

[54] **FLOTATION SLEEVES**

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[51] **Int. Cl.** **B63c 9/12**

[58] **Field of Search** 9/344, 340, 339, 338, 336,
9/337, 342, 329; D71/1 FF, 1 HH

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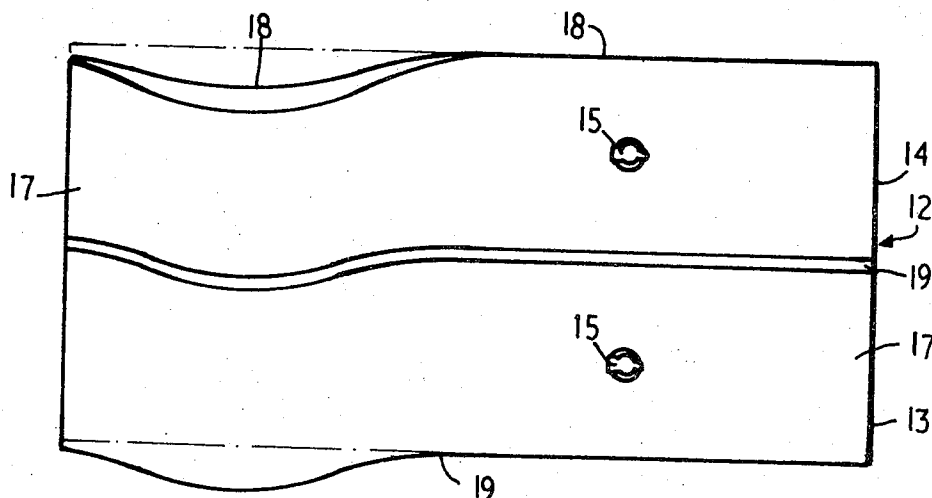
Attorney, Agent, or Firm—Eric H. Waters

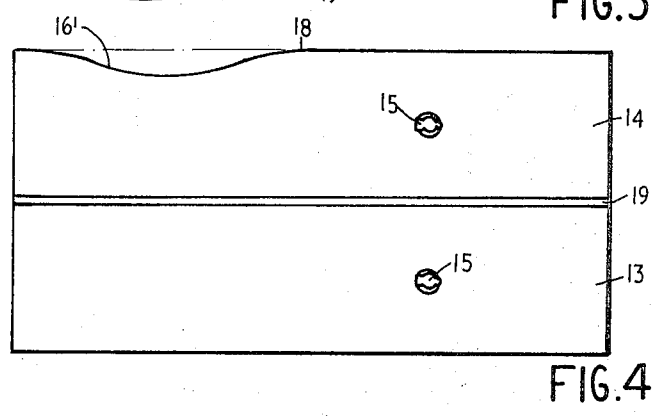
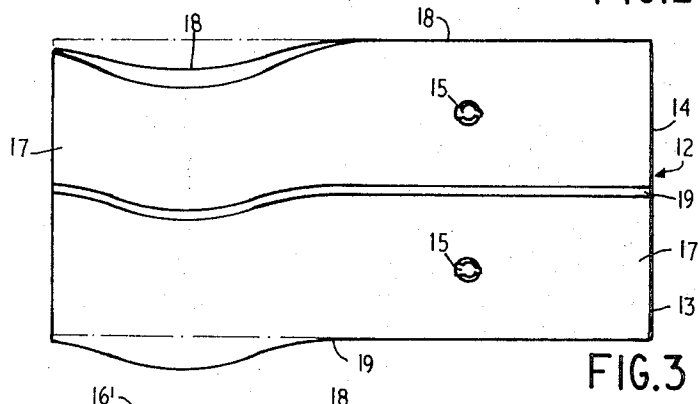
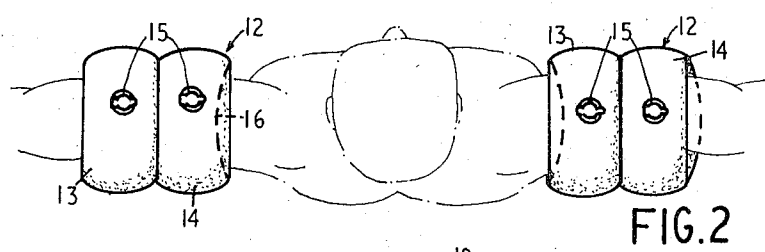
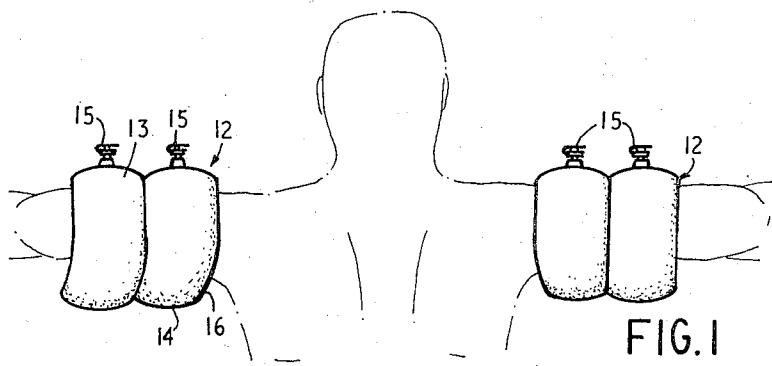
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ABSTRACT

An inflatable flotation sleeve adapted to be worn on the upper arm of the user. It includes at least one continuous generally tubular closed structure formed in a fluid impervious flexible resilient material and fluid valve means providing access to the structure for inflation thereof. The structure is adapted to surround the user's upper arm and includes a substantial portion adapted to be located on the arm adjacent the body, this portion being shaped so as to substantially reduce any bodily encumbrance thereby.

4 Claims, 13 Drawing Figures





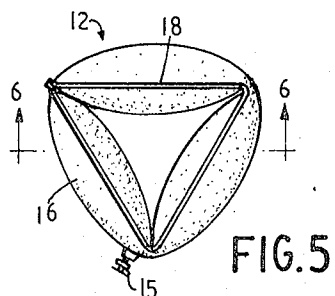


FIG. 5

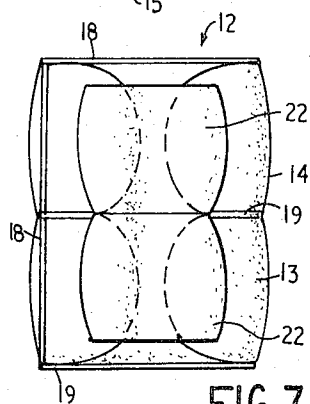


FIG. 7

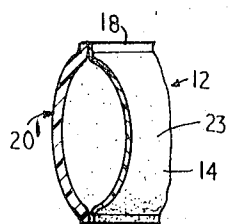


FIG. 9

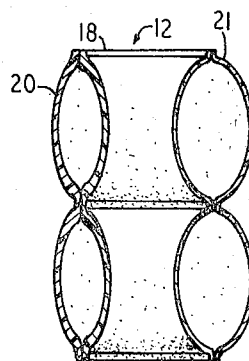


FIG. 6

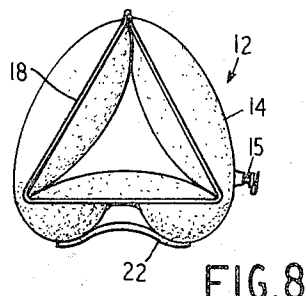


FIG. 8

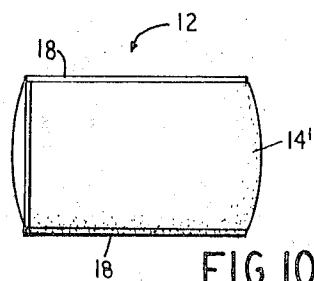


FIG. 10

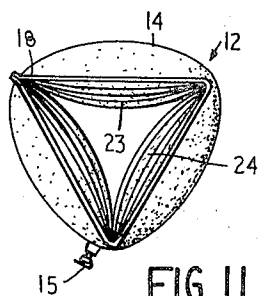


FIG. 11

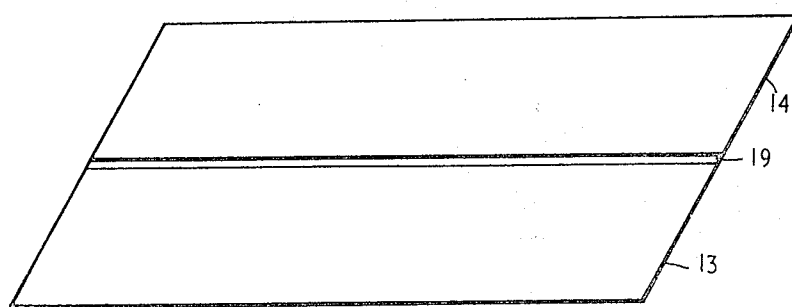
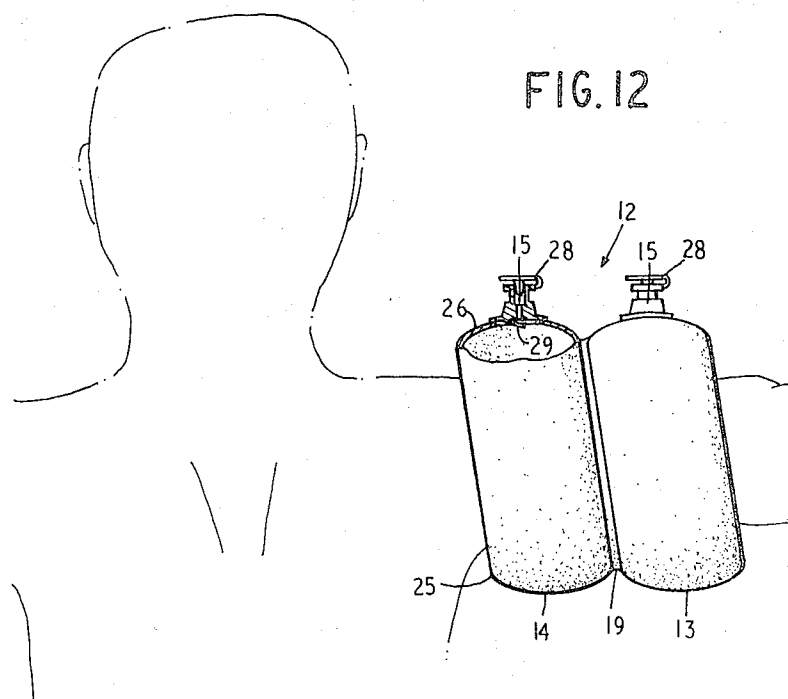


FIG. 13

FLOTATION SLEEVES

This invention relates to improvements in flotation sleeves and more particularly to a short inflatable flotation sleeve of the type which can be worn on the upper arm of the user to provide buoyancy when swimming.

Present known flotation sleeves of the type to which this invention is related are generally defective in that to provide the required amount of buoyancy it is necessary to envelop a major portion of the user's upper arm with the flotation sleeve which is inflated with a suitable fluid. These types of flotation sleeves generally cause bodily encumbrance which results in the user experiencing considerable discomfort in the region of the armpit and adjacent body portions.

Present known types of flotation sleeves also suffer from the lack of sufficient buoyancy in the region of the inner arm and thus fail to assist the user in keeping his or her head sufficiently clear of the water.

It is an object of the present invention to provide a flotation sleeve that substantially eliminates these defects.

It is another object of the present invention to provide a flotation sleeve that substantially reduces bodily encumbrance.

In one general form the invention is an inflatable flotation sleeve adapted to be worn on the upper arm of the user and comprising at least one continuous generally tubular closed structure formed in fluid impervious flexible resilient material, fluid valve means providing access to the structure for inflation thereof, said structure being adapted to surround the user's upper arm and including a substantial portion adapted to be located on the arm adjacent the body, said portion being shaped so as to substantially reduce any body encumbrance thereby.

Notwithstanding any other forms, that may fall within its scope, seven particular forms of the invention will hereinafter be described with reference to the accompanying drawings of which:

FIG. 1 is a rear illustration of a typical flotation sleeve located on each upper arm of a user and showing one method of reducing bodily encumbrance;

FIG. 2 is a top view of the illustration of FIG. 1 showing the general configuration of the sleeve in use;

FIG. 3 is an illustration of one form of the sleeve showing the manner in which the material is shaped prior to completion;

FIG. 4 is a similar view to that of FIG. 3 but illustrating an alternative method of forming the sleeve;

FIG. 5 is a plan view of a sleeve showing the form it achieves when inflated;

FIG. 6 is a cross section of an alternative form of the sleeve illustrating another method of reducing the bodily encumbrance.

FIG. 7 is an elevation of yet another form of the sleeve showing a fourth method of achieving the desired result;

FIG. 8 is a plan view of the sleeve of FIG. 7 illustrating the desired effect of the form of the invention illustrated in FIG. 7;

FIG. 9 is a fragmental cross section of a single structure;

FIG. 10 is an elevation of the structure of FIG. 9;

FIG. 11 is a plan view of one form of sleeve illustrating a series of friction gripping members.

FIG. 12 is an illustration of yet another form of the sleeve located on the upper arm of a user; and

FIG. 13 is an illustration of the sleeve of FIG. 12 before completion showing the method of forming the structure.

Referring first to FIG. 1 the sleeve 12 comprises two continuous tubular structures 13, 14, the interiors of which are sealed off from the atmosphere. The structures 13, 14 are provided with fluid valves 15 enabling them to be inflated with a suitable fluid when located on the user's upper arm to provide buoyancy to assist the user to stay afloat when swimming.

With present known types of flotation sleeves the surface adjacent the armpit will cause bodily encumbrance and substantial discomfort to the user when the arm is in the lowered position.

From FIG. 1 it will be seen that by providing the sleeve 12 with a shape that will cause a substantial portion 16 of the sleeve to veer away from the body, the user will be able to lower his arms without experiencing any substantial discomfort in the region of the armpit thus enabling the sleeve 12 to be located, in the desired position, as high on the upper arm as possible.

From FIG. 2 it will be seen that if the sleeve 12 is located too low on the upper arm of the user will experience difficulty in performing the motions required for swimming because the lower structure 13 would cause an encumbrance in the region of the elbow. The provision of the shaped portion 16 will allow the sleeve 12 to be located as high as possible on the upper arm, a sleeve of the maximum possible length be used without causing any undue discomfort or restricting the movement of the user's forearm.

In the manufacture of these sleeves several methods may be utilized to achieve the desired object in reducing the bodily encumbrance. The first of these methods is illustrated in FIG. 3. In this form, a sleeve 12 is formed from two substantial lengths of generally-rectangular material, 17, 18 preferably an extremely resilient and flexible thermoplastic material. The lengths 17, 18 of material have a sinuous shape, one of the lengths 17 having a greater degree of sinuosity than the other. The pieces of the material are superimposed one above the other and are heat sealed along their longitudinal edges 18, 19 to form a tube-like structure.

In some cases it may be desirable for the sleeve to have two such structures 13, 14 connected at one end to each other. This is achieved by cutting the material to a suitable width and heat sealing them together in the manner previously described and additionally heat sealing them together approximately mid-way through their width so that the joint 19 has a sinuous shape corresponding to the shape of the longitudinal edges 18, 19. A suitable fluid valve 15 may then be inserted into each structure 13, 14 and the material is then joined end to end and heat sealed to provide one or two continuous closed tube-like elements adapted to be inflated with a suitable fluid injected through the valve 15.

The inflation may be achieved by any means suitably at hand to the user, the most common method however would be by injecting air by oral means. When inflated the structure of FIG. 3 will assume the shape of the sleeve 12 of FIG. 1.

Referring next to FIG. 4 which shows an alternative method of achieving the desired result in which only

one longitudinal edge 18 of the material is sinuously curved. When in its completed condition, this form will provide a substantial portion 16' of the structure having a reduced dimension which substantially eliminates bodily encumbrance in the region of the user's armpit when it is inflated on the arm.

There are several methods of forming a structure 13 or 14 of this nature, most of which will cause it to assume a circular shape which, when the sleeve is located on the user's arm and inflated, will act in a similar manner to a tourniquet and restrict the user's arm to such an extent that the blood supply will be prevented from reaching the lower arm and hand, a condition which is totally undesirable and can even be highly dangerous. It is therefore preferable that the heat-sealed joints along the longitudinal edges 18 (FIG. 5) of the material be substantial in dimensions, providing a line that has a greater degree of resistance to flexing than the remainder of the structure to such an extent that when the sleeve is inflated on the user's arm it will assume a generally triangular shape, thus substantially eliminating the tourniquet effect.

Referring next to FIG. 6, a second method of achieving the desired object may be to provide the material with a section that is thicker than the remainder such that when the sleeve 12 is in its completed and inflated condition, the thicker portion 20 of the structure has a greater resistance to inflation than the remainder 21 and thus assumes a shape that is substantially smaller in dimensions than the remainder of the structure. This method however will result in an end product that is slightly more expensive to manufacture.

Referring next to FIG. 7, the fourth method of achieving a reduced dimension to eliminate bodily encumbrance is to provide a panel 22, in a portion of the structure 13, 14, that is not inflated. From FIG. 8, it will be seen that this panel will cause a substantial portion of the structure 13, 14 to assume a concave shape which will generally conform to the shape of the user's body in the region of the armpit without substantially reducing the desired buoyancy of the sleeve 12. In this form panel 22 may extend from the upper joint 18 to the lower joint 19 of each structure or alternatively may be merely a separate panel attached to the peripheral surface of the structure 14 to provide a curved portion adapted to conform generally to the shape of the user's body in the region of the armpit.

Referring now to FIG. 9, with a sleeve 12 having only a single structure 14 the desired shape may be achieved in any one of the aforementioned methods but one particular method may be to provide a section 20' that has less flexibility than the remainder of the structure 14. This may be achieved in one of two ways, the first being to attach a panel to the peripheral surface of the structure 14 which will substantially increase its rigidity or alternatively, having approximately one third of the peripheral surface formed in a thicker material so that the inner surface 23 of the portion will have a greater rate of expansion than the outer surface 20'.

Referring next to FIG. 10, in the case of a sleeve 12 having only one structure 14', the structure may be considerably greater in length than it would be possible to make each structure 13 or 14 of the form illustrated in FIGS. 1 and 2 thus providing an equal amount of buoyancy for a single structure and a double structure. A double structure, however, has the advantage in that the person learning to swim may, as he gains more con-

fidence, remove one of the structures to provide a lesser degree of buoyancy. This, it will be seen, will enable the person learning to swim to move from a stage of using a substantial amount of buoyancy in steps to a stage where no buoyancy is required at all whereas with a single structure of the type previously mentioned there only remains one method of reducing the amount of buoyancy other than completely removing the structure, this method being to reduce the amount of air in the structure.

Referring now to FIG. 11, it has been known in the past that a person "wearing present known types of flotation sleeves" when jumping into the water has experienced the loss of the sleeves due to the lack of a suitable means for retaining them in the desired position. This may be achieved by having on the inner surface 23 of the sleeve 12 a suitable means 24 such as a series of spaced ridges which will grip the skin lightly making it more difficult for the sleeve to come off accidentally during use. These ridges 24 may have a rough surface to assist their gripping action.

Referring to FIGS. 12 and 13, in another form, the invention comprises two structures 13, 14 which are of a relatively uniform size but formed so that the portion 25 adjacent the arm will be located lower on the arm than the portion 26.

The valves 15 comprise a tubular stem 27 the outer end of which is closed off with a plug 28. The end of the valve attached to the tube has a flap or membrane 29 which will, when the structure is inflated, close off the valve 15 and prevent the air from escaping. From FIG. 13 it will be seen that the structure is formed from two pieces of material as previously described except that the material is cut to form a parallelogram so that it will take the shape shown in FIG. 12.

It will be appreciated by those skilled in the art that the invention as hereinbefore described will enable a child, or even an adult, to learn to swim with a substantial degree of safety and comfort with the use of the present invention.

What I claim is:

1. An inflatable flotation sleeve adapted to be worn on the upper arm of the user and comprising at least one continuous generally tubular closed structure formed from two elongated lengths of fluid impervious flexible resilient material joined and sealed to each other along their longitudinal edges to form a hollow tube, the open ends of said tube being coaxially joined and sealed to each other, one longitudinal edge of said length of material having a sinuous shape defining a displaced portion adapted to be located on the user's arm adjacent the body to substantially reduce any bodily encumbrance to the user, and fluid valve means on said structure to permit inflation and deflation of said structure.

2. An inflatable flotation sleeve as claimed in claim 1 wherein said lengths of material are joined and sealed to each other along a line mid-way between and parallel to at least one longitudinal edge to define two tubular structures each being provided with said fluid valve means to provide for individual inflation and deflation.

3. A flotation sleeve as claimed in claim 2 wherein said two structures are separable.

4. An inflatable flotation sleeve as claimed in claim 1 wherein said structure is so dimensioned and arranged as to enable the structure, when inflated, to assume a triangular shape thereby substantially preventing constriction of the user's arm.

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