Feb. 25, 1958 B. R. SILVERMAN ET AL 2,824,570

FLUSH TYPE TOPPING-OFF VALVE

Filed April 7, 1953

FIG. 1

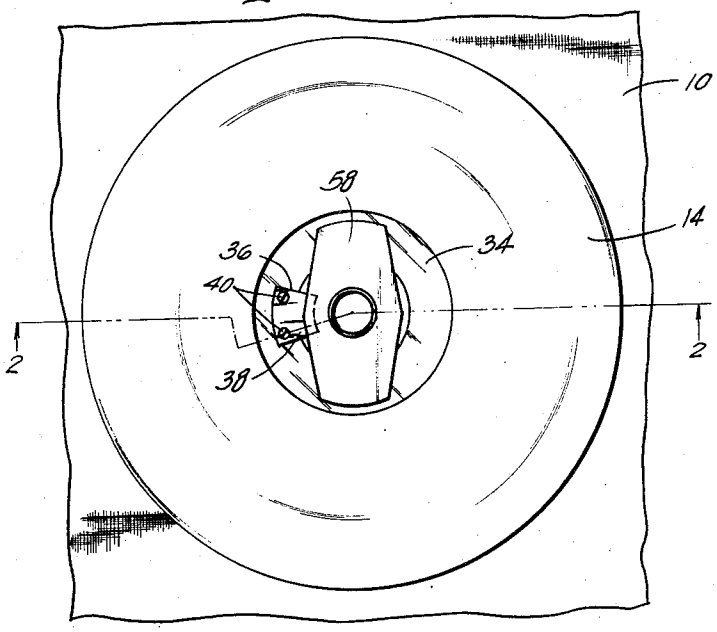


FIG. 2

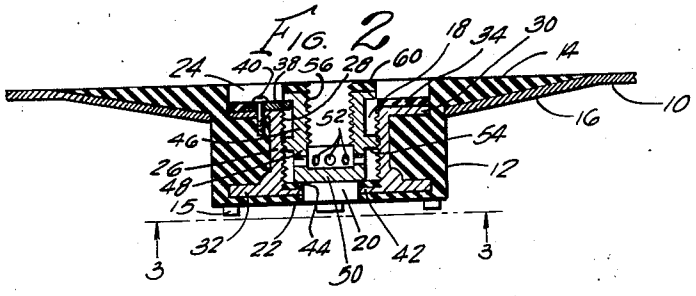


FIG. 4

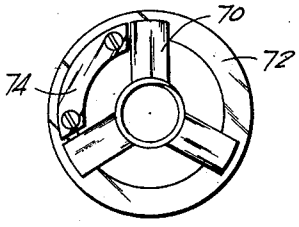
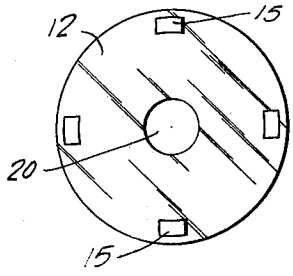


FIG. 3



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FLUSH TYPE TOPPING-OFF VALVE

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1 Claim. (Cl. 137—223)

(Granted under Title 35, U. S. Code (1952), sec. 266)

This invention described herein may be manufactured by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

This invention relates to a valve for use in inflatable, flexible life rafts and the like and particularly relates to the so-called "topping-off" type of valve which is adapted to be used as either a venting device or a filling device and which also may be used to form a fitting for attaching a hose to the raft.

Heretofore, the type of valve with which this invention is concerned comprised a metal valve body which extended above the skin of the raft and which required a chain or other such means for holding it attached to the raft when it was in its fully opened position. The exposed metal valve tended to abrade the surrounding areas of the raft by constant frictional contact between the two, while the chain was always in danger of tearing loose or ripping the fabric of the raft to which it was attached. Furthermore, the constant exposure of the metal parts resulted in the formation of dirt and salt deposits on the valve and in many cases also resulted in rusting of the valve parts.

It was sought to alleviate some of the defects outlined above by covering the exposed valve structure with a rubberized fabric patch similar to the material of which the raft itself was formed. However, this was a clumsy make-shift expedient which still fell short of completely solving the problem, especially insofar as concerned the abrasion caused by the frictional contact between the parts.

It is one object of this invention to provide a valve structure for an inflatable life raft wherein no part of the valve is normally exposed over the skin surface of the raft.

Another object of this invention is to provide a valve for inflatable life rafts wherein the valve body is, at all times, attached to the raft without the use of any chains, ropes, or the like.

Another object of this invention is to provide a valve for inflatable life rafts wherein all the metallic parts of the valve are protected from exposure to the elements.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawing wherein:

Fig. 1 is a top plan view of the valve device embodying the invention, showing it attached to the fabric of an inflatable life raft.

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a bottom plan view of the valve device taken on line 3—3 of Fig. 2.

Fig. 4 is a top plan view of a modified form of the invention.

Referring now in greater detail to the drawing wherein similar reference characters refer to similar parts, there

is shown a portion of an inflatable life raft 10 wherein the life raft is constructed of a rubberized fabric material. An opening is formed in the skin of the raft and in this opening is provided a cylindrical body 12 from which extends a ring-like sealing flange 14. The body 12 and flange 14 are integrally formed of a resilient material such as rubber or the like. It is to be noted that the portion of the raft 10 which surrounds the valve opening is concave or dish-shaped as at 16 and that the flange 14 which is radially tapered from a broad base adjacent the center thereof to a relatively narrow periphery, fills the concavity formed by the portion 16 in such a way that the top of the flange 14 lies in the same horizontal plane as that part of the raft which lies outwardly of the dish-shaped portion 16. The body 12 and flange 14 are attached to the rubberized fabric of the raft 10 by any convenient means such as by cementing.

The body 12 is formed with an axial opening 18 which connects with a smaller co-axial opening 20 formed at the bottom of the body 12 by a lateral flange 22 projecting radially inward from the body. A counterbore 24 at the top of the body forms the central opening of the ring-like flange 14.

Molded or otherwise mounted in a fluid-tight manner in the axial opening of the body 12 is a metal sleeve 26. The sleeve 26 is internally threaded as at 28 and is provided with a top flange 30 and a bottom flange 32. The bottom flange 32 is molded within the body 12 to give added strength thereto while top flange 30 overlies the body 12 within the counterbore 24.

Overlying the flange 30 is a resilient cover-ring 34 constructed of molded rubber or the like. At one side of the rubber ring 34 there is provided a recess 36 and within this recess is positioned a metal stop 38 held in position by a pair of screws 40. This stop 38 extends radially inward of the inner wall of the sleeve 26.

At the bottom of the sleeve 26 is formed a radially inwardly extending flange 42 which lies on the same horizontal plane as the outwardly extending flange 32 and which overlies and is joined to the flange 22 of the body 12. Over this flange 42 is provided a resilient sealing ring 44 which forms a seat for the valve body 46.

The valve body 46 comprises a hollow, cup-shaped, cylindrical portion 48 having a bottom wall 50 and a plurality of openings 52 on its periphery adjacent the bottom wall thereof. A peripherally threaded flange 54 extends from the periphery of the valve body immediately above the openings 52, this threaded flange mating with the internal threads 28 of the sleeve 26. Internal threads 56 are also provided in the valve body, and on the top of the body is provided an operating handle 58 integral with the valve body, this handle having a resilient covering 60 of rubber or the like in overlying relationship thereto.

In operation, when it is desired to vent or bleed the air or other fluid from the inflatable raft, the handle 58 is operated to lift the valve body 46 from the seat 44, thereby allowing the opening of a fluid passage through opening 20, holes 52 and through the open cavity of the valve body. This passage is also opened in like manner to allow the entrance of fluid into the raft. The internal threads 56 of the valve body are provided for the purpose of coupling the threaded nozzle of a hose or the like to the valve.

It can be seen that in its normally closed position the valve is completely positioned within the confines of the body 12 and that whatever metallic parts of the valve structure are exposed are substantially covered by the resilient rings 34 and 60. This construction not only prevents exposure of the valve structure to the elements but allows the use of relatively inexpensive metals in the construction of the valve since the anti-corrosion

properties of the metals are not an important factor. Furthermore, there is no likelihood of abrasion and tearing between the valve and the surrounding areas since the body **12** and its flange **14** act as a cushion between the valve and raft.

It is also to be noted that the stop **38** acts to keep the valve body from falling out since the flange **54**, by being adapted to abut against the stop, acts to limit the upward movement of the valve body.

The lugs **15** are provided for several reasons, one of which is to keep the bottom of the valve spaced from the bottom of the raft when the raft is in collapsed condition for storage. This is so as to prevent the formation of a vacuum in the opening **20** which might result in tearing the fabric of the raft when it begins to be inflated and the valve is pulled away from the bottom wall of the raft. Another reason is to keep a passage open to allow the entrance of the fluid for inflating the raft.

A modified form of construction is illustrated in Fig. 4 where a three-pronged actuating handle **70** is substituted for the handle **58**, the handle **70** being easier to grip and hold in some cases. The ring **72** and stop **74** serve the same functions as do the ring **34** and stop **38** respectively.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is, therefore, to be understood that within the scope of the appended claim the invention may be practiced otherwise than as specifically described.

What is claimed as the invention is:

A valve for inflatable devices comprising a cylindrical resilient body having an axial passage therethrough, said body having a counterbore therein at one end communicating with said axial passage and provided with an annular recess therein adjacent the opposite end thereof communicating with said axial passage, a sleeve mounted entirely within said axial passage, an annular flange on said sleeve, said flange seated in said annular recess, a valve seat on said sleeve adjacent said annular flange, an axially movable valve core in said sleeve movable between open and closed positions relative to said valve seat and being provided with a central bore therein, said valve core having transverse passages therein communicating with said central bore, a valve actuating means on the upper end of said valve core, said valve actuating means being positioned entirely within the confines of said counterbore in said body when said valve core is in said closed position, an integral resilient flange surrounding said body adjacent said counterbore, the upper surface of said integral resilient flange being perpendicular to the axis of said axial passage, the lower surface of said integral resilient flange being inclined toward said upper surface, a second flange on said sleeve, said second flange overlying and disposed within the counterbore in said body, a resilient ring overlying said second flange, a resilient cover overlying said valve actuating means, a flange on said valve core above said transverse passages therein, and a lug secured to said body and overlying said second sleeve flange to engage said valve core flange whereby said valve core is limited in its axial movement.

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