April 18, 1961 D. R. WALKER ET AL 2,979,740

MINIATURE LIFE PRESERVER

Filed Aug. 14, 1957 2 Sheets-Sheet 1

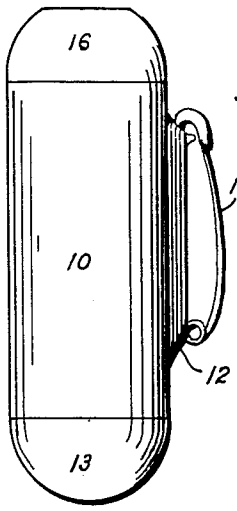


FIG. 1

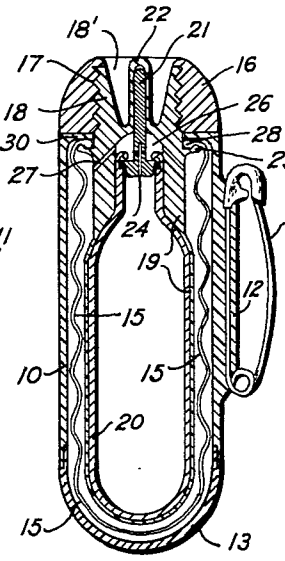


FIG. 2

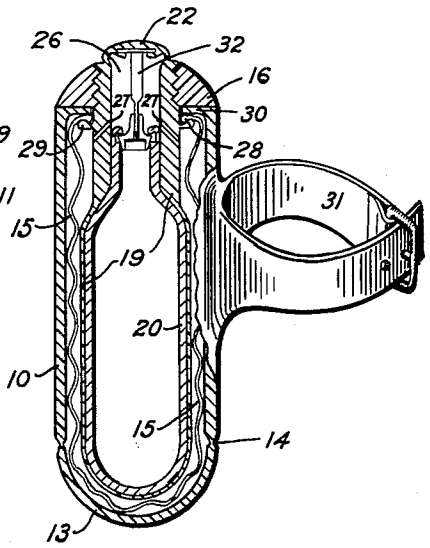


FIG. 3

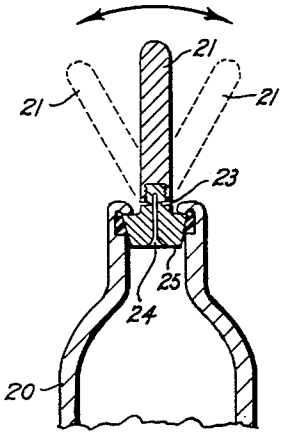


FIG. 4

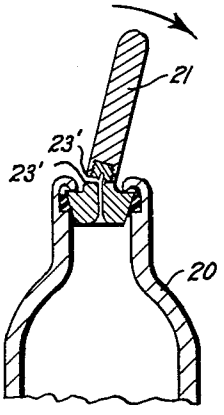


FIG. 5

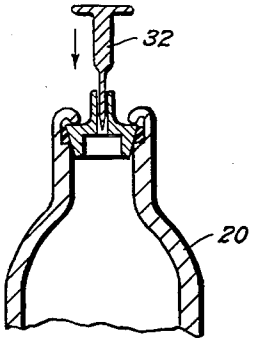


FIG. 6

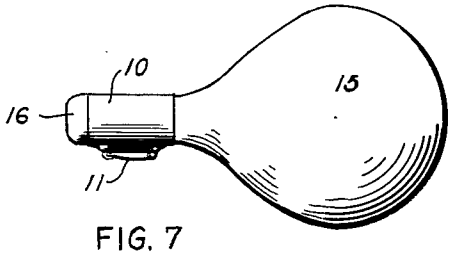


FIG. 7

DALE R. WALKER AND
WARREN A. AIKINS
INVENTORS.

BY Loyal H. McCarthy
ATTORNEY.

April 18, 1961 D. R. WALKER ET AL 2,979,740

MINIATURE LIFE PRESERVER

Filed Aug. 14, 1957 2 Sheets-Sheet 2

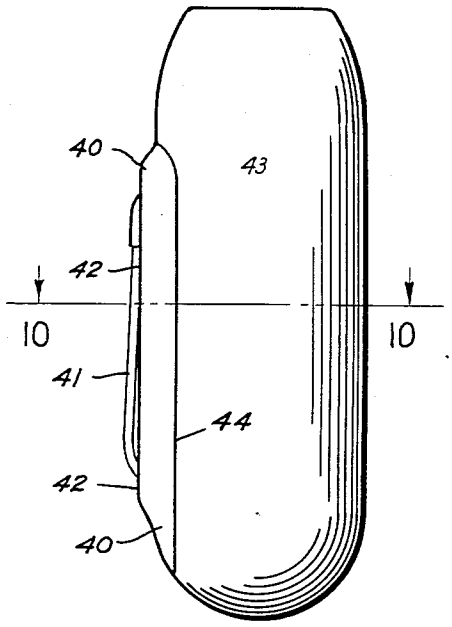


FIG. 8

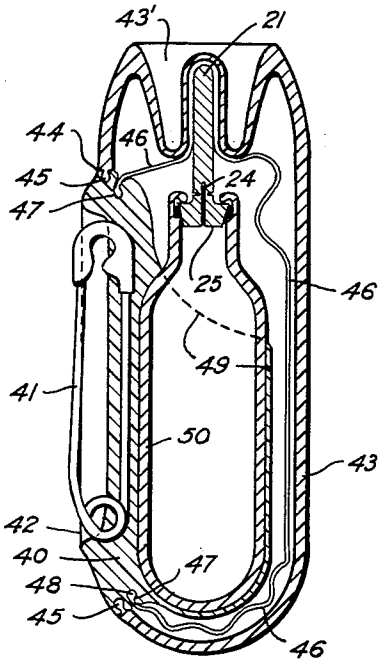


FIG. 9

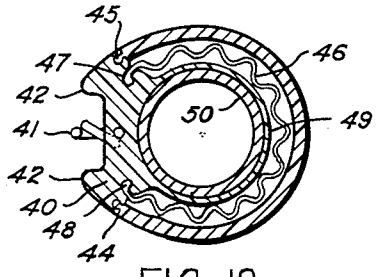


FIG. 10

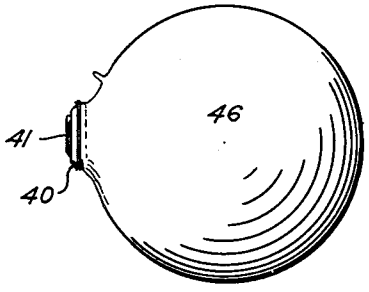


FIG. 11

DALE R. WALKER AND
WARREN A. AIKINS
INVENTORS.

BY Loyal H. Dailey

ATTORNEY.

United States Patent Office 2,979,740 Patented Apr. 18, 1961

2,979,740

MINIATURE LIFE PRESERVER

Dale R. Walker, Rte. 1, Box 1325, Vancouver, Wash., and Warren A. Aikins, 923 20th Ave., Longview, Wash.

Filed Aug. 14, 1957, Ser. No. 678,105

12 Claims. (Cl. 9—316)

Our invention relates to devices small in size which may be secured to the person or clothing of an individual and which may be caused to inflate at the discretion of the wearer to provide buoyancy sufficient to prevent sinking while in the water.

One of the objects of our invention is to provide a small, conveniently packaged life saving device which may be readily attached to the person or clothing of an individual.

Another object is to provide a life saving device which may be readily inflated at the will of the wearer and which will not be subject to accidental inflation.

Still another object of our invention is to provide a small life saving device that will be convenient, sufficient and inexpensive.

A further object of our invention is to provide a life saving device which, when inflated, will be secured to the person or clothing of an individual and will reveal only the fastening means and life saver.

Other and further objects of our invention will be apparent in the drawings, specification and claims herein set forth.

Referring to the drawings:

Fig. 1 is a side elevation view of one form of our device ready for use with a safety pin fastening means.

Fig. 2 is a sectional, elevation view taken through the middle of one form of a packaged, miniature life saver showing the inter-relationship of the compressed gas cylinder, the inflatable life preserver, the operable release means and the control means for gas flow.

Fig. 3 is a sectional, elevation view of a packaged life preserver, showing other forms of operable means and fastening means.

Fig. 4 is a fragmentary sectional, elevation view on an enlarged scale of a typical gas cylinder with one form of operable release means being shown.

Fig. 5 is a fragmentary sectional, elevation view on an enlarged scale of the gas cylinder shown in Fig. 4 with the operable release means shown in one of the possible positions to allow the escape of compressed gas.

Fig. 6 is a fragmentary sectional, elevation view on an enlarged scale, showing another operable means for releasing compressed gas from the cylinder.

Fig. 7 is a side elevation view on a reduced scale of a fully expanded miniature life preserver.

Fig. 8 is a side elevation view of a packaged life preserver of a different form.

Fig. 9 is a sectional elevation view through the center of the life preserver in Fig. 8 showing the inter-relationship of the gas cylinder, the inflatable life preserver, the operable means and the case.

Fig. 10 is a sectional view taken in the direction of the arrows along line 10—10 of Fig. 8.

Fig. 11 is a side view on a reduced scale of the inflated life preserver shown in Fig. 8.

Referring further to the drawings:

The semi-rigid, gas and liquid impervious case 10 of one form of our device is provided with a safety pin type

fastener 11 embedded in a thickened portion 12 of one side of said case to provide means for fastening the device to the clothing of an individual. The lower end 13 thereof is eruptible from the case 10 either by being formed of a separate piece which is compressibly fitted to the case 10 by means of complementary elements formed at the adjacent peripheral margins of the end 13 and the case 10, or by means of scribing the case 10 with a groove 14 near the lower end thereof, so that the end 13 will be forced off at the scribe mark 14 or the adjoining complementary, peripheral margins by pressure from the impervious, inflatable and expanding life preserver 15 encased therewithin. The upper end 16 of the case is secured by threads 17, or other suitable means, to the complementary end 18 of an inner carrier 19 so as to be retained tightly against the upper end of the case 10. Positioned within the inner carrier 19 is a compressed gas cartridge 20, containing any satisfactory compressible gas such as carbon dioxide. The gas cartridge 20 has a release mechanism 21 positioned at its upper end and within the protective covering 22 of the carrier case end 18. Release mechanism 21 is operable by being moved in any direction within the recess 18' of the end 18 of the inner carrier 19. This causes the release mechanism to fracture at the score 23 which is facilitated by leverage obtained through the sharp shoulders 23' adjacent each side of said score 23 co-acting against each other to provide a pivotal point leverage. This insures complete fracture and permits the compressed gas within the cartridge 20 to escape through the port 24 in the lower end 25 of the release mechanism 21 into the chamber 26 between the inner surface of the end 18 of the carrier case 19 and the upper end of the gas cartridge 20. The chamber 26 is provided with a plurality of outlets 27 of predetermined dimension. The outlets 27 are so formed to such a size and shape that the flow of the compressed gas therethrough from the cartridge 20 through the port 24 and the chamber 26 into the life preserver 15 will be controlled in order to prevent damage to the life preserver 15 by too rapid a release of the compressed gas and the resultant sharp temperature drop. The plurality of outlets 27 control the outward rush of the gas to such an extent that freezing or other damage will not be inflicted upon the inflatable life preserver 15, and yet they allow sufficiently fast release of the compressed gas to insure rapid inflation of the preserver once the release mechanism 21 has been operated. The pressure from the life preserver 15 expanding due to the influence of the inrushing compressed gas from the cartridge 20 will blow the end 13 off the case 10 and allow the preserver to expand and inflate through that end of the case.

The upper end 28 of the inflatable life preserver 15 is secured between the lip 29 of the carrier case 19 and the flange 30 of the case 10 by means of the pressure exerted through the end 16, being securely mounted by threads or other suitable means on the end 18 of the inner carrier 19. This arrangement not only secures the life preserver 15 against blowing off the inner carrier, the main portions of which will be disposed within the inflated life preserver, but also provides for secure attachment of the life preserver to the clothing or person of an individual through the fastening means 11 on the case 10.

As shown in Fig. 3 alternate fastening means such as the strap 31 may be provided on one side of the case 10. Also, alternate means of releasing the gas from the cartridge 20 may be provided, such as a sharpened plunger 32, as shown in Fig. 3. The design or form of the operable release means 21 or 32 is immaterial so long as the released gas escapes into the chamber 26 which is provided in the carrier 19. In either case with any operable means of releasing gas from the cartridge 20 the chamber 26 will always be provided with a plurality of

control outlets **27** positioned between said chamber and the interior of life preserver **15** for reasons specified hereinabove. As shown in Figs. 1, 2, 3, 8 and 9 the fracturable type release mechanisms are positioned within the recesses **18'** or **43'** of the ends of the cases, so that they will not project beyond the end of the cases.

Another embodiment of our invention, as shown by Figs. 8 through 11 inclusive, contemplates a semi-rigid base **40** with any suitable fastening means, such as a safety pin, **41** embedded therein, so that the edges **42** of the base **40** would stabilize the device when it is secured to the clothing of an individual. This design incorporates an eruptible, semi-rigid, gas and water impervious casing **43** snapped to the base **40** at its peripheral margins **44** by means of a tongue and groove arrangement **45**, or other suitable means. The life preserver **46** is, likewise, engaged with the base **42** by tongues and grooves, or other suitable arrangement, **47** between the case **43** and a carrier **49**. The rolled end **48** of the preserver **46** may have suitable characteristics to form a rigid tongue portion complementary to groove **47**. An alternative method is to provide a snap ring, not shown in the drawings, adapted to seat in the groove **47** for the purpose of securing the inflatable life preserver element **46** against coming off the base as it inflates. Within the carrier **49** is positioned a conventional compressed gas cartridge **50** containing any suitable gas such as carbon dioxide. This design can also be varied to have either the fracturable type operable means **21** for releasing the compressed gas into the life preserver **46**, or any other suitable method, such as the sharpened plunger **32**, shown in Figs. 3 and 6. However, in this arrangement the only control of the gas escaping from the cartridge **50** into the life preserver **46** is effected through the size of the port **24** in the lower end **25** of the operable means **21**. The port **24** is dimensioned to control the flow of the compressed gas to a speed which will not cause freezing or other damage to the life preserver **46** as it escapes into the same and causes the life preserver to inflate. The inflation within the case **43** creates pressures which will blow the case **43** out of snapped engagement with the base at the peripheral margins **44** thereof. After the case has been blown free from the base **40** the life preserver **46** can expand to its full predetermined shape and volume to provide ample buoyancy for the individual to which it is attached. In this design the inner carrier **49**, gas cartridge **50** and, also, the operable release mechanism **21** or **32**, as the case may be, would be contained entirely within the life preserver. One shape of the inflated life preserver would appear substantially as shown in Fig. 11; and, as in the designs hereinabove set forth, it would reveal only the case or base, the fastening means and the inflated preserver.

A dry, inert gas may be provided between the outer cases **10** or **43** and the life preservers **15** or **46**, as the case may be. Such a gas tends to prevent deterioration of the life preserver **15** or **46**, which is manufactured preferably from some suitable rubber or plastic substance. This feature insures the dependability of the life preserver after it has been inflated even though it may have been stored or carried for long periods of time before its use was required. Furthermore, the eruptible end may be transparent or provided with a transparent spot thereon, and a suitable dye reacting to air or water, such as the product known as Tell Tale Silica Gel or the product known as National Water Finder, may be provided on the inner surface of a transparent spot on the eruptible portion, or the said transparent eruptible end, of the cases of our invention, so that any leaks which would admit air or water to the case will be readily apparent to anyone intending to use or rely on the life preserver, due to the transparent areas having become colored by the reaction of the dye to the air or water seeping into the container. Thus, possibilities of reliance on a defective life preserver can be avoided.

It is understood that the disclosures set forth herein are merely preferred embodiments of our invention and that variations therefrom are feasible without departing from its spirit. We are, therefore, not to be understood as limiting ourselves to the particular disclosures set forth herein.

Having thus described our invention, what we claim is:

1. As an article of manufacture a life preserver consisting of a case having an eruptible, transparent end with a leak-reacting dye on its inner surface; removable securing means positioned on said case; an inner carrier, secured within said case by said securing means; a chamber formed internally near one end of said case, said chamber being provided with a plurality of ports connecting with the outer surface of said inner carrier, said inner carrier adapted to receive and retain a compressed gas cartridge below said chamber; manually operable gas release means; an expandable, inflatable, gas impervious container, having an open end secured between said inner carrier and said case, enveloping said inner carrier and adapted to be inflated by gas passing from the gas cartridge through the chamber provided with ports; inert gas sealed within said case and surrounding said expandable, inflatable envelope.

2. As an article of manufacture a life preserver consisting of a gas impervious case having an eruptible, transparent end and attachment means; a removable end on the case opposite the eruptible end; an inner carrier within said case; a manually operable gas release means projecting externally of one end of said carrier; a gas chamber immediately below said gas release means, provided with a plurality of ports communicating with the exterior of the inner carrier below said gas release means; a compressed gas cartridge retained internally of said inner carrier below the gas chamber, adapted to have its gas released by said gas release means positioned above said gas chamber; an expandable, inflatable, gas-impervious container enveloping said inner carrier secured to the inner carrier and case at a point above the gas ports, said inflatable, gas-impervious container being adapted to be inflated by gas escaping from the gas cartridge and to erupt the eruptible end from said case and dry inert gas within said case and surrounding said inflatable container.

3. As an article of manufacture a life preserver consisting of a gas-impervious case having an eruptible, transparent end and attachment means; a removable end on the case opposite the eruptible end; an inner carrier having manually operable gas release means projecting externally of one end and a gas chamber internally thereof, immediately below said gas release means, provided with a plurality of ports communicating with the exterior of the inner carrier below said gas release means, secured within the case by the removable end; a compressed gas cartridge retained internally of said inner carrier below the gas chamber therein, adapted to have its gas released by said gas release means positioned above said gas chamber; and an expandable, inflatable, gas-impervious container enveloping said inner carrier and secured to the inner carrier and case at a point above the gas ports communicating with the gas chamber internally of the inner carrier, said inflatable, gas-impervious container being adapted to be inflated by gas escaping from the gas cartridge and to erupt the eruptible end from said case.

4. As an article of manufacture a miniature life preserver consisting of a semi-rigid base element having a recess in one side thereof formed to provide a peripheral ridge and fastening means embedded in the base within the margins of said peripheral ridge and having in the opposite side two endless grooves, one groove being positioned within the periphery of the other; an inner carrier integral with the base and within the margins of said grooves; a compressed gas cartridge, having integral gas release means, positioned and retained by said inner car-

rier; an expandable, inflatable, impervious envelope secured to the base at the inner base groove, enveloping said inner carrier, compressed gas cartridge and gas release means, and adapted to be inflated by gas released from said gas cartridge; a semi-rigid, impervious case enclosing the inflatable envelope and having a tongued opening in one side thereof adapted to engage with the outer groove of the base and to be eruptible from said base as the inflatable envelope therewithin expands, said case being adapted to accommodate and enable the operation of the gas release means of the gas cartridge positioned within said inflatable envelope; an inert, dry gas within said case, surrounding said inflatable envelope; and a leak-reacting dye on the inner surface of said impervious case.

5. As an article of manufacture a miniature life preserver consisting of a semi-rigid base element having a recess in one side thereof formed to provide a peripheral ridge and fastening means embedded in the base within the margins of said peripheral ridge and having in the opposite side two endless grooves, one groove being positioned within the periphery of the other; an inner carrier integral with the base and within the margins of said grooves; a compressed gas cartridge, having integral gas release means, positioned and retained by said inner carrier; an expandable, inflatable, impervious envelope secured to the base at the inner base groove, enveloping said inner carrier, compressed gas cartridge and gas release means, and adapted to be inflated by gas released from said gas cartridge; a semi-rigid, impervious case with a transparent portion therein, enclosing the inflatable envelope, adapted to be detachably attached to the base and to be eruptible from said base as the inflatable envelope expands and further adapted to accommodate the operation of the gas release means of the gas cartridge within the inflatable envelope; and an inert, dry gas within said impervious case.

6. As an article of manufacture a miniature life preserver consisting of a semi-rigid base element having a recess in one side thereof formed to provide a peripheral ridge and fastening means embedded in the base within the margins of said peripheral ridge and having in the opposite side two endless grooves, one groove being positioned within the periphery of the other; an inner carrier integral with the base and within the margins of said grooves; a compressed gas cartridge, having integral gas release means, positioned and retained by said inner carrier; an expandable, inflatable, impervious envelope secured to the base at the inner base groove, enveloping said inner carrier, compressed gas cartridge and gas release means, and adapted to be inflated by gas released from said gas cartridge; and a semi-rigid, impervious case with a transparent portion therein, enclosing the inflatable envelope, adapted to be detachably attached to the base and to be eruptible from said base as the inflatable envelope expands and further adapted to accommodate the operation of the gas release means of the gas cartridge within the inflatable envelope.

7. A life preserver consisting of a case having an eruptible transparent end and integral attachment means; removable securing means positioned on the case opposite the eruptible end, having a recess forming a rim at and positioned in the end thereof opposite the case; an inner carrier, secured within said case by said securing means, having a chamber formed internally near one end thereof, said chamber being provided with a plurality of ports connecting with the outer surface of said inner carrier, said inner carrier adapted to receive and retain a compressed gas cartridge below said chamber and manually operable gas release means within and above said chamber, said manually operable gas release means being adapted to project into the recess in the removable securing means to a point below the rim of said recess; an expandable, inflatable gas-impervious container having an open end secured between said inner carrier and said case, enveloping said inner carrier and adapted to be inflated by gas passing from the gas cartridge through the chamber provided with ports and to erupt the eruptible end from said case; dry inert gas sealed within said case and surrounding said expandable, inflatable envelope; and a leak-reacting dye applied on the interior surface of the eruptible, transparent end.

8. A life preserver of the character described in claim 7, having the compressed gas cartridge thereof provided with release means consisting of a projecting nub with a metered port extending therewithin and scored externally therearound to form sharp shoulders on each side of said scoring, adapted to fracture at the scoring through the co-action between the scoring and leverage of one shoulder adjacent the scoring against the other adjacent shoulder to open the port within said nub.

9. A life preserver of the character described in claim 1, having the compressed gas cartridge thereof provided with release means consisting of a projecting nub with a metered port extending therewithin and scored externally therearound to form sharp shoulders on each side of said scoring, adapted to fracture at the scoring through the co-action between the scoring and leverage of one shoulder adjacent the scoring against the other adjacent shoulder to open the port within said nub.

10. A life preserver of the character described in claim 4, having the compressed gas cartridge thereof provided with integral release means consisting of a projecting nub with a metered port extending therewithin and scored externally therearound to form sharp shoulders on each side of said scoring, adapted to fracture at the scoring through the co-action between the scoring and leverage of one shoulder adjacent the scoring against the other adjacent shoulder to open the port within said nub.

11. A miniature life preserver consisting of a semi-rigid base element having a recess in one side thereof formed to provide a peripheral ridge and fastening means embedded in the base within the margins of said peripheral ridge and having in the opposite side two endless grooves, one groove being positioned within the periphery of the other; an inner carrier integral with the base and within the margins of said grooves; a compressed gas cartridge, having integral gas release means, positioned and retained by said inner carrier; an expandable, inflatable, impervious envelope secured to the base at the inner base groove, enveloping said inner carrier, compressed gas cartridge and gas release means, and adapted to be inflated by gas released from said gas cartridge; a semi-rigid, impervious case with a transparent portion therein, enclosing the inflatable envelope, adapted to be detachably attached to the base and to be eruptible from said base as the inflatable envelope expands and further adapted by a recess in one end thereof to accommodate the operation of the gas release means of the gas cartridge within the inflatable envelope from the exterior of said case; an inert, dry gas within said impervious case; and a leak-reacting dye on the inner surface of the transparent portion of said impervious case.

12. A life preserver of the character described in claim 11, having the compressed gas cartridge thereof provided with integral release means consisting of projecting nub with a metered port extending therewithin and scored externally therearound to form sharp shoulders on each side of said scoring, adapted to fracture at the scoring through the co-action between the scoring and leverage of one shoulder adjacent the scoring against the other adjacent shoulder to open the port within said nub.

References Cited in the file of this patent

UNITED STATES PATENTS

2,320,111	Ware	May 25, 1943
2,601,840	Smith	July 1, 1952
2,687,541	Bannister	Aug. 31, 1954