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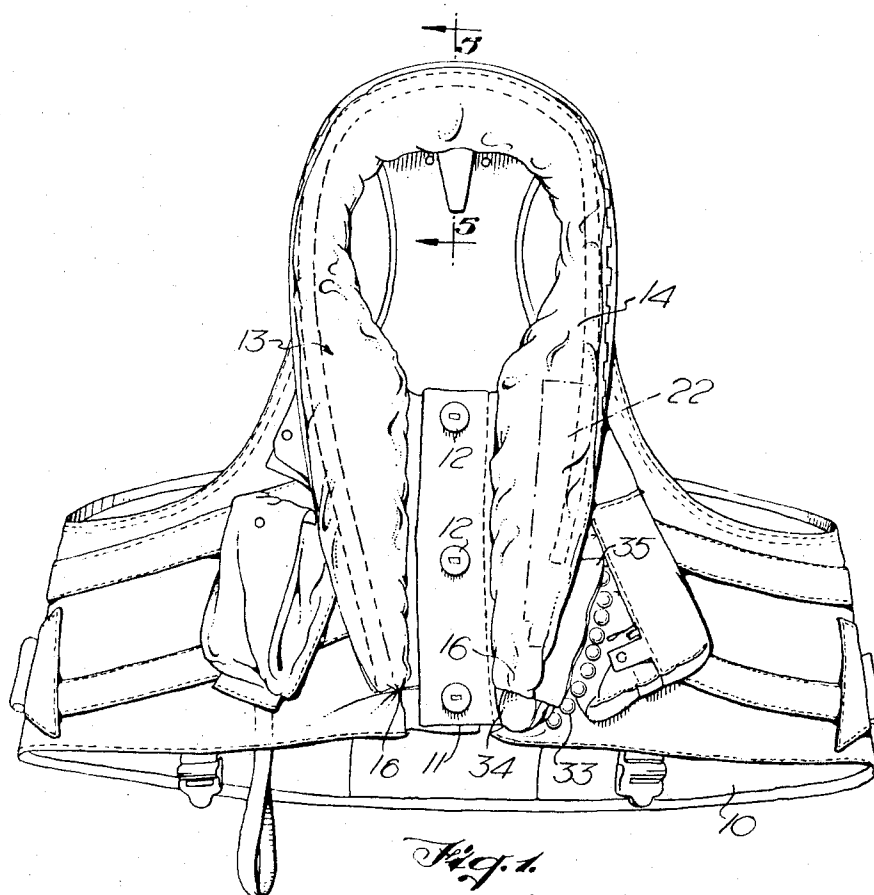
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3,362,034

INFLATABLE BODY ATTACHMENTS AND OTHER ARTICLES

Filed June 2, 1965

4 Sheets-Sheet 1



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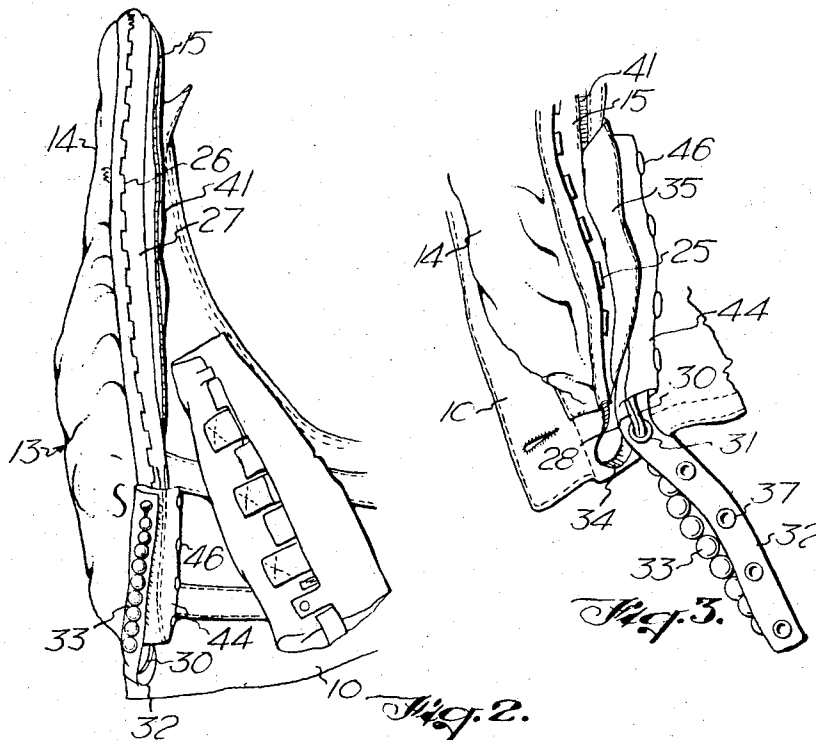
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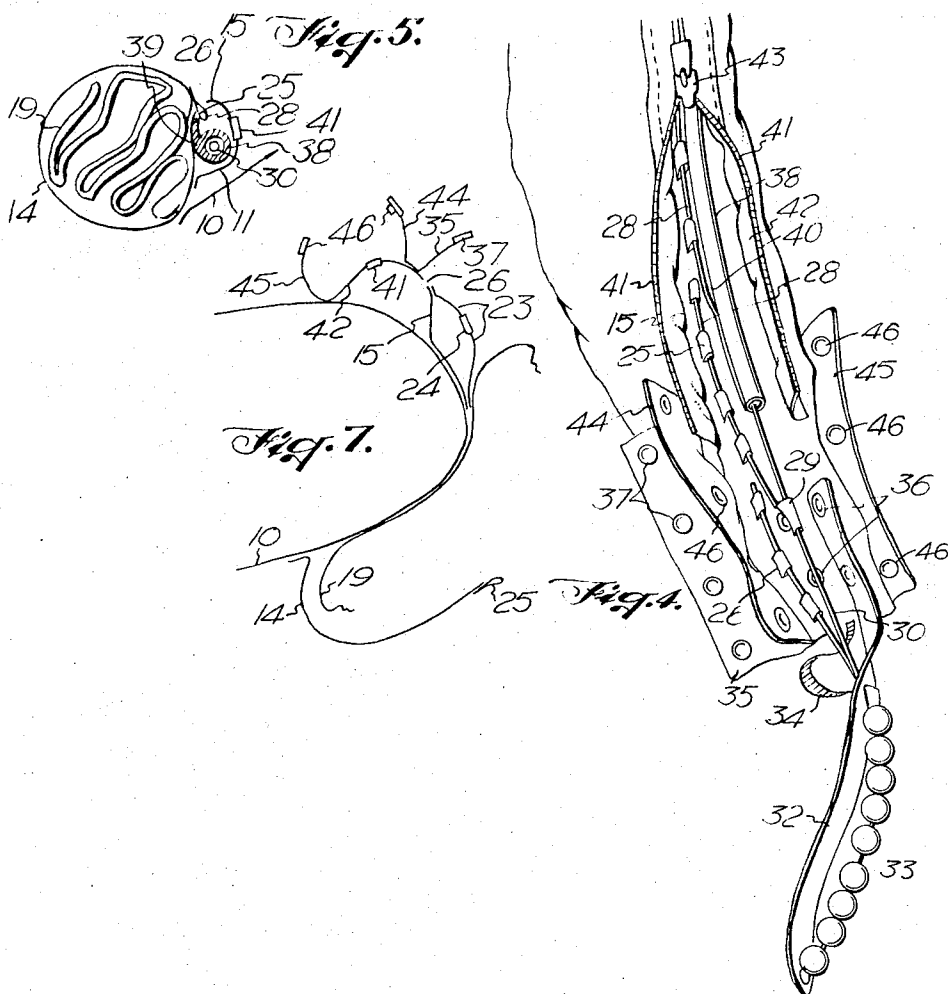
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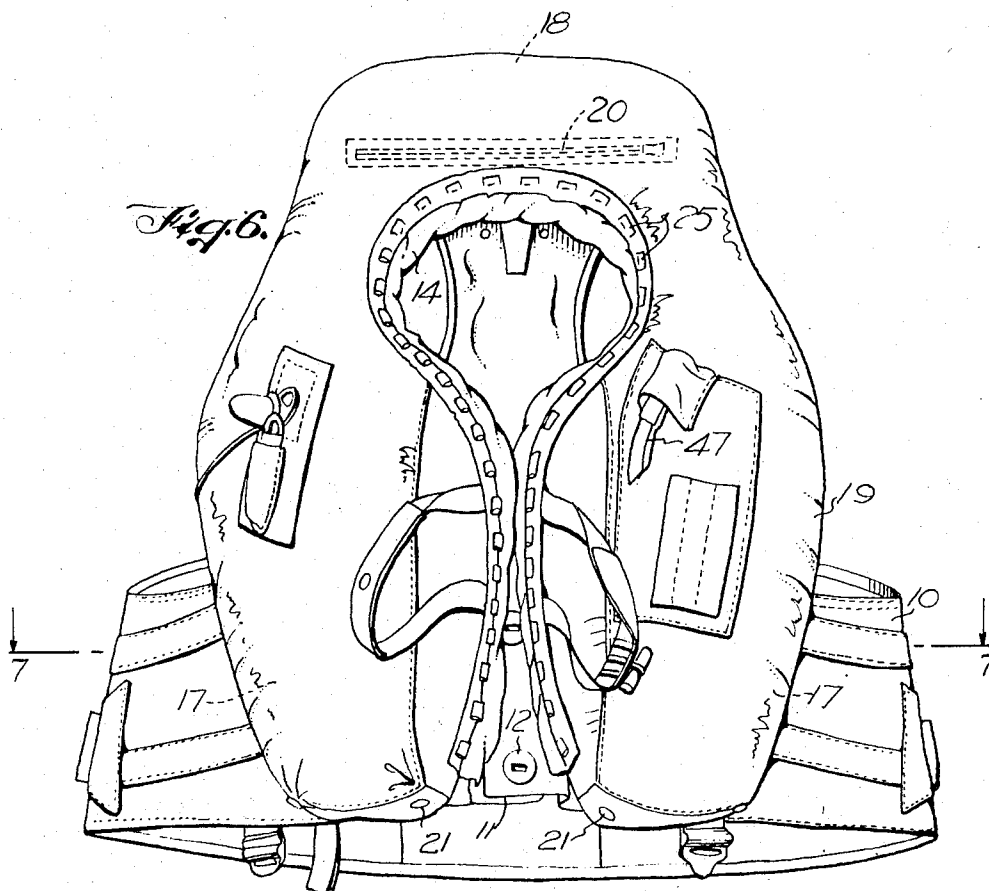
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INFLATABLE BODY ATTACHMENTS AND OTHER ARTICLES

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ABSTRACT OF THE DISCLOSURE

Stowage means for an inflatable article such as the buoyancy chamber of a lifejacket, comprising an elongated pouch in which such article is compactly accommodated prior to inflation and which is normally held closed by a series of connected toggles passed through loops at at least one of its edges, said article having self-inflation means operable by a pull on a flexible traction member which simultaneously effects collective withdrawal of the toggles from the loops to allow deployment of the inflating article. Except for the parts thereof engaged with the pouch-securing loops, the toggles are contained in a flexible guide tube to ensure their free operation around a curved pouch opening, such tube and the toggles being protected by flaps closable by a slide-fastener and press-studs.

This invention relates to inflatable articles for marine lifesaving, with particular (though not exclusive) reference to that type of body-attachment which comprises two elongated inflatable portions adapted to be secured together side-by-side for disposal in front of the wearer's chest, a third inflatable portion permanently connecting adjacent ends of the two first-mentioned and adapted to extend around the sides and back of the wearer's neck, and means for locating the appliance upon the body of the wearer.

Lifesaving appliances of the type aforesaid, and either provided with attachment harness or built into garments, have become standard equipment for service personnel and other individuals who require, or may require, to make parachute descents from aircraft.

In this connection, it is known practice to provide the attachment structure with stowage flaps under which the uninflated appliance can be compactly accommodated in rolled or folded condition and in such a manner as not to interfere with the wearing of a parachute harness or to be prevented by the latter from full deployment in the event of its self-inflation being initiated whilst the wearer is still airborne.

Although stowages secured by means of readily-rupturable press-studs and confining only the front chambers or lobes of the inflatable appliance are perfectly satisfactory during normal parachute descents, their bulkiness makes them quite unsuitable for use by the occupants of low-level tactical aircraft who may require to escape from the latter by ejection seat at very high speeds.

The violent wind-blast encountered on emergence at high velocities is liable to tear away or damage any projecting body-attachment upon which it can obtain a pur-

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chase, and clothing with built-in flotation means for the occupants of such aircraft has consequently been designed with a streamlined collar-like stowage adapted to contain the whole appliance and secured by means of a slide-fastener extending substantially the full length thereof.

This form of stowage fastening will not, of course, yield to the internal pressure of the expanding appliance without external assistance, and with this in mind it has already been proposed to arrange that the clasp of the slide-fastener will be pulled off one end thereof on operation of an actuating member also connected to self-inflation means for the stowed appliance, whose subsequent expansion is intended to effect a progressive opening of the slide-fastener from its released end.

The object of the present invention is to provide an improved construction of quick-opening stowage in which the effective deployment of the expanding appliance is not dependant upon the progressive bursting-open of a slide-fastener and hence liable to be hindered by a parachute harness or other equipment overlying such fastener intermediate its ends.

According to this invention, an inflatable article, initially stowed in uninflated condition within a restraining pouch, is characterised in that the edges of such pouch are held together by a series of toggles each passed through a loop or loops on at least one of said edges and all carried by a flexible traction member which is connected at one end to the actuating member of self-inflation means for the stowed article, so that a pull on said actuating member is accompanied by a simultaneous release of the several pouch-closure means.

The flexible traction member is preferably a length of stranded wire to which relatively short branches of the same material are fixed at intervals to constitute the toggles aforesaid, and conveniently each such toggle cooperates with a row of loops on one edge of the pouch which have been passed through a series of openings in the opposite wall of the latter.

The pouch wall having these openings therein may be folded back upon itself and secured by a slide-fastener so as to overlie and protect the several toggle fastenings without affecting the release of the latter in any way.

In the accompanying drawings:

FIG. 1 is a front elevation of a lifejacket having its inflatable portion stowed in accordance with the present invention.

FIG. 2 is a fragmentary view of the appliance from the right-hand side of FIG. 1.

FIGS. 3 and 4 are fragmentary perspective views showing successive stages in the actuation of self-inflating means associated with such appliance.

FIG. 5 is a section on the line 5—5 of FIG. 1.

FIG. 6 is a view corresponding to FIG. 1 but showing the lifejacket fully inflated, and

FIG. 7 is a section through the right-hand half of FIG. 6.

In the example illustrated, a waistcoat 10 having a medial front opening 11 closed by buttons 12 or other means is provided with a hollow collar 13 comprising two stole-shaped flaps 14, 15 whose inner peripheries are sewn around the neck-band of the garment and down the edges of its front opening 11.

This collar 13 has permanently-closed rounded ends 16 which are sewn to the front of the garment, the outer peripheries of its component flaps 14, 15 being securable together by means hereinafter described, to provide a stowage pouch for an inflatable appliance (see FIG. 6) of generally similar shape.

Such appliance is constructed, in known manner and as a single unit, from suitably shaped panels of a flexible impermeable material (such as rubberized fabric) whose edges are united by taping or otherwise to provide two elongated lobes 17 intended for disposal side-by-side in front of the wearer's chest and a connecting portion 18 of arcuate profile and smaller inflated cross-section which, under the above conditions, will extend around the sides and back of his neck.

For convenience in manufacture, the resultant air-bag 17, 18 is confined within, and its inflated shape defined by, an outer casing 19 made up from any suitable textile material and within which the inflatable appliance may be suitably located after insertion through a closable or other opening indicated at 20, this casing being permanently anchored within the stowage 13 at 21 so that the complete appliance can be retained in compactly rolled or folded condition, when such stowage is closed.

The air-bag, or its equivalent, has one of its front lobes 17 connected to the normally-sealed neck of a "bottle" 22 of liquefied carbon dioxide or other gas which will effect self-inflation of the appliance when admitted thereto by the pulling of an actuating member in known manner.

This "bottle" 22 may be located by means of two subsidiary flaps 23 sewn to the inner flap 15 of the main stowage 13 and having their free edges securable by a slide-fastener 24 or other means (FIG. 7).

The closure means for the main stowage 13, comprises a row of loops 25 provided at, or formed in, the free edge of its outer flap 14 at regular intervals and adapted to be passed inwardly through correspondingly spaced slits 26 woven in a tape 27 which is sewn along the edge of the inner flap 15, or alternatively they may be defined by circular or elongated metal eyelets or formed in the same manner as garment button-holes.

After a number of (say, three or four) consecutive loops 25 on the outer stowage flap 14 have been passed through the adjacent openings 26 in the inner flap 15, they are secured by threading therethrough a flexible toggle 28 comprising a short length of stranded stainless-steel wire cable, this procedure being repeated along the whole length of the closure means and corresponding ends of the several toggles 28 being fixed by crimped metal sleeves 29 to a common traction member 30 of the same material.

The first of the crimped sleeves 29 is located at one end of the traction member 30 and secured in an eyelet 31 in a loose strip of webbing 32 which carries an actuating loop 33 (preferably represented by an attached string of plastic beads) and is connected by a tape 34 to the release mechanism of the self-inflation means 22, this strip 32 being temporarily secured to the inner stowage member 15 and to a subsidiary flap 35 on the latter by means of press-studs 36, 37 respectively (see FIGS. 3 and 4).

Thus, to bring the inflatable appliance into use, the wearer merely has to tear away the actuating loop 33 from its attachments 36 and 37, and pull down upon it to initiate self-inflation of the stowed air-bag 17, 18, all the toggles 28 being simultaneously withdrawn from the coating loops 25 so that the stowage pouch 13 is free to open along its whole length as the appliance expands. The trailing end of the traction member 30 may (if desired) be anchored within the pouch 13 by means of a normally-slack cord which limits the withdrawal movement aforesaid.

To ensure that the flexible toggles 28 shall slide easily from the loops 25, each is covered with a polytetrafluoro-

ethylene or other plastic sheath which also serves to shield the raw ends of the cable strands and which is gripped in the adjacent crimped sleeve 29. Furthermore, the traction member 30 is guided in a plastic tube 38 having an integral fin 39 whereby it can be sewn along the inner flap 16 and a longitudinal slot or slots 40 through which the several toggles 28 protrude (FIGS. 4 and 5).

In the preferred arrangement shown the openings 26 in the inner stowage flap 15 are spaced sufficiently from its edge to allow the latter to be folded back over the threaded toggles 28 and guide tube 38 prior to securement by means of a slide-fastener 41 to a further flap 42 on the exterior of the stowage (FIGS. 4 and 7), the closure means being thereby protected against accidental release or damage and the stowage streamlined without in any way hampering the deployment of the expanding air-bag 17, 18 the slide-fastener 41 remaining secured until it is next desired to close the stowage 13 after deflation and re-packing of the appliance.

The slider 43 of the fastener 41, together with the temporary attachment of the strip 32 at 36, are protected by securing two further flaps 44, 45 over them by means of press-studs 46 (FIG. 7).

The appliance may be fitted in the usual way with a valved tube 47 through which the air-bag 17, 18 can be orally inflated by the wearer in the event of the self-inflation means 22 failing to operate when the actuating loop 33 is pulled.

Although specifically described hereinbefore as applied to a waistcoat, stowage means in accordance with the invention may be applied to flying overalls and other forms of outer garment provided with built-in flotation means.

I claim:

1. Buoyancy means for an inflatable lifejacket comprising an elongated pouch adapted snugly to accommodate said lifejacket in uninflated condition, a series of loops provided along one edge of one wall of said pouch each opposite to an opening in the other wall thereof, a series of toggles engaged with said loops after the same have been passed through said openings and thereby holding said pouch closed, slide-fastener means for securing the edge of said other wall to the exterior of said pouch to form a secondary pouch enclosing said toggles, an actuating member for a self-inflation means, a flexible traction member having said toggles attached thereto and also connected to said actuating member so that operation of the latter by a pull on said traction member simultaneously releases said toggles from said loops to allow deployment of the inflating lifejacket, a flexible tube in said secondary pouch forming a guide for said traction member and slotted to clear said toggles.

2. Buoyancy means for an inflatable lifejacket comprising an elongated pouch adapted snugly to accommodate said lifejacket in uninflated condition, a series of loops provided along one edge of one wall of said pouch each opposite to an opening in the other wall thereof, a series of toggles engaged with said loops after the same have been passed through said openings and thereby holding said pouch closed, slide-fastener means for securing the edge of said other wall to the exterior of said pouch to form a secondary pouch enclosing said toggles, an actuating member for a self-inflation means, a flexible traction member having said toggles attached thereto and also connected to said actuating member so that operation of the latter by a pull on said traction member simultaneously releases said toggles from said loops to allow deployment of the inflating lifejacket, readily-releasable means for temporary securement of said actuating member to said pouch, cover flaps on said pouch for protecting said temporary securement means to prevent inadvertent operation of said actuating member.

3. Stowage means for an inflatable lifejacket comprising an elongated pouch adapted to snugly accommodate said lifejacket in uninflated condition, a series of loops provided along at least one edge of said pouch, a plurality

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of toggles each passed through at least one of said loops to hold said pouch closed, self-inflation means for said lifejacket, an actuating member for said self-inflation means, a flexible traction member having a plurality of said toggles attached thereto and also connected to said actuating member, flexible guide means for said traction member in said pouch, said guide means having a plurality of openings, said toggles passing through at least two of said openings, whereby a pull on said traction member operates said actuating member, simultaneously releasing said toggles from said loops to allow deployment of the inflating article.

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