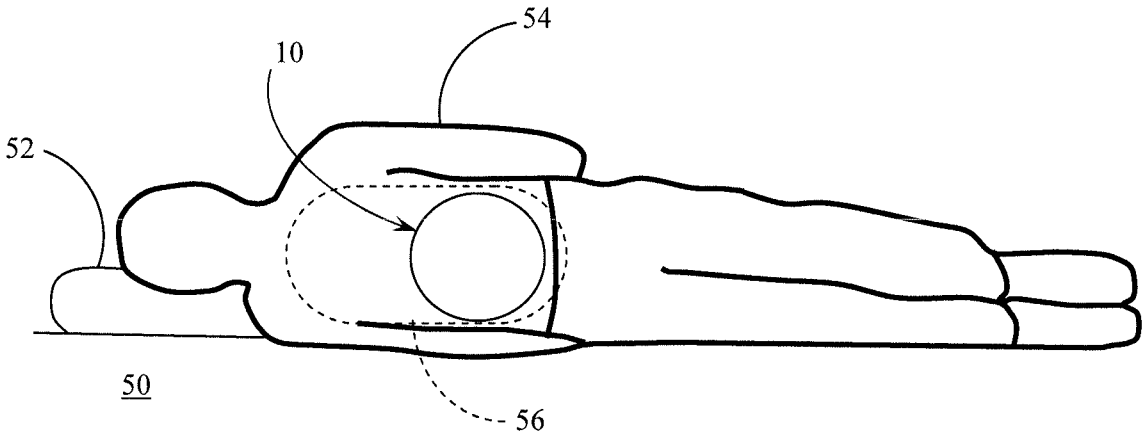


Fig. 7A

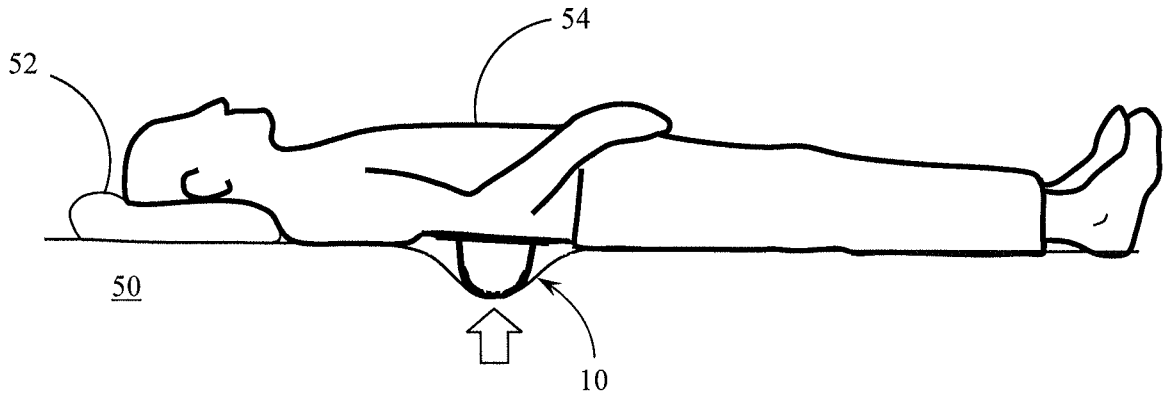


Fig. 7B

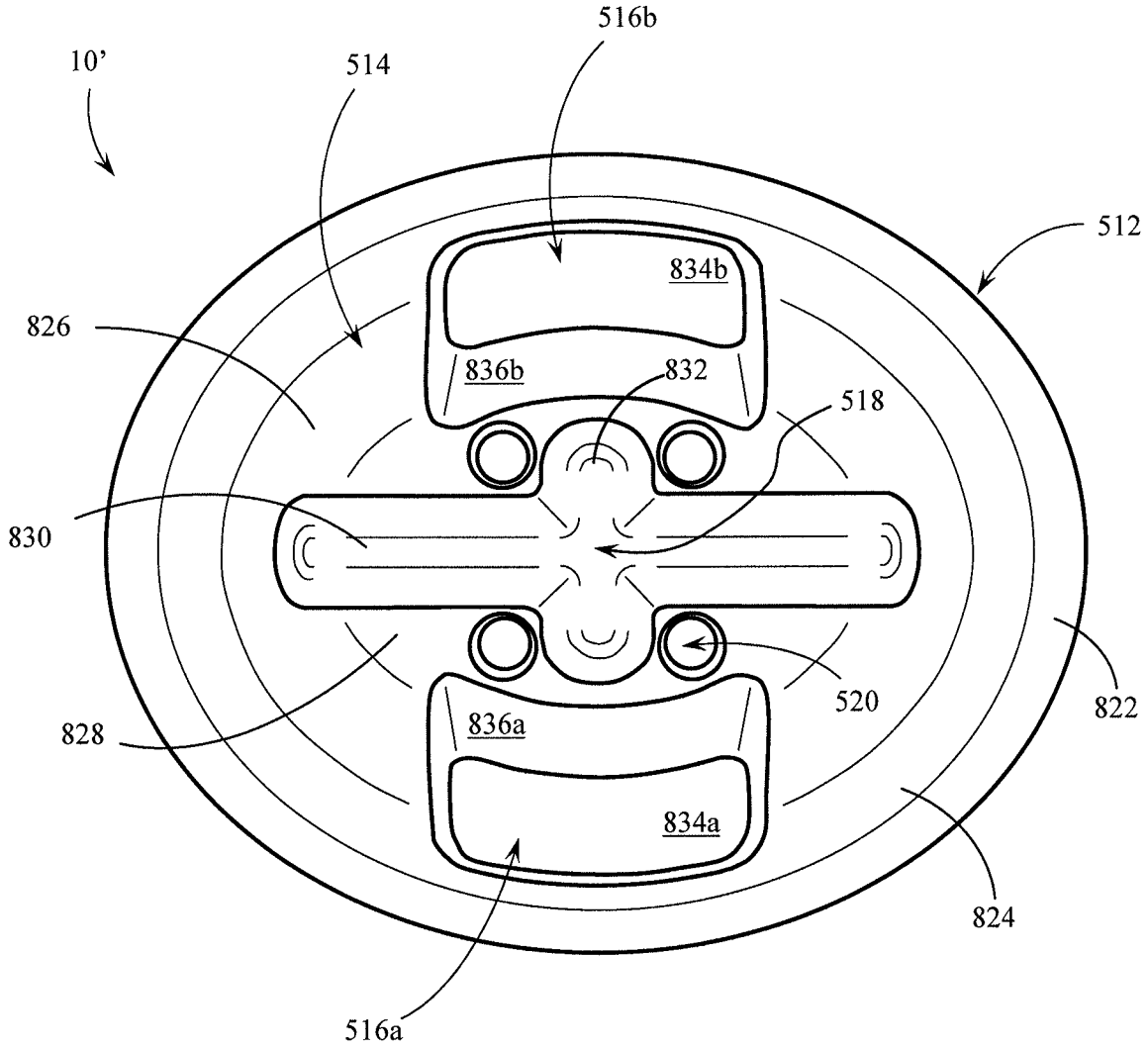

10'
514
516b
512
834b
826
836b
832
518
830
520
822
828
836a
834a
824
516a

Fig. 8

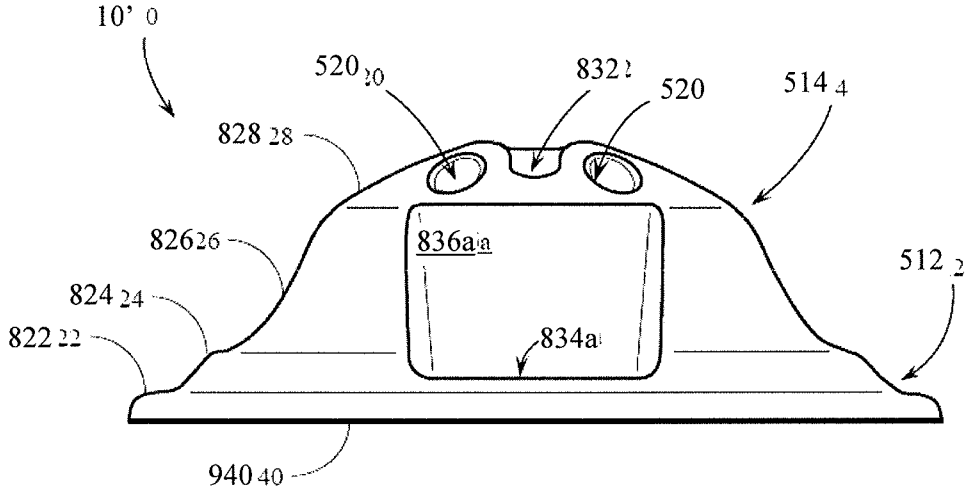
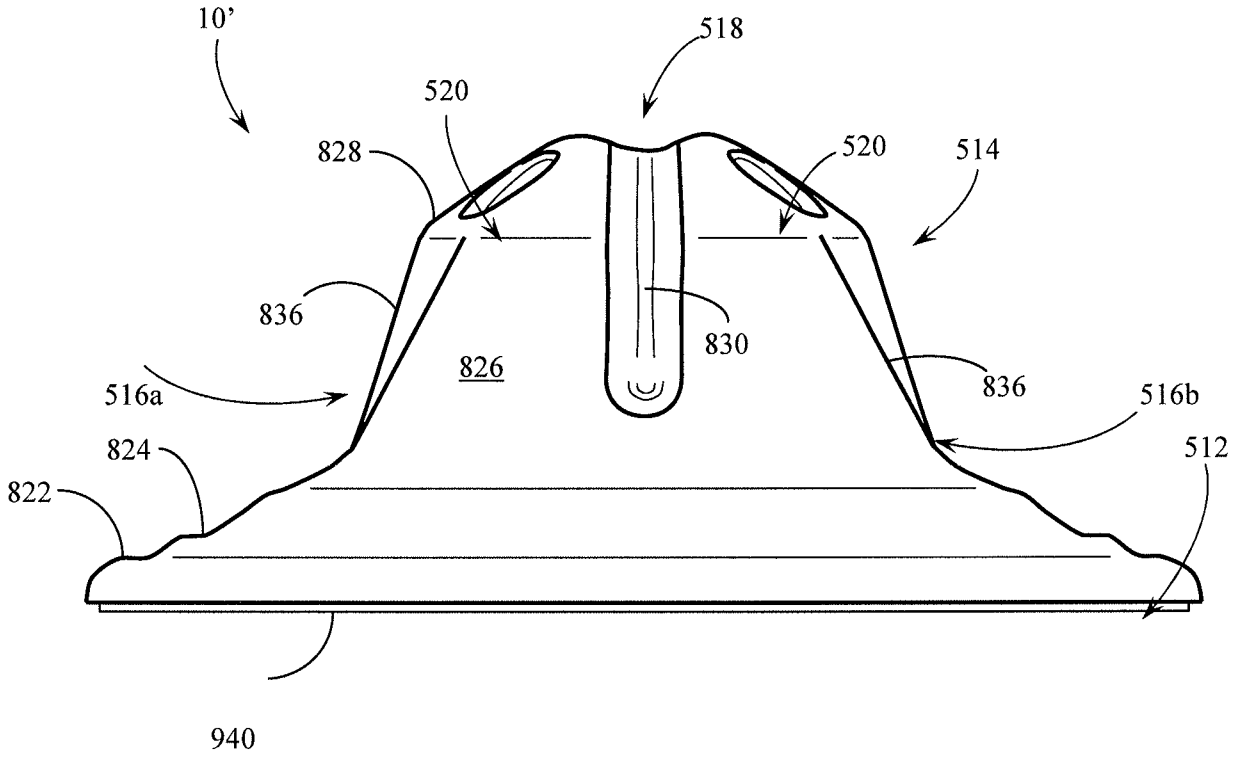

10' 0
520 20
832 2
520
514 4
828 28
826 26
836a a
512 2
824 24
822 22
834a
940 40

Fig. 9


10'
518
520
828
520
514
836
830
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516a
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940

Fig. 10

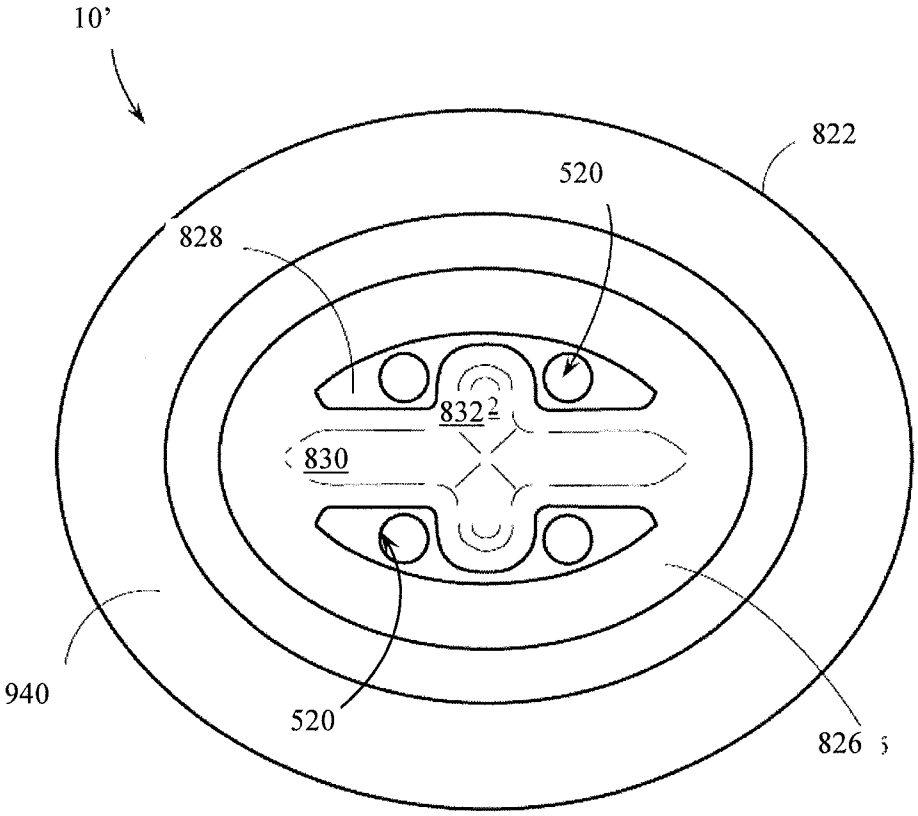
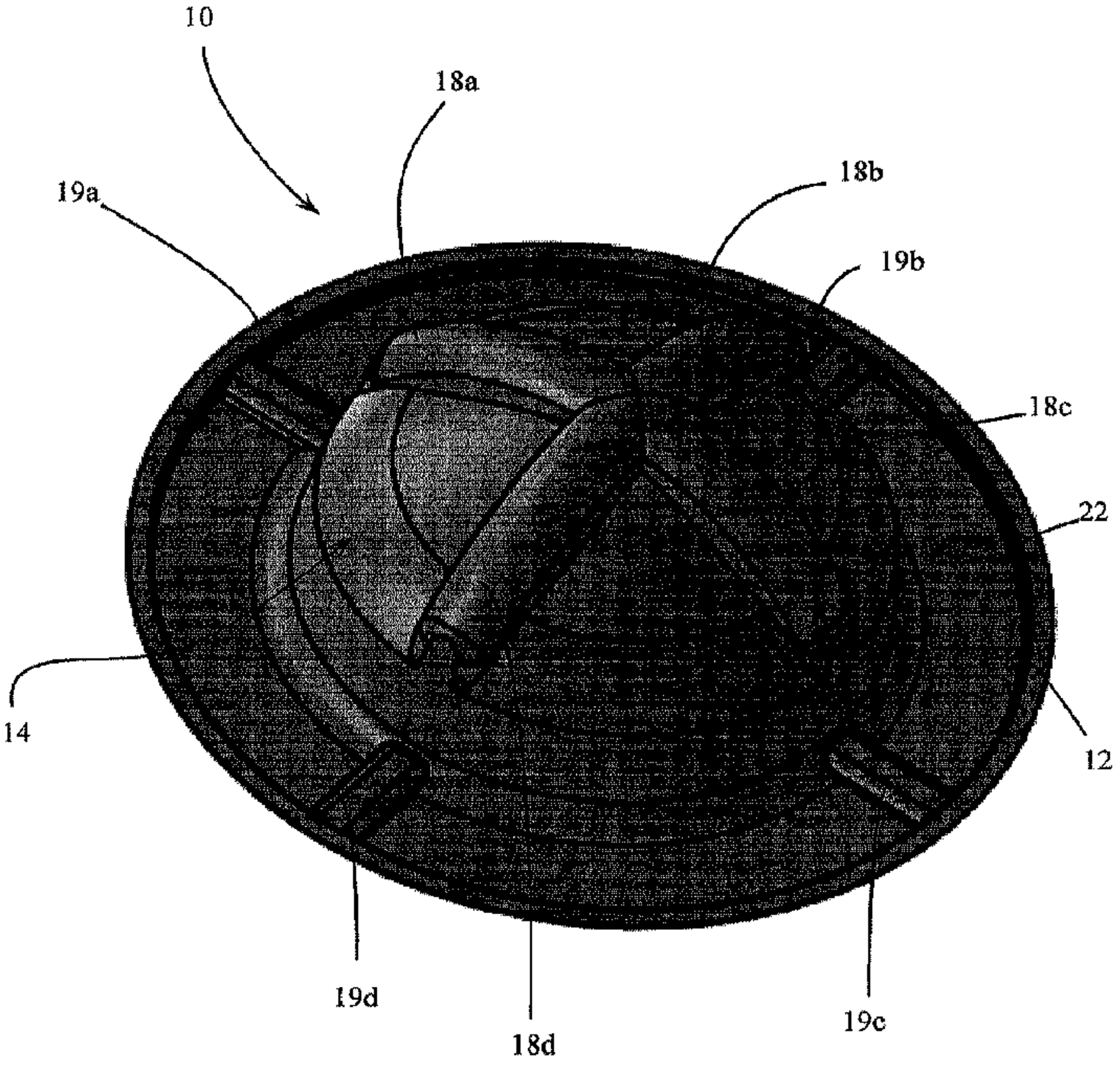


Fig. 11


10
18a
18b
19a
19b
18c
22
14
12
19d
18d
19c