

Sept. 25, 1951

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2,568,976

FLEXIBLE VALVE

Filed Oct. 30, 1948

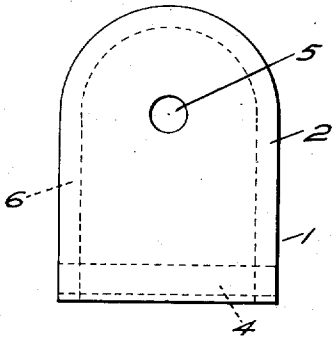


Fig. 1.

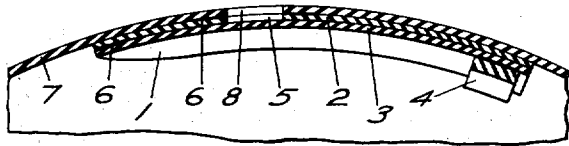


Fig. 3.



Fig. 2.

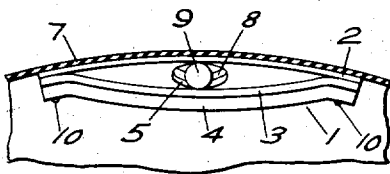


Fig. 5.

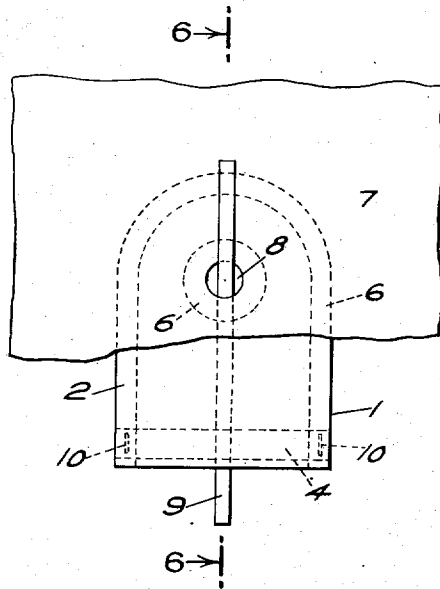


Fig. 4.

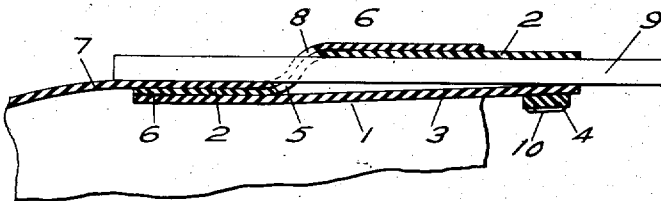


Fig. 6.

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2,568,976

FLEXIBLE VALVE

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Application October 30, 1948, Serial No. 57,610

4 Claims. (Cl. 251—119)

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This invention relates to an all flexible valve for inflatable articles such as pneumatic mattresses, pillows, footballs, or in fact anything that will be inflated to moderate pressures. These uses are not exhaustive but are named for information.

Since inflatable articles such as pillows may not have rigid parts in their composition, it is an object of this invention to provide an automatic self-closing valve that contains no hard structure, yet is as positive, if not more so, than a metal or rubber valve on a metal seat.

Since rubber articles, meaning rubber and those other substances having the well known characteristics of rubber, are not subject to corrosion from dampness, the objective is a valve of that character.

Another important object is a valve that, save for a very small area around the inlet opening, is wholly unattached to the inflated article itself; hence rough usage applied to the latter does not tend to loosen the valve from where it is placed.

A drawing accompanies and forms a part of this disclosure, in which Fig. 1 is a plan view of the valve showing the side that will be made fast to the inside of the article to be valved for inflation;

Fig. 2 is an end view in projection of Fig. 1, slightly enlarged;

Fig. 3 is the same section shown in Fig. 6, before the match stick 9 was inserted;

Fig. 4 shows a fragment of a valved inflatable object, with the valve of Fig. 1 partly beneath and partly projecting beyond the fragment, and containing a match stick for deflation;

Fig. 5 is an end view of Fig. 2, but with the addition of a match stick, or similar article thrust into the valve opening and projecting through the sack mouth, to deflate the inflated article when needful; and

Fig. 6 is a section taken on the plane 6—6 of Fig. 4.

Describing the valve in detail: A body portion 1, of the valve is in the form of a flat, open mouth sack made of Vinylite plastic or other flexible rubbery material. It is shown to be made up from two similar pieces, 2 and 3, vulcanized or otherwise similarly fastened together over the area designated in dotted outline in Fig. 1, and identified by numeral 6, save that the topmost piece, 2, is provided with a valve opening 5; and the lower, otherwise inside portion of the sack 1, indicated by numeral 3, has attached thereto a rubbery spring 4, attached at the points

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10, in any suitable manner, but is not otherwise attached.

The inflatable object, of which fragments only are shown as 7, is provided with a valve opening 8, that is first placed in registry with the valve opening 5; and the valve and the inside surface of the inflatable article 7, are securely vulcanized or otherwise firmly attached over the area designated in dotted outline by numeral 6 in Fig. 4. It will be seen that the valve, save for the area designated by numeral 6 in Fig. 4, hangs free on the inside of the inflated article 7. Whether or not it hugs the inside surface of 7 is unimportant.

The rubbery spring 4 can best be made, as I now am informed, by cutting an annulus from the end of a seamless vulcanized rubbery hose, having a circumference equal to the length of the spring 4, as required, cut at one point, when it will be found that the rubbery material has a natural set to remain in its annular shape and that when it is forcibly unrolled and fastened to the sack 1, it will cause the sack to assume an arcuate form as shown in Fig. 2; the strength of the spring and its tendency to bow the two parts of the open mouth sack into air tight contact being a function of its original thickness, as the wall of a rubbery hose. This is the self-closing feature and it will close the two parts of the open mouth of the sack together into a hermetic closure whether or not there is any internal pressure in the article 7. If made of good material, the rubbery spring does not lose strength with age.

When it is desired to deflate the article 7, a match stick 9, or any other convenient and similar tool may be easily inserted through the valve openings 8 and 5 and out past the end of the sack 1 as shown in Figs. 4, 5 and 6, when the air has a free passageway out.

Having disclosed my new valve and explained its construction and use, what I claim as new and desire to secure by Letters Patent, is:

1. A valve device for an inflatable article, said valve comprising a valve body including a pair of walls of flexible material, a pair of coextensive adjacent edges of said walls being free from each other at one end of said body and defining a valve mouth, an air passage opening in the median area of one of said walls and communicating with said mouth in the separated condition of said walls and mouth edges permitting free passage of air through said body, one of said walls adjacent said valve mouth including a relatively stiff resilient portion extending trans-

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versely of said body throughout the full width of said mouth and having a natural bias tending to cause it to assume an arcuate shape in the direction transversely of said body and aligned with said mouth edges whereby the mouth edge portions of said walls are normally held in close contact with each other.

2. A valve device for an inflatable article, said valve comprising a normally flat sack-like valve body including a pair of coextensive walls of flexible material, the adjacent edges of said walls being free from each other at one end of said body and defining a valve mouth, an air passage opening in the median area of one of said walls and communicating with said mouth in the separated condition of said walls and mouth edges permitting free passage of air through said body, the second of said walls including a portion having a normal resilient bias tending to cause said second wall to assume an arcuate configuration in the direction opposite said one wall whereby said one wall is normally held firmly against said second wall so as to close said valve mouth and said air passage opening.

3. A valve device for an inflatable article, said valve comprising a valve body including a pair of walls of flexible material, a pair of coextensive adjacent edges of said walls being free from each other at one end of said body and defining a valve mouth, an air passage opening in the median area of one of said walls and communicating with said mouth in the separated condition of said walls and mouth edges permitting free passage of air through said body, one of said walls adjacent said valve mouth including a relatively stiff resilient portion extending transversely of said body throughout the full width of said mouth and having a natural bias tending to cause it to assume an arcuate shape in the direction transversely of said body and aligned with said mouth edges, the concave surface of said

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arcuate shape facing away from said body whereby said other body wall portion adjacent said mouth is firmly held in sealed relation against the convex surface of said first wall portion.

4. A valve device for an inflatable article, said valve comprising a normally flat sack-like valve body including a pair of coextensive walls of flexible material, the adjacent edges of said walls being free from each other at one of said body and defining a valve mouth, the adjacent edges of said walls around the remainder of said body being sealed together, an air passage opening in the median area of one of said walls, an elongated resilient element having a normal bias tending to cause it to assume an arcuate shape, said element having a length at least as great as the width of the valve body mouth, said pair of walls adjacent said mouth being stretched across the convex surface of said element and secured at opposite edges to said element whereby said wall portions defining said mouth are normally held in firm contact with each other against the arcuate convex surface of said element.

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