Dec. 28, 1954 S. W. LEE ET AL 2,698,028

VALVE FOR SELF-CONTAINED INFLATABLE ARTICLES

Filed July 14, 1949

Fig. 1.

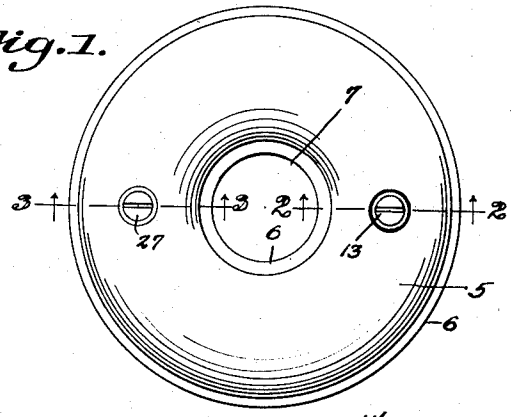


Fig. 2.

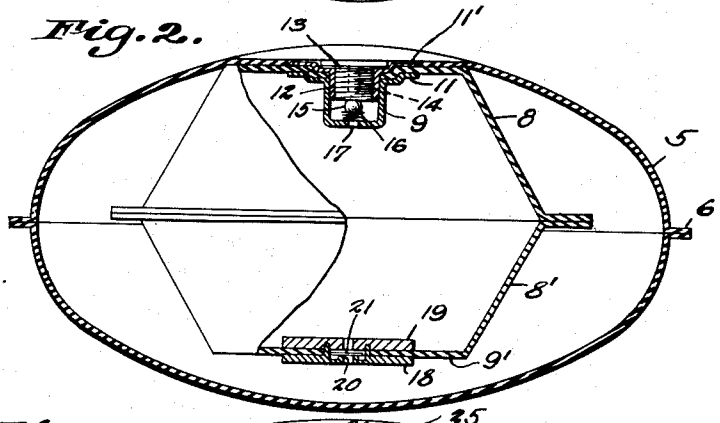
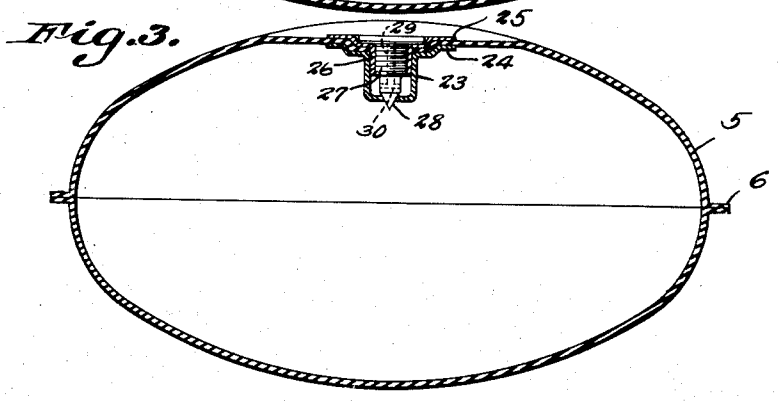


Fig. 3.



S. W. Lee
R. W. Vollman
INVENTORS

BY C. A. Snow & Co.
ATTORNEYS.

United States Patent Office 2,698,028 Patented Dec. 28, 1954

2,698,028

VALVE FOR SELF-CONTAINED INFLATABLE ARTICLES

Samuel W. Lee and Ross W. Vollmar, Buffalo, N. Y.

Application July 14, 1949, Serial No. 104,694

1 Claim. (Cl. 137—539)

This invention relates to inflatable objects, such as cushions, mattresses, or the like, articles, wherein the inflating means, which is in the form of a pump, is self-contained.

The primary object of the invention is to provide a pump or inflating unit enclosed within an inflatable body portion, wherein the body portion may be inflated without the necessity of using external mechanical means.

Another object of the invention is to provide an inflatable body portion supplied with an internal pump, as well as a deflating valve, the pump and valve being so constructed as to insure an air-tight and water-tight connection between the body portion and pump or valve.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claim, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

Referring to the drawing:

Figure 1 is a plan view of a pneumatic cushion equipped with an internal inflating pump constructed in accordance with the invention.

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

Fig. 3 is a sectional view taken on line 3—3 of Fig. 1.

Referring to the drawing in detail, the inflatable body portion, which in the present showing is in the form of a cushion, is indicated generally by the reference character 5 and is constructed of suitable material such as plastic, rubber or the like, embodying sections which are secured together at 6, or at their edges.

As shown, the cushion is formed with a central opening 7, which is common cushion construction, and at one side of this opening, between the opening and outer edge of the body portion, is arranged the pump, which comprises a body portion including upper and lower cup-shaped members 8 and 8', respectively, the open sides of said members being secured together, the upper member 8 and lower member 8' being constructed of flexible material, providing a diaphragm structure, the lower member 8' having a flat lower surface 9' providing a bearing surface for the pump when the pump is actuated to inflate the bag.

Formed in the upper surface of the pump, is an opening in which the valve casing 9 is positioned, the valve casing 9 having an annular flange 11 that cooperates with the annular flange 11', forming a part of the threaded barrel 12 in gripping the upper edge of the pump, adjacent to the opening. Positioned within the threaded barrel 12 is the threaded plug 13, which is formed with a central bore 14, the lower end of which is beveled, providing a valve seat for the ball valve 15 which is normally urged to its seat, by means of the coiled spring 16 which rests on the bottom of the valve casing directly over the inlet opening 17 of the valve casing.

In the bottom of the pump is the outlet opening of the pump, which is surrounded by the lower disc 18 and the upper disc 19, the discs 18 and 19 having aligned openings providing an outlet passageway for air to enter the inflatable body portion 5 from the pump.

The lower disc 18 is formed with upstanding lugs 20 which are spaced apart and provide a seat for the disc valve 21, which valve moves within the space between the discs 18 and 19, as shown by Fig. 2 of the drawing, so that when the body portion has been inflated, or with

each suction stroke of the pump, the disc valve will move to close the opening in the upper disc 19. Upon reverse movement, the disc valve 21 moves to rest on the lugs, allowing air to pass from the pump, between the lugs and through the opening in the lower disc 18.

The body portion is also provided with a deflating valve which comprises the valve casing 23, which is formed with a flange 24 that cooperates with the flange 25 of the threaded tubular member 26 in clamping the upper section of the body portion, providing an air-tight fit between the deflating valve and body portion. Operating within the threaded tubular member 26, is the threaded valve 27 formed with a tapered end 28 that fits into an opening formed in the bottom of the valve casing 23, normally closing the opening. This valve member 27 is formed with a longitudinal bore 29 that communicates with the transverse bore 30, establishing communication between the bore 29 and interior of the valve casing 23. When the valve 27 is operated to release air from the body portion, the tapered end 28 will move away from the opening in which it is normally held, allowing air to pass into the valve casing 23 from the body portion, and exhaust through the bore 29 to the atmosphere.

When it is desired to inflate the body portion equipped with a self-contained pumping mechanism, forming the essence of the present invention, it is only necessary for the operator to position the palm of his hand over the plug 13 and press downwardly against the body portion. With this pressure directed to the body portion, the pump is collapsed with the result that when the pressure in the body portion is relieved, the pump, due to the action of the diaphragm 8, will be extended causing air to be drawn into the pump through the valve casing 9.

As pressure is again applied to the body portion the air within the pump is forced into the body portion through the valve 21, the pressure of air within the body portion causing the valve 21 to seat against the inner end of the valve opening formed in the upper disc 19. Upon repeated pumping action it is obvious that the body portion will become inflated.

When it is desired to deflate the body portion, the threaded valve 27 is rotated to unseat valve 27. With pressure applied on the body portion, the air will be forced from the body portion through the valve 27.

Having thus described the invention, what is claimed is:

A pump valve of the class described, comprising a valve casing having an opening in the bottom thereof, said valve casing having an outwardly extended annular flange formed at the other end thereof, a threaded barrel fitted within said casing, said barrel having an outwardly extended annular flange adapted to cooperate with the flange of said casing in gripping a body therebetween, a threaded plug fitted within said barrel, said plug having a central bore, one end of the bore being beveled providing a valve seat, a ball valve mounted within the valve casing resting against the valve seat, normally closing the bore of said plug, and a coiled spring disposed between the bottom of said valve casing and ball valve normally biasing the ball valve to its seat.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
231,997	Chamberlain	Sept. 7, 1880
442,948	Bowley	Dec. 16, 1890
490,828	Lavigne	Jan. 31, 1893
615,187	Kertsting	Nov. 29, 1898
1,564,624	Riley	Dec. 8, 1925
1,590,173	Anglade	June 22, 1926
1,756,056	Dorward	Apr. 29, 1930
1,931,918	Bard	Oct. 24, 1933
2,068,134	Houghton	Jan. 19, 1937
2,391,906	Kearny	Jan. 1, 1946
2,437,602	Hann	Mar. 9, 1948

FOREIGN PATENTS

Number	Country	Date
258,031	Italy	Apr. 2, 1928