Jan. 3, 1928. 1,654,720

D. H. CLARK

RECEPTACLE WITH CLOSURE MEANS THEREFOR

Filed May 10, 1927

Fig. 1.

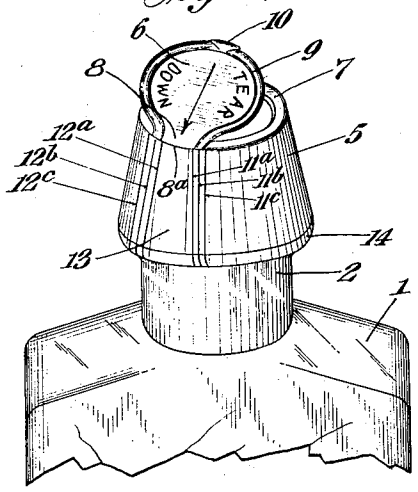


Fig. 2.

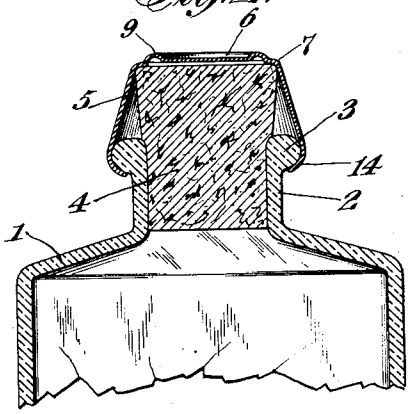


Fig. 3.

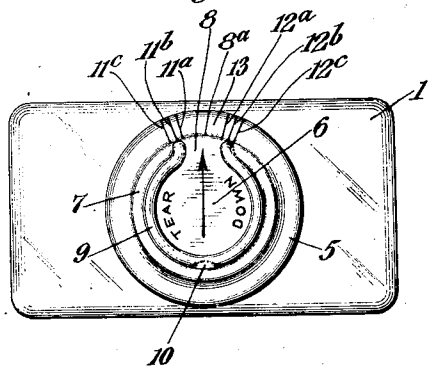
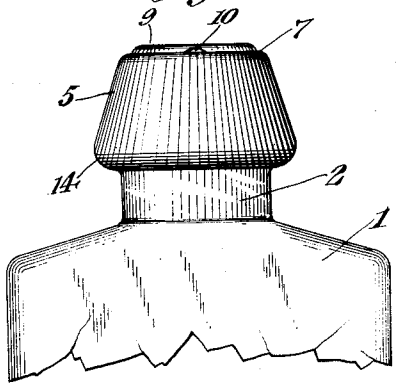


Fig. 4.



Inventor
David H. Clark
By his Attorneys
Ward Easby & Smith.

Patented Jan. 3, 1928. 1,654,720

UNITED STATES PATENT OFFICE.

DAVID H. CLARK, OF ORANGEBURG, NEW YORK.

RECEPTACLE WITH CLOSURE MEANS THEREFOR.

Application filed May 10, 1927. Serial No. 190,152.

This invention relates to receptacles with closure means therefor; and more particularly to such closure means used in conjunction with glass bottles.

An object of this invention is to provide bottle closure means adapted for economical manufacture, which firmly and securely seals the bottle; which may be easily and readily released by hand; and a part of which may be repeatedly replaced and removed throughout the life of usefulness of the bottle after the closure means is initially removed.

Various closure means have been suggested and used, but none of the these has proven entirely satisfactory for some uses, more particularly for medicines and such commodities as are used over a period of time. These prior devices may be divided broadly into two classes; first, where a disc stopper is used in conjunction with a relatively shallow metal cap, and where the closure having been once removed provides no means for securely closing the bottle thereafter; and second, where a protruding stopper, such as glass or cork, is held in position in the bottle mouth by means of an outer seal extending well down the neck of the bottle past the bead or flange at the mouth of the bottle and made of some suitable material such as soft metal which may be torn away to release the stopper. The former class of closure is not adapted for use except where the entire contents of the receptacle is to be immediately used at the time of opening. In the latter case it has been assumed that the metal cap could be removed by tearing, and while this is true, nevertheless it has been found that due to its tight form-fitting character it requires a process of "peeling" away the soft metal body, which is troublesome and annoying, and often requires the use of some instrument.

By the present invention I provide a closure means having a protruding stopper which may be readily grasped by the thumb and forefinger for removal after an outer securing member has been removed; and an outer capsule or member for firmly and securely holding the stopper in position by means of inturned flanges at its top and bottom fitting respectively over the cork and under the lip of the bottle; this capsule having a weakened portion extending lengthwise thereof substantially throughout its length and being provided with a thumb tab at the top, which is hingedly connected to the weakened portion. Upon grasping the tab—which is readily liftable by inserting the thumb nail beneath its edge—and pulling it relatively downwardly, the side wall of the capsule below the hinge of the tab is entirely and positively severed along a predetermined path to remove the capsule with ease and without danger of wringing off the tab without severing the capsule to release the cork.

The invention consists in the novel features, arrangements and combination of parts embodied by way of example in the article hereinafter described as illustrating the preferred form of the invention, and the invention will be more particularly pointed out in the appended claims.

Further objects and advantages of the invention will more fully appear from the following description taken in connection with the accompanying drawings which show, by way of example, the present preferred embodiment of the invention.

Referring to the drawings, illustrating the present preferred form of the invention:

Fig. 1 illustrates, in perspective, the upper part of a bottle, showing the outer seal of the closure means with engaging tab partially raised,

Fig. 2 is a section in elevation showing the closure means in its normal position,

Fig. 3 is a top plan view of the bottle and sealing means, and

Fig. 4 is a front elevation of the same.

The receptacle, such as a bottle, is represented as 1, having a neck 2 provided with an annular bead 3 adjacent its mouth. The mouth of the bottle is closed with a stopper such as the cork 4, which is of a sufficient length to project downwardly within the neck 2 a suitable distance, and to protrude above the mouth 3 a distance sufficient to be readily grasped by hand for removal and insertion so as to act as a permanent closure.

The outer seal or capsule 5 is made of any suitable material such for example as thin metal, preferably aluminum or tin plate. In the present embodiment it is frustro-conical in general form. From the top of the capsule a tab or engageable portion 6 is cut out, of such size as to leave a marginal top flange 7 which is adapted to engage the upper peripheral edge of the stopper 4, and the line of severance is discontinued to form a neck portion 8 serving to connect the tab 6 with the side wall of the

capsule, and forming at the juncture of the neck and side wall a hinge 8^a. A bead or embossed border 9 is formed along the marginal edge of the tab 6 for purposes of stiffening the same, and a portion of the border opposite the neck 8 is pressed outwardly to provide an engaging portion 10 under which a thumb nail may be inserted to raise the tab 6. A plurality of score marks or embossed lines such as 11^a, 11^b, 11^c, and 12^a, 12^b and 12^c extend downwardly from the respective ends of the hinge 8^a to adjacent the lower edge of the capsule 5 forming thereby a weakened area 13; of which the tab 6 in effect forms an upper extension, the neck 8 being a continuation of the area 13. The plurality of lines such as 11^a, 11^b, 11^c and 12^a, 12^b and 12^c may be made in the form of continuous scored or embossed lines or in any manner such as will provide suitable predetermined lines of severance.

It has been found to be important and far preferable for reliable operation, though possibly not absolutely necessary in all cases, to employ a plurality of such lines on each side portion of the weakened area 13, due to slight inaccuracies at the point of juncture of the edges of the neck 8 with the side wall of the capsule 5; in order to insure that at least one of these lines will terminate contiguous each respective end of the hinge 8^a and be in position to be intercepted by the line of tear, so that when it is attempted to tear off the tab, the two lines along which the soft metal is being torn will quickly intersect two of these weakened lines and follow them down to thereby sever the wall of the capsule before the tab is wrung off adjacent its hinge 8^a or before the entire side wall has been severed.

For example if it were attempted to pull the tab without any weakened lines, and if the pull is straight down and without a twist to the tab the metal usually tears along two sharply converging lines so that the tab is prematurely pulled off with a pointed tongue about one-fourth of an inch long, without severing the cap. Also if a slight twist is given the tab in tearing it, the metal would tear out more irregularly along a more oblique line. If only a single score line is provided at each edge of the hinge, the line of tear may not follow the score line, even when the tab is not at all twisted, and the tab will be torn off without severing the cap; unless each edge of the hinge substantially exactly coincided with the single score line thereat; but in manufacturing practice the exact position of the score lines will vary with respect to the edges of the hinge. Also in case of one giving a slight twist to the tab, it may tear out prematurely from one edge of the hinge across to the score line nearest the other edge of the hinge, even if the two single lines do coincide with the edges of the hinge. It is therefore important to have a plurality of score lines extending down from adjacent each edge of the hinge, preferably with at least one line on each side of each edge of the hinge so that even if the lines of tear vary, they will quickly intersect and follow down some two of the score lines. It will be noted in this respect that the stiffening border 9 is carried along the sides of the neck 8 to a point closely adjacent the score marks forming the predetermined position of severance of the side wall of the capsule 5.

After the stopper 4 has been placed in the bottle and the capsule placed in proper position over the same, the lower edge of the capsule 5 is turned inwardly under the bead 3, by suitable means such for example as spinning, to form an inturned flange 14. The operation of turning in this flange results in a downward pull on the capsule 5 relative to the bottle 1, which causes the stopper 4 to be further forced into the neck of the bottle. It will be observed that the lip of the bottle and the shape and size of the projecting stopper are so chosen that the side walls of the capsule 5 can be and are inclined downwardly and outwardly, resulting in the cap being frustro-conical in general form, and that a space is left between the projecting stopper and the inclined wall of the capsule. Both of these features are of some importance, whether used with only two or with a number of score lines. First, in holding the bottle in one hand and pulling the tab downwardly with the other, the pull is naturally exerted along an oblique line downwardly away from the vertical axis of the stopper, which tends to tear out the tab prematurely; but when the metal wall is inclined downwardly and outwardly this brings the line of exertion more parallel to the metal wall. Also it is believed that if the metal capsule is spun down tight onto the stopper, if the stopper is an expansible one, such as cork, then the closely fitting expansible stopper will interfere with the lines of tear following the score lines.

The hereindescribed problems are not so important in the case of thin disc closures, such for example as shown in U. S. Patent 758,273 where the length of metal to be torn is so short that the tab will nearly always sever the capsule in any event, rather than be prematurely torn out.

It will therefore be seen that the seal so formed not only firmly and securely holds the desirable protruding type of stopper in position, but also serves to protect such a stopper and the bottle mouth from dust and dirt. The closure means thus provided serves to permanently seal the bottle until it is desired to open it, and at such time the

outer seal may be readily removed with the fingers, after which the stopper may be grasped by the fingers to be removed and replaced at will as long as the bottle is in use. I have therefore provided a seal which firmly locks a protruding cork in place and may be readily torn off with the fingers.

Having thus described my invention with particularity with reference to its preferred form, it will be obvious to those skilled in the art, after understanding my invention, that changes and modifications may be made therein without departing from the spirit and scope of my invention, and I aim in the appended claims to cover such changes and modifications as are within the scope of the invention.

What I claim is:

1. In combination with a bottle having an annular bead adjacent its mouth, a stopper in the mouth of said bottle extending above the mouth thereof a sufficient distance to be grasped for removal and insertion, a metal cap substantially enclosing the extension of said stopper and provided with a lower inwardly extending flange engaging said annular bead, and with a tab portion severed from the cap, except for a neck which connects the severed portion to the cap body, forming a hinge, and the wall of said cap having two series each of a plurality of weakened lines extending from contiguous the respective ends of said hinge downwardly and substantially throughout the length of said cap, and providing a weakened area defined within the limits of the outer line of each series.

2. In combination with a bottle having an annular bead adjacent its mouth, a stopper in the mouth of said bottle extending above the mouth thereof a sufficient distance to be grasped for removal and insertion, a metal cap substantially enclosing the extension of said stopper and provided with a lower inwardly extending flange engaging said annular bead, a central portion of the top of said cap being severed from the cap along a path providing a marginal top flange over the stopper, except for a neck which hingedly connects the central severed top portion to the cap body, the margin of said severed central portion being provided with a stiffening bead formed in the metal and extending along the edges of said neck portion and terminating near the side wall of said cap adjacent the hinge, and the wall of said cap being weakened as by scoring along a plurality of lines extending from contiguous each end of said hinge downwardly substantially throughout the length of said cap.

3. In combination with a bottle having an annular bead adjacent its mouth, a stopper in the mouth of said bottle extending above the mouth thereof a sufficient distance to be grasped for removal and insertion, a metal cap substantially enclosing the extension of said stopper and provided with a lower inwardly extending flange engaging said annular bead, and with a tab portion severed from the top of the cap, except for a neck which connects the severed portion to the cap body, forming a hinge at the juncture of the top and body, the wall of said cap having a weakened area below the hinge produced by a number of weakened lines extending from contiguous the hinge downwardly substantially throughout the length of said cap, the weakened area having lines wider apart than the ends of the hinge and other lines lying within said ends to insure separation of the cap along one or more of such lines.

4. In combination with a bottle having an annular bead adjacent its mouth, a stopper in the mouth of said bottle extending above the mouth thereof a sufficient distance to be grasped, a frustro-conical sleeve surrounding said bead and extending stopper portion and having inturned flanges engaging respectively said bead and the top of said stopper and providing an annular space between the sleeve and stopper, said sleeve having a weakened area extending from adjacent the top of said sleeve to adjacent the bottom thereof providing a predetermined location of severance of said sleeve throughout its length, and an engageable tab formed as an extension of the upper margin of the weakened area, whereby when said tab is grasped and pulled downwardly said sleeve will be severed at a predetermined location throughout its length to permit the ready removal of the sleeve and permitting the stopper to be grasped to open the bottle.

In testimony whereof I have signed my name to this specification.

DAVID H. CLARK.