Jan. 14, 1964 J. BERNHARDT ETAL 3,117,326

LIFE SAVING APPARATUS

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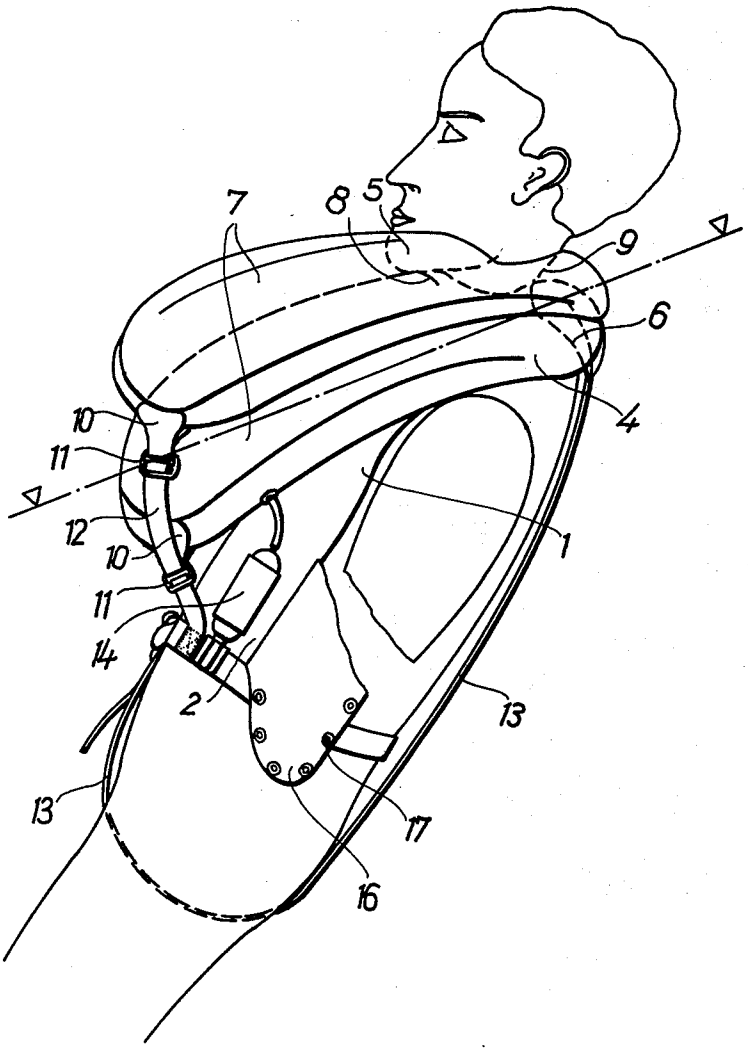


Fig. 1

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LIFE SAVING APPARATUS

Filed Nov. 30, 1961 5 Sheets-Sheet 2

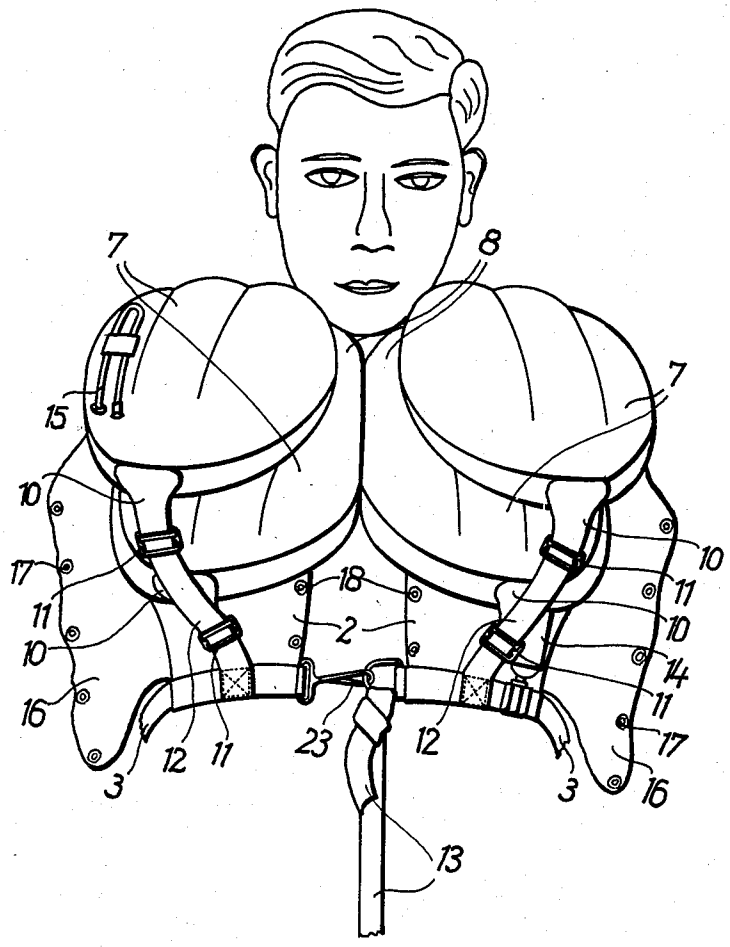


Fig. 2

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LIFE SAVING APPARATUS

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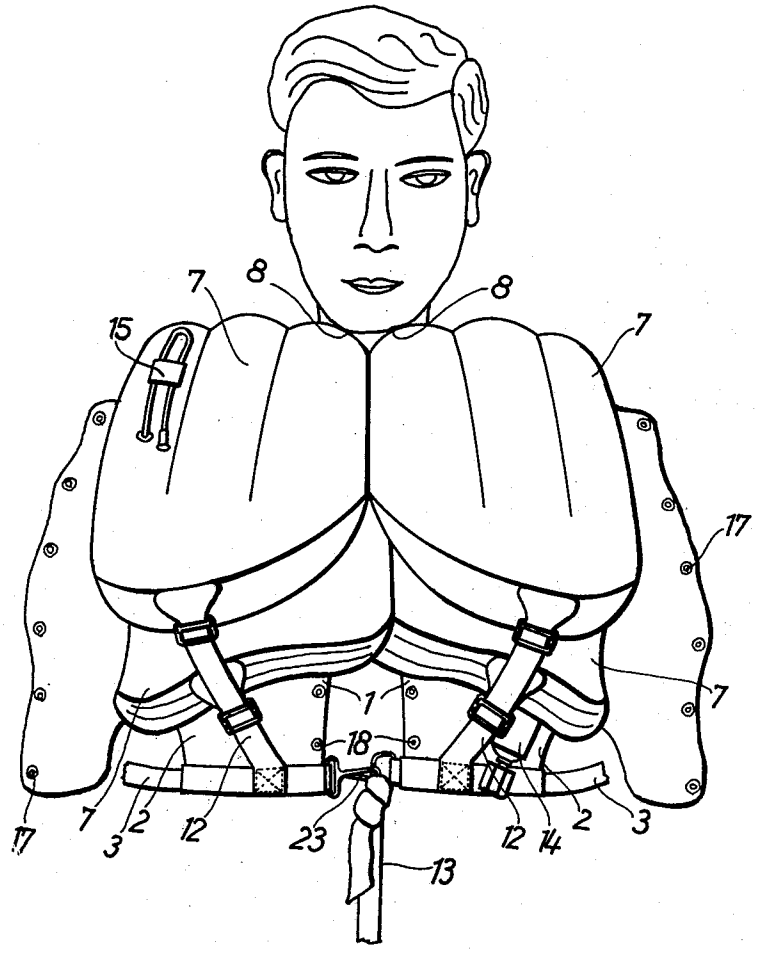


Fig. 3

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Jan. 14, 1964 J. BERNHARDT ETAL 3,117,326

LIFE SAVING APPARATUS

Filed Nov. 30, 1961 5 Sheets-Sheet 4

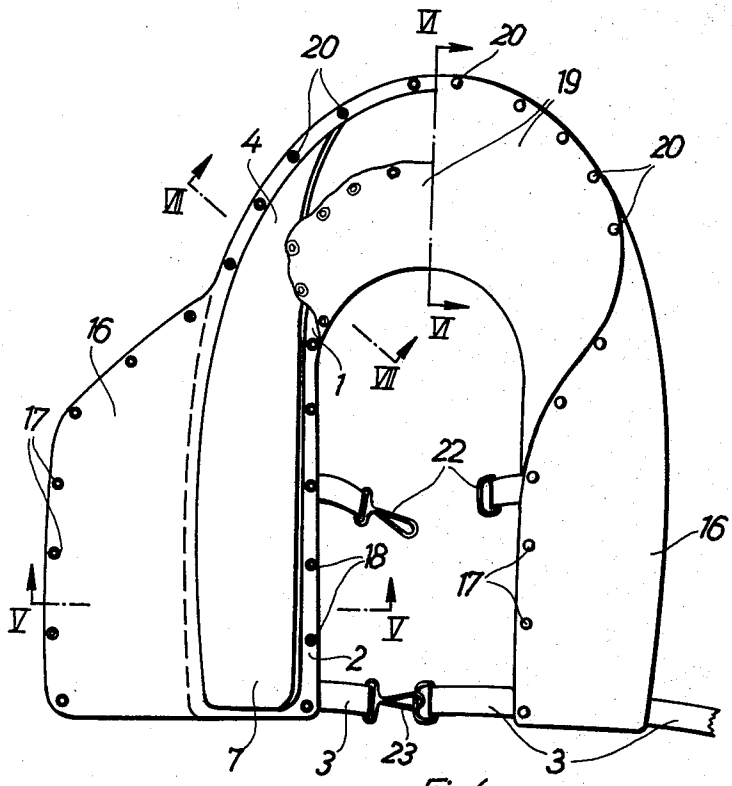


Fig.4

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Jan. 14, 1964 J. BERNHARDT ETAL 3,117,326

LIFE SAVING APPARATUS

Filed Nov. 30, 1961 5 Sheets-Sheet 5

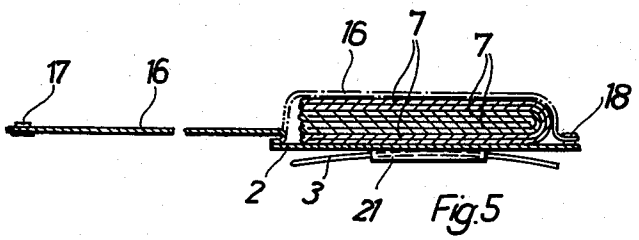


Fig.5

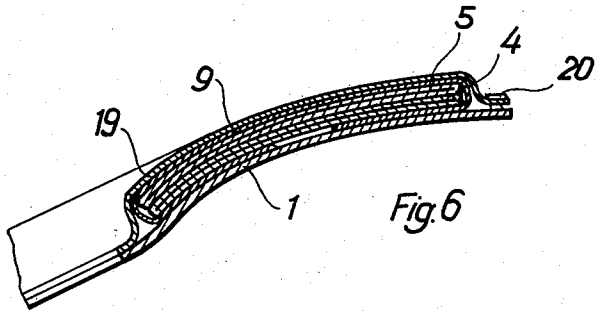


Fig.6

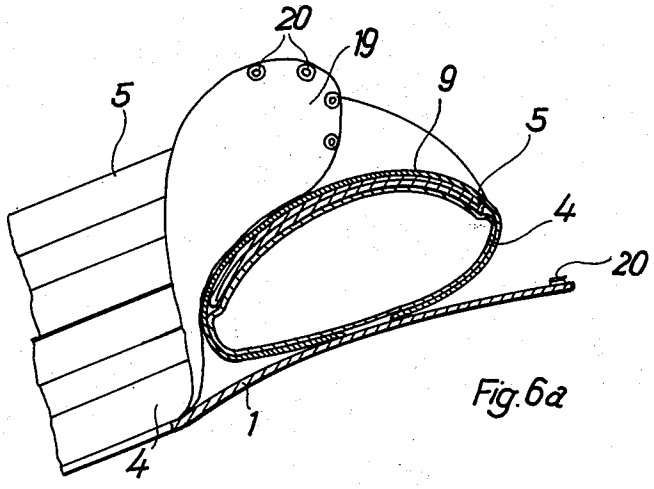


Fig.6a

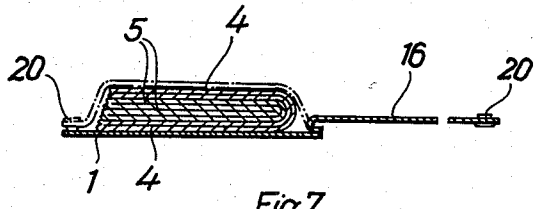


Fig.7

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3,117,326

LIFE SAVING APPARATUS

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Filed Nov. 30, 1961, Ser. No. 156,034
7 Claims. (Cl. 9—333)

The present invention relates to a life saving apparatus and, more specifically, to an inflatable life saving apparatus.

It is an object of the present invention to provide an inflatable life saving apparatus which will give a maximum of safety to the wearer of the apparatus in the water.

It is also an object of this invention to provide a life saving apparatus as set forth in the preceding paragraph which, when in inflated condition, will be characterized by a minimum of interference with the movements of the wearer.

It is still a further object of this invention to provide an inflatable life saving apparatus which normally is packed in uninflated condition and from this condition can quickly, in a simple manner and safely be transformed into its life saving condition.

These and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawings, in which:

FIG. 1 is a side view of a life saving apparatus according to the present invention in inflated condition.

FIG. 2 is a front view of the life saving apparatus according to FIG. 1.

FIG. 3 is a front view of the life saving apparatus according to FIG. 1 but with only the upper floating body inflated.

FIG. 4 shows the life saving apparatus according to the invention in folded condition.

FIGS. 5, 6 and 7 respectively illustrate on an enlarged scale cross sections through FIG. 4 along the lines V—V, VI—VI and VII—VII, whereas FIG. 6*a* shows the floating bodies in inflated condition.

The requirement to give the wearer of the life saving apparatus according to the invention maximum safety in the water when the apparatus is in inflated condition may be met by providing a sufficient buoyancy and in addition thereto a reserve buoyancy which will assure a favorable stable swimming position of the wearer while keeping his breathing openings away from the water. To allow an easy folding of the life saving apparatus, inflatable floating bodies for the buoyancy may be provided from which floating bodies the air may be withdrawn whenever desired so that the bodies may be folded together in a flat condition.

The solution to the above mentioned problems is in conformity with the present invention based on superimposing two individually inflatable floating bodies which respectively extend around the neck of the wearer and have two wings extending in front of the chest of the wearer. These inflatable floating bodies have straps connected thereto for connecting the life saving apparatus to the body of the wearer. According to the present invention, each of the floating bodies alone may have a sufficient buoyancy volume while the two floating bodies are folded together in collapsed condition and are located in a cover having connected thereto straps and a hip strap. The lower ends of the wing portions which extend around the chest are connected to the hip strap by pulling means which are combined for the two floating bodies and extend at an angle with regard to the central plane of the body. The upper inner edge of each wing has an arch as support for the chin of the wearer.

In view of this design and construction, each of the two floating bodies will, when inflated individually, be able safely to protect the wearer against drowning. However, following the inflation of both floating bodies, each of these floating bodies will be able to assume a position and shape which will assure the safety of the wearer without affecting the other floating body and without exerting pressure upon the neck and throat area of the wearer. Furthermore, each of the two floating bodies will be able to assume the above mentioned position and shape as soon as the other floating body becomes ineffective, regardless of whether originally one or both floating bodies were inflated.

The fact that the free ends of the lowermost portions of the lower floating bodies are held down near the waist area of the person wearing the life jacket, imparts upon said lower floating bodies a buoyancy at the desired area, i.e. that area which is most favorable for the desired inclined position on the back, namely below the chin, thereby counteracting the dangerous forward sloping of the head in case of unconsciousness. At the same time this attachment permits the inflated upper floating body with its chin portion to move at an incline laterally outwardly so that it will not handicap the wearer of the apparatus neither at the chin nor at the throat. If the air is released from the lower floating body, the connection of the floating body wing with the supporting means will permit the upper floating body automatically to move into the position and shape of the lower floating body whereby on one hand the inclined position of the wearer on the back will be assured and on the other hand the breathing openings will be held free even if the wearer should be unconscious. When the upper floating body has the air withdrawn therefrom, the position and shape of the lower floating body will not be affected because the connection of its wings with the supporting means will remain unaffected.

According to a further development of the present invention, the two floating bodies are at the neck portion of the supporting cover held in a loop. In this way, each of the two floating bodies will be exposed where its buoyancy will assure the head of the wearer a support in the neck. Furthermore, the connection of the floating body to the neck portion in conformity with the present invention is prevented from moving out of its intended position in upward direction.

Referring now to the drawings in detail, the apparatus according to the present invention comprises a U-shaped support 1 of strong woven material which extends around the neck of the wearer of the apparatus in the form of a collar and is provided with two wings 2 which are displaceable on a hip strap 3 and rest on the chest of the wearer. Two inflatable bags or containers 4 and 5 rest in superimposed position on said support 1. Each of these bags or containers likewise consists of a collar portion 6 and two chest wings 7. The cut of the containers 4 and 5 is such that the two wings 7 after having been completely inflated will at a certain pressure rest against each other and are able by means of an arch 8 to support the chin of the wearer as shown in FIGS. 2 and 3. The volume of each container 4, 5 is so selected that each one alone will have a buoyancy which is fully sufficient for the swimming position of the wearer.

In order to locate the containers 4 and 5, which form the floating bodies, on the support 1, a loop 9 is provided in the neck portion which loop extends around the two containers 4 and 5 and has a width substantially equalling the circumference of only one of the containers in inflated condition (see FIG. 6). The lower outermost portion of each chest wing 7 of the two floating bodies is provided with a flap 10. Each pair of flaps 10 respectively pertaining to two superimposed floating bodies 4 and 5

engages buckles 11 which are displaceably mounted on a holding strap 12. Each holding strap 12 is connected to the lower edge of the respective wing 2 of the support 1 at a portion which is closer to the central body portion of the wearer than the portions of connection of the flaps 10 to the respective floating bodies. Consequently, the straps 12 and the pulling forces conveyed thereby to the wing 7 of the floating body will be directed from the outside to the inside at an incline, see f.i. FIGS. 2 and 3. Connected to the neck portion of support 1 is a long strap 13 (FIG. 1) which passes through the crotch of the wearer and is connected at the front to the hip strap 3 (FIGS. 2 and 3) by looping or a knot.

In addition to inflating the lower floating body by air from the lungs, there may also be provided a compressed air bottle 14 (shown in FIG. 1 only) which is mounted on the support 1. The upper floating body may be inflated by air from the lungs through a hose 15 which is mounted on one of the floating bodies 7 (FIGS. 2 and 3). A corresponding hose is also provided for the lower floating body. However, for the upper floating body also a compressed air bottle may be provided.

The inner length of support 1 of U-shape or collar shape (FIG. 4) substantially equals the length of the floating bodies when in folded condition. However, the wings 2 of support 1 are considerably narrower than the floating bodies 4, 5 so that the support will on the chest side of the wearer require only so much space that the wearer will not be impeded with regard to his movability. Accordingly, the two inflatable envelopes forming the floating bodies have, when not inflated, their wings 7 folded in longitudinal direction (FIG. 5) for folding the apparatus together so that said wings 7 will be located within the circumferential lines of wing 2 of the support 1. In this position, the two containers of the floating bodies will be covered by one fabric flap 16 each and will be properly located, said flaps 16 being arranged on the outside of each wing 2 and being provided with snap button members 17 at the edge. These members 17 are adapted to cooperate with snap button members 18 on the inner edge of wing 2. The members 17 and 18 form a closure which during the inflation of only one, preferably the lower floating body, will open automatically by pulling apart the snap button members (see FIG. 5). The straps 12 with flaps 10 are in a convenient manner together with the wings 7 placed into folded condition. Similarly, the neck portions of the two containers 4 and 5 are folded together and covered by a collar 19 which latter is arranged on the inner edge of the collar of the support and is likewise closed by means of snap buttons 20 which open automatically during the inflation (see FIGS. 6 and 7).

Referring now to FIG. 5, this figure shows over FIGS. 1 to 4 that the displacement by the ends of the support wings 2 on the hip strap 3 is made possible by a loop 21 so that when inflating the envelopes of the floating bodies, the wings 2 may be displaced on the strap 3 toward the strap 13 and in this way may follow the change in the configuration and location of the container wings 7. The wings 2 of the support are held fast by a closure 22 (FIG. 4), whereas the closure 23 of the hip strap 3 is closed in any condition of the apparatus.

The right-hand portion of FIG. 4 illustrates the apparatus according to the invention in folded together condition. The cut of the support 1 is such as to allow the latter snugly to adapt itself to the shape of the body of the wearer so that the latter will not be handicapped in his movements. The wing portions 2 of the support contribute to this feature by their lateral location on the body. The left-hand portion of FIG. 4 shows the apparatus with opened up covers 16 and 19 after the snap buttons 17, 18 and 20 have been opened.

FIGS. 1 and 2 show the apparatus according to the present invention after both floating bodies have been inflated. FIG. 2 shows the direction of pull in the straps

12 along an incline and also shows the displacement of the support wings 2 on the hip strap 3 over the position of wings 2 in FIG. 4 as will be clearly evident from the drawing. The drawings also show the support of the chin of the wearer by the arched portion 8 of the lower floating body, and furthermore show the effected lateral outward displacement of the corresponding portions of the upper floating body. The wings 7 of the lower floating body are located ahead of the chest of the wearer while pressing against each other. These changes in shape and location of the floating bodies are aided further by the buoyancy. As will be evident from FIG. 1, the buoyancy, which almost exclusively has its origin with the lower floating body, has its force of buoyancy directed to the region of the upper chin and chest portion and thus will make sure that the wearer will occupy the desired inclined position on his back.

FIG. 3 illustrates the apparatus according to the present invention after the air has been withdrawn from the lower floating body. The buoyancy upon the now immersed upper floating body will take over the function of the previously inflated lower floating body. The said upper floating body will at the support 1 or the body of the wearer take on the same shape and location as was previously done by the lower floating body which now with emptied envelope rests in a flat manner upon the chest of the wearer. Due to the pull in inclined direction of the straps 12, the two upper floating body wings 7 are located closely to each other and thus assure the support of the chin portion. If for some reason the upper floating body becomes ineffective, the lower floating body will retain its shape, location and effect and will not be affected by the limp condition of the envelope of the upper floating body.

The limitation of the length of the neck loop 9 to the circumference of only one of the two inflated floating bodies prevents an impediment of the wearer with regard to his throat, neck and ear areas and at the same time gives him the desired support in the neck. This applies on one hand when both floating bodies are inflated in which instance the sideward movement of the arched portions 8 of the upper floating body on the chin still may be aided further by first inflating the lower floating body whereby only the neck loop 9 will be filled. On the other hand, the above remarks also apply when only one of the two floating bodies is inflated or when, as described above, the floating bodies interchange their locations. In the last two mentioned instances, the neck loop 9 prevents a possible upward movement of the apparatus from its desired position. Corresponding remarks apply also when due to incomplete but still sufficient filling of the upper floating body the buoyancy drives the air upwardly, i.e. into the neck portion. In such an instance, due to the filling of the neck loop 9 (see FIG. 6*a*), the upper floating body will be held in the neck position and in its turn holds the entire apparatus in the desired position. This will be aided further by the effect of the arched portions 8 supporting the chin and by the fact that the bottom end of the upper floating body is by means of straps 12 connected to hip strap 3.

If the buckle connection 11 of the floating body wing 7 is so designed that it can easily be opened, it is possible, due to the fact that the containers are loosely located in the neck loop 9, following the opening of the buckle 11, to pull one of the floating bodies with one of its wings out of the loop 9 whereupon it can be easily removed from the apparatus in order to have said floating body available for another person to be saved. This step may be carried out with the other floating body even in the water. After sufficient inflation, the removed floating body may, if necessary, be carried also without strap connection as an auxiliary device which may be held by hand in its desired position in high sea. The two floating bodies may without difficulties selectively be arranged in their upper or their lower position on the support.

As will be evident from the above, even the inflation of the two floating bodies will not impede the vision or the hearing of the wearer of the apparatus. Furthermore, the apparatus according to the present invention allows the wearer sufficient movability, especially of his head and arms, within the water as well as outside the water. When the floating bodies are in their folded condition and worn by the person, practically the upper body, the head and above all the arms have almost complete freedom of movement. In folded condition, the floating bodies may be located in the carrying container 16, 17, 18 including corresponding closure means which will automatically open when the floating bodies are inflated. Thus, the apparatus may merely by inflation be transformed from the folded condition into its life saving condition, and this is effected quickly and without particular operations. The inflation may preferably be effected by a compressed gas container, but may also be carried out by the air from the lungs.

It is, of course, to be understood that the present invention is, by no means, limited to the particular constructions shown in the drawings but also comprises any modifications within the scope of the appended claims.

Thus, while the U-shaped support 1 is preferably made of woven material, such as fabrics of wool, cotton, linen, or combinations thereof, also other materials, such as rubber, plastics or the like may be employed.

What we claim is:

1. A life jacket which comprises in combination: a horseshoe-shaped support having a neck portion to be placed around the neck of a person to be equipped with said life jacket, said support also having two leg portions for resting on the chest of the person to be equipped with the life jacket, two individually inflatable floating bodies of a shape similar to that of said support and supported thereby, each of said floating bodies comprising a collar portion and two leg portions respectively connected to opposite ends of said collar portion for resting over the chest of a person to be equipped with said life jacket, at least the upper one of said floating bodies being provided with a portion for supporting the chin of the person to be equipped with the life jacket, support strap means connected to said support and comprising a hip strap and a neck-crotch strap for connecting said support to the person to be equipped with the life jacket, floating body strap means respectively connected to the free end portions of the legs of said floating bodies for selective and detachable connection with said hip strap, and cover means connected to said support for enclosing and holding said floating bodies in their deflated condition on said support and storing said floating bodies therein.

2. A life jacket according to claim 1, in which the air capacity of each of said two floating bodies in inflated condition thereof is such as to furnish a buoyancy sufficient to keep an adult wearer of the life jacket afloat.

3. A life jacket according to claim 1, in which said floating body strap means are displaceable on said support strap means.

4. A life jacket which comprises in combination: a horseshoe-shaped support having a neck portion to be placed around the neck of a person to be equipped with said life jacket, said support also having two leg portions for resting on the chest of the person to be equipped with the life jacket, two individually inflatable floating bodies of a shape similar to that of said support and supported thereby, each of said floating bodies comprising a collar portion and two leg portions respectively connected to opposite ends of said collar portion for resting over the chest of a person to be equipped with said life jacket, at least the upper one of said floating bodies being provided with an arched portion for supporting the chin of the person to be equipped with the life jacket, loop means arranged at said collar portions of said floating bodies for holding the same to said support, the width of said loop means approximately equalling the circumference of one of the two floating bodies in inflated condition, support strap means connected to said support and comprising a hip strap and a neck-crotch strap for connecting said support to the person to be equipped with the life jacket, floating body strap means respectively connected to the free end portions of the legs of said floating bodies for selective and detachable connection with said hip strap, and cover means connected to said support for enclosing and holding said floating bodies in their deflated condition on said support and storing said floating bodies therein.

5. A life jacket which comprises in combination: a horseshoe-shaped support having a neck portion to be placed around the neck of a person to be equipped with said life jacket, said support also having two leg portions for resting on the chest of the person to be equipped with the life jacket, two individually inflatable floating bodies of a shape similar to that of said support and supported thereby, said two individually inflatable bodies being independent of but detachably connected to said support and each of said floating bodies comprising a collar portion and two leg portions respectively connected to opposite ends of said collar portion for resting over the chest of a person to be equipped with said life jacket, at least the upper one of said floating bodies being provided with a portion for supporting the chin of the person to be equipped with the life jacket, the inner length of said support corresponding substantially to the length of said floating bodies in a deflated condition, support strap means connected to said support and comprising a hip strap and a neck-crotch strap for connecting said support to the person to be equipped with the life jacket, floating body strap means respectively connected to the free end portions of the legs of said floating bodies for selective and detachable connection with said hip strap, and cover means connected to said support for enclosing and holding said floating bodies in their deflated condition on said support and storing said floating bodies therein.

6. A life jacket according to claim 1, in which said support cover means and said support are provided with closure means adapted normally to keep the cover means in closed position but operable in response to a certain minimum pressure developing in said floating bodies to open automatically to thereby release said floating bodies for further inflation thereof.

7. A life jacket which comprises in combination: a horseshoe-shaped support having a neck portion to be placed around the neck of a person to be equipped with said life jacket, said support also having two leg portions for resting on the chest of the person to be equipped with the life jacket, two individually inflatable floating bodies of a shape similar to that of said support and supported thereby, said two individually inflatable bodies being independent of but detachably connected to said support and each of said floating bodies comprising a collar portion and two leg portions respectively connected to opposite ends of said collar portion for resting over the chest of a person to be equipped with said life jacket, at least the upper one of said floating bodies being provided with a portion for supporting the chin of the person to be equipped with the life jacket, support strap means connected to said support and comprising a hip strap and a neck-crotch strap for connecting said support to the person to be equipped with the life jacket, floating body strap means respectively connected to the free end portions of the legs of said floating bodies for selective and detachable connection with said hip strap, and cover means connected to said support for enclosing and holding said floating bodies in their deflated condition on said support and storing said floating bodies therein, said cover means comprising a first cover section connected to the leg portions of said support and opening up toward the outside of said leg portions, said cover means also comprising a second cover section connected to the neck portion of

said support for covering the collar portions of said floating bodies.

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