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(54) Title: EYEWEAR HAVING SELF-CONTAINED ADJUSTABLE TEMPLE-SUPPORT MECHANISM

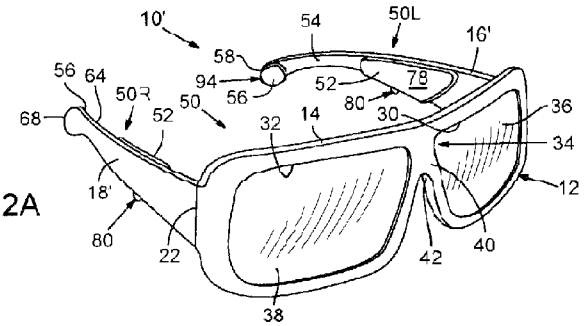

FIG. 2A

(57) Abstract: Eyewear (10') includes a frame (12) equipped with an adjustable temple-support mechanism (50) to displace the weight and pressure of the frame from the bridge of the wearer's nose to the temples of the wearer's head. Preferred embodiments of the temple-support mechanism include two inflatable bladders (52) installed by adhesive in the temple areas of eyeglass temples located at either side of the frame front (14). The inflatable bladders adjust to the anatomical shape of the wearer's temples and seat the frame to hold it in place against the temples of the wearer's head. Squeeze-bulb pumps (56) and the inflatable bladders are connected through a fluid flow channel (82). The squeeze-bulb pumps allow the wearer to inflate the inflatable bladders located at the temples of the wearer to adjust for positional stability and wearer comfort. Release valves (80) operatively connected to the inflatable bladders enable the wearer to deflate them.

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EYEWEAR HAVING SELF-CONTAINED ADJUSTABLE TEMPLE-SUPPORT MECHANISM

Related Application

[0001] This application claims benefit of U.S. Patent Application No. 61/368,025, filed July 27, 2010.

Copyright Notice

Technical Field

[0003] This disclosure relates to eyewear and, in particular, to eyewear having eyeglass temples in which inflatable bladders are positioned so that the eyeglass temples are supported by the temples of the wearer's face to keep the eyewear frame from applying appreciable pressure to the bridge of the wearer's nose.

Background Information

[0004] Sunglasses or corrective lenses are worn to enhance vision and protect the wearer's eyes from harmful UV rays, wind, sand, dirt and pollen, as well as for aesthetic and social reasons. Conventional eyewear frames are typically designed so that the weight and pressure of an eyewear frame are applied to the bridge of the wearer's nose. Construction and design features of one type of conventional eyewear are illustrated in Figs. 1A and 1B.

[0005] Figs. 1A and 1B are, respectively, frontal and rear perspective views of one type of conventional eyewear 10. Eyewear 10 includes a frame 12 having a frame front 14 to which a left eyeglass temple 16 and a right eyeglass temple 18 are

mounted by a left hinge 20 and a right hinge 22, respectively. Frame front 14 has a left eyepiece opening 30 and a right eyepiece opening 32 that are separated by a bridge 34 and are configured to receive a left eyepiece 36 and a right eyepiece 38, respectively. Bridge 34 shown in Figs. 1A and 1B is of a saddle type. Bridge 34 includes an arc portion 40 that is positioned above the wearer's nose and between eyepieces 36 and 38. Frame front 14 includes a nose pad 42 that is an integral part of arc portion 40 and drapes across and thereby distributes the weight of eyewear 10 on the top and sides of the wearer's nose. Nose pad 42 is, therefore, configured to hold eyewear 10 in position on the wearer's nose by fitting snugly against it. Other conventional eyewear is constructed with a type of frame front in which the nose pad includes two oval-shaped padded parts supported on pad arms that extend from opposite sides of the arc portion of the bridge to press against the sides of the wearer's nose.

[0006] Weight and pressure on the wearer's nose can be uncomfortable or even damaging to the surface and internal tissues of the nose. What is needed is eyewear that is configured to securely fit on the wearer's head in a manner that relieves pressure caused by the weight of the frame on the wearer's nose.

Summary of the Disclosure

[0007] Preferred embodiments of the disclosed eyewear include a lightweight, self-contained frame that is equipped with an adjustable temple-support mechanism to displace the weight and pressure of the frame from the bridge of the wearer's nose to the temples of the wearer's head. The temple is the flat surface just behind the forehead and in front of the ear. A preferred temple-support mechanism includes two inflatable bladders that are installed by adhesive in the temple areas of eyeglass temples located at either side of the frame front. The inflatable bladders are each of ellipsoidal shape, adjust to the anatomical shape of the wearer's temples, and seat the frame to hold it in place against the temples of the wearer's head. Each inflatable bladder is made of one layer or multiple bonded layers of lightweight urethane film and is connected to a rubber squeeze-bulb pump positioned at the temple tip of the eyeglass temple. The squeeze-bulb pump and inflatable bladder are connected in fluid communication through a channel. The squeeze-bulb pump allows the wearer to inflate the inflatable bladder located at the temple of the wearer to adjust for positional stability and wearer comfort. A release valve is operatively

connected to each inflatable bladder at a location where the wearer can easily push the valve to deflate the inflatable bladder.

[0008] Additional aspects and advantages will be apparent from the following detailed description of preferred embodiments, which proceeds with reference to the accompanying drawings.

Brief Description of the Drawings

[0009] Figs. 1A and 1B are, respectively, front and rear perspective views of one type of conventional eyewear.

[0010] Figs. 2A and 2B are, respectively, frontal and rear perspective views of a preferred embodiment of eyewear having an adjustable temple-support mechanism.

[0011] Fig. 3 is an enlarged fragmentary cross-sectional view of one of the eyeglass temples of the eyewear of Figs. 2A and 2B.

[0012] Fig. 4 is an exploded cross-sectional view of a squeeze-bulb pump installed in the eyeglass temple shown in Fig. 3.

[0013] Fig. 5 is a fragmentary cross-sectional view of a release valve installed in the eyeglass temple shown in Fig. 3.

Detailed Description of Preferred Embodiments

[0014] Figs. 2A and 2B are, respectively, frontal and rear perspective views of a preferred embodiment of eyewear 10′ constructed with an adjustable temple-support mechanism 50 that displaces the weight and pressure of frame 12 from the bridge of the wearer's nose to the temples of the wearer's head. Eyewear 10′ and conventional eyewear 10 are constructed with certain similar components and design features, and corresponding ones of which are identified by the same reference numerals. In the preferred embodiments described, frame 12 is made of zylonite or a cellulose acetate plastic material.

[0015] Fig. 2A shows a left eyeglass temple 16′ carrying a temple-support left-side component 50L, and Fig. 2B shows a right eyeglass temple 18′ carrying a temple-support right-side component 50R. Left-side component 50L includes a first inflatable bladder 52 that is positioned to protrude from an inner surface 54 of left eyeglass temple 16′ and is in fluid communication with a first pressurized-fluid delivery device 56 positioned at a left temple tip 58. Right-side component 50R includes a second inflatable bladder 52 that is positioned to protrude from an inner surface 64 of right eyeglass temple 18′ and is in fluid communication with a second pressurized-fluid delivery device 56 positioned at a right temple tip 68. Bladders 52

are preferably made of one layer or multiple bonded layers of lightweight urethane film. Channels integrally formed or narrow conduits provided in eyeglass temples 16′ and 18′ of the respective components 50L and 50R preferably provide the fluid communication by which their associated inflatable bladders 52 are filled with pressurized fluid. Squeeze-bulb pumps are preferred pressurized-fluid delivery devices 56 for introducing pressurized air into their associated inflatable bladders 52.

[0016] Left-side component 50L and right-side component 50R of temple-support mechanism 50 are of the same construction and use components of the same type; therefore, for purposes of simplicity and clarity, the following description is presented with reference to left-side component 50L.

[0017] Figs. 3 and 4 show in detail the construction of left-side component 50L of temple-support mechanism 50, in which inflatable bladder 52 provides a resilient cushion between the temple of a wearer's head and left eyeglass temple 16′. Inflatable bladder 52 is set in a chamber 70 recessed within left eyeglass temple 16′ and bounded by end walls 72 and 74 and an interior sidewall 76. Inflatable bladder 52 is bonded by adhesive to interior side wall 76. As it is filled with air, inflatable bladder 52 confined within chamber 70 compresses against end walls 72 and 74 and side wall 76 and expands so that its outer surface 78 (Figs. 2A and 2B) protrudes outwardly in an ellipsoidal shape from inner surface 54 of left eyeglass temple 16′. When it is in an inflated state, inflatable bladder 52 containing pressurized air provides uniform cushioning that is distributed across outer surface 78 of inflatable bladder 52. In operation of this embodiment, a wearer squeezes repeatedly squeeze-bulb pump 56 to introduce air into inflatable bladder 52. A release valve 80 coupled to inflatable bladder 52 can be used to release air from it according to the desire of the wearer.

[0018] Squeeze-bulb pump 56 and inflatable bladder 52 are connected by a narrow air flow channel 82. Channel 82 is formed either as an in-molded integral part of the interior or by a small diameter tube set within the interior, and extending along the length, of left eyeglass temple 16′. Squeeze-bulb pump 56 is set in a chamber 84 recessed within left eyeglass temple 16′ and bounded by left temple tip 58 and an end wall 86. Channel 82 is connected to inflatable bladder 52 by a one-way check valve 88. Squeeze-bulb pump 56 may be molded from rubber such as butyl rubber or a latex rubber to form a rubber bulb. A body portion 90 of squeeze-bulb pump 56 is of hemispheroidal shape with its flat surface portion contained within

chamber 84 and adhered to an interior side wall 92. With reference to Fig. 4, one end of body portion 90 of squeeze-bulb pump 56 is connected to a check valve 94, which prevents air from passing from squeeze-bulb pump 56 to the atmosphere while allowing air to pass into body portion 90. The other end of squeeze-bulb pump 56 is connected to channel 82, which enables air to communicate from squeeze-bulb pump 56 to inflatable bladder 52. Check valve 88 located at the end of channel 82 between squeeze-bulb pump 56 and inflatable bladder 52 allows air to be forced into inflatable bladder 52 upon a wearer's application of pressure to squeeze-bulb pump 56.

[0019] Fig. 4 also depicts one-way check valve 94 positioned outside of an opening 96 in body portion 90. One-way check valve 94 is inserted into opening 96 and enables air flow only in the direction indicated by an arrow 98. The operation of one-way check valve 94 depends on the position of a disc 110 fitted between a shoulder 112 and retaining pins 114. Disc 110 is free to move axially within one-way check valve 94 because disc 110 has a smaller radius than that of the interior cylinder formed by one-way check valve 94. If air is moving in a direction opposite to the direction of arrow 98, disc 110 adjoins shoulder 112 and air cannot escape from one-way check valve 94. If, however, air is entering one-way check valve 94 in the direction of arrow 98, disc 110 is retained against retaining pins 114. Retaining pins 114 are nonuniformly spaced around the fringe of the cylindrical space forming one-way check valve 94, thereby enabling air to pass around disc 110. Thus, one-way check valve 94 enables air flow only in the direction of arrow 98.

[0020] Operation of squeeze-bulb pump 56 entails the wearer pressing body 90, forcing air flow through channel 82 and eventually into inflatable bladder 52. The wearer can simply place her thumb on the rounded side of squeeze-bulb pump 56 protruding from inner surface 54 and one of her fingers on the other side of left eyeglass temple 16′ at left temple tip 58. The user repeatedly presses squeeze-bulb pump 56 to provide to inflatable bladder 52 the desired pressure of air.

[0021] Fig. 5 shows release valve 80 mated with a release fitting 118 located at the underside of left eyeglass temple 16′, where the wearer can conveniently activate release valve 80 to vent air from inflatable bladder 52. Release valve 80 includes a plunger 120 having a stem 122 positioned in the center and along the length of a coil spring 124. A stop flange 126 is positioned at the free end of and extends circumferentially around the periphery of stem 122. Stop flange 126 keeps air from

escaping between plunger 120 and release fitting 118 because, in the closed position of release valve 80, the beveled surface of stop flange 126 is in contact with release fitting 118. To release air from inflatable bladder 52, the wearer depresses plunger 120 to move stop flange 126 axially away from release fitting 118 and thereby cause escape of air from around stem 122. The components of release valve 80 may be made from different materials including plastic or metal, but aluminum is preferred because it is easier to ensure that an aluminum plunger 120 will exhibit a round shape, thus avoiding leakage problems that can be created by a plunger of irregular shape.

[0022] The disclosed eyewear 10′ is placed with its frame front 14 on the wearer's face, as would conventional eyewear 10. The wearer can then adjust the fit of eyewear 10′ by using her thumb and index finger to inflate temple-support mechanism 50 by squeezing or pumping squeeze-bulb pumps 56 located at temple tips 58 and 68 of the respective eyeglass temples 16′ and 18′. Repeated squeezing of squeeze-bulb pumps 56 causes inflatable bladders 52 to assume inflated states in which inflatable bladders 52 protrude toward each other from the respective inner surfaces 54 and 64 to apply pressure to the temples of the wearer's head. The wearer can then deflate temple-support mechanism 50 by using her thumb to adjust the fit for positional stability and comfort by pressing release valves 80, located on the underside of eyeglass temples 16′ and 18′ at the temple area of the wearer's head.

[0023] It will be obvious to those having skill in the art that many changes may be made to the details of the above-described embodiments without departing from the underlying principles of the invention. The scope of the present invention should, therefore, be determined only by the following claims.

Claims

1. In eyewear including a frame having a frame front to which first and second eyeglass temples are coupled, the frame front including a nose pad and first and second eyepiece openings that are separated by a bridge and configured to receive respective first and second eyepieces, the first and second eyeglass temples having respective first and second inner surfaces, and the nose pad configured to hold the eyewear in position on and fit the eyewear snugly against a wearer's nose, the improvement comprising:

a temple-support mechanism operatively coupled to the first and second eyeglass temples, the temple-support mechanism including a first inflatable bladder that is positioned to protrude from the first inner surface of the first eyeglass temple and is in fluid communication with a first pressurized-fluid delivery device carried by the first eyeglass temple to enable the wearer to inflate the first inflatable bladder, and a second inflatable bladder that is positioned to protrude from the second inner surface of the second eyeglass temple and is in fluid communication with a second pressurized-fluid delivery device carried by the second eyeglass temple to enable the wearer to inflate the second inflatable bladder, the first and second inflatable bladders positioned on the respective first and second eyeglass temples so that, when in inflated states, the first and second inflatable bladders apply against the temples of the wearer's head sufficient pressure to hold the eyewear in a stable position on the wearer's head and thereby eliminate the snug fit against the wearer's nose.

2. The eyewear of claim 1, in which:

the first eyeglass temple includes a first recessed chamber within which the first inflatable bladder is secured;

the second eyeglass temple includes a second recessed chamber within which the second inflatable bladder is secured; and

the first and second chambers confine the respective first and second inflatable bladders so that, when in their inflated states, the first and second inflatable bladders protrude toward each other from the respective first and second inner surfaces to apply pressure to the temples of the wearer's head.

3. The eyewear of claim 2, in which the first and second inflatable bladders are made of plastic film.

4. The eyewear of claim 1, in which the frame is of a saddle type.

5. The eyewear of claim 1, further comprising first and second release valves operatively coupled to the respective first and second inflatable bladders to enable the wearer to deflate them.

6. The eyewear of claim 5, in which the first and second eyeglass temples provide mounting supports for the first and second release valves.

7. The eyewear of claim 1, in which the first and second pressurized-fluid delivery devices include respective first and second air pump devices.

8. The eyewear of claim 7, in which the first and second eyeglass temples have respective first and second temple tips, and in which the first and second air pump devices are positioned at the respective first and second temple tips.

9. The eyewear of claim 8, in which the first and second air pumps are of a squeeze-bulb pump type.

10. The eyewear of claim 1, in which:

a first channel provides the fluid communication between the first inflatable bladder and the first pressurized-fluid delivery device;

a second channel provides the fluid communication between the second inflatable bladder and the second pressurized-fluid delivery device; and

the first and second channels are integrally formed or are conduits provided in the respective first and second eyeglass temples.

11. The eyewear of claim 1, further comprising first and second pairs of check valves operatively connected to the respective first and second inflatable bladders to enable one-way pressurized fluid delivery to inflate them.

12. The eyewear of claim 11, further comprising first and second release valves operatively coupled to the respective first and second inflatable bladders to enable the wearer to deflate them.

13. The eyewear of claim 1, in which the first and second eyeglass temples support the respective first and second inflatable bladders, and in which the first and second inflatable bladders protrude toward each other from the respective first and second inner surfaces to apply pressure to the temples of the wearer's head.

14. The eyewear of claim 13, in which the first and second inflatable bladders are made of plastic film.

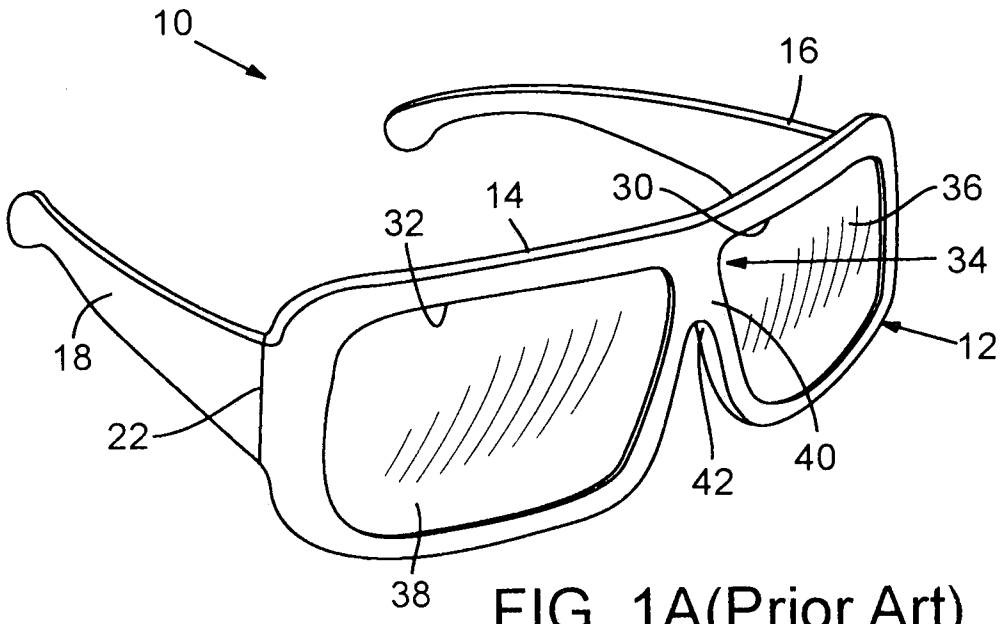

FIG. 1A(Prior Art)

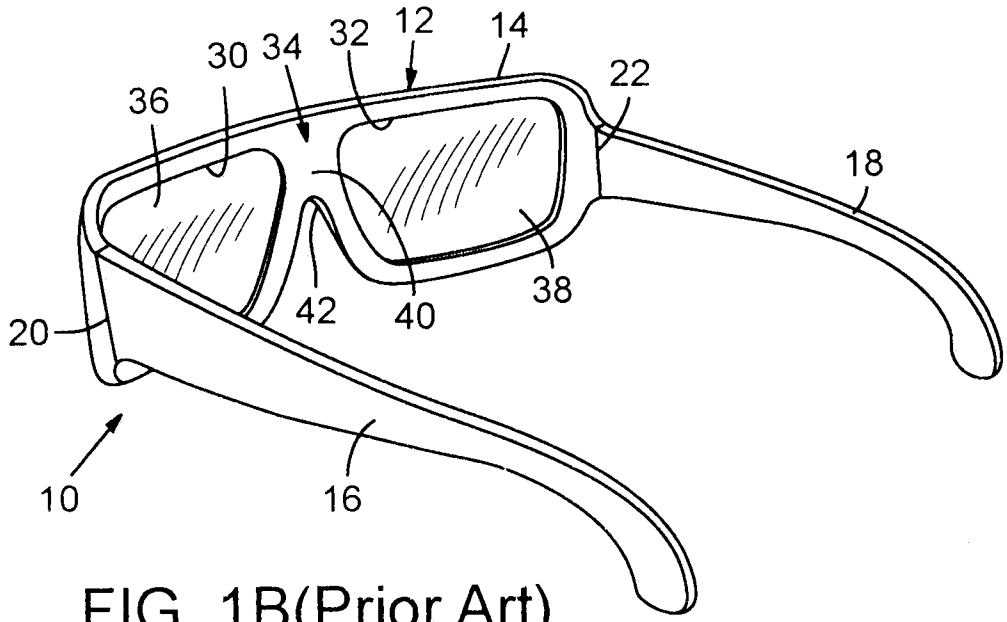

FIG. 1B(Prior Art)

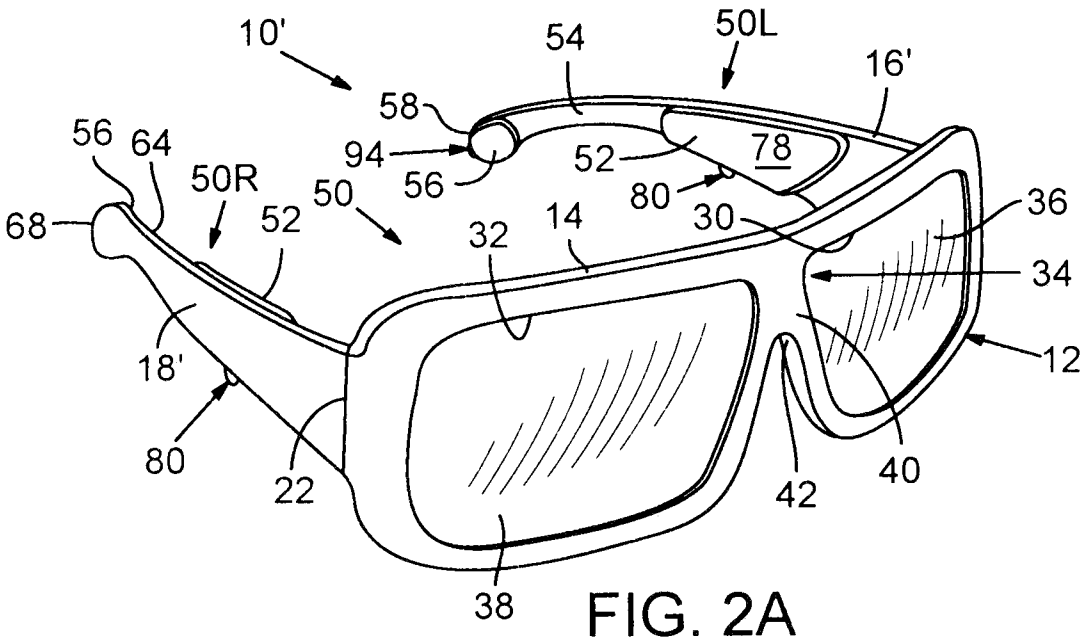
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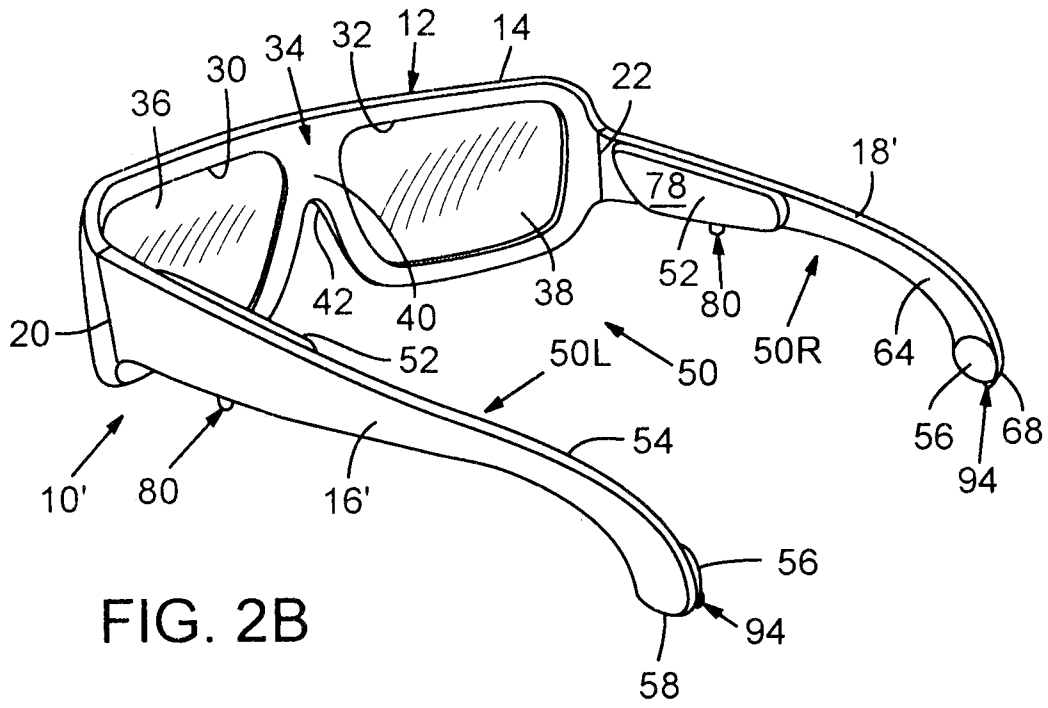
FIG. 2A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94
58

FIG. 2B

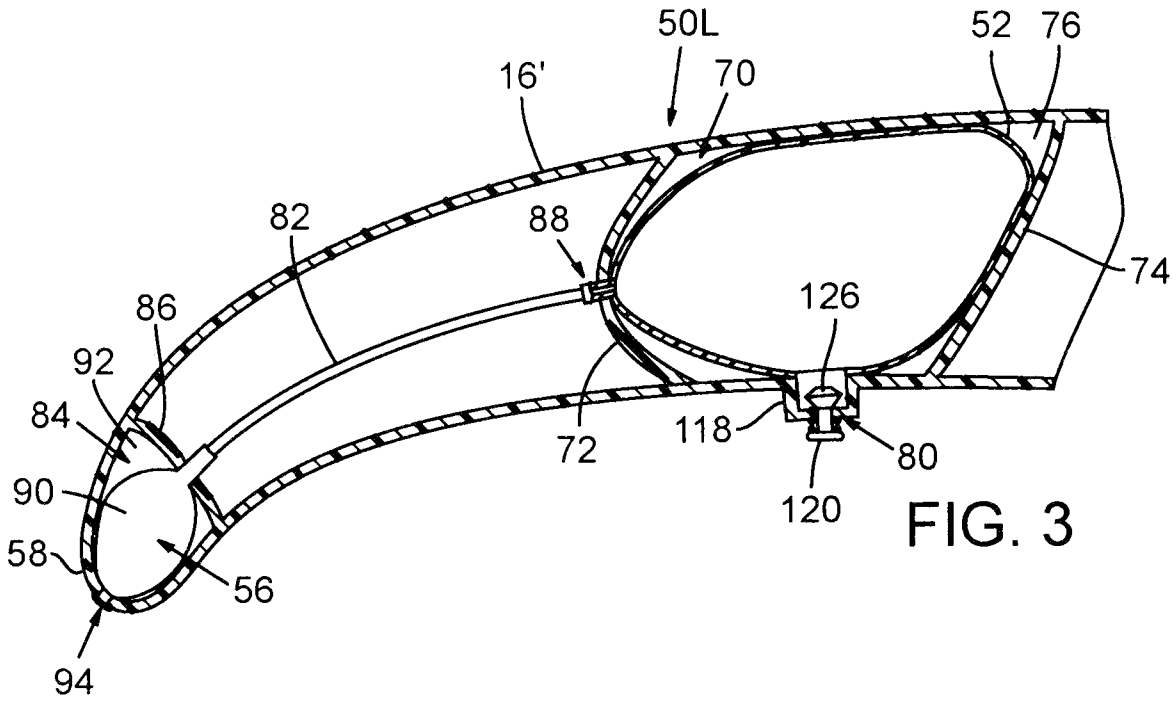

FIG. 3

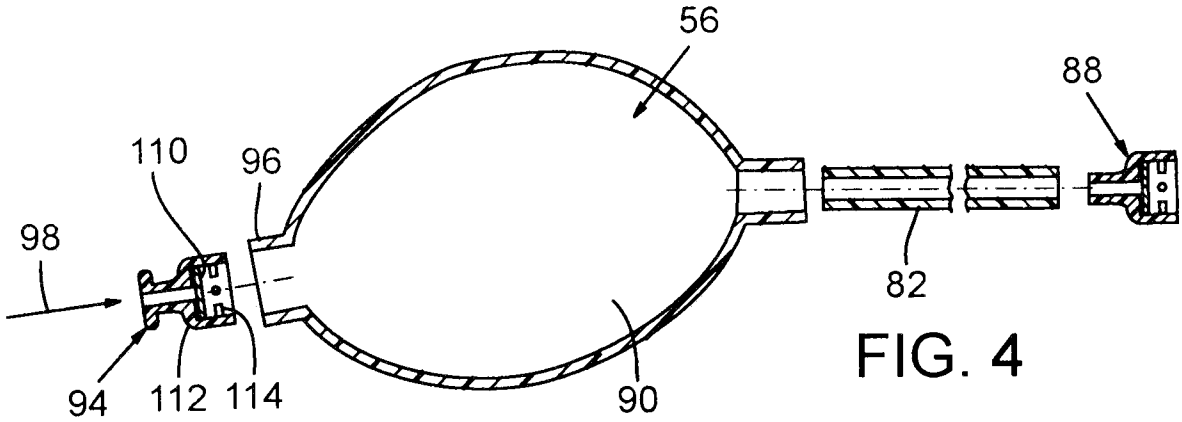

FIG. 4

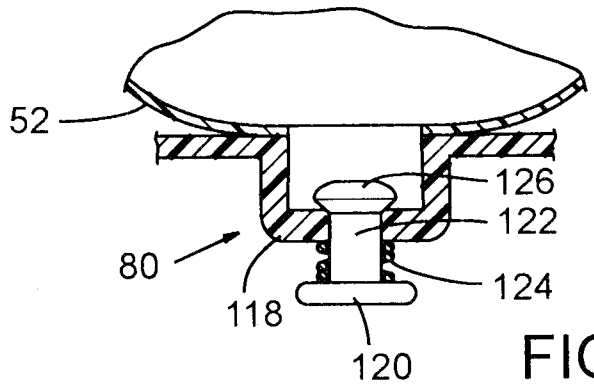

FIG. 5