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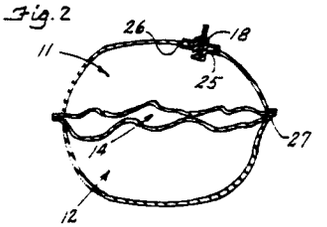
(54) Flotation device.

(57) An inflatable flotation device for use in recreational swimming and in swim training has at least one inflatable chamber and is placed over the hand of the user and then inflated. In one embodiment two adjustably inflatable chambers superimposed one upon another are joined by an airtight seam substantially circumscribing the periphery of the chamber. The two chambers are in mutual fluid communication and a sealed area in one of the two chambers corresponds generally to the location of the user's palm to facilitate bending of the device in the inflated mode. In another embodiment, a single inflatable, flotation chamber has a rigid flange element circumscribing the periphery of the inflatable chamber and a flexible lower sheet attached to the chamber. The inflatable chamber is formed with apertures through which the fingers and thumb of the user may pass, thereby permitting the user to utilize his hand for grasping objects and the like and yet still have the flotation chamber firmly attached thereto. The flange element is tapered so that it is deformed from a planar two-dimensional surface into a curved, three-dimensional surface to form a scoop-like element on the lower side and a curved water run-off channel on the upper side.

Fig. 2



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The present invention relates generally to flotation devices and, more particularly, to adjustably inflatable swimming devices for fitting over each of a user's hands and lower forearms to facilitate swimming or for physical conditioning or therapeutic use, and also to provide life-saving functions.

The use of air-filled bladders and the like to assist a person in floating or swimming has been known for many years. Inner tubes and inflatable rings are familiar objects at many beaches. There are also well-known devices to aid a person in propelling himself through water, in the form of fins with increased surface area over that provided by the hands and feet of the swimmer. Generally, these latter devices are not inflatable but are intended only to increase the surface areas of the hands and feet as used in swimming.

A specialized form of the above devices relates to a combination of both of these features and provides webbed finger stalls with an inflatable air flotation collar around the wrist area. Nevertheless, such known devices do not provide sufficient buoyancy to aid in flotation and the cumbersomeness of these combination devices have prevented their widespread use. There have also been known large inflatable cushion-like devices that are placed over the hands of the user, but these are so large as to inhibit, rather than facilitate, swimming.

A principal drawback with some of the heretofore known devices that fit over the hands relates to the cumbersomeness and relative large size of such devices. This results in restricting the ability of the user to manipulate his hands, not only to don the various devices but also to use the hands in potential life-threatening situations, such as grasping a rope or life-preserver ring.

Accordingly, it is an object of the present invention to overcome the aforementioned disadvantages inherent in the prior art.

It is another object of the present invention to provide an inflatable aquatic device, one placed over each hand of a swimmer, to both increase the buoyancy of the swimmer and also to improve his ability to propel himself through the water when swimming.

It is still another object of the present invention to provide an inflatable aquatic device useful in swim training and physical therapy.

In accordance with one aspect of the present invention, an inflatable flotation device comprises first and second adjustably inflatable chambers, superimposed one upon another, being in fluid communication and being joined by an airtight seam substantially circumscribing the periphery of the chambers and conforming to the outline of a user's hand and lower forearm. A hollow portion is arranged between adjacent sides of the inflatable chambers for receiving the user's hand and the lower forearm, and the fit about the same may be adjusted by corresponding changes in chamber air pressure. Further modifications are also possible, such as an enlarged air chamber on the back of the device, opposite the valve area, to increase buoyancy and an extended skirt element around the periphery of the device to offer increased swimming power.

In accordance with another aspect of the present invention, an inflatable aquatic device, one for use on each hand, comprises an inflatable chamber that is provided with an easily operated valve and a rigid, peripheral rim or flange, which is tapered rearwardly relative to the orientation of the hand, and in which the inflatable chamber is attached to a lower element that is formed of relatively strong, fabric-reinforced, flexible material that includes finger holes and a thumb hole through which the user's fingers and thumb may protrude. The finger holes and thumb hole may be further reinforced to prevent tearing or rupturing of the reinforced material at those locations. The peripheral flange is tapered and so attached to the inflatable chamber so that when the inventive device is inflated a scoop is formed on the downwardly facing side and the upward side forms a channel with the inflated chamber so that the water is permitted to run off more expeditiously. The inflatable chamber can be formed having an increased size relative to a cylinder of comparable dimensions and such expanded air chamber can be created by heat forming an upper sheet of material used to form the chamber, so that it is stretched out of shape, thereby increasing its volume when inflated. Additionally, in one embodiment, the two inflatable aquatic devices intended to be placed over the respective hands of the user can be mutually attached by means of an interconnecting web, which can also include further inflatable chambers, and which has an aperture through which the head of the user can be inserted, thereby to provide a life-saving device useful if the user becomes unconscious.

Fig. 1 is a top plan view of an inflatable swimming device in accordance with an embodiment of the present invention;

Fig. 2 is a cross-sectional view taken on section line I-I of Fig. 1;

Fig. 3 is a cross-sectional view taken on section line II-II of Fig. 1;

Fig. 4 is a cross sectional view taken on section line III-III of Fig. 1;

Fig. 5 is a rear perspective view of the inflatable swimming device of Fig. 1;

Fig. 6 is a bottom plan view of the inflatable swimming device of Fig. 1 shown fitted over a user's hand and lower forearm.

Fig. 7 is a rear perspective view of another embodiment of the device, showing an enlarged chamber to provide increased buoyancy;

Fig. 8 is a bottom plan view of a further embodiment of the device having finger holes and a peripheral skirt element;

Fig. 9 is a rear perspective view of the embodiment of Fig. 8, in an inflated condition and showing the peripheral skirt used to provide increased swimming power;

Fig. 10 is a top plan view of an inflatable aquatic device in accordance with another embodiment of the present invention;

Fig. 11 is a bottom plan view of the device of Fig. 10;

Fig. 12 is a rear elevational view of the device of Fig. 10;

Fig. 13 is a side elevational view of the device of Fig. 10 in an inflated condition;

Fig. 14 is a cross-sectional view taken along section line XIV-XIV of Figs. 12 and 13; and

Fig. 15 is a schematic representation of still another embodiment of the present invention.

Fig. 1 shows an inflatable aquatic device 10 comprising a pair of collapsible, adjustably inflatable chambers 11 and 12, which are seen more clearly in Fig. 2. Chambers 11 and 12 are formed of flexible plastic material and are interconnected by a duct, shown typically at 13. A hollow portion 14, having an opening 15 lies between adjacent surfaces of chambers 11 and 12 to receive a user's hand and lower forearm. Duct 13 that provides fluid communication between chambers 11 and 12 is located in an area substantially between a user's thumb and index finger, thereby to provide a thumb stall 16 to receive a user's thumb when his hand is inserted in hollow portion 14. The interior and exterior surfaces of chamber 12 are joined throughout an area substantially adjacent a user's palm, forming a noninflatable portion shown typically at 17, to facilitate hand flexing motions when the chambers are in an inflated mode. Chambers 11 and 12 are hollow and a valve 18 is arranged, for example, through the exterior side of chamber 11, to permit the user to inflate or deflate the flotation device.

Chambers 11 and 12 may be advantageously formed from four thin panels, shown in Fig. 3 as members 19, 20, 21, and 22, of substantially fluid impervious material, such as polyethylene, vinyl, or the like. Panels 19, 20, 21, and 22 are identical in shape and size and their outline, although not limited by such a configuration, substantially conforms to that of a user's hand and lower forearm. These panels may be manufactured by layering a suitable material and cutting the periphery with a single die, thereby providing one panel type which may be used for either left hand or right hand versions of the swimming device, and may be modified as required. An advantage of the present embodiment is that manufacturing costs related to tooling and assembly are relatively low because of the similarities in the mating parts and their ease of assembly into the completed flotation device, as described in further detail below.

Chambers 11 and 12 are comprised of panels 19 and 20 and panels 21 and 22, respectively, as shown in Fig. 3. Subsequent to being peripherally cut, panels 20 and 21, which form the adjacent surfaces of chambers 11 and 12 respectively, may be modified to include duct 13 for fluid communication. An aperture, shown typically at 23, is cut in dimensionally exactly locations on each of panels 20 and 21. Of course, a single die may be developed to simultaneously cut both the periphery and aperture 23, of panels 20 and 21. Panels 20 and 21 are subsequently placed, one on top of another, so that their respective edges are aligned. The panels are joined by the formation of a continuous airtight seam, shown typically at 24, defined by the periphery of aperture 23, to define duct 13. Seam 24 may be formed by electronic welding or by any other suitable method providing a durable airtight seam. A feature of the present embodiment is that duct 13, comprised of aperture 23 and seam 24, permits fluid communication between chambers 11 and 12; hence, valve 18 is the only valve required to regulate air flow into and out of the entire flotation device.

Panel 19, which is the present embodiment forms the exterior surface of chamber 11, may be modified by forming an aperture, shown typically at 25 on Fig. 2, for receiving air valve 18. Air valve 18 is inserted into aperture 25 and sealed to a surface of panel 19 by a continuous airtight seam, shown typically at 26. Seam 26 may be formed by electronic welding, or by any other suitable method providing a durable airtight seam. As featured in the present embodiment and shown on Fig. 1, it is preferably to located valve 18 on an exterior surface of chamber 11 adjacent a user's lower forearm, and not on a surface adjacent a user's hand when fitted in hollow portion 14. The surface areas adjacent a user's hand are subject to hand flexing motions which tend to reduce the clearance within chamber 11, thereby allowing contact between valve 18 and interiorly disposed surfaces of chamber 11, which would be felt by the user and possibly cause discomfort. Also, because valve 18 may protrude from the exterior chamber surface on which it is located, it may be safer to locate it away from the areas enveloping a user's hand, thereby decreasing the chance of contact between valve 18 and a user's face or eyes. Valve 18 may similarly be located on an exteriorly disposed surface of panel 22, of chamber 12, without any substantial change in performance or user comfort.

The noninflatable portion 17 is formed by joining the exterior surface of chamber 12, defined by panel 22 to the interior surface of that same chamber, defined by panel 21, through an area lying adjacent the palm of a user's hand when inserted in hollow portion 14, and substantially conforming to, although not limited by, the planar surface configuration of a user's palm. Noninflatable portion 17, may be formed by electronically welding panels 21 and 22 or by any other suitable method providing a durable airtight seam. The sealed surfaces of noninflatable portion 17 permit increased hand flexibility when a user's hand is inserted in hollow portion 14 and chambers 11 and 12 are in an inflated mode. Another advantage of the present embodiment is that the noninflatable portion 17 may facilitate a user's ability to swim with full strokes by reducing the magnitude of the buoyant forces exerted on the underside of the user's hand and lower forearm by inflated chamber 12.

Panel 19, which formed the exterior surface of chamber 11 in the present embodiment, is superimposed upon panels 20, 21, and 22, so that panel 19 is in contact with panel 20 and the edges of the four panels are substantially aligned, and panels 20 and 21 are interiorly disposed between panels 19 and 22 and are joined at duct 13, and panels 21 and 22 are joined at the noninflatable portion 17. Panel 19 is oriented so that its surface on the side of the filler opening of valve 18 is exteriorly disposed. Panels 19, 20, 21, and 22, are joined together at their edges to form an airtight peripheral seam, shown typically at 27, substantially circumscribing the four panels. Peripheral seam 27 may be formed by electronic welding or by any other suitable method providing a durable airtight seam. The peripheral portions of panels 19, 20, 21, and 22, disposed transverse to the longitudinal axis of the four interconnected panels defines an interrupted portion in the peripheral seam 27. Along the interrupted portion, panels 19 and 20 are joined at their edges and panels 21 and 22 are similarly joined to form continuous airtight seams contiguous to peripheral seam 27, as shown typically at 28 and 29, respectively. Seams 28 and 29 may be formed by electronic welding, or by any other suitable method providing a durable airtight seam. The formation of seams 28 and 29, in conjunction with peripheral seam 27, transforms panels 19, 20 and 21, 22, respectively, into inflatable chambers 11 and 12. Seams 28 and 29 also define the opening 15, to the hollow portion 14, defined by the space between the adjacent sides of chambers 11 and 12.

The thumb stall is arranged within the hollow portion, as shown typically at 16 on Fig. 2, to receive a user's thumb and thereby permit flotation device 10 to fit over a user's hand as would a mitten. Thumb stall 16 is defined by locating duct 13, comprised of aperture 23 and peripheral seam 24, substantially in the area between a user's thumb and index finger when the hand is fitted in the hollow portion 14, as shown typically on Fig. 6.

The swimming device 10 featured on Figs. 1 through 6 is designed to receive a user's left hand and lower forearm. The manufacture of a right hand version would require a few simple changes to the procedures previously set forth for the transformation of panels 19, 20, 21, and 22 into inflatable chambers 11 and 12. Noninflatable portion 17 would be defined by joining the exterior surface of chamber 11, defined by panel 19 on Fig. 3, to the interior surface of that same chamber, defined by panel 20 on Fig. 3, throughout an area lying adjacent a user's right hand palm when received in hollow portion 12 and his or her associated thumb is inserted in stall 16, and substantially conforming to the planar surface configuration of the user's palm. The outline of the right hand version's noninflatable portion would be a mirror image of the left hand version noninflatable portion 17 shown typically in Fig. 6

Valve 18 is preferably located on the exteriorly disposed surface of chamber 12 of the right hand version, adjacent a user's lower forearm and not within the analogous surface of chamber 11 as previously set forth for the left hand version of this embodiment of the present invention.

Fig. 7 shows a further modification of the inventive device that provides increased buoyancy. On the back side of the device, opposite the valve, a bulge, shown generally at 30, is formed in the locale of the user's forearm. This bulge then provides an increased air chamber volume that produces an increase in buoyancy. This so-called bulge 30 can be formed by vacuum forming and having an appropriately shaped mold, and also by providing more material at that location when that portion of the device is die-cut, so that when the portions of the device are sealed together a deep tray is used to take up the space.

Fig. 8 shows still a further modification of the inventive device in which finger holes are cut through the bottom two panels to permit the user's fingers to protrude therethrough and a skirt element is added to increase the swimming capabilities of the user. In this embodiment a skirt 34 formed of the same plastics material as the device is arranged to depend from the peripheral seal 27 and extend substantially all around the device, except for the hand-access portion. This skirt 34 in combination with the palm portion of the device provides a scoop-like effect when the device is inflated so that during swimming the scoop greatly enchances the power available in each stroke. The skirt 34 is made to form the scoop when the device is

inflated and to shape during use by a rigid but flexible, U-shaped, flat element 36 that is sealed inside skirt 34. This flat element 36 can be plastic or metal and is shown in phantom in Fig. 8. In place of flat element 36 a drawstring could be employed.

Also provided in the embodiment of Fig. 8 are finger holes, shown typically at 38, and a thumb hole 40 through which the user's fingers and thumb (not shown) could respectively protrude. This permits the user to grasp objects while wearing the device and could be particularly useful in a lifesaving portion for grasping a rope or life line. These finger and thumb holes are formed only through the bottom two panels of the device and the top surface remains as in the above-described embodiments.

Fig. 9 shows that top surface and also shows how skirt 34 is bowed downwardly and inwardly to form the scoop when the device is inflated. Because the entire device is a planar structure when uninflated, upon inflation skirt 34 being defined by rigid flat element 36 will deform somewhat. This deformation is represented by the wrinkles, shown generally at 42, appearing at the rounded peripheral areas. Also in this embodiment, the outline of the thumb has been deleted to provide a smooth, rounded appearance.

A further modification is shown by dashed line 40 in Fig. 4 that represents a metering flap-over value port 23. Flap 44 acts to restrict the flow of air between chambers 11 and 12 and adds a more rigid feeling to the inflated device. The flap 44 can be arranged to operate on either side or aperture 23 or a different kind of air flow regulator could be advantageously employed.

Fig. 10 shows an embodiment of an inflatable aquatic device 110 in a top plan view as comprising a main inflatable chamber 112 formed of flexible plastic material and having a valve 114 arranged in one wall of inflatable chamber 112. Inflatable chamber 112 can be formed of one sheet of plastic material folded over on itself and sealed all around its periphery, with the fold being along the rearward edge 115. Such seal or seam is represented at 116 in Fig. 10, and this seam can be formed by heat sealing or electron beam welding, for example. The seal 116 is not formed at the outermost edges of the folded-over sheet, however, but is moved inwardly so as to define two peripheral elements, a top skirt 118 and a bottom skirt, the bottom skirt is not seen in Fig. 10. A rigid, flat, tapered flange element also not seen in Fig. 10 is inserted between the skirts and the outermost thereof edges are sealed, by way of seam 124. This seam 124 can be heat sealed or electron beam welded.

In order to attach the device 110 to the hand of the user a lowermost sheet 126 is adhered to the inflatable chamber 112 and is also formed of flexible material, which may be strengthened preferably by the inclusion of fabric reinforcement or fiber glass or the like. Fig. 11 shows the manner in which lowermost sheet 126 is provided with a suitable number of through-holes for the user's fingers and thumb to protrude through, with the finger holes shown generally at 128 and the thumb hole at 130.

Bottom sheet 126 is of the same general size as the folded-over plastic sheet that forms inflatable chamber 112 and is attached thereto along the same seams 116, 118 that were shown in Fig. 10. That is, seam 132 corresponds to seam 116 and seam 134 corresponds to seam 124. Additionally, is this view, the form of the flange element is seen tapering towards the rear of the device, that is, toward a location 136 at which the user inserts his hand prior to inflation of inflatable chamber 112. Because the flange element is integrally formed with the inflatable chamber, when the device is inflated the flange deforms with advantageous results. For example, the flange element increases the swimming abilities of the user, so that by providing a tapering of the flange the water run-off is accentuated and the device is more streamlined in the water. The flat element forming the flange can be plastic or metal to increase manufacturability, and one or more flange elements can be stacked on top of each other in order to provide a thicker flange. The flange element further defines the shape of the inventive device 110.

As seen in fig. 11, the finger holes 128 and thumb hole 130 through which the user's fingers and thumb (not shown) respectively protrude can be formed having scallopped edges, shown generally at 138, to permit movement of the fingers and to accommodate various finger sizes. Additionally, these holes 128, 130 could be reinforced by additional material or gussetting to prevent tearing of the bottom fabric-reinforced layer 126.

Upon inflating the inventive device 110, it will appear from the rear as shown in Fig. 12 and from the side as shown in Fig. 13. The rear of the inflated chamber 112 at fold 115 forms a rounded surface, and it is at location 136 between chamber 112 and lower sheet 126 that the user's hand is inserted prior to inflation. The deformation of tapered flange 140 can be clearly seen in Figs. 12 and 13.

Air valve 114 is advantageously arranged at the rear portion of inflated chamber 112 to facilitate inflation by the user after the inflatable device 110 has been placed over the hand. It is appreciated, of course, that the present invention is not intended to be first inflated and then subsequently placed over

the hand but, rather, first placed in an operable position with the user's fingers protruding through the appropriate apertures and then the inflatable chamber inflated by the user blowing into valve 114, which can be of the kind that is self-sealing or sealed by mouth actuation.

Fig. 13 shows clearly the manner in which flange 140 is deformed into a three-dimensional surface and, more particularly the leading or front edge 142 of flange 140 becomes downwardly facing, thereby forming a scoop-like element to increase the swimming ability of the user. The trailing or rearward edge 144 of flange 140 also is tilted downwardly and cooperates with a channel 146 that is formed along seam 116 when chamber 112 is inflated to provide a run-off channel for water during use. Channel 146 is seen in Fig. 12 as being on both sides of inflated chamber 112.

The cross-sectional view of Fig. 14 shows that the channel 146 does not extend around the periphery of the device 110, but exists only along the downwardly sloping portion 144 of flange 140. The cross section along lines XIV-XIV of Fig. 14 is taken roughly at the transition point along flange 140, where it changes direction of the curvature that occurs when it is deformed by inflating chamber 112. In Fig. 14 the rigid, flat element 148 that is inserted between the skirt elements, as described above in relation to Fig. 10, is seen. It is understood that although element 148 is rigid, because it is flat it can flex longitudinally, thereby permitting such deformation as shown in Fig. 13. Element 148 can be metal or plastic and while only one such element is provided in the embodiment of Fig. 14, additional elements may be stacked, one on top of another, to provide increased rigidity.

Referring to Fig. 15, a further embodiment of the present invention is schematically represented in which two identical elements 150, 152, such as shown in Figs. 10 through 14, are arranged at either end of a third substantially flat, flexible element 154 that has a suitable aperture 156 formed therein through which the user's head (not shown) may be inserted. Such aperture 156 preferably is formed as a tapered collar or is sized sufficiently small, so that it would be relatively difficult to remove the user's head once it has been inserted thereinto. Furthermore, interconnecting element has provided with one or more inflatable chambers 158, 160, each of which has its own valve 162, 164, respectively. This embodiment is useful as an emergency, life-saving device, in which if one is required to be in the water for a long period of time or if the device is to be used with an unconscious person, the head of the user is inserted through the center aperture 156 and the hands inserted into the respective inflatable devices 150, 152, and all available inflatable chambers are inflated. The relative dimension of this embodiment are chosen so that swimming or treading water can take place yet the user's head is supported out of the water by the center element 154 and the two inflated chambers 158, 160. That is, the distance between the two end elements 150, 152 can be advantageously somewhat short of the actual arm span of the intended user, so that swimming is not adversely inhibited, yet all the inflatable chambers combine to provide buoyancy to the user, who may be in an unconscious state.

Further modifications of the embodiment of Fig. 15 may comprise having no inflatable chambers in the center element 154, or having more chambers than the two shown, or varying the length of the interconnecting element 154.

Claims

1. An inflatable flotation device for placement over the hand of a user, characterized by an adjustably inflatable chamber formed of flexible material; a lower, bottom element, said inflatable chamber being superimposed upon said lower, bottom element and joined at respective, selected, peripheral regions to form a seam substantially circumscribing said chambers; an opening and a hollow portion between adjacent sides of said chamber and said lower, bottom element at a non-joined region for receiving a user's hand and lower forearm; and at least one valve means formed in said chamber for selectively permitting air to enter and exit said chamber.

2. A flotation device as in claim 1, in which said lower, bottom element is a second adjustably inflatable chamber superimposed upon the first chamber and joined at respective peripheral regions to form an airtight seam substantially circumscribing said chambers;
fluid communicating means arranged within said hollow portion for permitting fluid communication between said first and second chambers; and
a noninflatable portion arranged within at least one of said chambers for permitting flexing of a user's hand when received in said hollow portion and said chambers are in an inflated state.

3. A flotation device as in claim 2, in which each of said first and second inflatable chamber include two panels of flexible, substantially fluid impervious material.

4. A flotation device as in claim 3, wherein an opening to said hollow portion is defined by an interruption in a peripheral seam transversely disposed to the longitudinal axis of said chambers, and said pairs of exteriorly disposed and adjacent interiorly disposed panels are respectively joined at

their edges to form two continuous airtight seams along said interrupted portion contiguous with said peripheral seam.

5. A flotation device as in claim 2, wherein said fluid communicating means includes an aperture through adjacent sides of said chambers and a continuous airtight seam joining said chambers along the periphery of said aperture.

6. A flotation device as in claim 2, wherein another of said chambers not having said noninflatable portion arranged therein has a distended surface portion for increasing an interior volume of said another chamber.

7. A flotation device as in claim 2, further comprising a skirt device affixed to said peripheral regions and extending thereaway for forming a scoop around said one chamber having said noninflatable portion therein.

8. A flotation device as in claim 7, wherein said skirt device includes a drawstring attached to an edge thereof not affixed to said peripheral regions.

9. A flotation device as in claim 1, in which said lower, bottom element comprises a flexible sheet element attached to said inflatable chamber substantially around its periphery and including a non-attached peripheral portion adapted to receive a hand of the swimmer, said flexible sheet element including a plurality of apertures formed therein through which fingers and thumb of the hand can protrude after being received therein; and

a rigid flange element, attached to said inflatable chamber along the peripheral portion thereof coextensively with said flexible sheet element, said flange element being adapted to be substantially flat when said inflatable chamber is uninflated and being curved downwardly relative to said flexible sheet element when said inflatable chamber is inflated.

10. An inflatable aquatic device according to claim 9, in which said plurality of apertures formed in said flexible sheet element include means for adapting said aperture to various finger sizes.

11. An inflatable aquatic device according to claim 9, in which said rigid flange element is tapered rearwardly toward said non-attached peripheral portion.

12. An inflatable aquatic apparatus for use by a swimmer, comprising:

first and second inflatable chambers, each including a respective valve for permitting said inflatable chamber to be inflated and deflated, each including a flexible sheet element attached to said inflatable chamber substantially around its periphery and including a non-attached peripheral portion adapted to receive a hand of the swimmer, said flexible sheet element including a plurality of apertures through which fingers and thumb of the hand can protrude after being received therein, and each including a planar flange element, attached to said inflatable chamber along the peripheral portion thereof coextensively with said flexible sheet element, said flange element being adapted to be substantially flat when said inflatable chamber is uninflated and being curved downwardly relative to said flexible sheet element when said inflatable chamber is inflated; and

an elongate interconnecting element attached to said first and second inflatable chambers, and including a central aperture arranged to receive therethrough the head of the swimmer.

13. An inflatable aquatic apparatus according to claim 12, in which said interconnecting element includes at least one inflatable chamber integrally formed therewith, and means for inflating and deflating said at least one inflatable chamber.

Fig.1

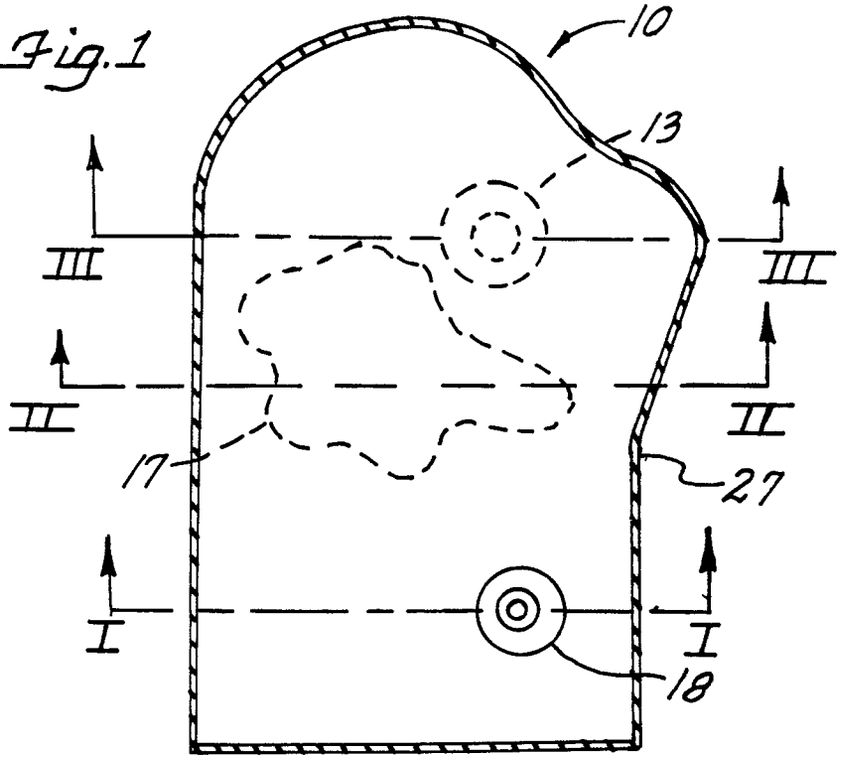


Fig.2

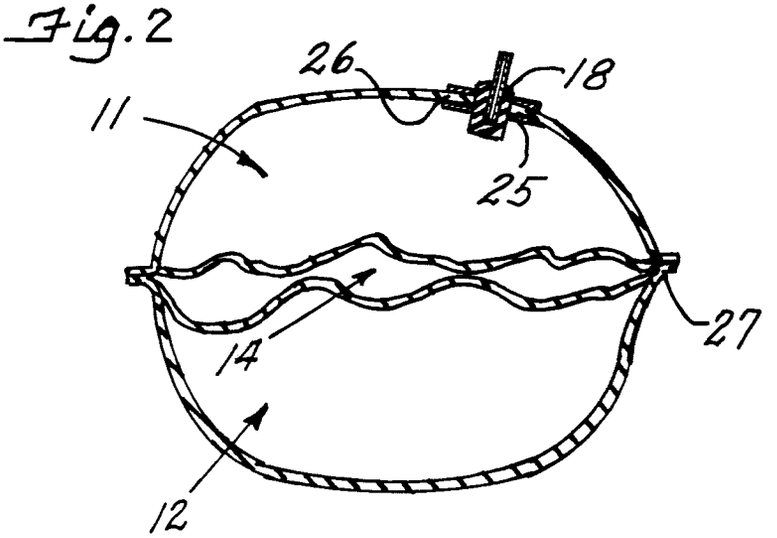


Fig. 3

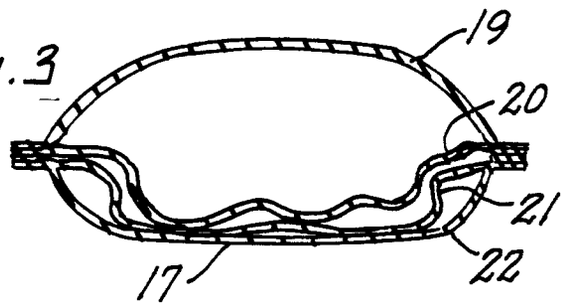


Fig. 4

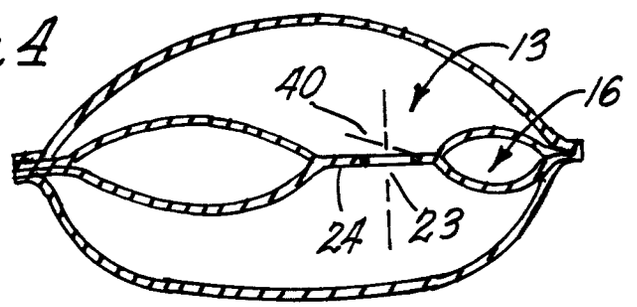


Fig. 5

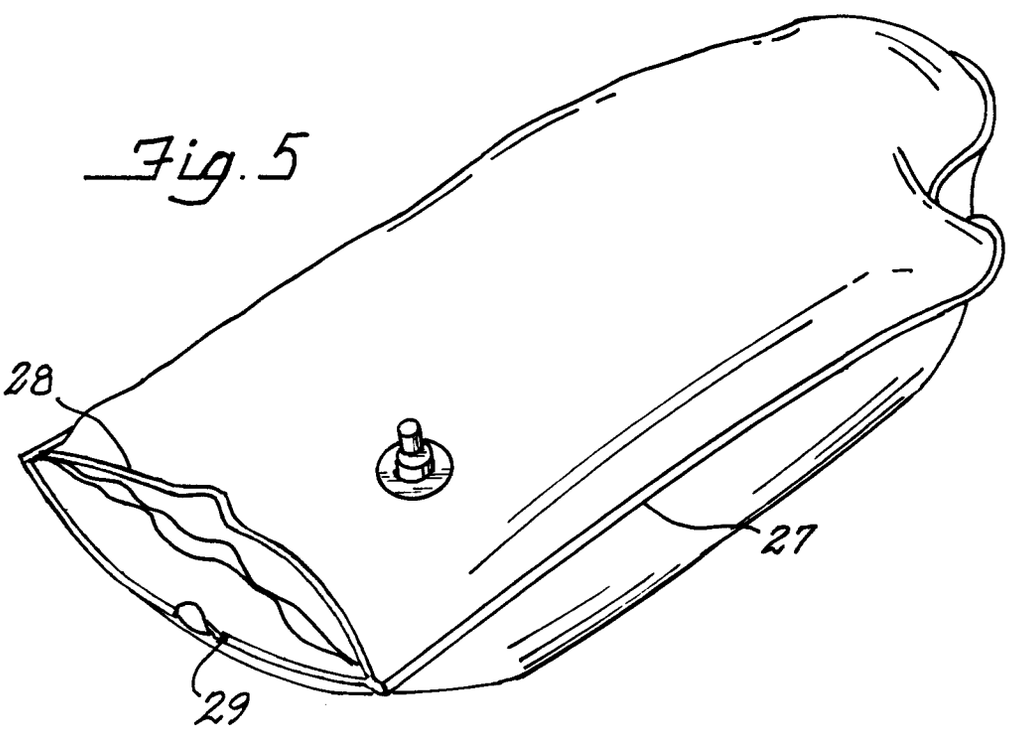


Fig. 6

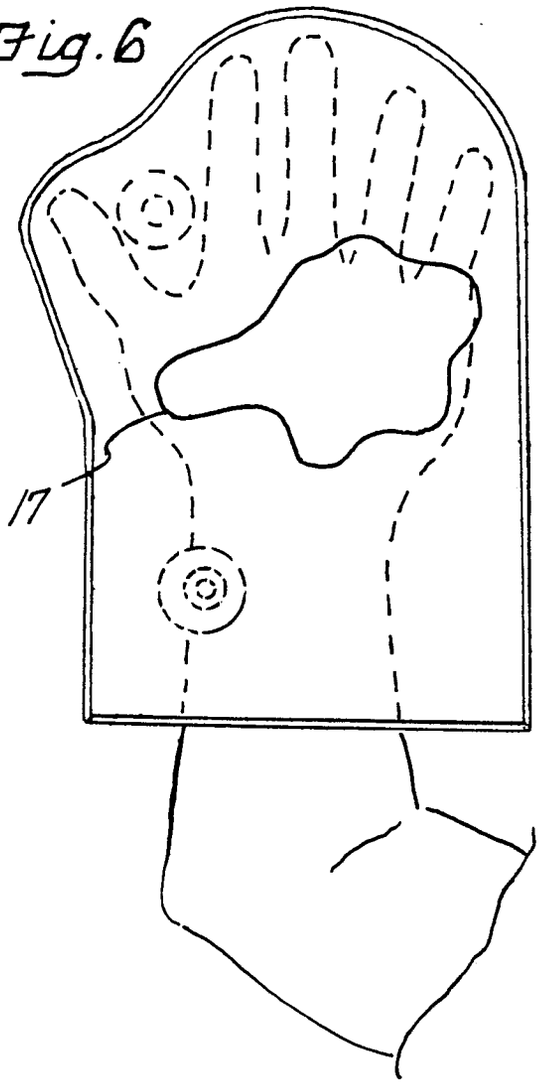


Fig. 7

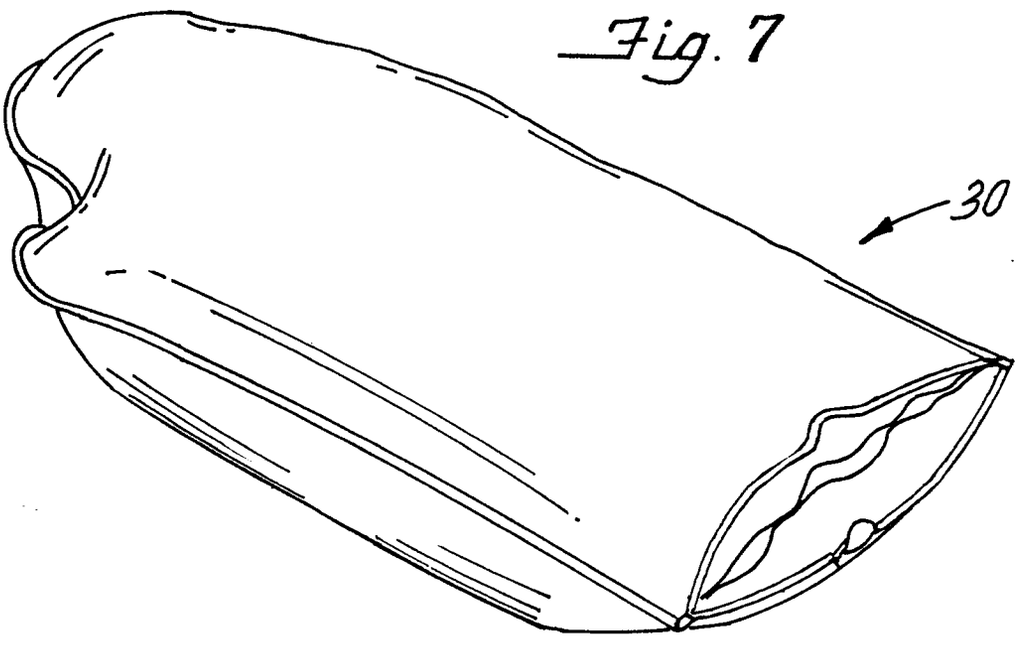


Fig. 8

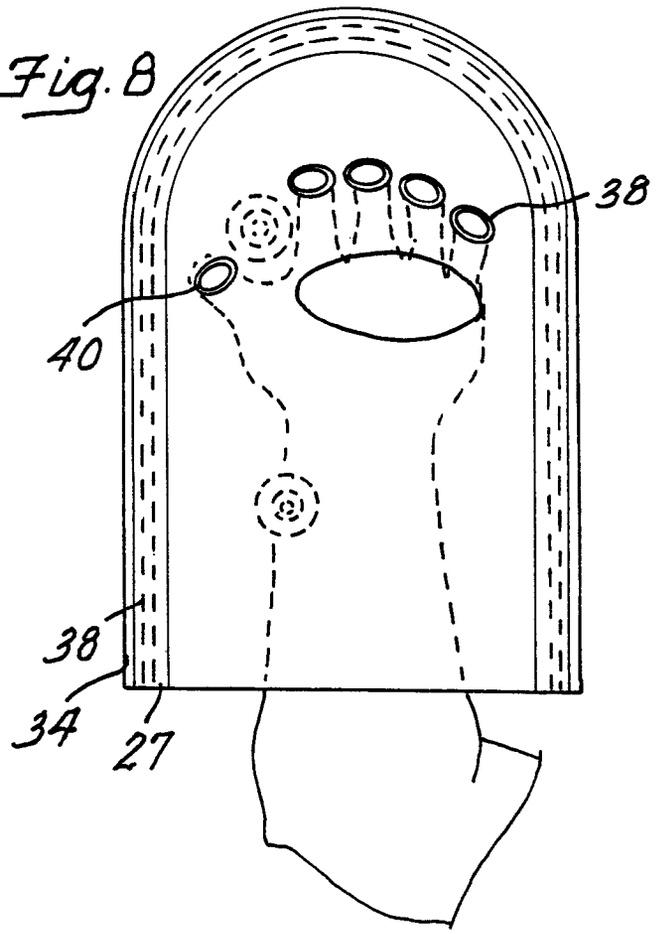
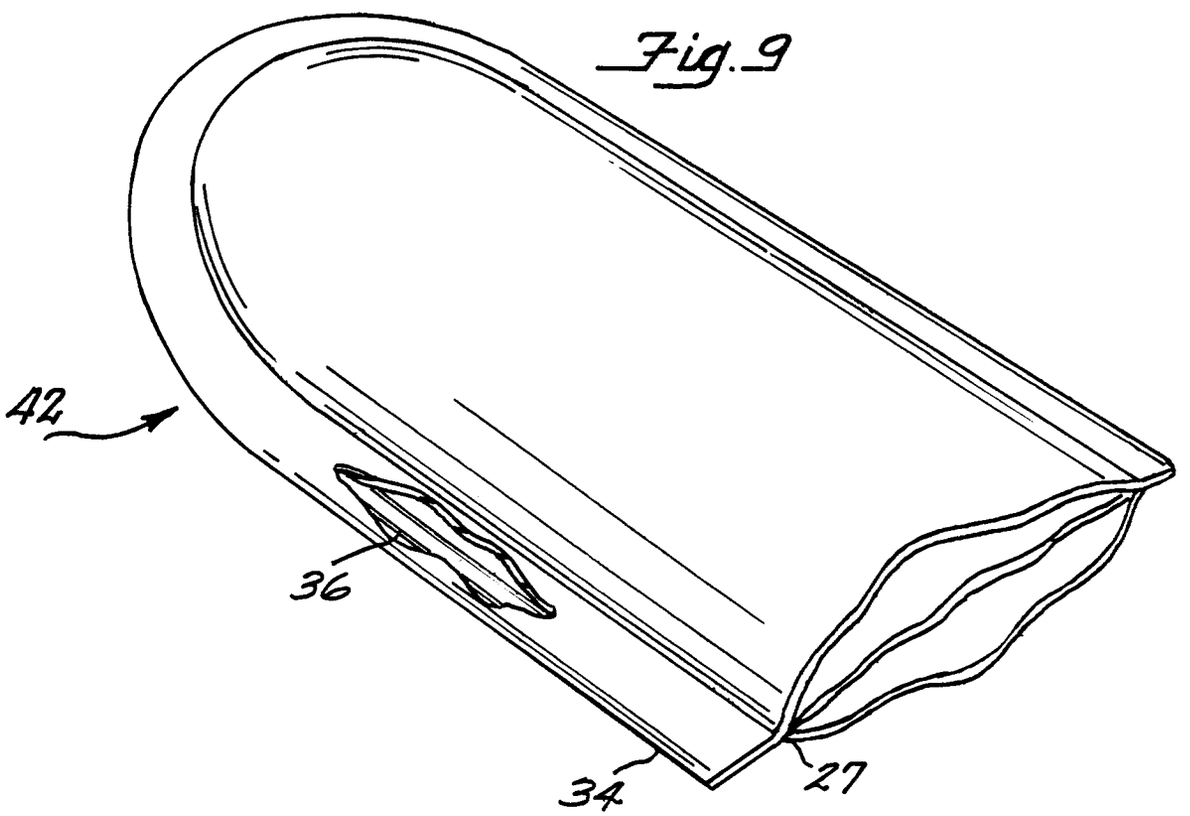


Fig. 9



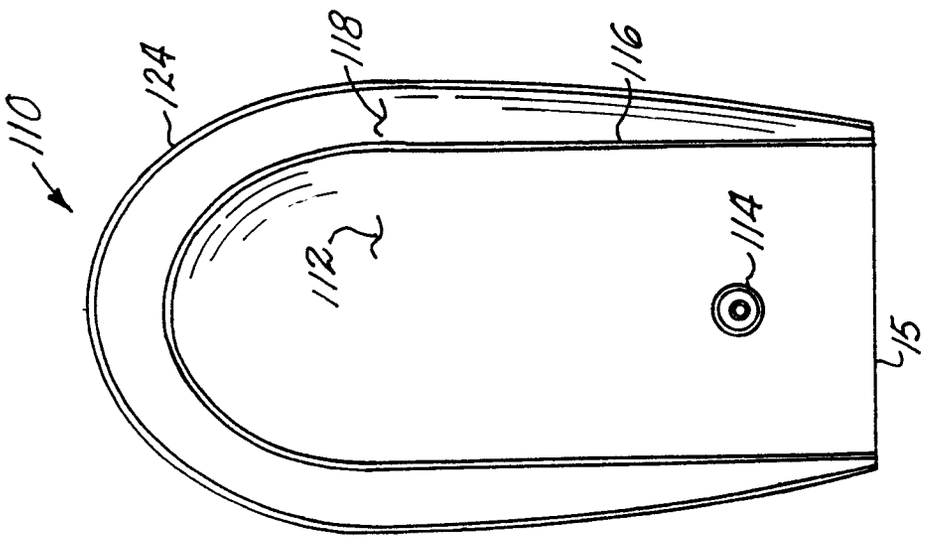


Fig. 10

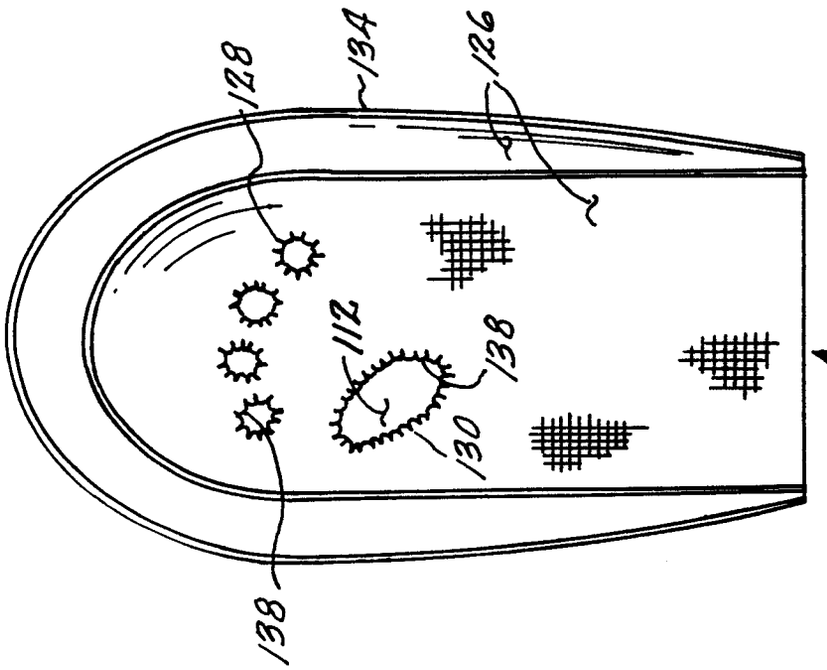


Fig. 11

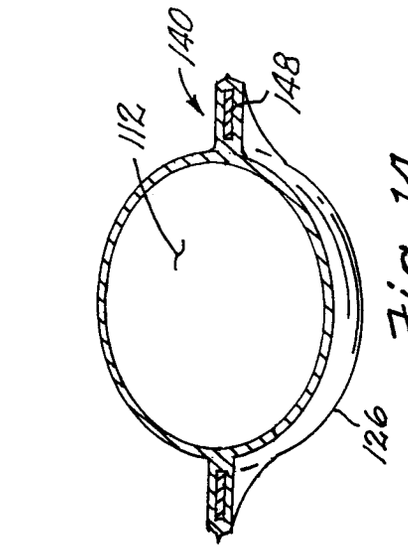


Fig. 14

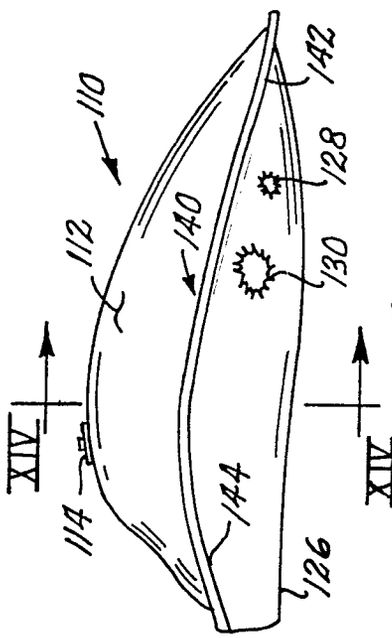


Fig. 13

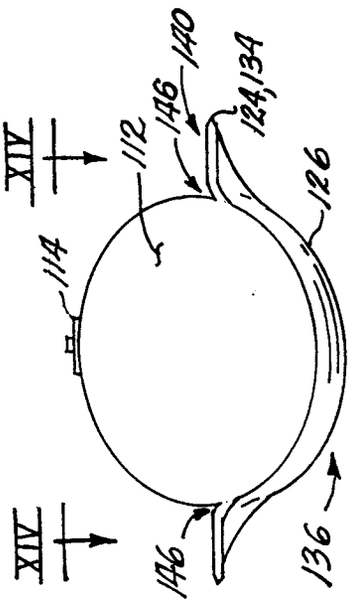


Fig. 12

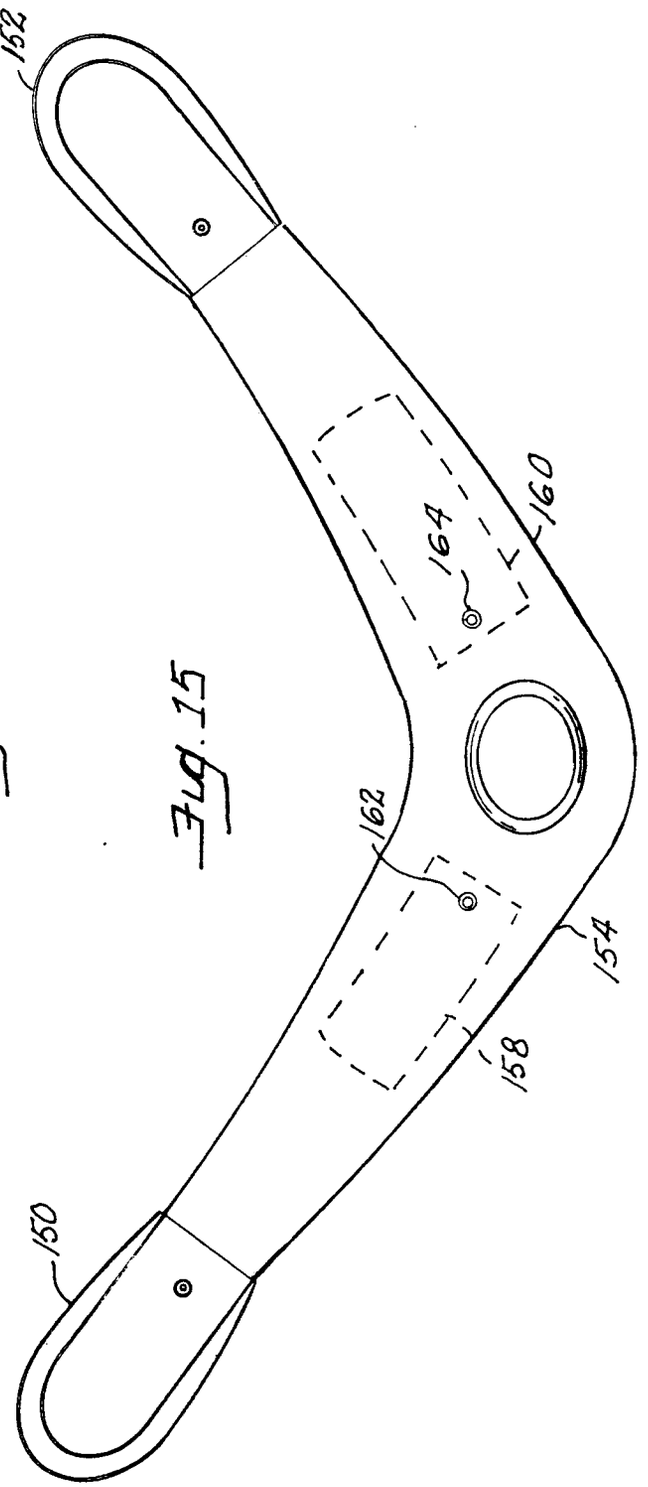


Fig. 15