March 9, 1954 W. SATZ 2,671,572

MANUALLY REMOVABLE CLOSURE

Filed June 7, 1949

Fig. 1.

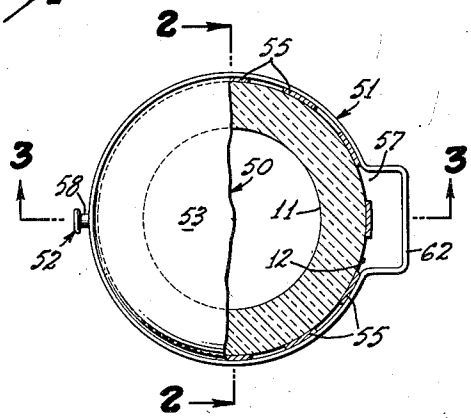


Fig. 2.

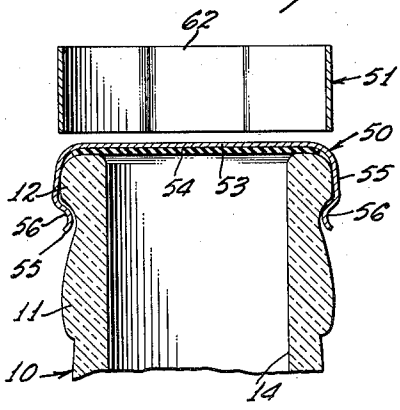


Fig. 3.

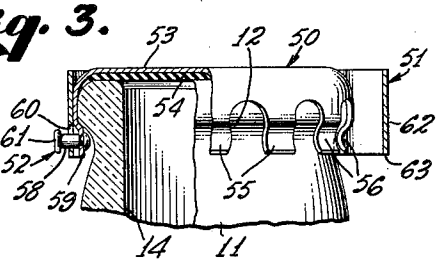
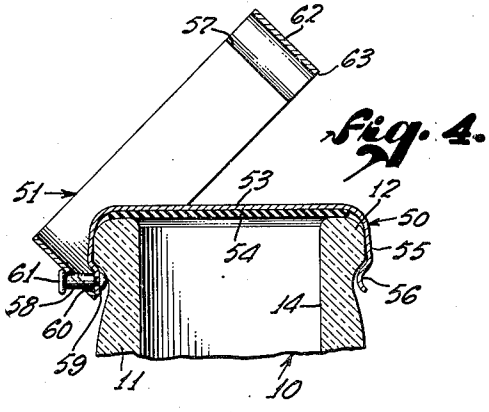


Fig. 4.



WILLIAM SATZ,
INVENTOR.

HUEBNER, BEEHLER, WORREL,
HERZIG & CALDWELL,
ATTORNEYS.

BY Vernon D. Beehler

Patented Mar. 9, 1954

2,671,572

UNITED STATES PATENT OFFICE

2,671,572

MANUALLY REMOVABLE CLOSURE

William Satz, Los Angeles, Calif.

Application June 7, 1949, Serial No. 97,581

1 Claim. (Cl. 215—45)

1

The invention relates to closures for containers and has particular reference to a closure which fits sufficiently tightly so that it is capable of sealing contents in which there may be considerable pressure built up but which is so designed that the seal can be easily released by hand without the employment of any special instrument.

A great deal of development has been directed in the past to closures in order to form a tight seal on jars, cans and bottles and particularly where those jars, cans and bottles are made of glass. The activity has been directed not only to providing a dependable air-tight seal capable of insuring against the passage of air or gas into or out of the container but also to the making of a seal or closure sufficiently inexpensive so as not to be reflected to any great extent in the pricing of ingredients sold in the sealed container. Closures which have been most successful have been of the throw away type, not being designed for reuse. Invariably, however, closures which have been most widely used have not been designed for opening with the hands alone and have needed either a can opener, bottle opener, or some special instrument for breaking the seal between the closure and the container.

The necessity for the use of a special instrument has been most apparent for uncapping bottles of the sort in which soft drinks, beer, and carbonated beverages are dispensed. Unless a special instrument is available, uncapping such containers becomes extremely inconvenient and in the case of carbonated beverages when the contents are unnecessarily agitated during uncapping in some manner other than by use of a proper instrument, much of the contents is lost.

It is therefore among the objects of the invention to provide a new and improved gas-tight closure for containers which is relatively inexpensive, which is capable of forming a tight seal sufficient where necessary to retain high gas pressures, which can be used upon containers of presently standardized sizes and construction about the opening, and which, no matter how tightly applied, is capable of being released by hand without the use of any instrument.

Also among the objects of the invention is to provide a new and improved closure for containers which is adaptable to use on containers of various sizes having openings of variable diameter, one which is easily applied, one which is certain in its sealing action and also one which is reusable after having once been removed.

Still further among the objects of the invention is to provide a new and improved closure for

2

containers which, when assembled and ready for use, is essentially a single unit and which in use is hygienic, safe when used with containers made of glass, as well as providing a highly efficient seal which can be broken and released by hand action.

With these and other objects in view, the invention consists in the construction, arrangement and combination of the various parts of the device whereby the objects contemplated are attained, as hereinafter set forth, pointed out in the appended claims and illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a plan view partially in section of another modified form of the device.

Figure 2 is an exploded elevational sectional view taken on the line 2—2 of Figure 1 showing the relationship of the parts.

Figure 3 is an elevational view partially in section taken on the line 3—3 of Figure 1 showing the parts in closed or sealing position.

Figure 4 is a view similar to Figure 3 showing the parts separated as in releasing position.

For the purpose of illustrating the invention the closure is described herein in a form applicable to bottles in which carbonated beverages are stored having in mind that a closure capable of successful operation under such circumstances wherein a high degree of sealing efficiency is requisite can be depended upon as a successful seal or closure under other circumstances as well where the sealing requirements are less rigid. The selection of a bottle closure by way of illustration further takes into consideration the fact that a closure which can be successfully built in a size small enough to be accommodated to the neck of a bottle of the type customarily used for soft drinks can even more readily be built for containers having openings of substantially larger sizes.

By way of illustration therefore in an embodiment chosen to illustrate the invention there is shown the neck of a bottle 10 having a conventional upper end 11 at the outer extremity of which is a bead 12 provided with a recess 13 therebeneath. An opening 14 having a rim at its outer end provides access to the interior of the bottle. It should be borne in mind further that the bottle sructure thus described is of a conventional variety widely used for all sorts of varieties of soft drinks.

In a form of the invention chosen for the purpose of illustration there is shown mounted upon the bottle 10, having the customary bead 12 at

the rim of the upper end 11, a releasable closure comprising a cap 50 which is held in place upon the bottle by utilization of a generally ring-shaped fastening element 51. In this case the fastening element and the cap are permanently secured together at one point only by use of a movable connection or loose tie 52 by which one part is pivotally connected to the other.

In this form the cap 50 may be constructed for use with a rotating fastening means in that the cap has a flat top 53, a sealing disk 54 to make the closure air-tight where the cap is pressed against the top of the bead, and an annular continuously rounded flange at the lower edge of which are spaced fingers 55 having slots therebetween. The fingers have depressions 56 adjacent the lower portions thereof. As previously described the depressions are adapted to underlie the bead 12 thereby to assist in holding the cap in place.

In order to effectively secure the cap upon the bead with such force as to confine the contents even when a gas pressure of 90 to 100 pounds may possibly be present, the fastening element 51 is applied to the cap and particularly the fingers 55 in the position shown in Figure 3. To build into the closure the desirable function of being capable of release by manual pressure the fastening element is herein shown as one generally annular in form except for a space 57 which may be in the neighborhood of 45 degrees, thereby leaving substantially a 315-degree portion of the fastening element in a position encircling the flanges. As illustrated in Figure 3 the side wall of the fastening means is substantially cylindrical.

To hold the parts together, namely, the fastening element and the cap, there is provided in this instance a rivet 58 securely fastened upon one flange 59 of the cap which has a straightened portion adapted to receive the rivet head. As here shown the shank of the rivet is adapted to extend through an aperture 60 in the wall of the fastening element which is very much greater in diameter than the shank of the rivet but slightly smaller in diameter than an external head 61 of the rivet. The purpose of this connection is primarily to hold the cap and fastening element together so that they cannot inadvertently become separated and therefore may be considered as a single piece. The connection further serves as a fulcrum for lever action between the fastening element and the cap.

To assist the user in lifting and thereby releasing the fastening element 51 there is provided a laterally projecting extension 62 on the side of the fastening element opposite from the rivet which is designed to stick out far enough so that the thumb or finger of the user can be applied to the underside. The fastening element 51 as a whole is designed to be made of stiff material slightly resilient to the extent that it exerts considerable stress upon the fingers 55 and thus is adapted to hold them tightly against the bead to effectively seal the cap upon the bottle.

When the closure is applied to the bottle in sealing position the parts will assume the relative locations illustrated in Figure 3. This may be done by machine if preferred and in the ordinary course of commercial use machine application of the closure to the bottle would be customary. When the closure is initially applied the fastening element is pressed tightly around the flanges and the cap pressed down against the bead so that an air-tight seal is made at the bottle opening.

When it is desired to remove the closure, finger pressure may be applied at the point 63 whereby to lift the fastening element upwardly to the position shown in Figure 4. During this releasing operation the rivet 58 acts as a fulcrum for the end of the fastening element opposite from the projection 62. It will be clear from an examination of Figure 4 that even in extreme position the rivet holds the fastening element to the cap but nevertheless permits the fastening element to be tilted relative to the cap to a position such that the wall of the cap is entirely free from pressure against the fingers 55. After the fastening element has been lifted, the cap can be readily pulled from its position on top of the bottle either by pressing against the rivet 58, by pulling upon the cap at the area of the rivet or merely by prying under any one of the fingers 55.

In capping a container by use of the closure herein described the fastening element may be set with respect to the fingers 55 in the relationship shown in Figure 4. The closure may then be placed upon the neck of the bottle in engagement with the bead 12 thereon as shown in Figure 4 by operation of a substantially conventional capping machine of the type well known in the trade which may be employed to force the fastening element into position. By use of such a machine highly carbonated contents, for example, can be successfully and rapidly sealed by the efficient application of the cap in a manner already proved successful.

By use of the closure defined, constructed so as to be accommodated to containers of conventional construction, there need be no substantial departure from presently acceptable commercial mechanisms for the filling and capping of containers. Further, because of the compactness in size of the closure, such cartons, cases or other means as are customarily used for the transportation of the containers may be employed without change.

Because of the fact that rotation of the fastening element relative to the cap does in no way distort or damage any portion of the closure, the closure is reusable. As such the closure can operate as a temporary recapper by application of the closure to the container with the fastening element pressed into place manually so that the fingers are pressed into position beneath the bead. Reclosing in this manner is sufficient for ordinary needs even though the fastening element may not be moved all the way into its former position overlying the fingers. For utilization of the closure in a mechanical recapping operation the disc 54 may be replaced if need be, the fastening element reset above the fingers in the position initially described, and the closure again applied to the container by the conventional capping means in the manner initially related.

As will be noted from the foregoing description the closure is so formed that the parts are interconnected in order that the closure acts as a single unit with the parts incapable of separation one part from another. In mass production the parts, simple in form and construction, can be made and assembled relatively inexpensively and once formed are capable of reuse innumerable times with an equal degree of sealing success sufficient to far offset any slight additional initial cost due to there being a number of parts in excess of those used on conventional caps and closures heretofore adapted to the same general

purpose. Because of the fact that the closure is so designed that it can be released by manual pressure, not only is there the convenience of having the closure capable of use under all circumstances without the operation of auxiliary tools or appliances but also, because of the fact that manual pressure only is required to effect a release, the likelihood of damage to the closure is minimized to the extent that reuse over and over again is substantially assured.

While I have herein shown and described my invention in what I have conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of my invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claim so as to embrace any and all equivalent devices.

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

A closure for a bottle having a neck providing an opening, a rim around the opening and a bead below the rim having a lower inwardly tapered surface, said closure comprising a sealing cap having an unobstructed interior surface adapted to fit over the rim and seal the opening, a depending annular continuous rounded flange at the perimeter of the cap, said flange having slots at the free edge to provide a series of spaced fingers of substantially equal length and uniform thickness extending throughout the circumference of the flange and normally diverging downwardly, said fingers having each a convexly formed portion on its inside face initially diverging out of contact with the tapered surface of the bead, said convexly formed portion having a shape adapted to conform to the tapered surface of the bead, a relatively flat sealing disk on the inside surface of the cap and confined within said flange, said disk being adapted to engage only the rim of the bottle, and means for pressing the fingers on all

sides of the cap into position against the tapered surface of the bead comprising a fastening ring having a width sufficient to overlie said flange and fingers, said ring having a pivotal connection with one of the fingers at its convexly formed portion, said ring having an upwardly tilted position before sealing and adapted to be tilted downwardly to engage and force the diverging fingers into sealing position over the bead with the convexly formed portions of the fingers on all sides of the cap forced slidably against said tapered surface whereby the sealing disk is compressed against the rim of the bead, said fastening ring having a lateral projection adapted to be manually lifted whereby the ring may be tilted upwardly about its pivotal connection to release the fingers for movement away from the tapered surface of the bead to permit removal of the cap.

WILLIAM SATZ.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
796,734	Kirkegaard	Aug. 8, 1905
848,174	Jebsen	Mar. 26, 1907
1,021,483	Reutter	Mar. 26, 1912
1,123,670	Bohleber	Jan. 5, 1915
1,545,227	Baltzley	July 7, 1925
1,713,676	Rose	May 21, 1929
2,045,480	Magnesen et al.	June 23, 1936
2,392,507	Sebell	Jan. 8, 1946
2,398,554	Nyden	Apr. 16, 1946
2,444,779	Krasberg	July 6, 1948

FOREIGN PATENTS

Number	Country	Date
1,641 of 1887	Great Britain	Feb. 2, 1887
709,751	France	May 20, 1931
446,612	Great Britain	May 4, 1936