The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

This invention relates to inflatable life preservers, and particularly to those especially adapted for use by military personnel in military assault and landing operations over water or at beaches. Military personnel, when landing in or on water, would have life preservers that when not inflated and in use are visually inconspicuous and do not seriously hamper the military activities of the wearer, yet when inflated and in use enable quick visual identification to enable the wearer to be located and assisted or rescued.

An object of the invention is to provide an inflatable assault life preserver particularly useful for military personnel in assault operations over water or in military landing operations, which, until its use is needed as a life preserver, may be worn deflated and visually inconspicuous, without seriously hampering the military and physical activities of the wearer, but which when its use is needed may be quickly and easily inflated, by simple and rapid movements of the wearer, which, when inflated for use in water, will be visually conspicuous so that the wearer may be rapidly located and aided in his operations or in reaching his objective which enables the wearer to quickly and easily discard it and free him from its hindrance to his physical and military activities when it is no longer needed, and which will be light in weight, compact when deflated, and relatively simple, practical and inexpensive.

Other objects and advantages will be apparent to those skilled in the art, from the following description of one example of the invention, and the novel features will be particularly pointed out hereinafter and in connection with the appended claims.

In the accompanying drawings:

FIG. 1 is a front elevation of a preserver constructed in accordance with this invention, as worn in inactive and deflated condition;

FIG. 2 is a front elevation of the same when inflated on the wearer;

FIG. 3 is a view similar to FIG. 2 but with the arms of the preserver somewhat separated after a coupling between the arms is disconnected, in partial, to illustrate more clearly certain details of the harness;

FIG. 4 is a view similar to FIG. 3 but with the harness partially disconnected to illustrate more clearly certain details of the harness;

FIG. 5 is a perspective of the preserver removed from the wearer, but inflated and with the casing arms positioned apart to show certain details of construction; and

FIG. 6 is a cross sectional elevation of one arm of the preserver, the section being taken approximately along the line 6—6 of FIG. 2.

In the illustrated embodiment of the invention, the preserver employs a yoke-shaped, closed, hollow casing 1 of flexible textile fabric, with the cross part of the yoke having a width, in a direction between the arms 2 and 3 of the casing, approximately equal to the diameter of the neck of an average adult, so that when the casing is inflated, it can fit snugly around the neck of a wearer, with the arms 2 and 3 extending down the front of the chest of the wearer. The casing, near the front of the neck portion has means (not shown) for connecting the arms 2 and 3 close to the neck, as indicated at 4 in FIGS. 3 and 4, so that the inflated casing will engage the wearer around his neck and below his chin, as shown in FIGS. 2, 3 and 4. This fastening means 4 may be a snap fastener (not shown), one part of which is secured to the inner edge of one arm and the cooperating part of which is secured to the inner edge of the other arm, both close to the front of the neck of the wearer. When these parts of the fastener are coupled they unite the arms 2 and 3 at about the area 4. The casing has flexible straps 5 and 6 (FIG. 2) secured to the upper face of the casing, one strap to each arm 2 and 3, and these straps extend across the gap between the arms 2 and 3 near their lower ends, and are detachably coupled together, as shown in FIG. 2, by a quickly detachable fastener 7. While a detachable fastener may be employed the one illustrated and preferred employs a stud carried on the outer face of the under strap 6. It is of the well known type which has an annular groove a short distance from its free end. The other strap 5, which is on top, carries a fastener disc with an aperture in it that fits over the post and has a spring (not shown) extending from the aperture to snap into the annular groove in the end of the post and yieldingly latches the disc to the post, thus latching the two straps together. By pulling the outer strap free end outwardly, the spring yields and allows the disc to move over the post and be separated therefrom. The aperture disc 8 shown near the free end of the strap 6 in FIGS. 4 and 5.

Additional flexible straps 8 and 9 (FIGS. 1 and 5) are secured to the under faces of arms 2 and 3 of the casing 1, near the lower ends of the casing, in approximate horizontal alignment with one another, and when the casing is secured on the body of the wearer, as illustrated in FIGS. 1 to 4, the straps 8 and 9 cross and are connected together by a quickly detachable connector. In the example illustrated, the strap 9, which is secured to the under face of arm 2, carries spaced apart connector studs 10 and 11 (FIGS. 1, 3 and 5) that have annular grooves near their free ends. The strap 8 crosses strap 9 as shown in FIG. 4, and where strap 8 crosses strap 9 it carries an aperture disc, with spring, that fits over post 11 on strap 9, which serves to connect the straps 8 and 9 and thus connect the arms 2 and 3. A further flexible strap 12 (FIGS. 5, 4 and 5) is also secured to the under face of arm 2, so as to extend along and over strap 9, and it carries two apertured fastener discs 13 and 14 (FIG. 5) that are spaced apart along the strap 12 in positions to fit over the fastener studs 10 and 11 as shown in FIG. 1. Straps 15 and 16 (FIG. 1) are connected one to arm 2 and the other to arm 3, on the underside of the arms, and have two cooperating snap fasteners 17 by which the overlapping face studs of these straps may be detachably connected together to aid in keeping the arms 2 and 3 of the casing 1 against separation from positions along the front of the chest of the wearer.

The preserver, both before and after inflation, is secured to the wearer by a harness, which is capable of quick disengagement from the person of the wearer when its usefulness has ended. The illustrated example of such harness employs a harness, flexible strap 18, connected to the under face of arm 2 of casing 1 near the lower end of that arm. This strap 18 extends from arm 2 around the adjacent side of the wearer, over his buttocks, between his legs at the crotch and up the front of the wearer where it passes adjustably through a double ring clamp 19 that is carried on the lower end of
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a fabric link 20. The other or upper end of link 20 has an apertured disc fastener 21 (FIG. 3) which is secured to the outer end of the fastener post 10 or 11. In FIGS. 1 and 2, fastener 21 is secured over post 10, and in FIGS. 3 and 4 it is secured over post 11. The disc fasteners 21 are similar to disc fasteners 7a and when passed over a fastener post will be yieldingly held thereon against their removal by the spring on the disc that engages with the annular peripheral groove near the free end of the fastener post.

Another long, flexible strap 22 is secured to the under face of the arm 3 of the casing 1 near its lower end, and passes around the other side of the wearer over his buttocks, then between his legs at the crotch, and up the front of the wearer where it passes adjustably through a clamp ring 23 by which it is releasably held in its adjusted length. The ring 23 is carried by the lower end of a fabric link 24 that extends further up the front of the wearer and terminates in an apertured fastener disc 25, that is similar to the fastener discs 7a and 21. This disc 25 can be fitted over either post 10 or 11 and is shown as fitted over post 11 (FIG. 4). When the straps 8 and 9 are connected together as explained, the fabric links 20 and 24 are brought up the front and secured to either post 10 or 11, or one over post 10 and one over post 11. Then the strap 12 is then placed over strap 9 and its apertured fastener discs 13 and 14 then placed over posts 10 and 11.

The free end of this strap 12 carries a ring 26 (FIG. 3) which the wearer may grasp and yank outwardly to release the links 20 and 24 so that they can be pulled off from the posts 10 and 11, which releases the straps 18 and 22, enabling the wearer to pull them from between his legs. The wearer can then, by a simple pull, separate the straps 8 and 9 which permits the arms 2 and 3 of the casing to swing apart. The wearer can quickly and easily separate straps 15 and 16 by separating their snap fasteners 17, separate straps 5 and 6 by separating the fastener post and disc 7, and also separate the arms 2 and 3 at the fastener 4 (FIG. 4). The preserver may then be fully removed from the wearer's person.

The exposed or outer face of the casing 1 preferably has a distinctive color, such as a bright orange or yellow, for visibility so that a wearer wearing such a life preserver and floating in the sea can be quickly located and rescued, or aided in landing. The under face of the casing 1 is of a standard camouflage olive-green color for presentiment detection of the wearer, as will be later explained, when the casing is deflated and rolled upon itself as shown in FIG. 1.

The casing 1 contains an inflatable, flexible insert 27, see FIG. 6, which extends from the free end of one arm of the casing 1 to its other end. Insert 27 is divided by a flexible partition or bulkhead wall 28 into two superposed compartments or chambers 29 and 30 that are coextensive in size and position relatively to one another from one end of the casing to the other, so as to have two separate but superposed compartments throughout the casing. The casing 1, in the example illustrated, is made of lightweight nylon fabric and the insert 27 and the partition or inner bulkhead wall are made of light-weight, neoprene coated nylon fabric. Secured side by side on the exterior of one arm, such as arm 2, of the casing are two sockets 31 and 32 (FIG. 5) both being secured adjacent to the inner edge of arm 2, one to the portion above chamber 29 and another close to the chamber 30. Each such socket 31 and 32 has an open end into which a tube 33 of highly compressed gas, such as carbon dioxide for example, is detachably secured in any suitable manner. The end wall of each such ported compartment 28 is closed by an imperforate wall that can be punctured when delivery of the gas is desired. Within a chamber in each socket is a puncturing element (not shown) which is mounted in a manner to enable its movement to puncture the imperforate wall, and this puncturing movement is produced by operation of a lever 34 (FIG. 5) that is pivotally connected to one of the fastener posts 10 or 11. From the end that receives and holds the tube of compressed gas. The chamber of the socket between its ends end into which the gas from the related tube escapes when the end wall of the tube is punctured as explained above, is connected by a passage (not shown) to the interior of the related compartment 29 or 30 of the casing. The tube or wall of which the socket is secured. A handle 35 is connected by a rope 36 having two branches to the free ends of the levers 34, and when pulled downwardly the handle and the rope will operate the levers 34 to cause simultaneous puncturing of the inner end of the tubes 33 that are within the sockets. The gas of the tubes released in this manner will pass into the compartments 29 and 30 and simultaneously inflate both chambers of the insert and thus inflate the casing 1. These sockets, puncturing elements, gas tubes operating levers, and handle are well known and in use on other inflatable life preservers and hence, the interior details of the sockets are not illustrated.

A fabric shield 37 (FIGS. 1–5) is attached to the casing 1 between the pair of sockets (see FIG. 5) as at 37a, and its side edges have snap fastener elements 38 (FIG. 5) that cooperate with complementary fastener elements 39 on casing 1 to maintain the shield in a position in which it covers the gas tubes and the sockets, with the handle 35 exposed below the shield for ready accessibility and operation.

The casing 1 also mounts two flexible tubes 40 and 41 (FIG. 3), which extend from the casing and have flanges that readily reach to the mouth of the wearer as shown in FIG. 2. The tube 40, at its end that is anchored to the casing 1, is on the upper face of the casing and its passage communicates with the upper chamber 29. The other tube 41, at its end which is anchored to the casing 1 is on the lower face of the casing and its passage communicates with the other or under chamber 30. Each tube 40 and 41 at its outer end has a free check valve opening freely to pass a fluid into the related chambers in casing 1, but which may be forcibly opened by pushing the valve casing disposed on the free end of each tube 40 and 41 to release the air or gas in either tube. The wearer may, by putting either or both tube ends in his mouth, forcibly inflate the casing insert chambers with his breath by blowing into the tubes, in case the tubes of compressed gas fail to inflate the casing. The wearer may also forcibly open the check valve of either tube to release the air or gas in either tube to partially or fully deflate the preserver. These tubes 40 and 41 are identical with tubes having these functions that are in commercial use on other life preservers and hence, the interior details of the check valve ends of the tubes are not illustrated, since such details per se were not part of this invention, but only the adoption of such tubes in the present preserver.

Before the wearer of this preserver lands in the water or is about to land, it is advisable to wear the preserver deflated and in as compact a condition as possible so as not to interfere with or hamper the wearer's activities and use of his arms and legs. To this end, when the casing 1 is deflated, but otherwise equipped with compressed gas tubes 33, the casing 1 is rolled up in a direction crosswise of its length into the condition shown in FIG. 1, with the camouflage color on the outside. The casing carries additional cooperating snap fasteners located conveniently along the casing that couple with one another while the casing is so rolled, to hold it in rolled condition. The preserver while deflated and so rolled, is applied around the neck of the wearer with the ends extending down the front of the wearer's chest. The straps 15 and 16 are connected together and 8 and 9 which prevent separation of the arms 2 and 3 of the casing 1 from the positions shown in FIG. 1. The straps 18 and 22 are passed around the opposite sides of
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the wearer, over the buttocks, between the wearer's legs at the crotch and up the front where the links 20 and 24 are secured over the fastener posts 10 and 11 on strap 9, the apertured fastener discs of strap 8 being first passed over posts 10 and 11 to connect straps 8 and 9. Then the strap 12 is passed over posts 10 and 11 and the apertured disc fasteners on strap 12 passed over and secured to posts 10 and 11 as shown in FIG. 1. The wearer is then ready for his military operation and since the camouflage color is on the outside of the preserver, he will be relatively inconspicuous.

When the wearer finds that he is going to land in the water, he unrolls the casing 1, and pulls the handle 35 downwardly to unfasten 1 and fastens the casing arms 2 and 3 together at 4, or he may inflate casing 1 or either inflatable chamber therein by blowing into one or both of the free ends of tubes 40 and 41. When the casing is unrolled and inflated, the distinctive color on its upper face is visible to enable others to locate the wearer and rescue or aid him. After the wearer gets out of the water and does not need the buoyant effect of the casing 1, he deflates casing 1 by forcibly opening the free check valves in the free ends of the tubes 40 and 41, then grasps ring 26, yanks it to his right which pulls strap 12 loose from posts 10 and 11, and then he can pull straps 20 and 24 from posts 10 and 11. These straps 24 and 26 and straps 18 and 22 can then be disengaged from between the wearer's legs and the preserver can be fully removed from the wearer. It is not essential that the casing 1 be deflated before yanking on ring 26 to initiate detachment of the preserver. The preserver can be worn without too much interference with normal military operations and activities of the wearer, yet can be easily and quickly discarded.

It will be understood that various changes in the details, materials and arrangements of parts, which have been herein described and illustrated in order to explain the nature of the invention and one example thereof, may be made by those skilled in the art within the principle and scope of the invention as expressed in the appended claims.

We claim:
1. An inflatable life preserver for use by military personnel employed in military assault and landing operations, which comprises a yoke-shaped casing of flexible textile fabric of a size to fit around the neck of the wearer, with its arms extending in slightly spaced apart relation to one another down the front of the wearer's chest, a yoke-shaped inflatable insert of a flexible fabric that is substantially immovable to the passage of a gas therethrough disposed in said casing and, when inflated, fitting and expanding said casing, said insert being divided by a flexible wall, impervious to the passage of a gas therethrough, extending approximately from end to end of the casing and providing two superposed inflatable chambers in the casing, said casing having connectable fastening means for coupling together the arms of the yoke immediately in front of the neck of the wearer, one of said arms carrying along its edge facing the other arm, a pair of compressed gas tubes connected, one to one of said chambers and the other to the other said chambers, through connections normally closed by interior walls that can be punctured when gas is to pass into said chambers, manually operable means in the connection from each of said tubes to its related chamber and operable from the exterior of such connection for puncturing said puncturable walls, a common means connected to both of said manually operable means for operating both to puncture said puncturable walls concurrently in operation, harness means having straps connected to the free end portions and said arms and coupled to one another by a quickly separable means with the arms in spaced apart relation, and also having additional straps separate from one another and connectable to extended from said arms and of length to pass around to the back of the wearer, then between his legs to the front, and there having means for quick attachment to and detachment from said first mentioned straps that directly and detachably couple together said arms.

2. The preserver according to claim 1 wherein said casing, with its insert when deflated and free of the wearer, can be rolled in a direction sidewise of said arms while said harness means is coupled to the wearer, and quickly detachable means carried by said rolled casing by which the casing can be held in such rolled position while worn around the neck of the wearer and held on the wearer by coupling of said additional straps, whereas by the preserver when rolled and worn occupies a minimum of space and offers minimum interference with the normal movement of the wearer until need for its inflation arises.

3. An inflatable life preserver for use by military personnel employed in military assault and landing operations which comprises an inflatable, yoke-shaped casing of flexible textile fabrics, of a size when inflated to fit around the neck of the wearer, with its arms extending in slightly spaced apart relation to one another down the front of the wearer's chest, means carried by said casing by means of which said casing can be inflated, cooperating quickly attachable and detachable coupling means carried by said casing arms immediately in front of the neck of the wearer by which the casing arms may be coupled to fit closely around the neck of the wearer, with the arms of the yoke diverging downwardly from the wearer's neck, said carried by said casing near the free ends of said arms and connected directly together, with quickly attachable and detachable coupling means to prevent separation of said arms, an additional individual strap connected to each arm near its free end, and of a length to extend therefrom around to the rear of the wearer, pass between his legs, up his front to said first mentioned straps and at its free end carrying coupling means quickly attachable to and detachable from said directly connected straps.

4. The preserver according to claim 3, and quickly detachably fastening means carried by said casing in positions to engage with one another when said casing is deflated and rolled sidewise of its length, and to releasably hold the casing in rolled compact condition until its inflation and use is desired.

5. An inflatable life preserver for use by military personnel employed in military assault and landing operations which comprises an inflatable, yoke-shaped casing of flexible textile fabric, of a size when inflated to fit around the neck of the wearer, with its arms extending in slightly spaced apart relation to one another down the front of the wearer's chest, means carried by said casing by means of which said casing can be inflated, cooperating quickly attachable and detachable coupling means carried by said casing arms immediately in front of the neck of the wearer by which the casing arms may be coupled to fit closely around the neck of the wearer, with the arms of the yoke diverging downwardly from the wearer's neck, said carried by said casing near the free ends of said arms and connected directly together, with quickly attachable and detachable coupling means to prevent separation of said arms, an additional individual strap connected to each arm near its free end, and of a length to extend therefrom around to the rear of the wearer, pass between his legs, up his front to said first mentioned straps and at its free end carrying coupling means quickly attachable to and detachable from said directly connected straps, said first mentioned straps having their free ends overlapping, with a connected post carried on the covered face of one of such straps where they overlap and an ejeve carried by such connected straps and passing over said post to couple such straps together, and the free ends of said additional straps hav-
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ing eyelets engageable over said post beneath that one of said first mentioned straps which has the eyelet, whereby when said last mentioned strap is stripped from its post, the first mentioned straps will be disconnected and the free ends of the additional straps concurrently released, thereby enabling the wearer to quickly and with a minimum of movements to release himself from such preserver.

6. An inflatable life preserver for use by military personnel employed in military assault and landing operations, which comprises an inflatable yoke-shaped casing of flexible textile fabric of a size when inflated to fit approximately around the neck of a wearer, with its arms extending down and over the chest of the wearer in spaced relation to one another, straps carried by the under faces of the arms in pairs at intervals along the arms, with the straps of each pair having quick detachable coupling means between them while the arms are spaced apart, additional individual straps attached to the under side portion of each arm near the lower ends of the arms, of lengths enabling each to pass around the back of the wearer, through the crotch and up the front to the lower said pair of said straps and there terminating in quickly detachable couplings engaging with the couplings between the said straps of said lower pair, said arms being individually rollable on themselves lengthwise while deflated and so coupled by said straps, means carried by the inner edge of one of said arms, effective when activated to inflate said casing and included within the roll of that arm and concealed thereby when the casing is deflated and the arms rolled.

7. The preserver according to claim 6, wherein said casing has coextensive superposed separate chambers and said inflating means includes a tube of compressed inflating gas for each chamber and both tubes being carried by its supporting arm to be both contained within the roll of that arm when the casing is deflated and the arms are rolled.

8. An inflatable life preserver for use by military personnel employed in military assault and landing operations which comprises an inflatable yoke-shaped casing of flexible sheet material of a size to fit closely around the neck of a wearer with its arms extending down the front of the chest of the wearer in spaced relation to one another, straps carried by the under faces of both arms, in pairs, at intervals along the lengths of the arms, with the straps of each pair having a quick detachable coupling between them while the arms are spaced apart, a pair of further straps secured to the opposite upper, exposed faces of the arms near their lower ends and having quickly detachable couplings between them for use when the arms are inflated, and a pair of additional, individual straps, each connected to the lower part of one of said arms, of a length enabling it to pass around to the back of the wearer, through his crotch and up his front to one of the first mentioned pairs of straps and there being quickly detachably coupled to the coupling between the straps of that pair.

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