

[54] **INFLATABLE LIFE PRESERVER**

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[22] Filed: **Dec. 6, 1974**

[21] Appl. No.: **530,139**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 502,434, Sept. 3,
1974, abandoned.

[52] **U.S. Cl.**..... **9/319; 9/345**

[51] **Int. Cl.²**..... **B63C 9/16**

[58] **Field of Search**..... 9/311, 314, 316-319,
9/322, 324, 327-329, 333, 337, 340, 345;
114/2 A, 11 A

[56] **References Cited**

UNITED STATES PATENTS

3,144,667 8/1964 Dobbs..... 9/345

3,148,393 9/1964 McCuaig..... 9/316
3,633,230 1/1972 Horton..... 9/345

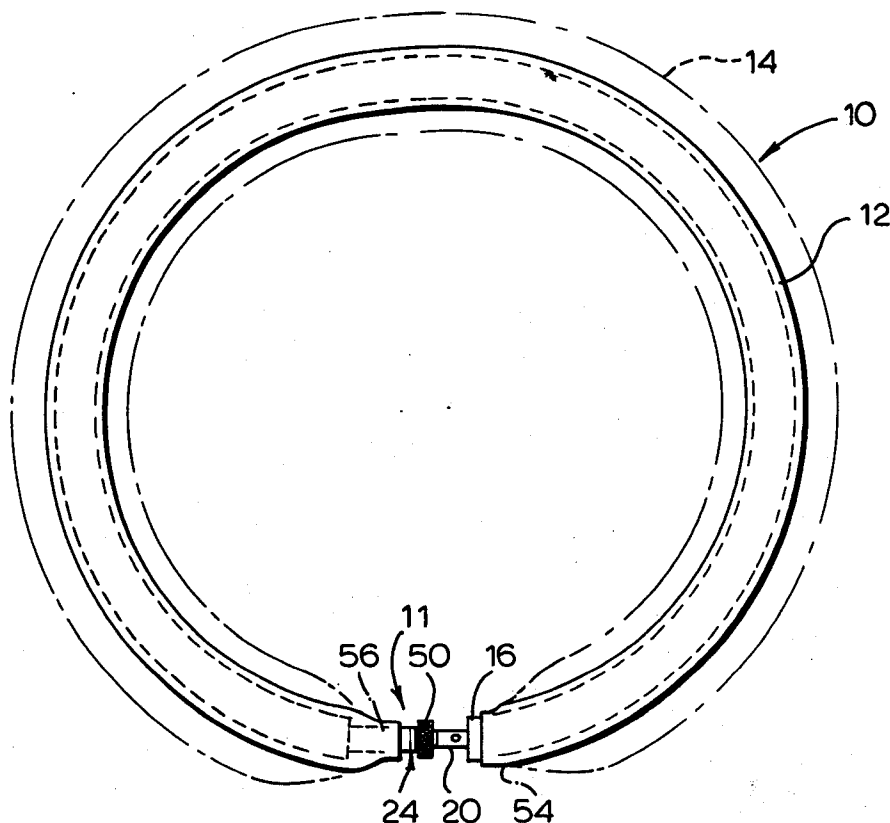
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[57]

ABSTRACT

An inflatable life preserver collar having a toroidal, tubular core forming a closed chamber and a coaxial, inflatable membrane forming an annular closed chamber outside the core. A passage leading from the chamber of the core to the chamber of the membrane has a valve which is openable by pulling apart the two ends of the core which are fastened together to form the collar allowing pressurized gas which is sealed in the core chamber to escape and inflate the membrane.

10 Claims, 5 Drawing Figures



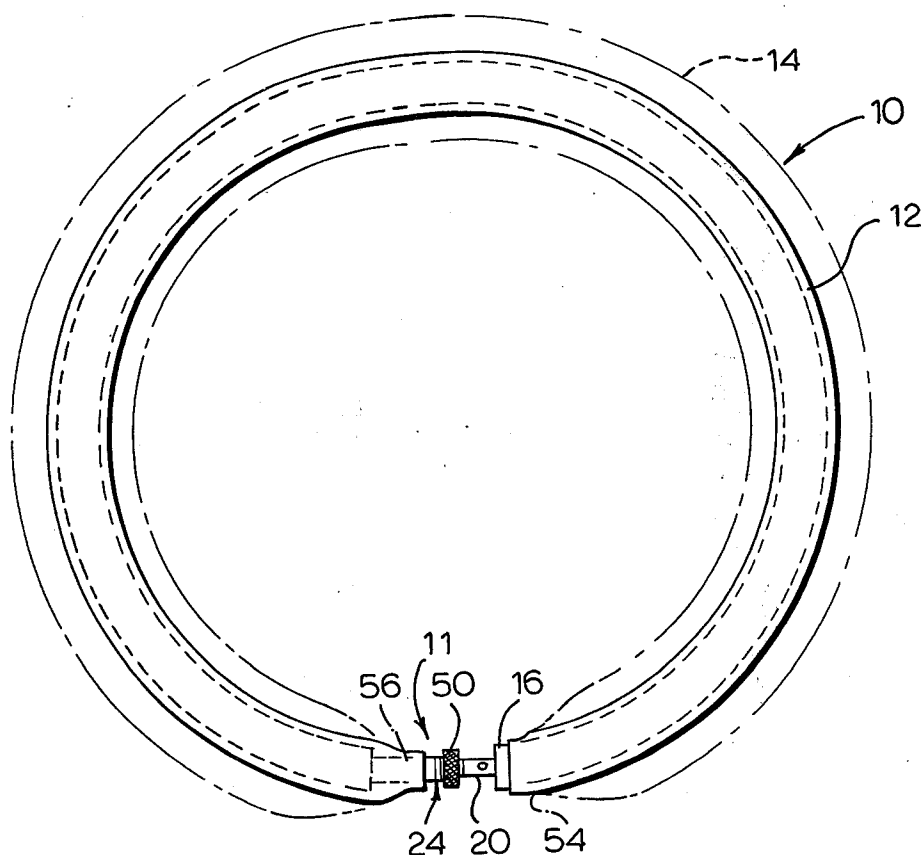


FIG. 1

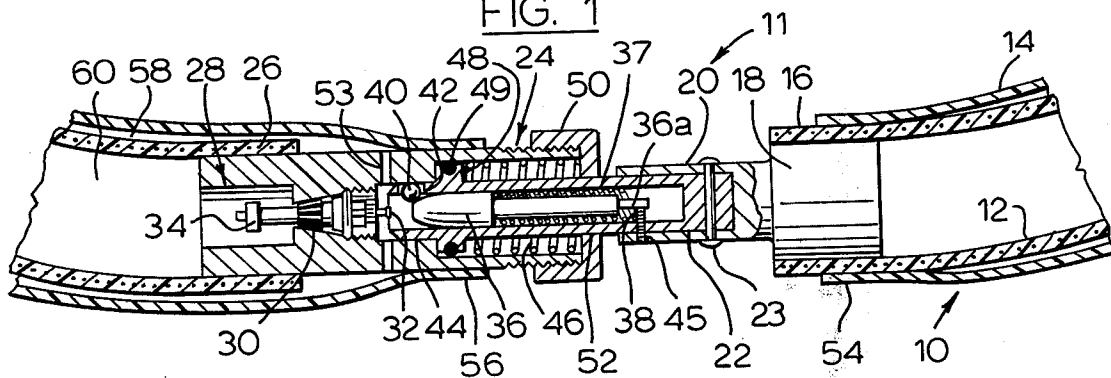


FIG. 2

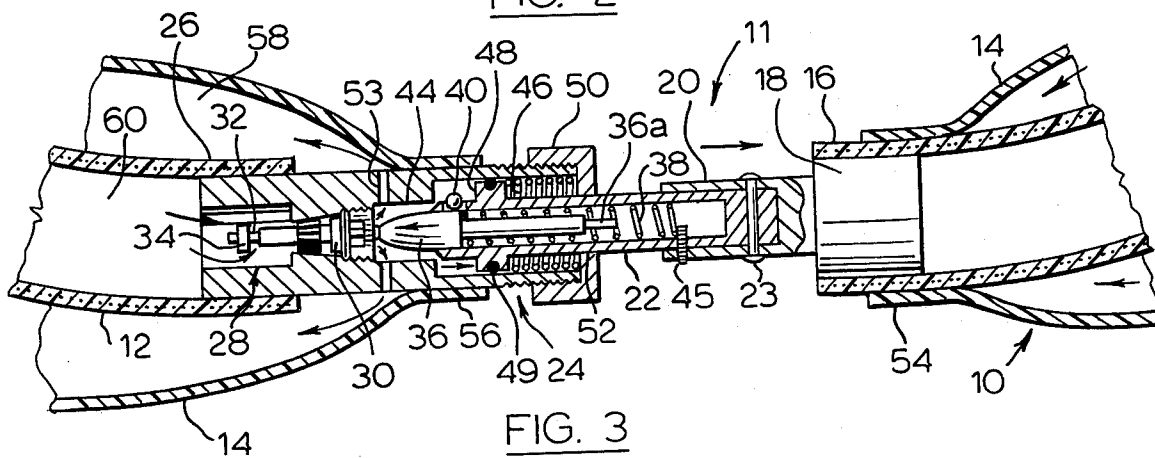


FIG. 3

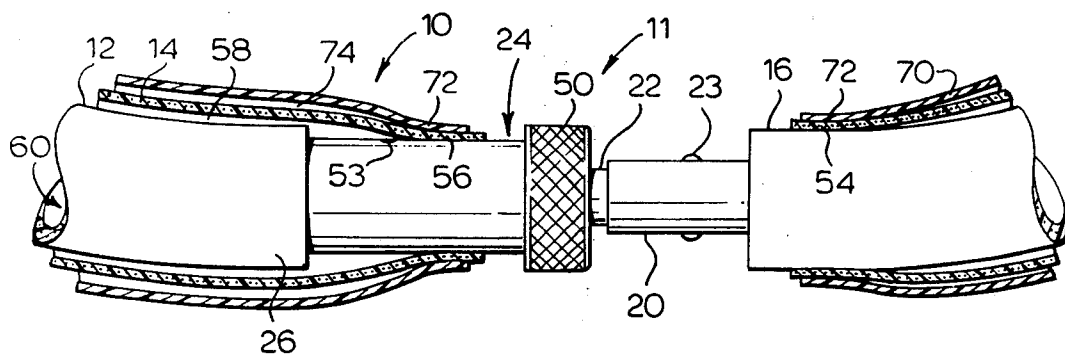


FIG. 4

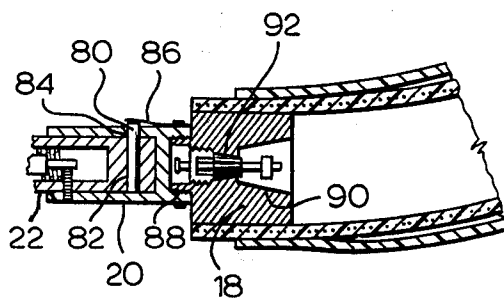


FIG. 5

INFLATABLE LIFE PRESERVER

This is a continuation-in-part of U.S. Pat. application Ser. No. 502,434 filed Sept. 3, 1974 in the name of Patrick Hayes Kennedy entitled INFLATABLE LIFE PRESERVER now abandoned.

This invention relates to an inflatable life preserver.

Life preservers are known in which the preserver is worn as a vest, jacket or neck band and a cord is pulled to release pressurized gas which inflates the preserver. In neck band life preservers a cartridge or canister of pressurized gas is attached externally to one end of the inflatable portion of the preserver, as shown for example in U.S. Pat. No. 3,144,667 issued Aug. 18, 1964 to D. G. Dobbs. Such a structure adds to the bulkiness of the device, which is unwieldy for storage, handling, and for being worn about the neck.

It is an object of the present invention to provide an inflatable life preserver collar which is more compact and which is more easily worn.

An example embodiment of the invention is shown in the accompanying drawings in which:

FIG. 1 is a plan view of a life preserver according to the invention;

FIG. 2 is a cross-sectional view of the coupling portion of the life preserver of FIG. 1 showing the release valve arrangement;

FIG. 3 is a cross-sectional view similar to FIG. 2 showing the valve when released;

FIG. 4 is a plan view of the coupling portion of an alternate embodiment of the invention showing a second annular inflatable tube; and

FIG. 5 is a plan view of the coupling portion of a further embodiment of the invention showing the coupling separable.

The embodiment shown in FIGS. 1 to 4 of the drawings consists of a collar 10 with a coupling 11. Collar 10 has a toroidal, tubular core 12 of pressure resistant, gas impervious material and a tubular membrane 14 of resilient, gas impervious material mounted coaxially on the core. Core 12 is preferably made of rubber hose or similar light material and membrane 14 is preferably made of expandable rubber.

One end 16 of tubular core 12 is sealed by a fixed plug 18 having a coaxial, socketed boss 20 extending outwardly from the core. An elongated barrel 22 fixed to boss 20 by a rivet 23 extends from the free end of the boss into a valve housing 24 which is fixed in the other end 26 of core 12. Housing 24 has a central bore 28 which includes as valve 30 openable by a stem 32 which when depressed unseats a valve head 34 (as shown in FIG. 3). A plunger 36, slideable in a bore 37 in barrel 22, is held depressed against the action of a compression spring 38 by a movable detent in the form of a ball 40 which rests in an aperture 42 in the wall of the barrel. Ball 40 bears against a shoulder 44 of housing 24 and projects into bore 37 of barrel 22 against plunger 36. A set screw 45 is set in the wall of boss 20 and barrel 22 and is adjustable to bear against an extension 36a of plunger 36. A compression spring 46 acting against a flange 48 on barrel 22 and against a cap 50 threaded onto housing 24 forces flange 48 against shoulder 44 of the housing. Flange 48 carries a sealing ring 49 bearing against the wall of bore 28. Barrel 22 is freely slidable in an aperture 52 in cap 50. Radial passages 53 in shoulder 44 adjacent valve 30 connect bore 28 with the outside of housing 24. Tubular membrane 14 is sealed at one end 54 on end 16 of core 12 and at

the other end 56 on housing 24 between radial passages 53 and cap 50 to form an annular, closed chamber 58 about core 12. Plug 18 and housing 24 form a closed chamber 60 in core 12.

In the operation of the embodiment shown in FIGS. 1 to 3 of the drawings compressed gas is introduced into chamber 60 of core 12 through valve 30 by removing cap 50 and barrel 22 from housing 24, after which the barrel is reintroduced into the housing and the cap is replaced to prime the unit as seen in FIG. 2. To keep plunger 36 depressed against the action of spring 38 while the firing unit is being assembled, set screw 45 is rotated to bear against extension 36a of plunger 36. After the firing unit has been assembled, i.e., when ball 40 bears against shoulder 44, set screw 45 is loosened to release plunger 36 to bear against ball 40. Preferably the compressed gas is freon (dichlorodifluoromethane, a refrigerant) which is introduced into chamber 60 as a liquid at 85 pounds per square inch. Approximately two or three ounces of freon would normally be sufficient. To inflate tubular membrane 14, end 16 of core 12 is pulled away from housing 24 against the action of spring 46, as seen in FIG. 4, i.e., the two ends 16 and 26 of core 12 are pulled apart. When aperture 42 of socket 22 clears shoulder 44 of housing 24, ball 40 is freed and releases plunger 36 which moves against valve stem 32 by the action of spring 38. Plunger 36 depresses valve stem 32 to open valve 30 and the compressed gas in chamber 60 of core 12 is released through the valve into radial passages 53 and into chamber 58 of membrane 14 to inflate the membrane.

When collar 10 is placed on a person's neck with end 16 of core 12 adjacent the person's throat it is easily accessible for inflation and has no bulky and cumbersome radial or axial container attachments for providing the compressed gas.

In the embodiment shown in FIG. 4 of the drawings a second tubular membrane 70 is mounted coaxially on core 12 with ends 72 of the second membrane sealed on ends 54 and 56 of membrane 14 to provide a closed annular chamber 74. A highly odorous gas is sealed in chamber 74. If membrane 70 is punctured the odorous gas will leak out and provide a warning that the life preserver is damaged.

In a further example embodiment of the invention shown in FIG. 5 of the drawings coupling 11 of collar 10 is separable and this embodiment also shows a convenient alternate construction for charging core 12 with compressed gas. In this embodiment barrel 22 is separable from boss 20, the barrel being held in the boss by a pin 80 located in aligned bores 82 and 84 in the barrel and the boss respectively. Pin 80 is urged into bores 82 and 84 by a leaf spring 86 clamped on boss 20. Plug 18 in end 16 of core 12 has an axially projecting collar 88 which is threaded to receive boss 20. An axial bore 90 passes through collar 88 and plug 18, and a valve 92 similar to valve 30 is located in the bore.

In the operation of the embodiment shown in FIG. 5 compressed gas is introduced into chamber 60 of core 12 through valve 92 by removing boss 20 from collar 88, after which the boss is again threaded onto the collar. In use, ends 16 and 26 of collar 10 are uncoupled by removing pin 80 from bores 82 and 84 and separating barrel 22 from boss 20. When the collar has been placed around the person's neck the ends of the collar are coupled together again by re-inserting barrel 22 into the socket of boss 20 and re-inserting pin 80

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into aligned bores 82 and 84.

I claim:

1. An inflatable life preserver collar comprising:
 - a toroidal, tubular core of pressure resistant material forming a first closed chamber;
 - a first inflatable tubular membrane mounted coaxially on the core and forming a second, annular closed chamber about the core;
 - passage means connecting the first chamber and the second chamber;
 - valve means located in the passage means; and
 - means, actuable on the application of axial force to the collar, to open the valve means for the passage of pressurized gas from the first chamber into the second chamber.
2. A life preserver as claimed in claim 1 including a second tubular membrane mounted coaxially on the core and forming a third, annular closed chamber about the core to contain a gas of detectable odour.
3. A life preserver as claimed in claim 1 in which the core has a pair of spaced ends interconnected by said passage means and said actuable means.
4. A life preserver as claimed in claim 3 in which said passage means comprises a housing projecting from one end of the core, a passage in the housing leading from the first chamber, at least one aperture opening laterally from the passage into the second chamber, said valve means comprising a valve located in the passage between the first chamber and the lateral aperture, said actuable means comprising barrel means projecting from the other end of the core into the housing and engageable therewith, said barrel means carry-

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ing means constructed and arranged to open the valve on the application of axial force to the collar.

5. A life preserver as claimed in claim 3 in which the valve carries a stem coaxial with the passage, and the valve opening means comprises a plunger located in the barrel means coaxial with the stem, the plunger being actuable to strike the stem and open the valve on the application of said axial force.

6. A life preserver as claimed in claim 4 in which the passage includes a shoulder, the barrel means having a detent bearing against the shoulder and against the plunger, the plunger being held by first compressive means against the detent, the barrel means being held by second compressive means against the shoulder, whereby on the application of said axial force the barrel means is moved against the action of the second compressive means to release the detent from the shoulder thereby releasing the plunger to strike the valve stem under the action of the first compressive means.

7. A life preserver as claimed in claim 5 in which the free end of the housing carries a removable cap against which the first compressive means bears.

8. A life preserver as claimed in claim 3 in which the actuable means includes means to uncouple and recouple the spaced ends of the core.

9. A life preserver as claimed in claim 4 in which the barrel means is releasably engageable in a boss carried by the other end of the core.

10. A life preserver as claimed in claim 9 in which a pin is receivable in bores aligned in the barrel and in the boss, the pin being urged into the bores by spring means.

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