June 24, 1930. P. MARKUS 1,766,182

INFLATING DEVICE

Filed Feb. 25, 1929

Fig. 1.

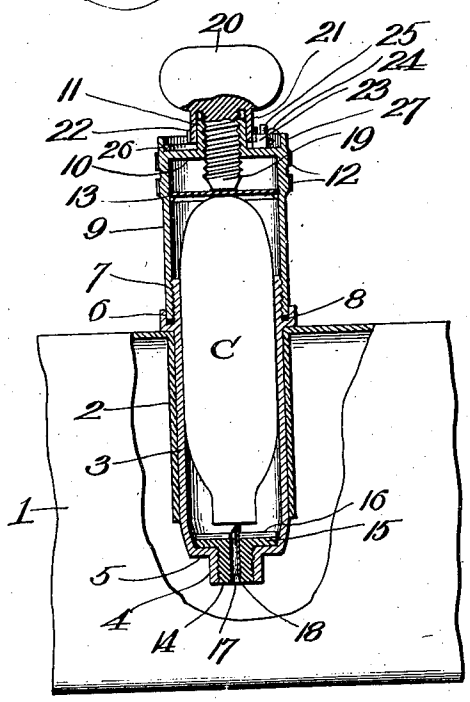


Fig. 3.

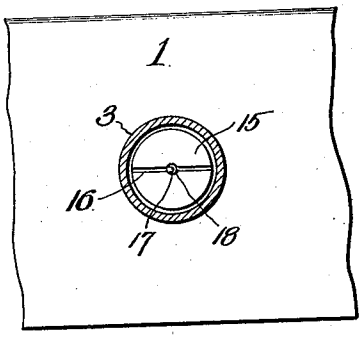


Fig. 2.

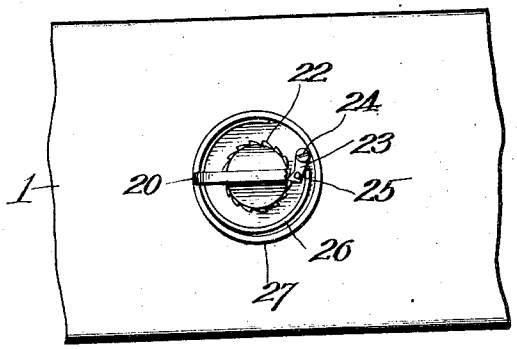
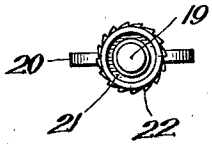


Fig. 4.



Inventor,
Peter Markus.
By Thorpe & Thorpe
Attorneys.

Patented June 24, 1930

1,766,182

UNITED STATES PATENT OFFICE

PETER MARKUS, OF KANSAS CITY, MISSOURI

INFLATING DEVICE

Application filed February 25, 1929. Serial No. 342,335.

This invention relates to inflating devices for bathing suits, hunting and fishing coats, steamer sport coats, life preservers and the like, and belongs to that class in which the medium held under pressure in a cartridge, is released to perform its inflating function, by the puncture of the cartridge, as exemplified in Patent No. 1,694,714, granted to me on December 11, 1928.

I have found after much experimentation over an extended period, that it is absolutely essential in providing an efficient and dependable device of this character to have a cartridge chamber from which air cannot leak, a condition which it is not always possible to secure with a construction of the type disclosed in my aforesaid patent, because if the threads of the operating screw are initially in air-tight relation with the threads of the cartridge chamber, repeated operations might, in time, develop a leak, and hence render the device unsafe for sustaining a person for a relatively long period.

My object therefore is to provide a construction of such character that when the cartridge is punctured and the bathing suit or the like inflated through the charging thereof by the compressed fluid from the cartridge, it shall be impossible for air to leak from the cartridge chamber and thus result in the deflation of the bathing suit or the like. A further object is to produce a device of this character provided with means for insuring proper manipulation to effect a quick and almost instantaneous puncturing of the cartridge, and a still further object is to provide a device of this character of simple, strong, durable and inexpensive construction.

With these objects in view, the invention consists in certain novel and useful features of construction and combinations of parts as hereinafter described and claimed; and in order that it may be fully understood, reference is to be had to the accompanying drawing, in which:

Figure 1 represents a longitudinal section of a cartridge holder embodying the invention applied in operative position, to an article which may represent a bathing suit or any other device adapted for inflation for the purpose of sustaining a person in water.

Figure 2 is a top plan view of the construction shown by Figure 1, with the handle or grip of the appliance for effecting the puncturing of the cartridge, broken away.

Figure 3 is a horizontal section on the line III—III of Figure 1.

Figure 4 is an inverted end view of the adjusting screw for effecting the puncturing of the cartridge.

Referring to the drawing in detail, 1 indicates a bathing suit or the like, provided with an internal cylindrical neck portion 2 to be secured in any suitable manner to effect a permanent union or air-tight relation with what may be termed the cup member 3 of a cartridge container or holder. Said cup member is preferably cylindrical in form and of reduced diameter at its lower end to provide an internally threaded nipple 4 and a shoulder 5 at the upper end of said nipple. The upper end of the cup member is formed with a circular groove 6, the inner wall of the groove projecting to a higher plane than the outer wall and being externally threaded as at 7. The groove is adapted to contain a compressible gasket 8, which may be replaced from time to time in order that the gasket may be at all times prepared for engagement with an air-tight relation by the outer or what may be termed the cap member 9 of the container, this cap member being of cylindrical form by preference and when in operative position, screwed tightly down upon the threaded portion 7 and the gasket of the cup member. The top 10 of the cap member is formed centrally with an opening extending up through an extension 11 of the top, the opening being threaded, and said cap is preferably formed with external milled or roughened portions 12 to facilitate the screwing of the cap member down upon the cup member until it applies sufficient pressure on the gasket to insure that air shall not leak from the interior of the container past said gasket.

The cap member is provided with a flex-

ible diaphragm 13 adapted to constitute a partition, and said diaphragm is soldered or otherwise united to the wall of the cap member with an air-tight relation so that it shall be impossible for air to pass from a point below the diaphragm to a point above the same. It will thus be seen that the interior of the cartridge chamber below the diaphragm, through the use of the latter and of the gasket 8 inhibits any possibility of air leaking from the cartridge chamber to the atmosphere.

To effect the puncturing of the cartridge C which fits snugly in the cartridge chamber below the diaphragm, a screw plug 14 is in engagement with the threaded nipple 4, and the head 15 of said plug, rests on said shoulder 5 so as to limit the downward adjustment of the plug, the latter having a kerf 16 in its head whereby it is screwed into place before the cap member is screwed onto the cup member of the container.

The plug is provided with a passage 17 to permit compressed air from the cartridge to pass into the inflatable object, and to puncture the lower end of the cartridge, which is not detailed because of conventional type, a sharpened pin 18 is fastened to and projects upward from the plug and engages the puncturable end of the cartridge, the latter at its upper end being in substantial contact initially with the diaphragm.

To effect downward movement of the diaphragm and hence of the cartridge, to perforate or puncture the lower end of the latter, a screw 19 engages the threaded opening of the top of the cap, and when in position for operation, is about in contact with the upper side of the diaphragm, so that the advance of the screw shall spring the diaphragm downward and thus impart like movement to and effect the puncturing of the cartridge.

To avoid unintentional back revolution or unscrewing movement of the screw, which is provided with a grip or handle piece 20 for its manipulation, said screw is provided with a sleeve portion 21 externally embracing the extension 11 of the top of the cap, and said sleeve is formed externally with ratchet teeth 22 engaged by a dog or detent 23 pivoted at 24 on the top of the cap. This dog or detent by engagement with the ratchet teeth, obviously guards against back rotation, but in order that back rotation may be readily effected when desired, the dog or detent has an upwardly projecting pin 25 by which it may be readily swung from engagement with the ratchet against the resistance of an actuating spring 26 fastened to the cap and bearing at its free end against the dog or detent, it being noted in this connection that the cap is provided with a circumferential flange 27 projecting upward to about the plane of the top of the dog so as to protect the latter against being accidentally disengaged from the ratchet.

An article such as a bathing suit, hunting coat or other garment provided with an inflatable device, will afford a great measure of protection to those whose business or inclination results in taking them upon or in dangerous waters, and if the wearer of such a protective article is incapable of swimming or perhaps incapacitated from swimming when falling or thrown into the water, it will be possible in most instances for such person to give the screw 20 a single turn and thus effect the puncturing of the cartridge and the inflation of the bathing suit or other protective article worn. In some instances a person under such circumstances might, under excitement, attempt to turn the screw the wrong way and thus fail to effect the puncturing of the cartridge, and for this reason the pawl and ratchet mechanism is provided to prevent back movement of the screw. A person under such excitement and under such conditions, if they could not turn the screw backward would almost unconsciously reverse the movement and thus effect the puncturing of the cartridge and hence the inflation of the protective article, and because of the fact that the air thus supplied cannot leak back and escape to the atmosphere, the wearer would be sustained in safety—assuming that the article itself was air-tight—for an indefinite period of time, and in this connection it will be noted that there is such a frictional extended threaded relationship between the cup member and the cap member, that a spasmodic backward pressure applied on the handle of the plug would not be sufficient to unscrew the cap member from the cup member, this being more readily appreciated when it is understood that an excitable person struggling in the water would be compelled to grip the cup member tightly to afford sufficient resistance to enable one attempting to turn the plug backwards to unscrew the cap member. If the cup member was not gripped and held tightly, any backward pressure applied on the screw would simply tend to twist the fabric of the protective garment, as the latter would afford less resistance to such action than would be offered by the threaded engagement between the cup and cap members. It will therefore be appreciated that a person struggling in the water and under excitement could not readily effect unscrewing action of the cap member from the cup member and meeting resistance in turning the device as a whole backward, would instinctively reverse such application of force and thus impart proper turning movement to the screw to effect the puncturing of the cartridge.

From the above description it will be apparent that I have produced inflating devices embodying the features of advantage set forth as desirable in the statement of the object of the invention, and which is susceptible of minor changes within the principle of construction involved and the spirit and scope of the appended claims.

I claim:

1. In a device of the character described, an inflatable body, a compressed-fluid cartridge container fitting in the inflatable body with an air-tight relationship and communicating at its inner end with the interior of said body and provided with a puncturing pin, adjustable means mounted on the container, a diaphragm interposed between said adjustable means and the cartridge and forming an air-tight partition for the container between the said adjustable means and the cartridge and adapted to transmit power from the adjustable means to the cartridge to cause the puncturing of the latter by said pin, and means for preventing accidental reverse adjustment of said adjustable means.

2. In a device of the character described, an inflatable body, a compressed-fluid cartridge container fitting in the inflatable body with an air-tight relationship and communicating at its inner end with the interior of said body and provided with a puncturing pin, adjustable means mounted on the container, a diaphragm interposed between said adjustable means and the cartridge and forming an air-tight partition for the container between the said adjustable means and the cartridge and adapted to transmit power from the adjustable means to the cartridge to cause the puncturing of the latter by said pin, and pawl and ratchet means for preventing accidental reverse adjustment of said adjustable means.

3. In a device of the character described, an inflatable body, a compressed-fluid cartridge container comprising a cup member projecting into the body and secured thereto with an air-tight relationship and communicating at its inner end with the chamber of said body and provided with a puncturing device, and a cap member detachably fastened to the outer end of the cup member with an air-tight relationship, and having an opening at its outer end, a diaphragm partitioning the cap member into outer and inner non-communicating chambers, and means projecting into the outer chamber of the cap and adjustable to apply pressure on the diaphragm to impart movement to the latter and cause the same to press the cartridge upon the puncturing device until punctured by the latter.

4. In a device of the character described, an inflatable body, a compressed-fluid cartridge container comprising a cup member projecting into the body and secured thereto with an air-tight relationship and communicating at its inner end with the chamber of said body and provided with a puncturing device; the outer end of said cup member having a circular groove, and a compressible gasket within said groove, and a cap member screwed upon the outer end of the cup member and fitting in said groove upon said gasket, the cap member having a threaded opening at its outer end; a diaphragm partitioning the cap member into inner and outer non-communicating chambers, a screw engaging the threaded opening of the cap member and adapted, when advanced, to cause the diaphragm to engage a cartridge within the container and press it against said puncturing device until punctured by the latter; the screw being provided externally of the container with a ratchet wheel, and a spring-actuated pawl mounted on the cap member and engaging the ratchet wheel to prevent accidental back rotation of the screw.

In testimony whereof I affix my signature.

PETER MARKUS.