May 2, 1933. H. A. RISHEL 1,907,120

CLOSURE OR STOPPER FOR BARRELS AND OTHER CONTAINERS

Filed June 26, 1931

FIG. I.

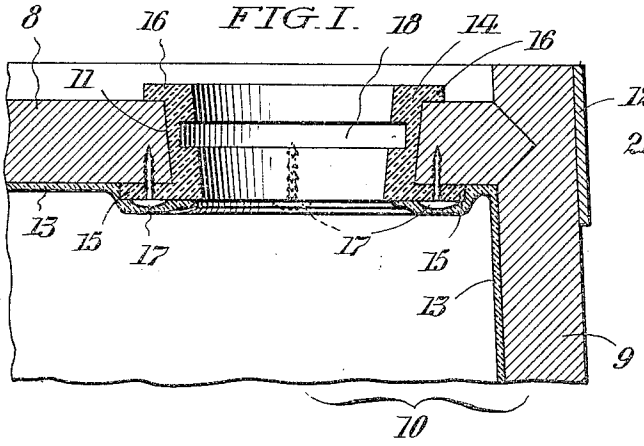


FIG. III.

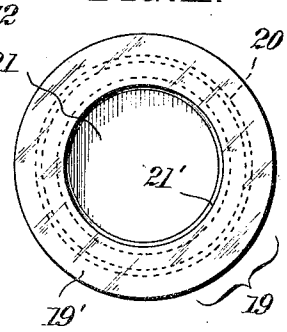


FIG. II.

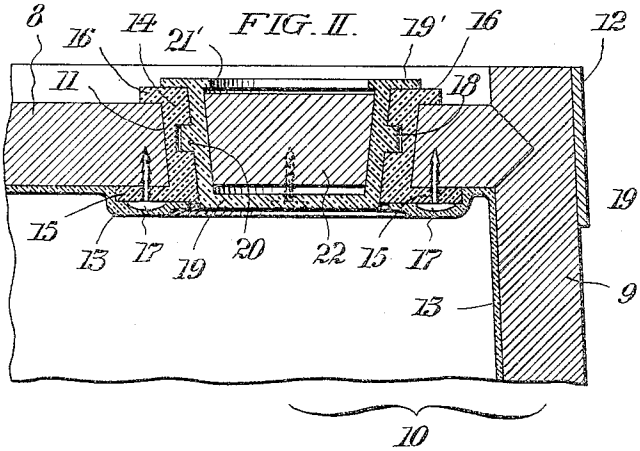


FIG. IV.

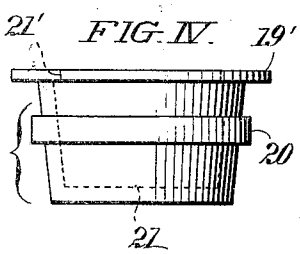


FIG. V.

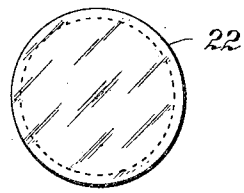


FIG. VII.

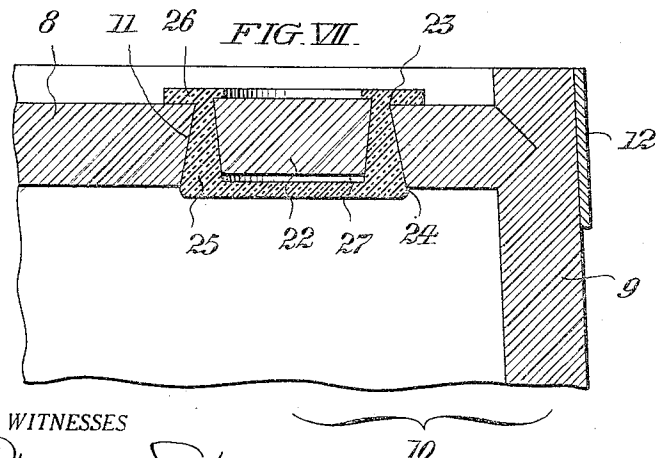
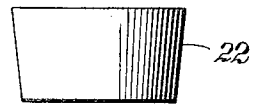


FIG. VI.



WITNESSES

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Patented May 2, 1933 1,907,120

UNITED STATES PATENT OFFICE

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CLOSURE OR STOPPER FOR BARRELS AND OTHER CONTAINERS

Application filed June 26, 1931. Serial No. 547,036.

This invention relates generally to closures for barrels, vessels and other containers, the contents whereof it is requisite to protect against deterioration, loss and so forth.

More specifically the present improvements have reference to what may be conveniently termed a self-sealing closure for barrels, vats, tanks and other containers, lined with rubber or other equivalent material.

The primary object of this invention is to furnish a positive means for locking the closure or stopper of a barrel or other container in place so as to prevent it from accidentally falling-out when said barrel or container is being transported; or, while such containers are being moved about after filling and before, during, or subsequent to storage.

Another object is to provide a closure or stopper of novel construction possessing inherent resistivity to the ravages of acid, chemicals, or other media tending to deteriorate or destroy its sealing capacity.

A further object is to furnish a closure or stopper which can be easily inserted, or withdrawn, without the aid of specially designed tools.

A still further object is the provision of a closure or stopper for barrels, vats, tanks and other containers that may be readily removed without destruction of said closure or stopper, or damage to the container, from which it is withdrawn, whereby both are safeguarded for re-use.

With the stated and other objects in view, my invention consists in the novel features of construction, mode of manipulation, and the combinations and arrangements of parts hereinafter fully disclosed, illustrated by the accompanying sheet of explanatory drawing constituting a part of this specification, and particularly pointed out in the claims hereunto appended.

In the drawing:

Fig. I is a fragmentary section of a lined wooden barrel head and staves, taken through the bunghole, and showing one practical form of an aperture-liner in accordance with this invention positioned therein.

Fig. II is a similar sectional view but showing my novel co-active molded-rubber lock-stopper and associated plug fitted therein.

Fig. III is a top plan view of the molded-rubber lock-stopper, hereinafter fully explained.

Fig. IV is an elevation of the same.

Fig. V is a detached plan view of a plug adapted to back-up and secure the lock-stopper to the aperture-liner aforesaid.

Fig. VI is an elevation of the same; and,

Fig. VII is a sectional view, similar to Fig. II, of a modified form of the invention.

Like characters of reference are applied to corresponding parts in all the several views.

In the embodiment of my invention shown by Figs. I–VI, inclusive, the numeral 8 designates the head and 9 the staves of a conventionally constructed barrel 10; said head having an inwardly-tapering bung-hole 11 while the staves 9 are bound by hoops 12, one only being shown, in accordance with known cooperage practice. The barrel 10 is conveniently, although not essentially, lined with a rubber or similar coating 13, applied in accordance with the disclosure in a companion application filed, concurrently herewith, by me the 26th day of June, 1931, Serial Number 547,035.

Fitting snugly into the bung-hole 11 is an aperture-liner or sleeve 14, of rubber, molded or otherwise provided with inner and outer flanges 15, 16, respectively. This liner or sleeve 14 is firmly held to the barrel-head 8 by suitable securing means, such as flat-headed nails 17 equally spaced around the inner flange 15, in an obvious manner. The heads of the nails 17, as well as the joint between the barrel-head 8, as well as the inner flange 15 of the liner or sleeve 14, are protected by the rubber or similar coating 13, to properly seal them against injurious action by the barrel contents; while said sleeve is provided with an inner rectangular-section groove 18, interme-

diate the flanged ends 15, 16, for a purpose later on explained.

Adapted for coaction with the liner or sleeve 14 is a hollow collapsible-rubber plug or cupped lock-stopper 19 having, at one point in its varying diametric dimensions, a surrounding rib 20 of a diameter which is greater than the major diameter of the opening in the sleeve 14, or, the liner bung-hole 11 in which it is fitted, and a top flange 19′ for seating on the outer face of liner sleeve flange 16 or the barrel head 8. Attention is, at this juncture, particularly directed to the fact that the dimensions of the plug or lock-stopper 19, relative to the bung-hole 11, are so adjusted that the two will properly register after said lock-stopper is inserted in place.

In order to insert the liner or sleeve 14, it is only necessary to collapse the same by pressure between the fingers to an extent sufficient to permit its passage into position in the bung-hole, whereupon it will automatically expand to proper seating relation therein.

Now, as will be best appreciated from Fig. II, it will be seen that, after the liner or sleeve 14 is seated and secured in the bung-hole 11, by a similar collapsing of the plug or cupped lock-stopper 19, the latter can be easily slipped into place with the surrounding rib 20, of similar section, engaged lockingly in the sleeve groove 18 aforesaid. The thickness of the walls of the rubber plug or cupped lock-stopper 19 as well as its inherent pliability, obviously, is such as to permit said stopper being contracted sufficiently to enter the liner or sleeve 14 in the manner stated.

While the inherent yielding capacity of the rubber plug or cupped lock-stopper 19 ordinarily holds the same in place, it is advisable as a precautionary measure against severe jars to the barrel 10 forcing-out said stopper 19, to insert into the hollow 21 thereof a rigid-plug or secondary-stopper 22 of wood, rubber, cork or other suitable material. By so doing, the rubber lock-stopper 19 and rigid plug 22, jointly function as a solid component, to prevent the former working out, excepting in the event that the locking rib 20 should shear-off where it adjoins the main body wall of said stopper; while the hollow 21 may be provided at its upper part with an overhang or lip 21′ to more effectively hold the plug 22 in position. Furthermore, it will be obvious that when the rigid plug 22 is inserted, the yieldable walls of the lock-stopper 19 are reinforced and thereby rendered incollapsible as long as such plug 22 is in place in the stopper 19; hence, the stopper 19 is locked rigidly in place.

To re-open the bung-hole 11, the plug 22 is first removed in any convenient manner, whereupon the stopper 19 is collapsed and withdrawn.

Referring now to the form of my invention shown in Fig. VII, all parts corresponding with those previously described are designated by similar reference characters to obviate repetitive descriptive matter, while it is to be noted that the bung-hole 11 is reversely tapered or expands inwardly; or, in other words the diameter at 23 is less than that at 24. The yieldable rubber lock-stopper 25 is not provided with a surrounding-rib, however, but externally conforms to the taper of the bung-hole 11 with its hollow counter-tapered; while said stopper has an upper flange 26 for engagement on the barrel head 8, as and for the purpose before set forth. A rigid plug 22 is then inserted in the counter-tapered hollow 27 of the bung lock-stopper 25, as before explained in connection with Figs. I–VI, whereupon said parts function as a composite solid unit, whereby the rubber stopper 25 is locked in place in the bung-hole 11.

While the foregoing description has made reference to a wooden barrel, it will be readily apparent this invention is equally applicable to glass bottles, metal cans, steel drums and other tight containers. Hence I do not desire to limit my invention to the precise details of construction and arrangements of parts hereinbefore set forth, as it is obvious various changes of form and modifications for particular purposes may be effected without departing from the essential features of said invention as defined by the following claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The combination with a container having an orifice of variant diametric dimensions, of an insertable rubber or similar material cupped-closure of corresponding cross-sectional configuration; said closure embodying means which, when it is expanded into conformity with the orifice, provide an effective locking seal while permitting its withdrawal by inwardly-directed collapsing action.

2. The combination with a container having an orifice of variant diametric dimensions, of an insertable rubber or similar material cupped-closure of corresponding cross-sectional configuration; said closure embodying a diametrically dimensioned portion greater than the minor diameter of the orifice aforesaid, whereby such closure is positively locked in the inserted position while permitting its outward withdrawal by inwardly-directed collapsing-action when desired.

3. The combination with a container having an orifice of variant diametric dimen-

sions, of an insertable rubber or similar material cupped-closure of corresponding cross-sectional configuration, said closure embodying a diametric portion of greater dimension than the minor diameter of the orifice and being adapted for removal from the orifice by inwardly-directed collapsing-action, and a rigid plug insertable into the cupped-closure to effect expansive locking of the latter in orifice sealing position.

4. A closure for container orifices of tapering formation comprising a cupped-element of rubber or similar material with a surrounding seating flange and a reversely-tapering hollow, and a rigid plug adapted to the hollow of the cupped element effective to expansively lock the closure in position.

5. A closure for container orifices of tapering formation comprising a correspondingly shaped cupped-element of rubber or similar material with a seating flange and an inwardly directed lip, the hollow of such element being reversely-tapered relative to its outer formation, and a rigid plug adapted to the hollow of the cupped element effective, when forced below the lip aforesaid, to positively lock the closure in sealing position.

6. A closure for container orifices of tapering formation comprising a rubber or similar material sleeve embodying means preventive of longitudinal displacement and having an inner circumferential groove, and a co-active similar material cupped stopper embodying a seating flange and a surrounding rib adapted to engage the sleeve groove aforesaid in locking such stopper in sealing position, said stopper being adapted for outward withdrawal from the liner sleeve by collapsive-action.

7. A closure for container orifices of tapering formation comprising a rubber or similar material sleeve embodying means preventive of longitudinal displacement and having an inner circumferential groove, a co-active similar-material cupped-stopper embodying a seating flange and a surrounding rib adapted to engage the sleeve groove while permitting outward withdrawal of said stopper under inwardly-directed collapsive-action, and a rigid plug adapted to the hollow of the cupped-stopper for expansively locking the parts aforesaid in rigid sealing relation.

8. A closure for container orifices of tapering formation comprising a rubber or similar material sleeve embodying means preventive of longitudinal displacement and having an inner circumferential groove, a co-active similar-material cupped-stopper embodying a seating flange and a surrounding rib adapted to engage the sleeve groove, said stopper also having an inwardly directed lip at the top of its hollow and being capable of outward withdrawal from the sleeve under inwardly-directed collapsive-action, and a rigid plug adapted when forced below the stopper lip to expansively lock the parts aforesaid in rigid sealing relation.

9. A closure for bung-holes and container orifices, of inwardly expanding taper, comprising a rubber or similar material cupped-stopper having at least two different diameters, the major of which is greater than the smaller diameter of the orifice, and a rigid plug adapted to the hollow of the stopper effective to expand the stopper into orifice sealing position.

10. A closure for bung-holes and container orifices, of inwardly contracting taper, comprising a collapsible rubber sleeve adapted to the orifice having at least two different diameters with an internal groove intermediate its ends, the major of which is greater than the smaller diameter of said orifice, a cupped-stopper conformative-stopper engageable in the sleeve aforesaid likewise having one dimension greater than the sleeve minor opening, the proportions of said sleeve and stopper being such that they will sealingly-register upon expansion to substantially normal shape.

11. Means for closing the bung-hole of a barrel or the filler-openings of other containers comprising a rubber sleeve with an internal groove and means for retaining it against longitudinal displacement in the bung-hole or filler-opening, and a collapsible-rubber stopper for insertion therein, said stopper embodying an exteriorly surrounding lock-ring dimensioned and located to engage in the groove aforesaid when the stopper is applied and expands to normal shape.

12. Means for closing the bung-hole of a barrel or the filler-openings of other containers comprising a rubber sleeve with an internal groove intermediate its ends of rectangular cross-section, and a collapsible-rubber stopper for insertion therein while adapted for withdrawal therefrom under inwardly-directed collapsive-action, said stopper embodying an exterior surrounding lock ring of corresponding cross-section located to engage the groove aforesaid when the stopper is applied and expands to normal shape.

13. A closure for container orifices of irregular formation comprising a collapsible rubber sleeve adapted to the orifice and having at least two different diameters intermediate its ends, the major of which is greater than the smallest diameter of said orifice, a cupped rubber conformative stopper engageable in the sleeve aforesaid likewise having one dimension greater than the sleeve minor opening, the proportions of said

sleeve and stopper being such that they will sealingly-register upon expansion to substantially normal shape.

In testimony whereof, I have hereunto signed my name at Philadelphia, Pennsylvania, this 16th day of June, 1931.

HARRY A. RISHEL.