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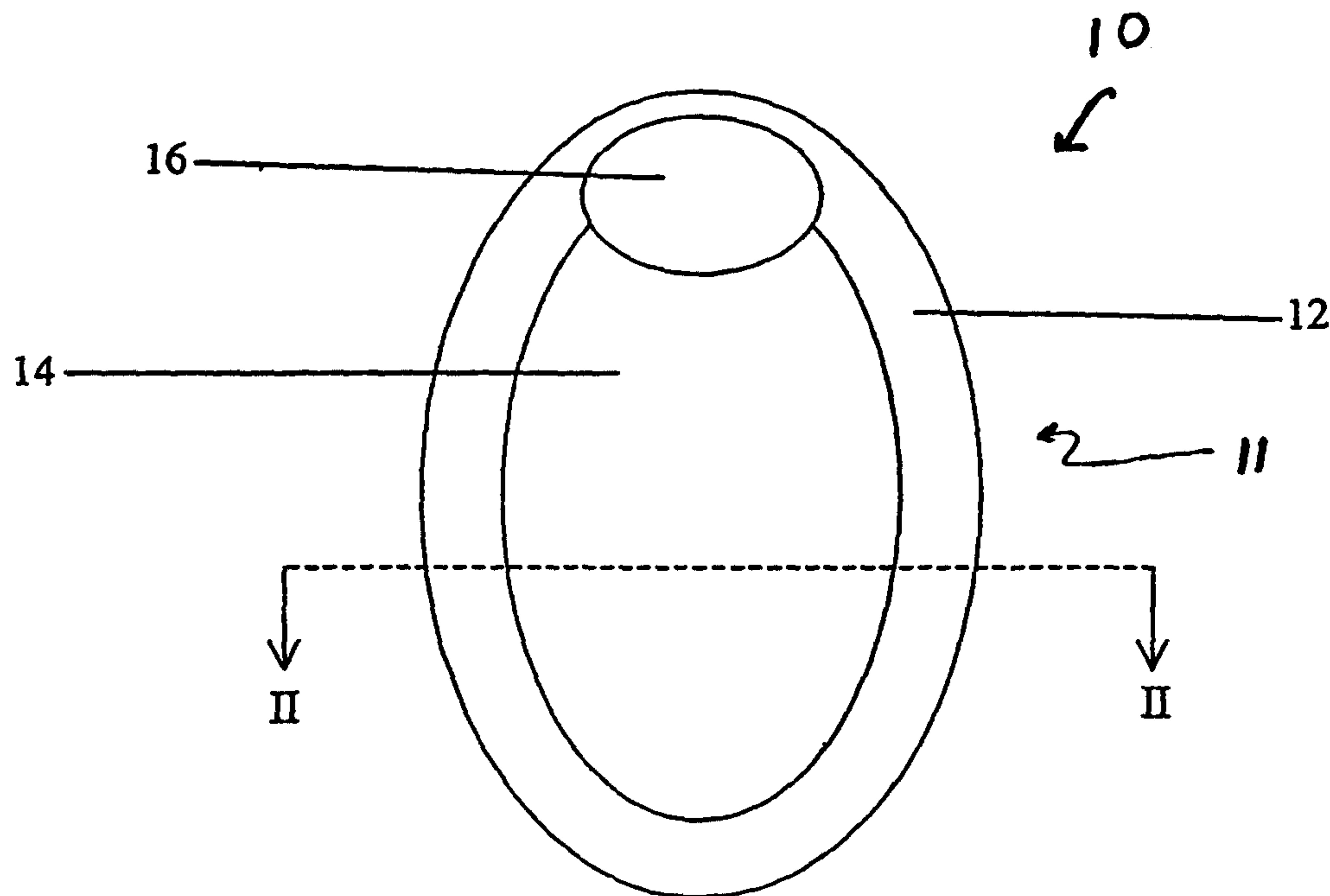
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(54) Title: COLLAPSIBLE FLOTATION DEVICE



(57) Abrégé/Abstract:

A collapsible flotation device has an uncollapsed configuration and a collapsed configuration. The device includes a spring (18) that is formed to coil in upon itself by folding to achieve the collapsed configuration of the device and which is biased towards the uncoiled configuration. The spring is located along the perimeter of the device in a pocket formed along the perimeter of a panel (11) of flexible material or on the external perimeter of the device. Also located within the pocket are one or more inflation chambers (20) that are inflated to provide buoyancy. Additional or alternate pockets that include inflatable chambers may be located in the central portion of the flexible panel.



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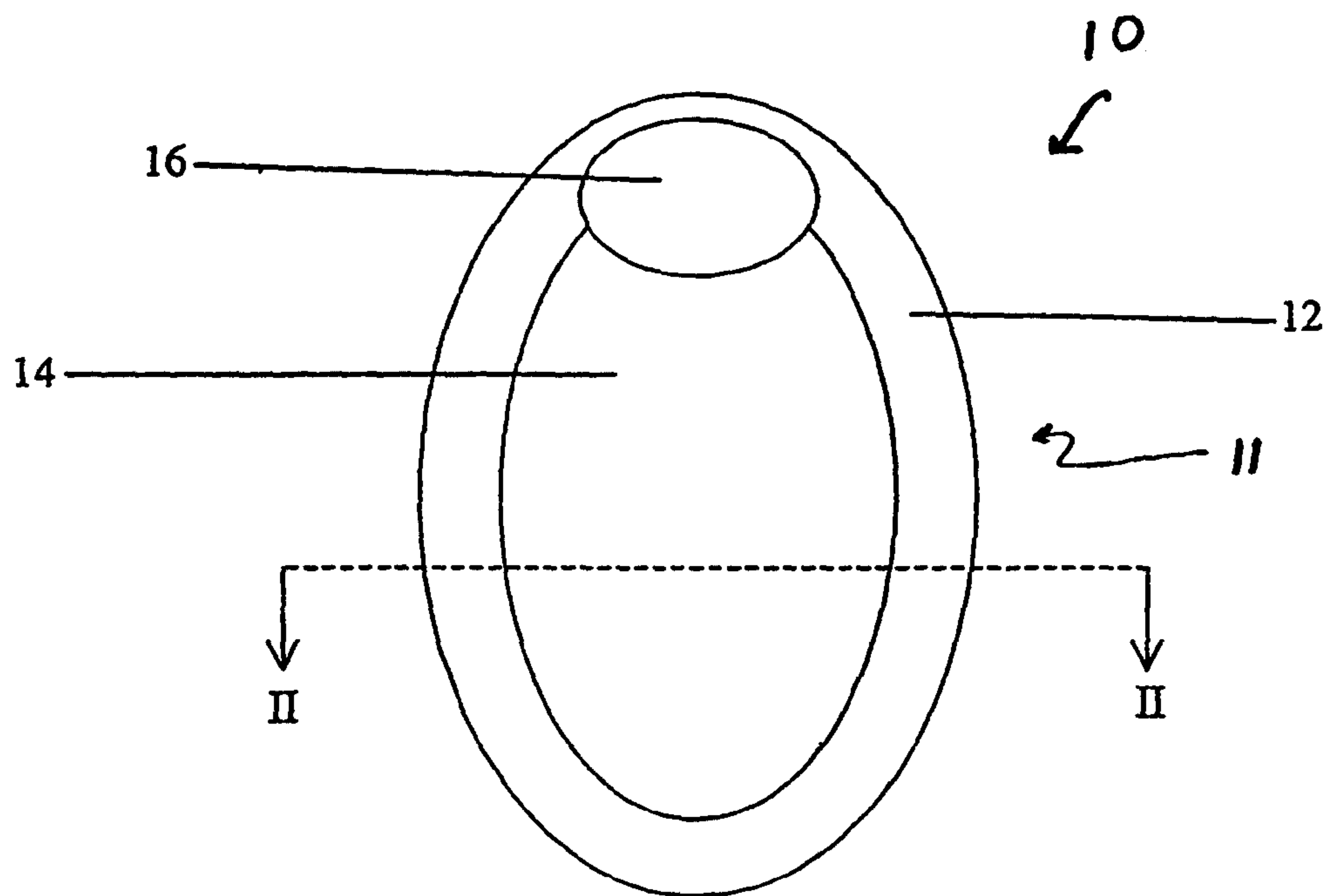
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## COLLAPSIBLE FLOTATION DEVICE

### BACKGROUND OF THE INVENTION

#### 5 1. Field of the Invention

The present invention relates to inflatable devices. In particular, the present invention relates to inflatable devices that are collapsible through the use of a perimeter spring mechanism.

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#### 2. Description of the Related Art

Inflatable devices are well known in the form of floats, rafts, lifeboats, life preservers and similar devices. Previously known devices generally maintain their shape through air pressure alone and generally collapse when deflated. Also well known in the art are collapsible items that are collapsible through the use of a collapsible spring, made, for example, from metal, plastic, or fiberglass.

Collapsible springs are typically retained or held within fabric sleeves provided along the edges of a piece of fabric or other panel. The collapsible springs may be provided as one continuous loop, or may be a strip or strips of material connected at the ends to form a continuous loop. These collapsible springs are usually formed of flexible coilable steel, although other materials such as plastics and fiberglass are also described. The collapsible springs are usually made of a material that is relatively strong and yet is flexible to a sufficient degree to allow it to be coiled. Thus, each collapsible spring is capable of assuming two configurations, a normal uncoiled or expanded configuration, and a coiled or collapsed configuration in which the spring is collapsed into a size that is much smaller than its uncoiled (or expanded) configuration. The springs may be retained within the respective fabric sleeves without being connected thereto. Alternatively, the sleeves may be mechanically fastened, stitched, fused, or glued to the springs to retain them in position.

## SUMMARY

A collapsible flotation device includes a coilable spring and a flexible panel.  
5 Along the outer edge of the flexible panel is a perimeter sleeve into which the coilable spring and at least one inflatable bladder are placed. The coilable spring can be made from steel that has been treated such that it is resistant to water damage or the coilable spring can be made from a waterproof material. The flexible panel can be made from any material that is appropriate for use in the water such as nylon. Alternatively, the  
10 flexible panel can be constructed from multiple materials. For example, the perimeter sleeve can be made from nylon while the central portion can be made from mesh material. The inflatable bladders are made from any appropriate material and are, for example, puncture resistant. Each bladder includes a means for inflating and deflating the bladder such as a valve. The flotation device can also include a pillow section to  
15 provide buoyant support for a user's head. The pillow section includes an inflatable chamber to form the pillow. The spring can be placed within the perimeter sleeve of the flexible panel, or can be mechanically attached to the outer edge of the flexible panel.

## 20 BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a top plan view of an embodiment of the collapsible flotation device of the present invention;

Figure 2 is a cross sectional view of the collapsible flotation device of Figure 1  
25 taken along line II-II of Figure 1;

Figure 3 is a view of a sleeve with joined ends of a coilable spring as used in one embodiment of the present invention;

Figure 4 is a top plan view of an alternative embodiment of the collapsible flotation device of the present invention;

30 Figure 5 is a top plan view of another alternative embodiment of the collapsible flotation device of the present invention;



Figure 6 is a cross sectional view of the alternative embodiment of the present invention across line VI-VI of Figure 5; and

Figure 7 is a top plan view of a further alternative embodiment of the collapsible floatation device of the present invention.

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## DETAILED DESCRIPTION

Figures 1-7 illustrate embodiments of a collapsible floatation device. Each of the embodiments of the collapsible floatation device includes a coilable metal or plastic  
10 spring 18. The coilable spring 18 can be made from other materials, for example, a material that is strong and flexible. The spring 18 can be coilable such that it folds on top of itself to become more compact. In its uncoiled state, the coilable spring 18 can be round or oval or any satisfactory shape. Because it is to be used in water, the coilable spring can be, for example, either manufactured from a waterproof material or  
15 coated to protect any material that is not waterproof. The coilable spring 18 can be a single continuous element or can include a joining means, such as a sleeve, for joining the ends of one or more spring elements together. The coilable spring 18 can be of any appropriate shape and dimension. The coilable spring 18 also has memory such that is biased to return to its uncoiled configuration when not held in the coiled configuration.

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Stretched across the coilable spring 8 is a flexible panel 11. The flexible panel 11 can be one continuous piece of material or can be made up of several different types of material. The panel 11 includes a central portion 14 and a perimeter portion 15. In one embodiment, the central portion 14 of the flexible panel is mesh, or another  
25 material permeable or semi-permeable to a liquid, to allow water to flow through while the perimeter edges are impermeable to liquid, such as nylon or polyester. At the edges of the flotation device, the material is a double thickness, forming a sleeve 12 around the perimeter of the flotation device 10. One or more inflatable bladders 20 are disposed in the sleeve 12. One inflatable bladder 20 may surround the entire perimeter  
30 of the flotation device 10 or it may be divided into two or more inflatable bladders 20 with each inflatable bladder 20 having a means for inflating and deflating the inflatable bladder 20. In the illustrated embodiment of the invention, one inflatable bladder 20 is

specifically dimensioned and positioned to accommodate a user's head. In this embodiment, the sleeve 12 is wider along a small portion of the perimeter of the flotation device 10 to allow for a wider inflatable bladder 20. This will prevent the user's head from sinking below the rest of the user's body. The size of the inflatable bladder 20 can vary significantly and need only be as wide as necessary to support the body weight of a user disposed on the panel 11. The inflatable bladder 20 can be, for example, 3 inches in diameter when inflated. The inflatable bladder 20 can be made from any material and can be a material that is resistant to punctures. The coilable spring 18 may also be located within the perimeter sleeve 12. If one inflatable bladder 20 is selected, the coilable spring 18 can be placed inside or outside the inflatable bladder 20. If multiple inflatable bladders 20 are used, the coilable spring 18 can be outside the inflatable bladders 20 along the edge of the perimeter sleeve 12. Alternatively, the coilable spring 18 may be located outside the perimeter sleeve 12 along the outer edge of the flotation device 10. The coilable spring 18 may be attached to the flexible panel 11 through mechanical means such as fastening, stitching, fusing, or gluing.

An embodiment of the flotation device 10 is shown in Figures 1 and 2 in its expanded configuration. The perimeter sleeve 12 of the flexible panel 11 can be nylon while the central portion 14 of the flexible panel 11 can be made from a mesh material. Because the mesh material in the central portion 14 is permeable to liquid, when the device 10 is placed in the water with the bladders 20 in the inflated configuration, the majority of the user's body that is disposed on the central portion is located below the surface of the water. The buoyancy provided by the bladders 20 and the pillow 16 keep the remainder of the user's body above the surface of the water. The pillow 16 is part of the perimeter sleeve 12 and includes a double layer of fabric to accept an inflatable chamber 20 between the layers of fabric. In this particular embodiment, two inflatable chambers 20 are disposed in the perimeter sleeve 12 of the flotation device 10 and one is disposed in the pillow portion 16, each of which includes a means for inflating the inflatable chamber 20. The inflation means can be, for example, a valve (not shown) on the underside of the flotation device 10. The inflatable bladders 20 in the perimeter

sleeve 12 of the flotation device 10 expand to approximately a 3-inch diameter when inflated.

5 The coilable spring 18 is made from flexible, collapsible steel and is coated with a layer of PVC 22 to protect the coilable spring 18 from corroding and rusting due to contact with water during normal use of the flotation device 10. In an alternative embodiment, the coilable spring 18 can be made of plastic or fiberglass. The coilable spring 18 also can have memory such that it will open to its uncoiled configuration when not held in the coiled configuration. The coilable spring 18 can be a unitary  
10 element or can include sleeves 24 for joining the ends of one or more elements as shown in Figure 3 in which the ends of the coilable spring 18 within the sleeve 24 are shown in dashed lines for clarification.

In a further embodiment of the invention illustrated in Figure 4, a collapsible  
15 flotation device 110 can include inflatable bladders 126 which cross the panel 111. In the illustrated embodiment, while the bladders 126 may keep a greater part of the user's body above the surface of the water, a portion of the user's body that is disposed on the mesh central portion 114 may be located below the surface of the water.

20 Figures 5 and 6 show a further alternative embodiment of the present invention in which a device 210 includes a coilable spring 218 that is attached externally to the perimeter of the sleeve 212 of the flexible panel 211 through the use of a mechanical coupling. In this particular embodiment, loops 228 can be used to attach the coilable spring 218 to the sleeve 212 of the flexible panel 211.

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In a further embodiment of the invention illustrated in Figure 7, the collapsible flotation device 310 includes a pillow portion 316 that is separated from the perimeter sleeve 312. The pillow portion 316 includes an inflatable bladder 322 that includes a valve (not shown) to inflate and deflate the bladder 322. In the illustrated embodiment,  
30 the inflatable bladder that is disposed in the perimeter sleeve 312 need not be a continuous loop. For example, the inflatable bladder 320 in the perimeter sleeve 312 may extend substantially around the perimeter of the collapsible flotation device 310,



but not completely around the perimeter. In such an embodiment, the inflatable bladder 320 disposed in the sleeve 312 would be closed at both ends and could extend throughout the perimeter sleeve 312 around the central portion 314 but need not surround the pillow portion 316. In this embodiment, the inflatable bladder 322 in the pillow portion 316 provides sufficient buoyancy to support at least the user's head and the inflatable bladder 320 in the perimeter sleeve 312 provides sufficient buoyancy to support the body weight of the user. In some embodiments, the inflatable bladder can provide sufficient buoyancy to support some of the weight of the user in addition to the user's head (e.g., the user's shoulders).

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Note that the sufficient buoyancy to support the body weight of the user can differ for various embodiments depending on the desired effect. More specifically, by pre-selecting the size of the inflatable bladder and/or pillow, the extent to which a user's body is in or out of the water can be controlled (depending, of course, on variations of user body weights). In addition, the tautness or looseness of the panel, as well as its elasticity when in the expanded (or uncoiled) configuration can also control the extent to which a user's body is in or out of the water. In sum, the size of the inflatable bladder and pillow, the tautness/looseness of the panel, and the elasticity of the panel can be used alone or in combination to control the extent to which the user's body is in or out of the water.

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Moreover, in the embodiment of the collapsible floatation device illustrated in Figure 7, the central portion 314 may be constructed from multiple materials such that only a portion of the central portion is permeable to liquid. The mesh material that extends across the central portion 314 may either be taut or loose when the panel 11 is in the expanded configuration.

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Additionally, a layer of mesh material can cover the pillow portion 316 to provide a matching ornamentation of the pillow portion 316 and center portion 314.

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While the description above refers to particular embodiments of the present invention, it will be understood that many modifications may be made without

departing from the spirit thereof. The accompanying claims are intended to cover such modifications as would fall within the true scope and spirit of the present invention.

1. A collapsible device, comprising:
  - a panel having a central portion and a perimeter sleeve, said panel being permeable to a liquid;
  - a spring coupled to the panel and moveable between a coiled and an uncoiled configuration; and
  - an inflatable bladder disposed circumferentially about, and being encapsulated within, at least a portion of said perimeter sleeve, said inflatable bladder configured to support a body weight of a user disposed on the panel.
2. A collapsible floatation device, comprising:
  - a panel having a central portion and a perimeter portion;
  - a coilable spring coupled to the panel; and
  - an inflatable bladder offset from at least a portion of said coilable spring, coupled to the panel and configured to support a body weight of a user disposed on the panel.
3. The collapsible floatation device of claim 2, wherein said inflatable bladder is encapsulated within a perimeter sleeve defined by said perimeter portion.
4. The collapsible floatation device of claim 3, wherein said coilable spring is disposed within at least a portion of said perimeter sleeve.
5. The collapsible floatation device of claim 3, wherein said coilable spring is disposed within at least a portion of said inflatable bladder.
6. The collapsible floatation device of claim 2, wherein said coilable spring is coupled to said perimeter portion.

7. The collapsible floatation device of claim 2, further comprising a sleeve extending through said central portion, said inflatable bladder being disposed within at least a portion of said sleeve extending through said central portion.
8. The collapsible floatation device of claim 2, said inflatable bladder being a first inflatable bladder, further comprising:
  - a pillow section configured to encapsulate a second inflatable bladder.
9. A collapsible device, comprising:
  - a panel having a central portion and a perimeter sleeve;
  - a coilable spring coupled to the panel; and
  - an inflatable bladder disposed circumferentially about, and being encapsulated within, at least a portion of said perimeter sleeve.
10. The collapsible device of claim 9, wherein said spring is moveable between a coiled configuration and an uncoiled configuration.
11. The collapsible device of claim 9, wherein said inflatable bladder is configured to support the body weight of a user.
12. The collapsible device of claim 9, wherein said coilable spring is disposed within at least a portion of said perimeter sleeve.
13. The collapsible device of claim 9, wherein said coilable spring is disposed within at least a portion of said inflatable bladder.
14. The collapsible device of claim 9, wherein said coilable spring is coupled outside of said perimeter sleeve and outside of a perimeter of the panel.



15. The collapsible device of claim 9, further comprising:  
a pillow section configured to encapsulate at least a portion of said inflatable bladder.
16. The collapsible device of claim 9, said inflatable bladder being a first inflatable bladder, further comprising:  
a pillow section configured to encapsulate a second inflatable bladder.
17. The collapsible device of claim 9, wherein said panel is configured to allow water to flow through said central portion.
18. A collapsible device, comprising:  
a panel having a central portion and a perimeter sleeve;  
a coilable spring coupled to said panel; and  
a plurality of inflatable bladders disposed circumferentially about, and being encapsulated within, at least a portion of said perimeter sleeve, the plurality of inflatable bladders include a first inflatable bladder and a second inflatable bladder being disposed on opposite sides of the panel.
19. The collapsible device of claim 18, wherein said coilable spring is disposed within at least a portion of said perimeter sleeve.
20. The collapsible device of claim 18, wherein said coilable spring is coupled outside of said perimeter sleeve and outside of a perimeter of said panel.
21. The collapsible device of claim 18, further comprising:  
a pillow section configured to encapsulate one of said plurality of inflatable bladders.
22. A device, comprising:  
a panel having a central portion and a perimeter sleeve;

- 11 -

a spring moveable between a coiled configuration and an uncoiled configuration, said spring disposed within at least a portion of said perimeter sleeve; and

an inflatable bladder having its own perimeter, at least a portion of which is offset from said spring.

23. A device, comprising:

a spring configured to form a closed loop, the spring being moveable between a coiled configuration and an uncoiled configuration and defining an interior area within at least a portion of the closed loop; and

an inflatable bladder coupled to said spring and being disposed circumferentially within said interior area.

24. The device of claim 23, said inflatable bladder defining a second interior area, further comprising:

a panel coupled within said second interior area.

25. The device of claim 24, wherein said panel is permeable to a liquid.

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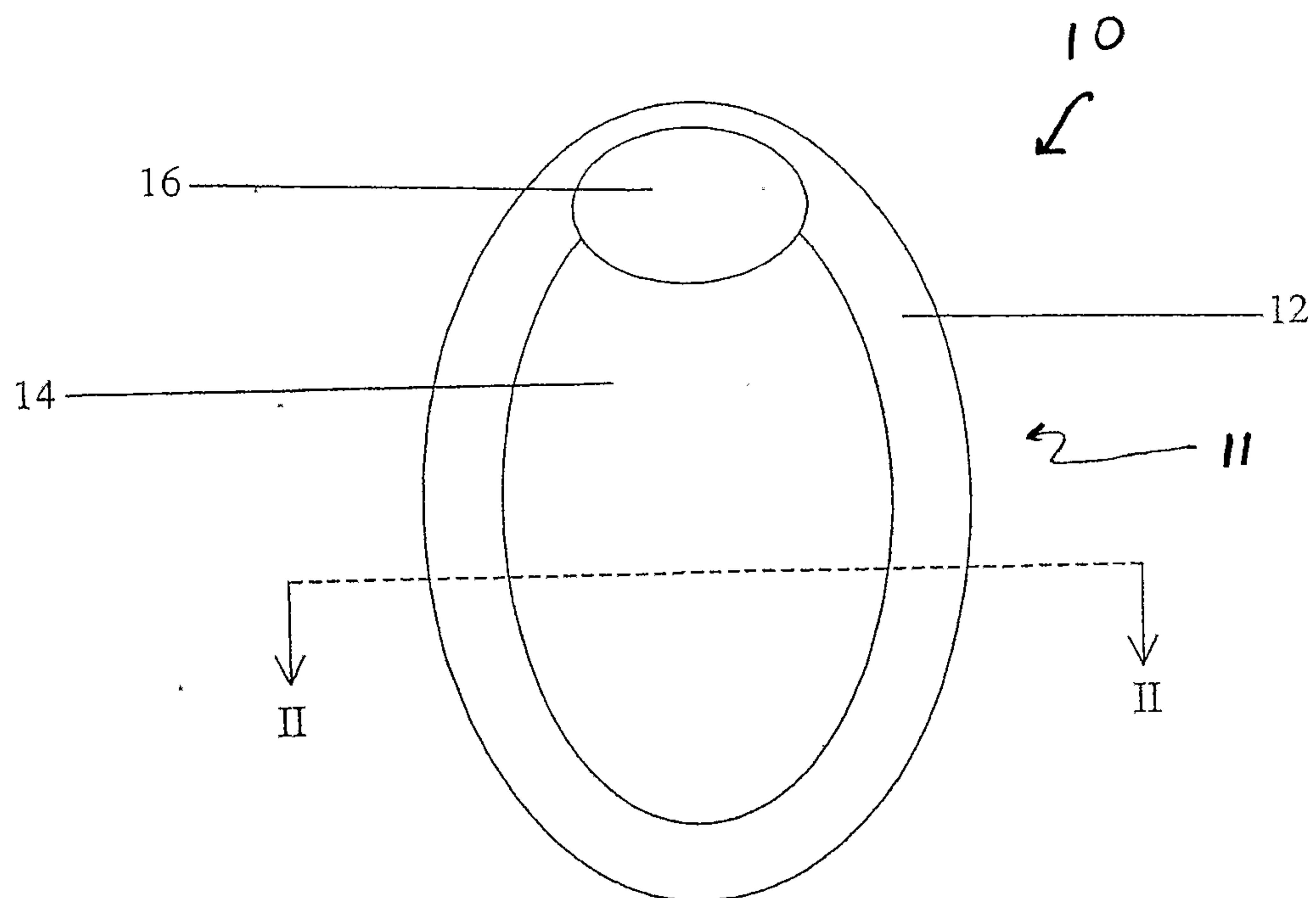


Fig. 1

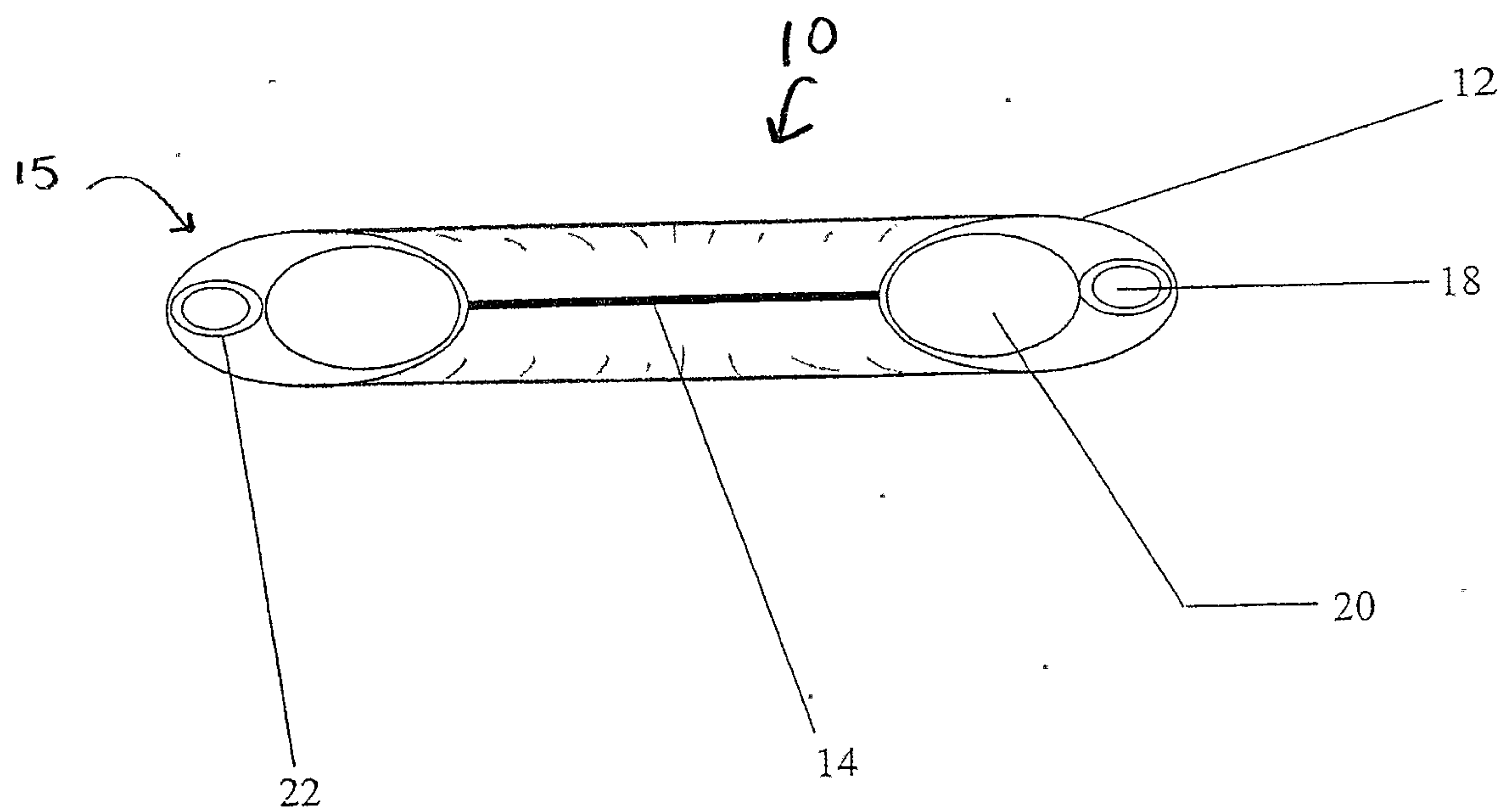


Fig. 2

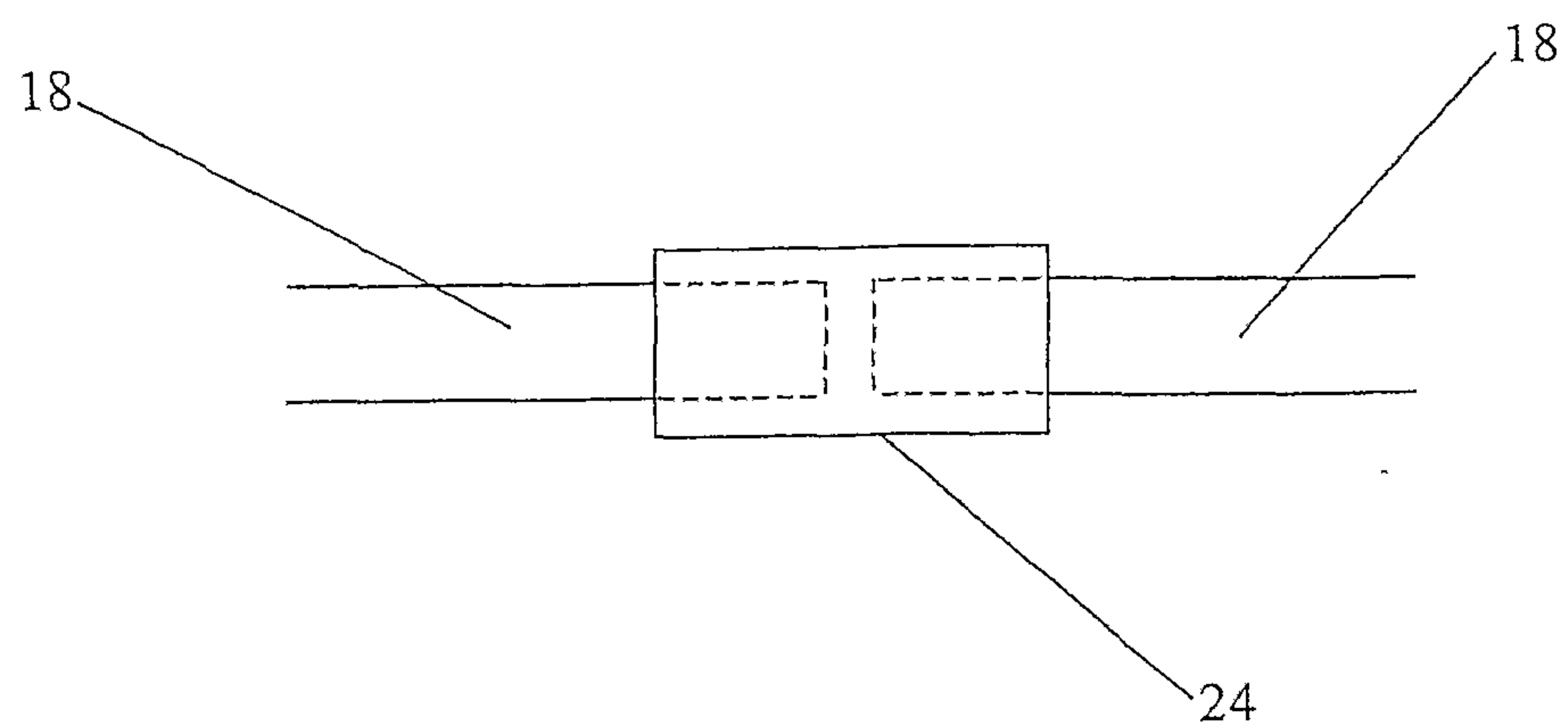


Fig. 3

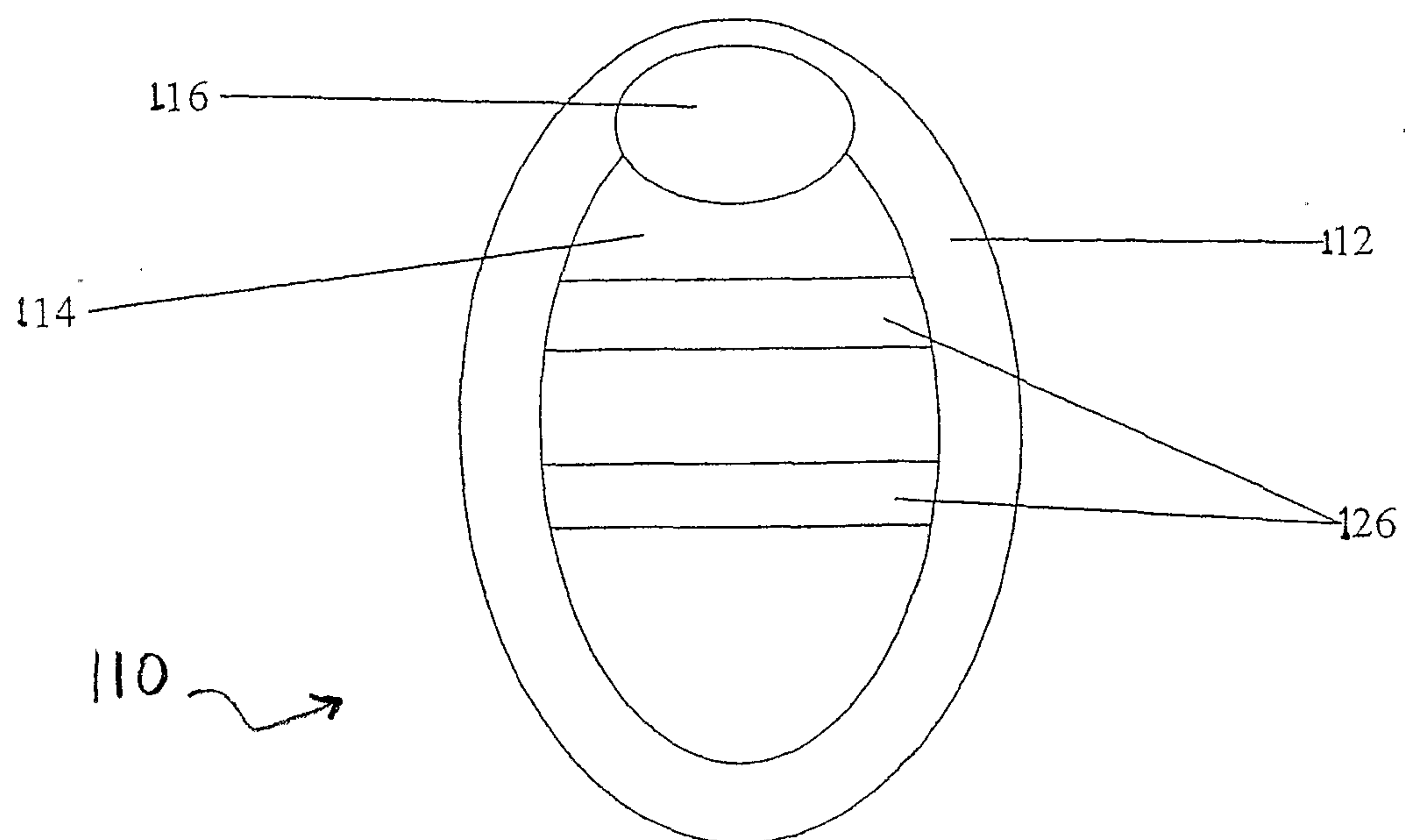


Fig. 4



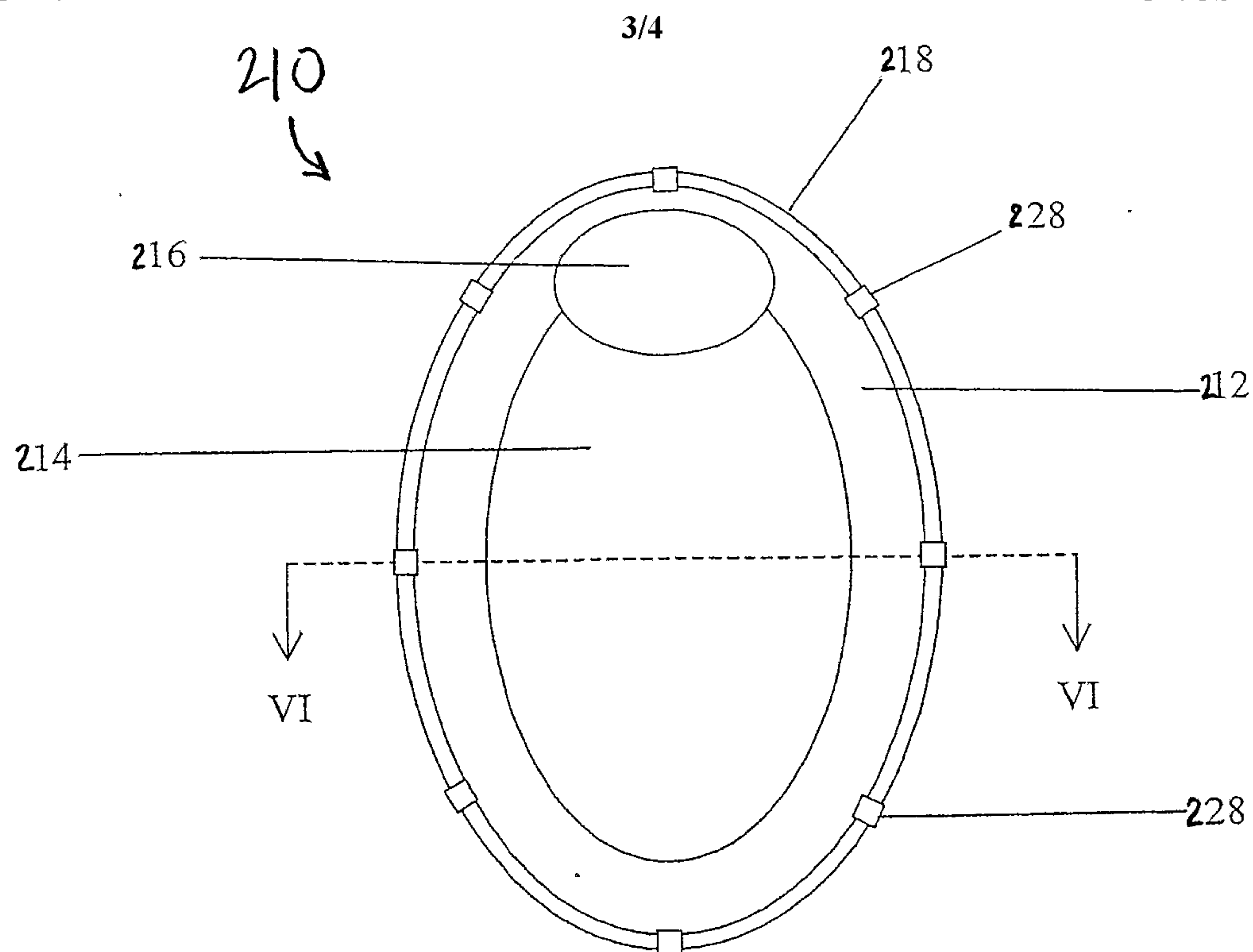


Fig. 5

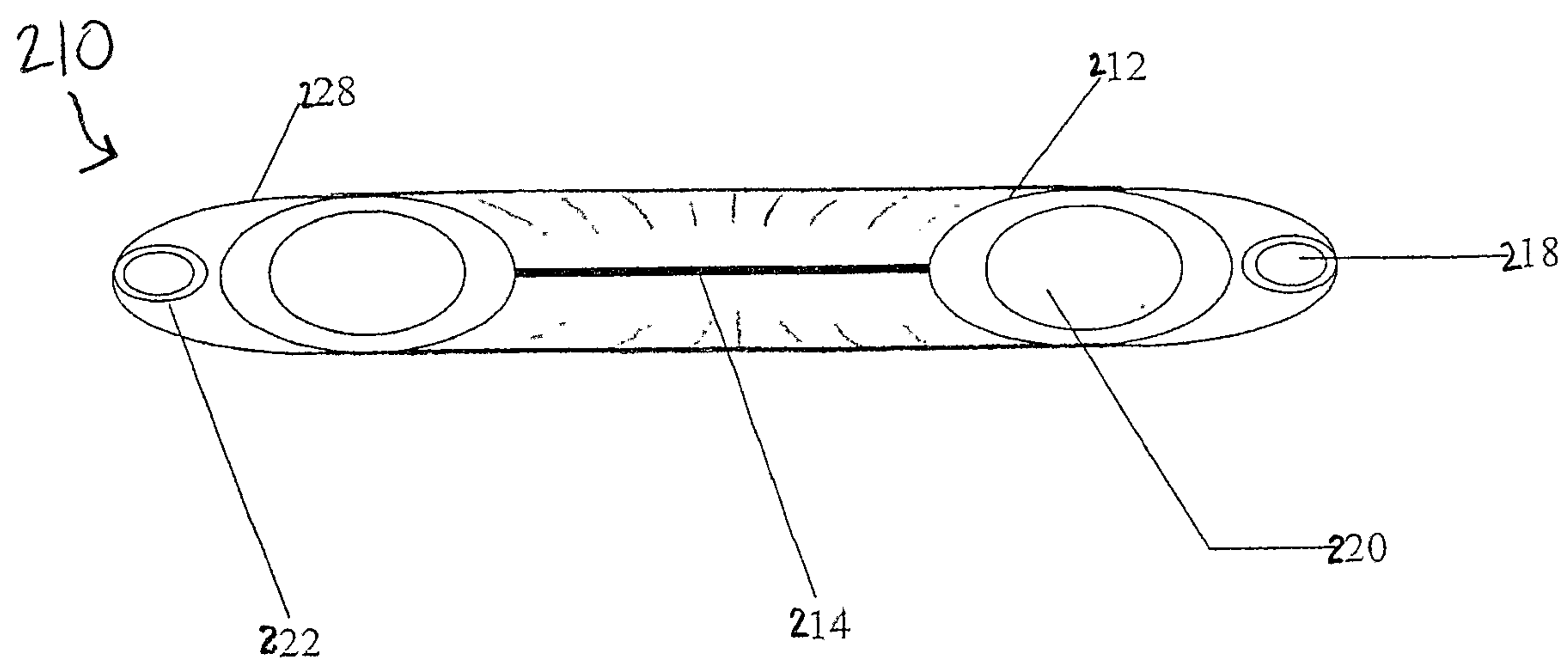


Fig. 6

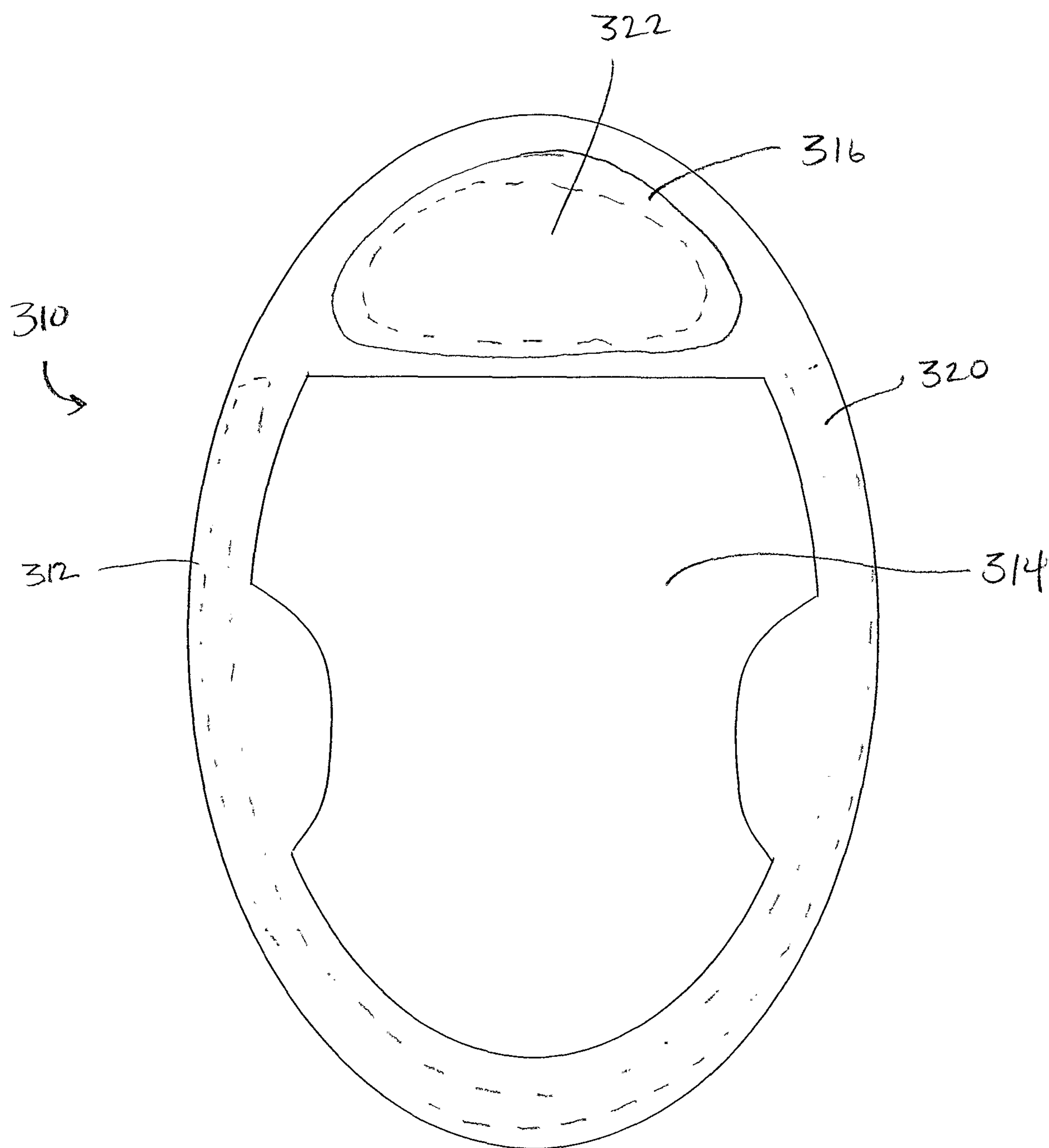


FIGURE 7

