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2,169,142

LIFESAVING DEVICE

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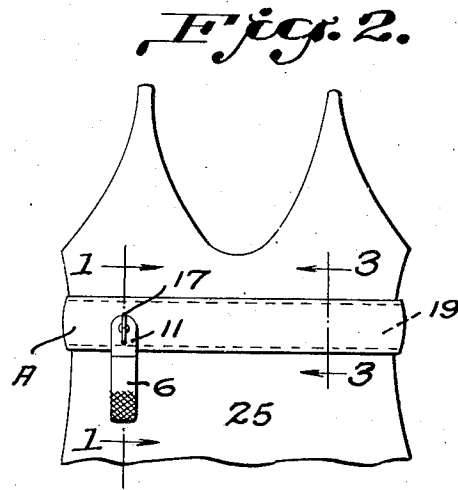
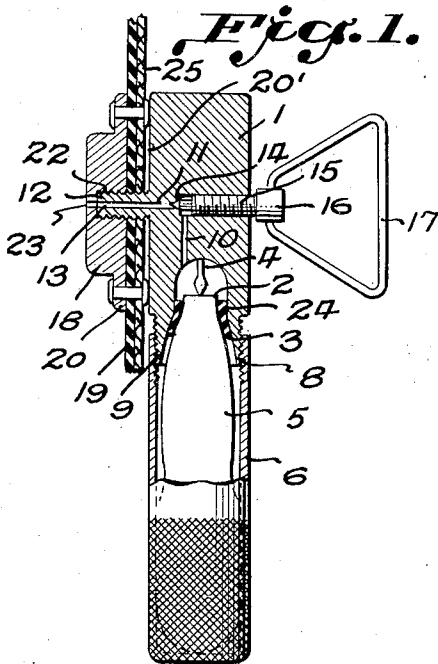


Fig. 3.

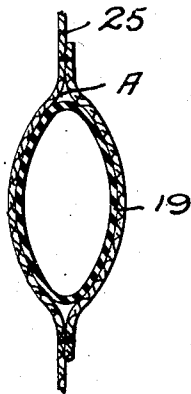
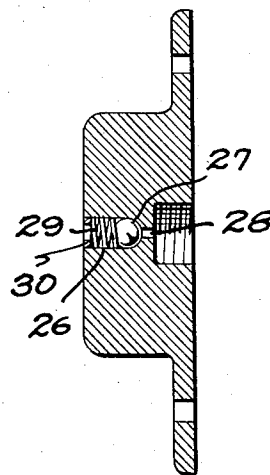


Fig. 4.



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LIFESAVING DEVICE

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2 Claims. (Cl. 221—73.5)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government of the United States for governmental purposes without the payment to me of any royalty thereon, in accordance with the provisions of the act of April 30, 1928 (ch. 460, 45 Stat. L. 467).

This invention relates to an inflation device, or one to inflate apparel or parts of apparel to adapt the inflated article to safely and comfortably support the wearer in water.

It comprises in the main a cartridge or capsule containing highly compressed air or liquefied gas such as carbon dioxide, control means, and means of attachment to the inflatable part of the apparel. The device, by slight modification quite within the skill of one skilled in the art, may be adapted for other uses than that to which I have elected to apply it and in connection with which I have illustrated it.

I am aware that it is not new to inflate various articles of apparel and other things to insure safety of the wearer or user, but these have been unnecessarily complicated, heavy and cumbersome. An object, therefore, of this invention, is to simplify such devices, enabling them to be manufactured at a cost that would justify placing them on bathing suits, inflatable life-saving equipment and the like without adding prohibitively to the cost of the whole assembly.

A further object is to so construct the device as to adapt it for use with the ordinary gas-containing capsule or cartridge easily obtained at very small cost.

In the drawing illustrating the invention—

Figure 1 is a vertical section of the contrivance attached to a wall of a tubular inflatable element which may be a belt to be removably worn around the body, or an inflatable section permanently secured in proper position to a bathing suit.

Figure 2 is a front view of the upper portion of an ordinary bathing suit with my device attached.

Figure 3 is a section taken about on line 3—3 of Figure 2, showing the inflatable tube within a pocket formed in a bathing suit.

Figure 4 is a section of a modification of the securing nut.

Referring to the drawing, the numeral 1 designates the main body of the device that houses the control and puncturing elements. This is provided at one end with an annular recess or chamber 2 of larger diameter at one end than at the other, as indicated at 3. In the upper end of the recess and centrally positioned therein is

a puncturing pin 4 for puncturing the frangible disk located in the upper end of the usual gas-containing capsule or cartridge 5. This cartridge is positioned directly below the pin and is supported in a casing 6 formed at its upper end with a portion 7 internally threaded as indicated at 8 for engagement with similar threads 9 on the body, by which means the body proper and the casing are separably secured together.

Communicating with the recess 2 is a duct or passage 10 which connects with a similar passage 11 at right angles to the first. Preferably integral with the body there is a threaded lateral extension 12 in which there is a passage 13 forming, regardless of how the extension is secured to the body 1, a continuation of the passage 11 and is the outlet for the inflating fluid or gas. At the intersection of the passages 10 and 11 a valve seat 14 is formed for the conical end of the needle valve 15 that is threaded into the body 1 opposite the extension 12, the valve being provided with a head 16 to which is attached a ball or handle 17 by which the valve may be readily advanced or retracted to vary the size of the communicating opening between the passages 10 and 11 to thus control the flow of gas from the body to the points of use.

The numeral 18 designates a comparatively flat securing nut which, as best shown in Figure 1, may be secured in a gas-tight manner to the wall 19 of the inflatable element, such as a rubber tube. The nut is provided with a thin flange 20 for convenient passage of rivets by which the nut is secured to the wall 19 or to both the wall and the material, say, of a bathing suit.

When the device is to be used for inflating a tube in a bathing suit as 25, there will preferably be formed a pocket A extending entirely around the suit and the material thereof will lie between the wall 19 of the tube and the flat face 20 of the body 1, and will necessarily be tightly clamped between these members. The nut is provided with an interiorly threaded socket 22 which screws on the threaded section 12, there being a duct or passage 23 to register with the passage 13 in the extension 12.

There will preferably be a gasket 24 of rubber or other compressible material in the chamber 2 of the body 1 engaged by the shoulder of the cartridge whereby said cartridge is normally held away from the puncturing pin, the arrangement being such that when the casing 6 is screwed up on the body to operate the cartridge there will at the same time be formed a

gas-tight fit between the gasket and cartridge, thus confining the gas within the recess or chamber above the cartridge. However, as a precaution, the casing 6 will be made sufficiently strong to withstand the pressure of any small amount of gas that may escape from the space above the gasket.

Referring to the modification shown in Figure 4, the nut is provided with a pocket 26 for the reception of a ball valve 27 which is held normally against the outer end of a short duct 28 by a spring 29 held in the pocket by a ring 30. The duct 28, as shown, communicates with the internally threaded socket in the nut that receives the outer end of the extension 12 attached to the main body 1. This form of nut is useful where it is desired to inflate a bathing suit and thereafter remove the main inflating device after the inflation operation has been completed.

The device will be so light and compact that the whole assembly may be worn by a bather without inconvenience and in readiness to be operated in emergency. Indeed, this is the prime object of the contrivance. On the other hand, it may be, as above intimated, used as an inflation device for inflating a tube, say, within a child's bathing suit to provide the wearer with the equivalent of water wings or other safety aids in swimming lessons or to relieve parents and nurses of their anxiety about their charges, in which uses the nut may be provided with the check valve as above described and illustrated in Figure 4, to prevent the escape of gas from the tube. In these circumstances the body 1 and its connected parts may be removed.

The extension 12 is threaded into the nut which is fastened to the inflatable element and the body 1 turned until its flat face 20 is drawn tightly against said element. The inflator with the valve 10 tightly closed is now ready for operation, which is accomplished by screwing the casing 6 upwardly on the body 1, carrying with it the cartridge which is pierced by the pin 4 as the cartridge moves upwardly and letting the gas escape into the recess around the pin, but no further, until the needle valve is manually operated to open the passage 11 when, obviously, the gas may pass to the point of use. By test, where carbon dioxide is used, and for which the inflator is designed, the size of the fixed passages, as well as the orifice that occurs at the needle valve point will be such that clogging by freezing will be avoided, even when the inflator is used un submerged. The lengths of the threads on the body 1 and on the casing 6 are such that the cartridge which rests upon the bottom of the casing is normally supported just below the end of the piercing or puncturing pin so that little rotation of the casing relative to the body 1 will be sufficient to carry the cartridge up to a point where the frangible disc in its upper end is pierced. Obviously, before the cartridge is operated the needle valve is firmly seated and after the cartridge is pierced the control of the flow of gas is effected by the needle valve through the convenient manipulation of the handle 17.

Instead of the bale or handle 17 I may employ a rod secured to the head 16 and generally extending at right angles thereto to form a lever that may be pulled down or pulled in one direction a sufficient distance to sufficiently unseat the needle valve 15 and permit the gas to flow from the body 1 to the point of use. This form in an emergency would enable the user to operate the device more quickly.

It sometimes happens that the carbon dioxide cartridge, such as I employ, fails to receive the charge of gas in manufacture, although from outside appearances it is perfectly good. The construction of my device is such that when the cartridge is punctured the gas from a good cartridge will fill the space immediately above the cartridge and the passage 10. The device can then be tested by very slightly opening the valve and permitting a minute quantity of gas to escape, when the valve is immediately closed. This operation serves to test the cartridge, after which the whole device may be, with confidence, applied to the article to be inflated.

In illustrating the body which contains the gas passages, puncturing pin and valve, the flat portion thereof is shown as more extensive than it need be. Obviously, the purpose of making the body flat is to permit it to fit snugly or evenly against the article to which the inflating device is attached.

What I claim is—

1. An inflating device comprising a body having a substantially flat side to adapt it for attachment to the flat wall of an inflatable element and a recess in said body, a puncturing pin rigidly secured in said recess, a fluid passage adjacent said pin and leading outside of said body, a threaded extension on the flat side of said body and having a passage therethrough forming a continuation of the body passage, a securing nut for said extension arranged to clamp a portion of the wall of an inflatable article between said nut and said body for the purpose set forth, a cartridge container rotatably secured to the body and operating to advance a cartridge therein toward the puncturing pin to puncture said cartridge, and a manually operable needle valve in said body for controlling the passage of the fluid through said body.

2. An inflating device comprising a body having a recess therein, a puncturing pin rigidly secured in said recess, a fluid passage adjacent said pin and communicating with said recess, a second passage in communication with the first and leading outside of the body and forming substantially a continuation of said first passage, a valve seat at the juncture of said passages and common to both of said passages, a manually operable valve arranged for movement relative to said seat to control the flow of fluid through said passages, and a gas cartridge container movable relative to said body and adapted when moved in one direction to force a cartridge in the container into contact with the puncturing pin to operate the cartridge.

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