May 8, 1928. 1,668,803

F. A. CIGOL ET AL

FLUSH TANK BULB

Filed March 26, 1924

Fig.-1

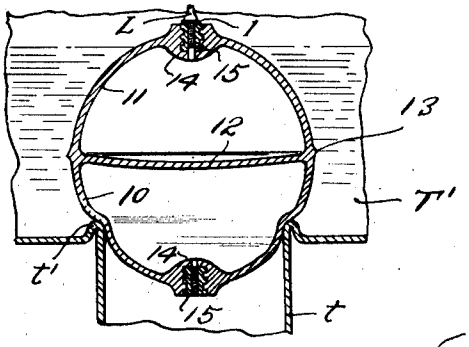


Fig.-2

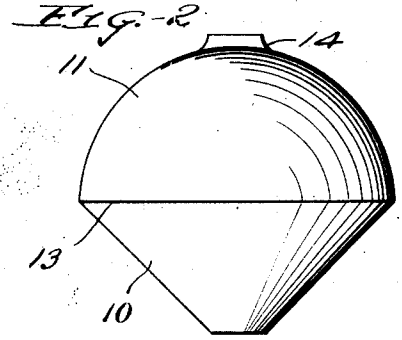


Fig.-3

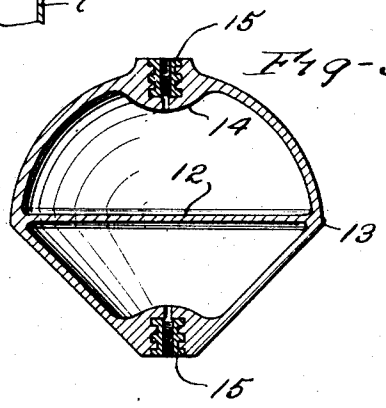


Fig.-4

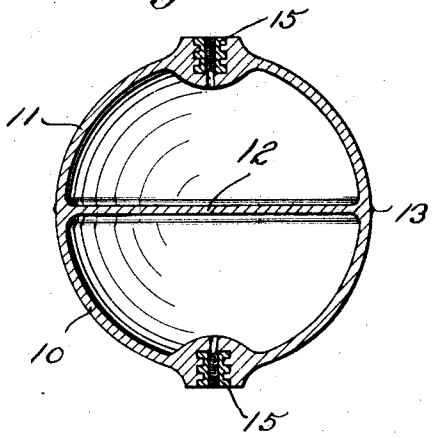
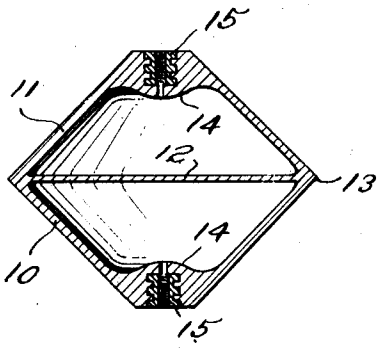


Fig.-5



INVENTORS
Frank A. Cigol, and
Fred Thomas Roberts,
By Dale & Macklin,
ATTYS.

Patented May 8, 1928. 1,668,803

UNITED STATES PATENT OFFICE.

FRANK A. CIGOL, OF PATERSON, NEW JERSEY, AND FRED THOMAS ROBERTS, OF YONKERS, NEW YORK, ASSIGNORS TO PARAMOUNT RUBBER CONSOLIDATED, INC., OF TUCKAHOE, NEW YORK, A CORPORATION OF DELAWARE.

FLUSH-TANK BULB.

Application filed March 26, 1924. Serial No. 701,924.

This invention relates to hollow rubber articles together with the method of making them and refers particularly to articles such as flush tank bulbs.

The practice heretofore of making flush tank bulbs has been to employ a soft rubber lower portion which is arranged to engage a valve seat. To hold this pliable material so as to enable it to retain the original shape, the practice has been to employ a comparatively rigid upper portion which is adapted to receive a lift rod. The rigid material is not well adapted for effecting a tight closure with the valve seat, wherefore such bulbs are not reversible.

One of the objects of our invention, therefore, is the provision of a flush tank bulb which is so made that the entire wall therefore is sufficiently flexible to effect a tight seal irrespective of which end of the bulb is downward while internal means are provided to cause the bulb to retain the original shape. In this way we provide a bulb which is reversible and which is therefore capable of doubling the period of available use.

We accomplish the above object by making both portions of the bulb of flexible material and of sufficiently thick rubber and providing a diaphragm extending across the interior, dividing the bulb into substantially upper and lower halves. We provide a spud in each end of the bulb, each of which spuds is adapted to receive the usual lifting rod. The spuds being placed at the opposite ends of the vertical axis, when one is in engagement with the lifter, the other in no manner interferes with the bulb seating against its valve seat.

Openings are made through the rubber aligning with the bore of the spuds to connect the corresponding internal space with the atmosphere. However, the upper space is closed by reason of the lifter rod, which may be provided with a gasket to make a tight fit with the spud it occupies. We thus provide a closed air chamber in the upper half of the bulb. This helps to hold whichever half is uppermost comparatively rigid while allowing the lower half to be sufficiently pliable to readily seat against the annular valve seat.

In the manufacture of the bulb, we prefer to seat rubber stock pneumatically in mold cavities, reinforcing the same, either externally before seating or internally after seating, with material adapted properly to embrace and support the spuds. Then we place in the lower lined cavity a substance adapted to produce a gas when the article is heated. We then place a sheet of rubber stock across the mouth of the lined cavity, add gas generative material on top of this sheet, and then bring the other mold member with the cooperative lined cavity into coaction with the diaphragm sheet and the lining of the lower mold. When these two mold members are forced together, annular cutting edges about the cavities cut through the sheets separating them from the surrounding material and at the same time joining all three portions by a single peripheral seam. We then transfer the article to a vulcanizing mold and vulcanize by heating, incidentally producing the internal gas which forms the proper vulcanizing pressure.

The invention covers the article having features by which we attain the desirable characteristics noted. This will all be more fully set forth in the following description, which pertains to the accompanying drawing. The essential characteristics of our invention will be summarized in the claims.

In the drawings, Fig. 1 is a vertical section of a flush tank bulb made in accordance with our invention, shown in position in a flush tank; Fig. 2 is a side elevation of our bulb in a different shape; Figs. 3, 4 and 5 are vertical sections through bulbs of various shapes made in accordance with our invention.

In the drawings, we have illustrated various shapes of round flush tank bulbs, each having portions 10 and 11 and an internal diaphragm 12, all of which are united by a single peripheral seam 13. Each portion of the bulb is thickened at its pole, as indicated at 14, and carries a spud 15. These spuds are illustrated as being of a standard form, having grooved exteriors and longitudinal bores which are threaded to receive lifter rods. After the manufacture of the article, the rubber across the inner face of the spud is perforated in alignment with the bore of the spud to allow access to the interior.

In Fig. 1, we have indicated at L, a lifter rod screwed into the upper spud. This rod is shown as having a shoulder clamping a

gasket 1 against the upper end of the spud 15 whereby an air-tight connection is made. The air in the upper chamber is of atmospheric pressure while the air in the lower chamber will be somewhat rarified due to the action of suction in the discharge pipe, which causes the diaphragm 12 to bend downwardly somewhat, as illustrated in Fig. 1. This view indicates at T^1 any usual flush tank having the discharge pipe t, at the upper end of which is an annular valve seat t^1.

Figs. 1 and 4 show the bulb completely spherical. Figs. 2 and 3 show it of spheroconical form and Fig. 5 of double conical form. In all of these cases there is the diaphragm separating the body into two chambers and the two spuds in the two polar regions, and either spud may be engaged by the screw threaded lifter rod. The bores of these spuds also furnish convenient means by which they may be anchored in the moulds by suitably inserted pins during the process of manufacture.

From the foregoing description, it will be understood that we have provided a flush tank bulb comprising a hollow rubber article having pliable walls, which may be used either end up—the diaphragm and upper air chamber giving it sufficient resistance against collapse. This reversible characteristic practically doubles the life of the bulb.

Moreover a bulb made in accordance with our invention is well adapted for manufacture by the very economical process described, wherein the rubber stock is seated by suction within a mold cavity and is held therein while the cooperating sections are brought together to form the article.

We claim:

1. A double ended rubber flush tank bulb having spuds at its top and bottom respectively and a rubber diaphragm dividing the bulb into two chambers.

2. As a new article of manufacture, a hollow rubber flush tank bulb made of two cup-shaped sections vulcanized together and an internal rubber diaphragm in the form of a disc having its edges vulcanized to the bulb at the seam.

3. A double ended rubber flush tank bulb having attaching devices embedded in its two polar regions and an internal rubber diaphragm dividing the bulb into upper and lower chambers, there being openings from the exterior into said chambers, the upper of said openings being closed by the lifter rod.

4. A double ended rubber flush tank bulb having spuds embedded in its upper and lower polar regions and an internal rubber diaphragm vulcanized in place at its edges and dividing the bulb into upper and lower chambers.

Signed this 16th day of February 1924.

FRANK A. CIGOL.
FRED THOMAS ROBERTS.