Aug. 8, 1939. L. BURRELL ET AL 2,168,321

RECEPTACLE AND CLOSURE CAP THEREFOR

Filed Nov. 12, 1936

Fig. 1.

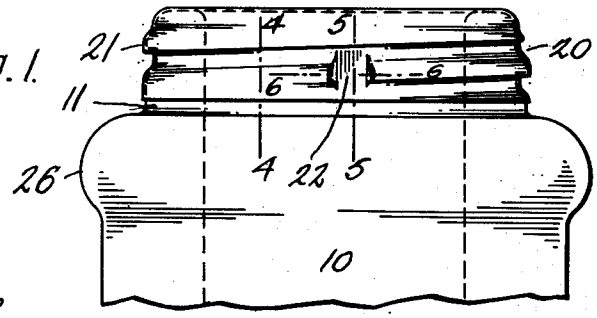


Fig. 2.

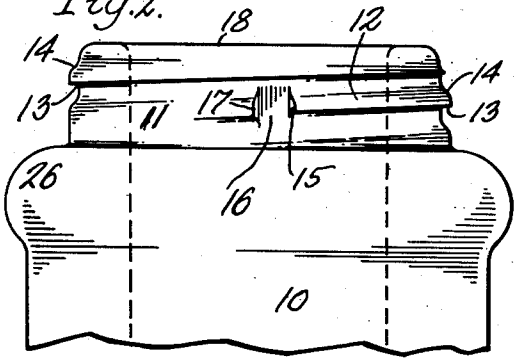


Fig. 3.

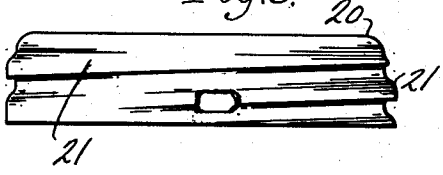


Fig. 4.

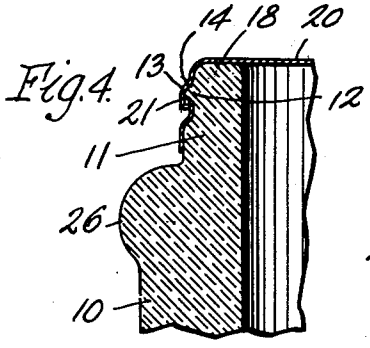


Fig. 5.

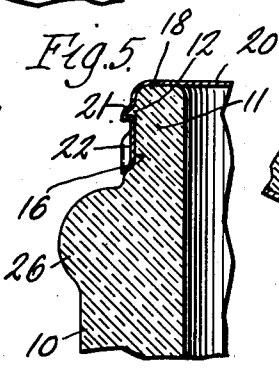


Fig. 6.

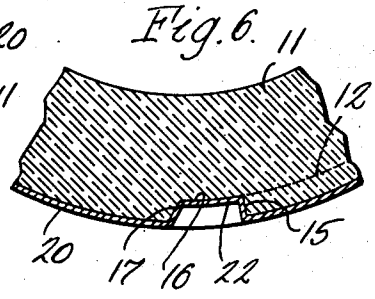


Fig. 7.

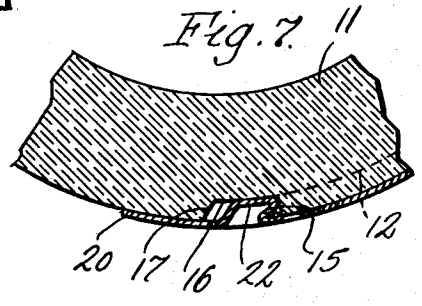
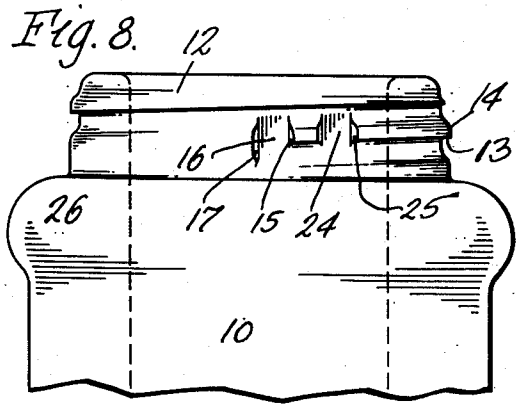


Fig. 8.



INVENTORS.
Loomis Burrell
and
BY Ralph K. Miner.
Parker, Prochnow & Farmer.
ATTORNEYS

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RECEPTACLE AND CLOSURE CAP THEREFOR

Loomis Burrell, Little Falls, and Ralph K. Miner, Oriskany Falls, N. Y., assignors to Cherry-Burrell Corporation, Chicago, Ill., a corporation

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2 Claims. (Cl. 215—7)

This invention relates to bottles or receptacles and sealing caps or closures therefor, and more particularly to improvements in bottle or receptacle closures of that type in which the receptacle is sealed by a pliable or metal foil cap which is molded or formed on the receptacle so as to interlock or interengage with parts of the receptacle which hold the cap in sealing relation on the receptacle, but permit intentional removal of the cap. While the improvements are primarily designed for application to bottles suitable for use as milk delivery or distributing bottles, and are herein so described, it is not thereby intended to restrict the invention to such bottles.

The objects of the invention are to produce a bottle and pliable or metal foil cap therefor of novel form or construction which will insure proper sealing of the bottle against leakage of its contents, but which permits the ready removal of the cap by hand without the use of a tool or opener; which will insure proper sealing of the bottle against leakage, but will permit the ready removal of the cap and its reuse for sealing the bottle; in which the bottle and cap are so formed that while the cap will properly seal the bottle and can be removed without deforming the cap so as to prevent its reuse for sealing the bottle, nevertheless the cap, when once removed, will definitely show that it has been removed or the bottle opened; also to provide a bottle and screw cap therefor in which the cap can be removed by unscrewing it and can be again screwed on the bottle for tightly closing it, but in which the first removal of the cap changes its appearance so as to show that the bottle has been opened without, however, preventing reuse of the cap; also to provide a bottle and a pliable or metal foil cap therefor which is molded or formed on the bottle so as to provide the cap with parts which interlock with parts of the bottle to hold the cap in sealing relation on the bottle but which interlocking parts permit the ready removal of the cap and its reuse for tightly closing the bottle; also to produce a bottle having parts adapted to hold a pliable or metal foil cap in sealing relation on the bottle, and a neck bead which protects the cap and cap-holding parts of the bottle from injury and also affords means for holding or handling the bottle; and also to produce a bottle and closure cap therefor having the other features of improvement and advantage hereinafter described and set forth in the claims.

In the accompanying drawing:

Fig. 1 is an elevation, on an exaggerated scale, of the upper end portion of a bottle and cap therefor embodying our invention and showing the cap in sealing position on the bottle.

Fig. 2 is a similar view of the upper end of the bottle without the cap.

Fig. 3 is an elevation of the cap removed from the bottle.

Fig. 4 is a fragmentary sectional elevation of the bottle and cap on line 4—4, Fig. 1.

Fig. 5 is a similar view on line 5—5, Fig. 1.

Fig. 6 is a fragmentary, sectional plan view on an enlarged scale, on line 6—6, Fig. 1.

Fig. 7 is a view similar to Fig. 6, but illustrating how the locking boss of the cap is altered by removing the cap from the bottle.

Fig. 8 is an elevation of the upper portion of a bottle of slightly modified form.

Referring first to the construction shown in Figs. 1 to 7, 10 represents the upper portion of the neck of the bottle, which has an externally screw threaded or circumferentially shouldered upper end or lip 11. Preferably the screw thread or shoulder 12 extends completely around the lip or neck-end with the ends of the thread overlapping somewhat, for example, for a distance about one-quarter of the circumference of the lip, and as shown, the thread may be formed with an abrupt or substantially flat under edge or face 13 and with a bevelled or rounded upper edge or face 14. The bottle end or lip is also made with a locking face or shoulder 15 adapted by engaging a boss or part of the cap to oppose the turning of the cap on the bottle as hereinafter more fully explained. As shown, this locking face is transverse to and crosses the lower overlapping or base portion of the thread but it may constitute the lower end of the thread or may be formed by a cross groove, depression or gap 16 in the overlapping lower portion of the thread, or may be of other formation or location, and preferably, the face 15 is relatively deep and abrupt or extends substantially radially of the bottle neck, whereas the opposing face or shoulder 17 of the depression 16 may slope or be inclined to the radial, as shown in Figs. 6 and 7. The top end face 18 of the bottle lip is preferably flat with rounded inner and outer edges or corners.

The cap 20 may be made from metal foil or other thin pliable or plastic material which is capable of being molded or formed by pressure on the upper end of the bottle so that the skirt or rim of the cap, which extends down around the threaded lip of the bottle, is caused to conform to the surface contour of the threaded lip of the bottle, so that the cap will have a threaded skirt complemental to the threaded bottle lip. For example, caps suitable for milk bottles such as that illustrated in

the drawing can be made from aluminum foil and will properly seal the bottles without need for any paper or other internal sealing disk, gasket or lining. In the operation of capping a filled bottle according to the usual practice, a cupped cap with a plain or cylindrical peripheral flange or skirt is first formed by stamping the same from a sheet or strip of metal foil or analogous material, and this cupped cap is placed over the end of the bottle and its skirt is then compressed or squeezed around the threaded lip of the bottle by a suitable tool or means which forms the material of the skirt over the raised portions and into the thread groove or depressed portions of the lip thereby molding or conforming the cap to the threaded lip of the bottle and providing the cap with a thread or shoulder 21 and internal boss 22 fitting and complemental respectively to the thread 12 and cross gap or depression 16 of the lip.

In thus molding the cap on the bottle a circumferential portion of the skirt is drawn under the abrupt under edge 13 of the lip thread and this draws the cap down tight against the top face and outer corner edge of the lip, thereby producing a tight closure of the bottle which seals the same against leakage of its contents. Since the thread 12 extends more than a complete turn around the lip, this insures that the cap will be drawn tightly against the top edge of the lip and the under edge of the thread throughout the complete circumference of the neck or lip, thus making two circumferential sealing joints and insuring a perfect sealing of the bottle.

The internal boss or part 22 of the cap, which occupies the notch or gap 16 of the neck and engages the locking face 15 of the thread, acts to lock the cap against accidental or unintentional turning on the neck so as to break the seal between the bottle and the cap. However the cap can be unscrewed and removed by hand without the use of a tool or opener by applying sufficient turning force to the cap to cause the face 15 to cut or tear the boss 22, as indicated in Fig. 7, and permit the turning or unscrewing of the cap. By making the face 15 abrupt or approximately perpendicular to the outer edge of the thread 12, as shown, the outer edge of the face is adapted to cut or tear the boss 22 by turning the cap on the bottle.

Thus, the cap can be removed by unscrewing it as in removing the ordinary screw cap or cover of a bottle or other receptacle, and the cap is not deformed or mutilated with the exception of the cutting or tearing of the internal boss 22 so that the cap can be reused and again screwed tightly into place on the bottle for tightly closing or sealing it. In other words the thread or portion of the cap which engages the lip thread for drawing the cap down on and holding it in sealing relation on the bottle is not mutilated or obliterated so as to prevent reuse of the cap.

However, the boss 22 is cut, torn or ruptured by the initial removal of the cap, and the mutilation of the boss, or the hole thus made in the skirt of the cap, as shown in Fig. 3, serves as a tell-tale to show that the bottle has been opened or tampered with. In the use of the bottle by milk distributors, for instance, the cap is molded or formed on the filled bottle and the bottle thus sealed in the dairy or distributing plant, and when the consumer receives the bottle, if the boss is intact, it will be apparent to the consumer that the bottle has not been opened, but if the consumer, after opening the bottle, desires to preserve all of a portion of the contents in the bottle, the cap can be reused to seal the bottle for this purpose, by simply screwing the cap tightly in place on the bottle in the same manner that the ordinary screw cap is used.

The bottle lip can, if desired, be furnished with more than one locking shoulder or face 15. For instance, as shown in Fig. 8, the thread is interrupted by two cross depressions or gaps 16 and 24, providing two locking shoulders or faces 15 and 25. When the cap is molded on the bottle thus formed, the cap will be provided with two locking bosses instead of one, thus giving a double lock, and when the cap is unscrewed, leaving two holes or mutilations in the cap, to show that the cap has been removed.

As described, the bottle is formed with a single cap-securing or holding thread, but obviously, if desired, it could be made with two or more threads, if found desirable or necessary, to insure better sealing of the bottle or quicker removal of the cap.

If two threads are used, each thread need not extend more than a little over half way around the neck, while if three threads should be used, each need not extend more than a little over one-third of the circumference, so that in any case, there would be the effect of a thread completely encircling the neck and ensuring an unbroken sealing pressure on the cap and a sealing joint completely encircling the bottle mouth.

The bottle is preferably provided below and adjacent the threaded lip with a rounded circumferential bead or enlargement 26. This bead, in addition to strengthening the bottle, provides a convenient grip for lifting and carrying the bottle, and also serves as a holding part for engagement with holding means in the bottle filling, washing or other machine in which the bottle may be used. In addition, this enlargement 26 adjacent the threaded lip of the bottle acts as a guard to prevent injury to the cap or to the thread or other portion of the lip, since the bead 26 will largely prevent contact of these parts with objects which could mutilate or injure the lip or cap.

A lip thread formed, as before mentioned, with an abrupt under edge or face 13 and a bevelled, sloping or rounded upper edge or face 14, makes the bottle more sanitary and easier to keep clean than a thread having both its upper and under edges square or abrupt. Such a thread also is easier to form in glass and produces a stronger thread less likely to chip. Moreover the bevelled or rounded upper edge of the thread facilitates the placing of the partially formed cap on the bottle and the reuse of the cap after it has been once removed. Nevertheless the thread has an abrupt or nearly square under face which insures that when molding the cap on the bottle it will be drawn down tightly against the top edge or face of the lip to insure the proper sealing of the bottle. However, the invention is not restricted to the use of this particular type of thread, and a thread or threads of other character could be employed.

We claim as our invention:

1. A bottle or the like provided adjacent its mouth with an external screw thread, and an abrupt locking face transverse to the circumferential direction of said screw thread, in combination with a removable closure cap of thin pliable material which has a skirt of substantially uniform strength throughout its circumferential extent formed with a screw thread that engages said bottle thread for securing the cap in sealing

relation on the bottle, the skirt of said removable cap having an integral locking part which by engaging said locking face opposes the turning of the cap on the bottle, but which is adapted to be ruptured by said locking face by applying turning force to the cap in the direction to unscrew it and allow the cap to be unscrewed.

2. A bottle or the like provided adjacent its mouth with an external screw thread having an interruption forming an abrupt locking face transverse to said thread, in combination with a removable closure cap of thin pliable material which has a skirt of substantially uniform strength throughout its circumferential extent formed with a screw thread that engages said bottle thread for securing the cap in sealing relation on the bottle, the skirt of said removable cap having an integral locking part which by engaging said locking face opposes the turning of the cap on the bottle, but which is adapted to be ruptured by said locking face by applying turning force to the cap in the direction to unscrew it and allow the cap to be unscrewed.

LOOMIS BURRELL.
RALPH K. MINER.