May 19, 1970 H. J. MORAN 3,512,807

MANIFOLD FOR INFLATABLE LIFE PRESERVERS AND THE LIKE

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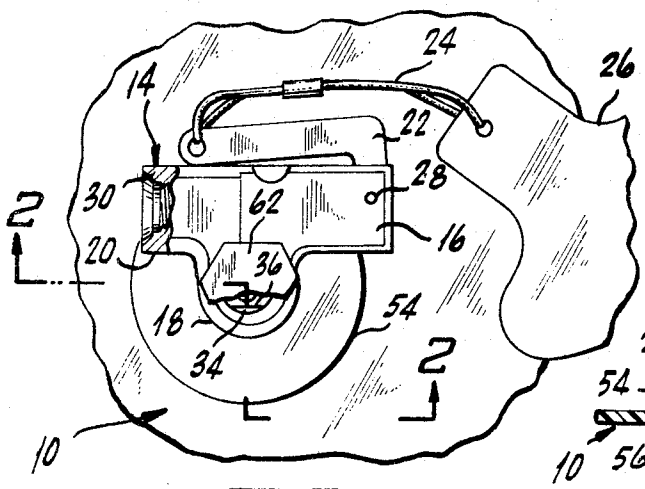


Fig. 1.

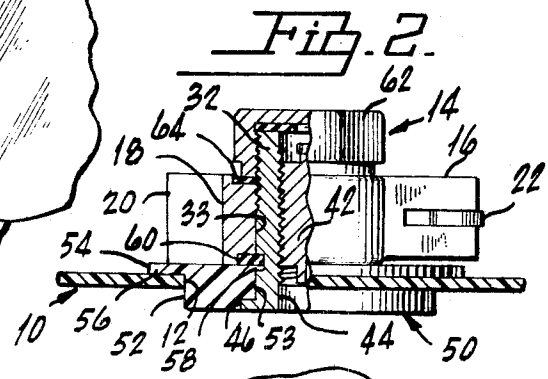


Fig. 2.

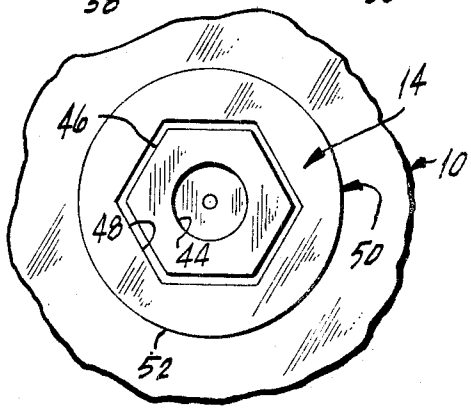


Fig. 3.

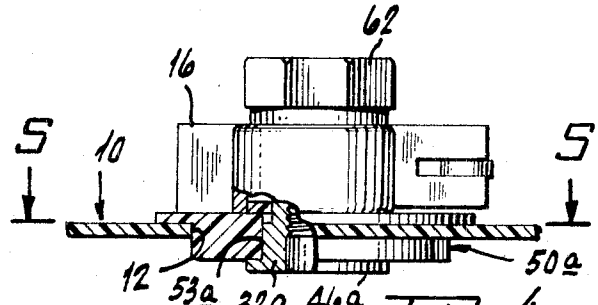


Fig. 4.

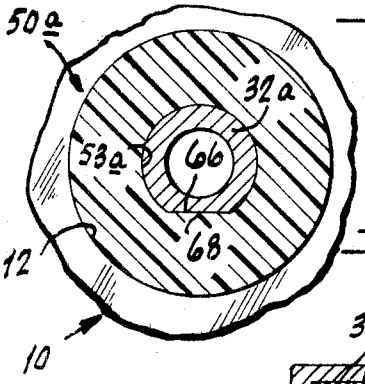


Fig. 5.

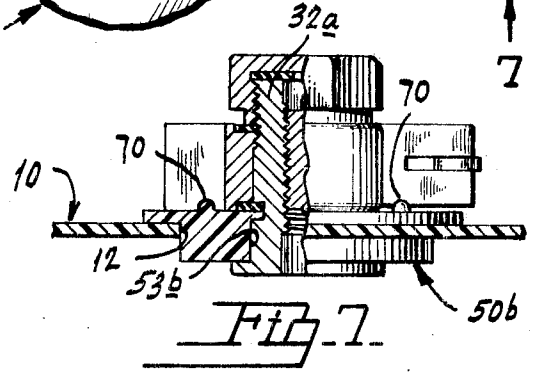


Fig. 7.

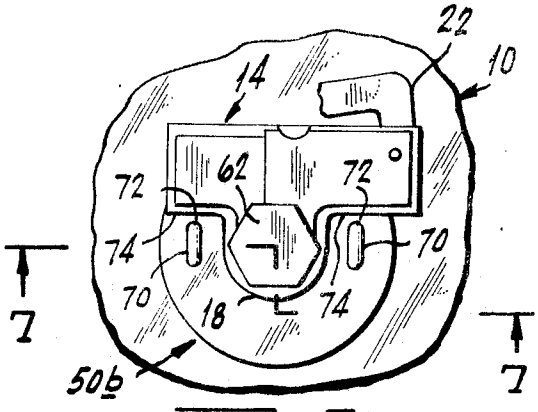


Fig. 6.

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MANIFOLD FOR INFLATABLE LIFE PRESERVERS AND THE LIKE

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U.S. Cl. 285—158 9 Claims

ABSTRACT OF THE DISCLOSURE

A manifold for inflatable flotation devices, such as life preservers, utilizes a plastic base having the property of sealably adhering to the body of the inflatable responsive to the application of heat. A tubular insert extends through the manifold body and has a noncircular collar at one end engaging in a mating recess of the base to prevent relative rotation of these components. The insert and the manifold body are also interengaged against relative rotation. The base and manifold body are clamped between the between the collar and a cap nut threaded on the insert.

BACKGROUND OF THE INVENTION

Field of the invention

The invention pertains to inflatable flotation devices in general, and in particular to the provision of a novel manifold construction utilized in devices of this type. Such flotation devices, though usually body-attached or worn, also include life rafts, swimming aids, and the like. A manifold mounted on the inflatable bodies of such devices may include a lever operable by a user to puncture a container holding a compressed, gaseous, inflating medium, which is thereby released for expansion within the body of the inflatable article.

Description of the prior art

Heretofore, a manifold of the type incorporated in a plastic life vest has conventionally comprised three main parts. One of these, a manifold body, carries the operating mechanism for releasing the compressed gas, and extending through the body is a second part, an insert, usually of brass or other noncorrosive material. The insert has a check valve which permits the released inflating medium to pass through the insert into the body of the buoyant device. Mounting the manifold body and insert upon the inflatable body is a base, which heretofore has been of neoprene.

It has been conventional practice to mold the neoprene base about the base of the insert, so that the insert is embedded within the neoprene material against rotation relative to the neoprene base. Then, the neoprene base has been cemented to the inflatable body.

This has been a relatively costly arrangement, in that the expense of molding the insert within the neoprene base has been such as to add materially to the cost of the manifold. Further, the cementing of the neoprene to the body of the inflatable article is undersirable, not only in respect to the cost involved, but also in respect to maintaining a perfect seal, over an indefinite period of time. Obviously, if a completely leak tight seal is not effective between the neoprene base and the inflatable body, or if the seal should deteriorate over a long period of time during which the life vest may be awaiting use, the effectiveness of the life vest is completely destroyed.

Summary of the invention

Briefly, the construction devised to overcome the deficiencies of the prior art includes a comparatively flat, circular, plastic base, formed of any plastic having the properties of adhering sealably to an adjacent plastic material, responsive to the application of heat. The base includes a relatively thin peripheral flange overlying the adjacent areas of the inflatable body, and connected thereto by well known heat-sealing methods. The flange bounds a thicker body portion, having a center opening in communication with a non-circular recess.

A brass insert is positioned through the center opening of the base, and has a noncircular collar mating with the recss. Thus, the insert and base are interengaged against relative rotation. Thereafter, a manifold body is positioned over the insert, with the insert serving as a stud receiving the manifold body. The insert has an inlet port in communication with an inlet portion of the manifold body, with the inlet portion being adapted for connection to a CO_2 bottle. Conventional means is provided upon the manifold body for puncturing the CO^2 bottle, and a conventional check valve is provided within the insert permitting passage of the inflating medium into the body of the flotation device.

In accordance with the invention, the necessity of embedding the insert within the mounting base is dispensed with, and at the same time said mounting base is connected more efficiently to the body of the inflatable article than has heretofore been the case, through the provision of a base of a plastic material which can be heat-sealed to the inflatable body. At the same time, without the necessity of molding the base about the insert, the insert and base are engaged against relative rotation. The insert is also engaged with the manifold body against relative rotation, so that all the parts are held against relative movement about the axis of the insert. The prevention of such movement is of course important, for the reason that operation of the puncturing mechanism tends to impart torque to the manifold, and if any of the main components of the manifold should turn in respect to the others, the release of the gaseous medium would be made difficult if not completely impossible.

Brief description of the drawing

FIG. 1 is a top plan view of a manifold according to the present invention, portions being broken away, an inflatable body on which the manifold is mounted being shown only fragmentarily;

FIG. 2 is a view of the manifold partly in side elevation and partly in section, substantially on line 2—2 of FIG. 1;

FIG. 3 is a bottom plan view of the device, the inflatable body being shown fragmentarily;

FIG. 4 is a side elevational view of the device, partly in section, showing a modified construction;

FIG. 5 is a sectional view through the base and insert of the modified construction shown in FIG. 4, taken substantially on line 5—5 of FIG. 4.

FIG. 6 is a view similar to FIG. 1, a portion of the operating mechanism being broken away, showing another modification; and,

FIG. 7 is a view partly in elevation and partly in section, taken substantially on line 7—7 of FIG. 6.

Description of the preferred embodiments

A device according to the present invention can be utilized as an inlet valve mechanism for any of various inflatables of the type designed to be inflated in response to opening of a source of compressed gas for flow thereof into the body of the inflatable, and for expansion of the gas within said body to inflate the same. Normally, the device, being of relatively compact, simplified form, would be used in an inflatable life vest construction. How-

ever, it could be employed, perhaps in larger forms still retaining the inventive concept, in other inflatables, including life rafts, escape chutes, inflatable buoys, etc.

The term "inflatable body" as used herein, accordingly, shall be intended to refer to any body falling within the general description provided above. Such body has been designated by the reference numeral **10** in the drawing, and would be formed of plastic material, as is conventional.

Also conventional is the provision of an aperture **12** of said body, in which is mounted a manifold **14** constructed according to the present invention.

The manifold **14**, in the illustrated embodiment, and referring particularly to FIGS. 1–3, includes a metal casting **16** provided in the illustrated example with a sleeve portion **18** integral and communicating with a gas inlet portion **20**.

Inlet portion **20**, at one end thereof, supports a mechanism for puncturing a CO_2 bottle or the like, not shown, and since this mechanism is completely conventional, only the externally visible parts are shown. Such mechanism includes, as shown, a lever **22** which interiorly of the inlet portion **20** would operate a needle element or the like, to drive it into the end of the CO^2 bottle for the purpose of permitting the escape of the gaseous medium held therein under pressure.

For the purpose of rocking the lever from its normally inoperative position shown in FIG. 1, there is provided a thong **24**, to which is connected a handle **26** conveniently located to be grasped by a user when the lever is to be pivoted about its pivot pin **28** to the bottle-puncturing position thereof.

At its opposite end **30**, inlet portion **20** is open, and is interiorly threaded for reception of the threaded neck of the CO_2 bottle or other source of gas under pressure, with the gaseous inflating medium entering in the direction of arrows shown in FIG. 1.

The manifold also includes a tubular insert **32**, normally formed of brass or other noncorrosive material, and extending within the bore **33** of sleeve portion **18**. The insert and the sleeve portion have confronting flats **34**, **36**, respectively, engaging the insert against rotation relative to the manifold body **16**.

Formed in the side wall of the insert is an inlet port communicating with the inlet passage of the portion **20** of the manifold body, so that the carbon dioxide or other inflating medium is permitted to pass into the insert. Said medium, when it flows into the insert, passes through an inlet check valve **42** of conventional design threadedly engaged in bore **44** of the insert, and thus enters the inflatable body. Here the inflating medium expands to inflate the flotation device.

On the inner end of the insert there is integrally formed a collar or flange **46**, which in the illustrated example is of hexagonal configuration, although obviously other noncircular shapes could be employed to equal advantage. The collar **46** seats in a complementary recess **48** formed in the underside of a mounting base **50** formed of a plastic material having the property of forming a leak tight connection to the adjacent areas of the inflatable body **10**, responsive to the application of heat. For example, polyurethane may be employed as the material of which the base is constituted, and the body of the inflatable article could be similarly constituted wholly of plastic film, such as a sheet vinyl, though alternatively, the body of the inflatable could be clothed with a plastic coated outer surface, the coating being, for example, polyurethane.

In any event, mounting base **50** includes a relatively thick, circular body portion **52** engaging within aperture **12**, and having a center opening **53** communicating with recess **48**. Integral with body portion **52** is a peripheral, thin flange **54**, overlying the area of the body **10** that bounds the aperture **12**. The flange is heat sealed as at **56** to said body **10**, to mount the manifold thereupon

in such fashion as to prevent leakage of gas or water between the manifold and the body **10**.

The insert extends through the opening **53** and sleeve portion **18**, and as shown, is formed with an external groove **58** receiving an annular gasket **60**, said gasket being compressed between the sleeve portion **18** and the body portion **52**, in the assembled relation of the parts.

The gasket extends about the opening **53** and thus prevents leakage between the insert and the mounting base **50**.

The outer end of the insert is externally threaded to receive a cap nut **62** bearing against a gasket **64** that extends about the insert within sleeve portion **18**.

In use, with the mounting base sealably connected as described above to the inflatable body **10**, the insert is positioned through opening **53**, with collar **46** engaging in recess **48**. Sleeve portion **18** is then positioned over the insert, with gasket **60** interposed between the sleeve portion and mounting base **50**. Then, cap nut **62** is threaded onto the insert, and when turned down tightly against the gasket **64** of sleeve portion **18**, causes the sleeve portion and the mounting base to be clamped tightly between the collar and the cap nut, with gasket **60** being compressed to prevent leakage between the mounting base and the insert.

In the modified construction shown in FIGS. 4 and 5, the insert **32*a*** is similar to the insert of FIGS. 1–3, except for having a flat, circular collar **46*a***, bearing against the unrecessed, flat surface of a plastic base **50*a***. Base **50*a*** is similar to base **50**, except for omitting the recess **48**, and except, further, for having an opening **53*a*** formed with a flat **66** engaging a completmentary flat **68** provided upon the insert **32*a***.

The arrangement, thus, interengages the insert and base against relative rotation, obtaining the same result as is achieved through the provision of the collar **46** and recess **48** of FIGS. 1–3.

In this form of the invention, the insert and the sleeve portion **18** would have the confronting flats **34**, **36** as in the first form of the invention and thus the insert, base, and manifold body are all interengaged against relative rotation.

In the form of the invention shown in FIGS. 6 and 7, the base **50*b*** is formed with a center opening **53*b*** similar to the opening **53*a*** shown in FIG. 5, that is, opening **53*b*** has a flat surface engaging a flat surface on the insert. In this form of the invention, the insert **32*a*** can be employed, and thus the insert and the base are held against relative rotation. Base **50*b*** in this form may be provided with projections **70** disposed at opposite sides of the sleeve portion, in position to engage the inlet portion **20** of the manifold body.

Thus, as shown in FIG. 6, the projections **70** define abutment surfaces **72** engageable against surfaces **74** of the manifold body in the assembled contion of the parts, to prevent the manifold body from turning in respect to the base **50*b***. As noted above, base **50*b*** and insert **32*a*** are also interengaged against relative rotation and thus none of the components can turn about the axis of the insert, when the flange **54*b*** of the base **50*b*** is heat sealed to inflatable body **10**.

Other expedients may very possibly be employed to prevent torque of any part in respect to any other part, when the handle **26** is pulled. Thus, the arrangements illustrated and described herein are illustrative of the invention, but are not necessarily the only arrangements that can be employed for carrying out the inventive concept. In every instance, as will be understood, the invention incorporates the idea of a base connectable as by heat sealing to the inflatable body, and so designed as to cooperate with the insert and the sleeve portion in such fashion that all three parts are held against rotation in respect to one another, without necessity of any part being molded into any other part. The heat sealing, further,

is a concept which so far as is known, has not heretofore been employed in this particular application.

I claim:

1. A manifold for life preservers and other flotation bodies of the inflatable type, comprising;

(a) a base for mounting in an aperture of an inflatable body, said base having an opening;

(b) a manifold body including a sleeve portion and a gas inlet portion, said sleeve portion being supported upon the base in alignment with said opening;

(c) a tubular insert extending within the sleeve portion and providing communication between the gas inlet portion and the interior of said inflatable body;

(d) means at opposite ends of the insert for clampably engaging said manifold body and base therebetween with the sleeve portion, base, and manifold body interengaged against relative rotation about the axis of the insert.

2. A manifold as in claim 1 wherein the manifold body and insert are formed with confronting flat surfaces spaced radially from said axis and angularly disposed in respect thereto to effect the interengagement of the manifold body and insert against relative rotation.

3. A manifold as in claim 2 wherein the insert and base are formed with confronting flat surfaces to engage the base against rotation relative to said insert.

4. A manifold as in claim 2 wherein the base has a noncircular recess in communication with the opening thereof, said insert being formed with a collar mating with the recess whereby to effect the interengagement of the insert and base against relative rotation.

5. A manifold as in claim 2 wherein the base and the manifold body are formed with confronting surfaces radially spaced from said axis and engaging the manifold

body against rotation in either direction relative to the base.

6. A manifold as in claim 1 wherein the base is of a plastic material having the property of being heat sealable to said inflatable body.

7. A manifold as in claim 6 wherein the base is formed with a body portion concentric with said opening and integral with a thinner peripheral flange, said flange overlying and being sealably adhered to the inflatable body in the area thereof adjacent to the body portion.

8. A manifold as in claim 7 wherein the body portion of said base is formed with a noncircular recess in communication with the opening thereof, said insert having a collar complementing said recess and engaging therein to constitute the clamping means at one end of the insert.

9. A manifold as in claim 8 wherein the clamping means at the other end of the insert comprises a cap nut threaded onto the insert, in engagement with said sleeve portion.

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285—200, 330