March 5, 1963 A. L. CORRINET 3,080,088

TAMPERPROOF CONTAINER

Filed June 30, 1960

Fig. 1

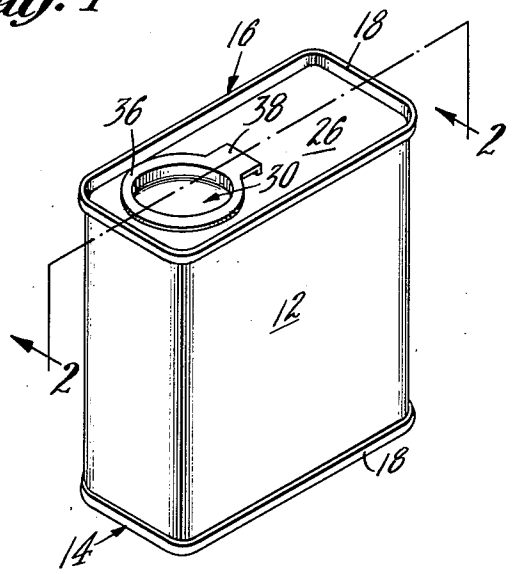
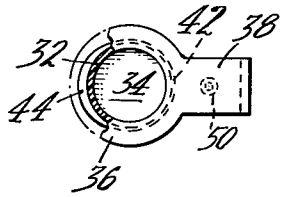


Fig. 4



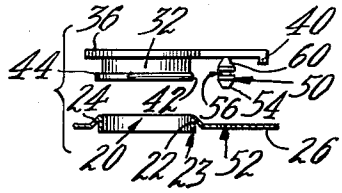


Fig. 5

Fig. 2

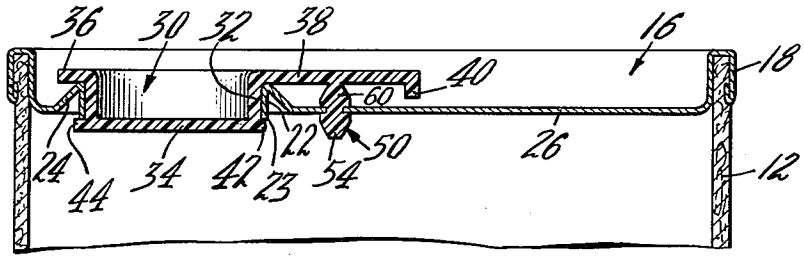
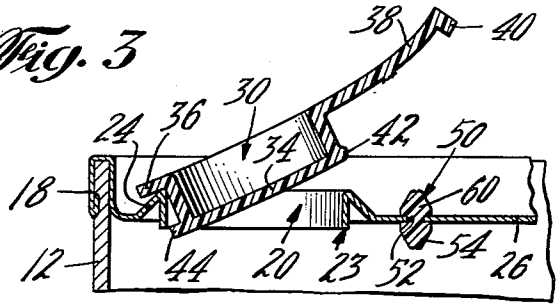


Fig. 3



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TAMPERPROOF CONTAINER

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The present invention relates to friction plug closures and more particularly to a plastic snap-in plug closure which is provided with means to prevent surreptitious, undetected removal of the closure and unauthorized tampering with the container contents.

Since the development of flexible plastics such as polyethylene, polystyrene, polypropylene, or the like, there has been an increasing tendency toward the use of such materials in fittings and closures for containers. These plastic materials are particularly suitable for such use because of their flexibility and resistance to corrosion. However, because of their flexibility and their tendency to resume their original shape after distortion, it is difficult, if not impossible, to determine when such closures have been removed from the container and replaced thereon. As a consequence, the danger of undetected pilferage of or tampering with the container contents prior to purchase by the ultimate consumer is ever present.

The present invention overcomes this danger by providing a flexible plastic closure which is provided with frangible means comprising a break-off pin which is formed integrally with the closure and is permanently secured to the container proper, the closure being formed in such manner that it cannot be removed from the container without detachment from the break-off pin, thus giving the original purchaser of the container an indication of prior removal of the closure.

An object of the invention therefore is the provision of a plastic plug closure of simple design which can be pressed into sealing position in the dispensing opening of a container and which cannot be removed from such dispensing opening without detection.

Another object of the invention is the provision of such a closure which is so constructed that it can only be removed from the dispensing opening by an upward pulling force exerted on a pull tab formed on one side of the closure, the pull tab being formed with an integral break-off locking pin which is permanently secured to the container adjacent the dispensing opening and which, until such time as it is broken from the tab, prevents upward movement of the pull tab and removal of the closure.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

FIGURE 1 is a perspective view of a container which is sealed with a plastic plug closure made according to the principles of the invention;

FIG. 2 is a vertical section on an enlarged scale taken substantially along the line 2—2 of FIG. 1;

FIG. 3 is a fragmentary view of a portion of the container shown in FIG. 2, the view showing the closure being removed from the dispensing opening after its pull tab has been broken away from the break-off pin which remains secured to the container;

FIG. 4 is a plan view, on a smaller scale, of the plastic closure of the instant invention; and

FIG. 5 is a side elevation showing the plastic closure of FIG. 4 in position over the dispensing opening of the container prior to being inserted into sealing position.

As a preferred and exemplary embodiment of the instant invention, the drawings illustrate a container 10 formed with a tubular fibrous body 12 having a bottom end member 14 secured to its lower end and an upper end member 16 secured to its upper end. Both end members 14, 16 are preferably formed of thin sheet metal and are clinched in place on the container body 12 in suitable clinched end seams 18.

The upper end member 16 is formed with a dispensing opening 20 (see FIG. 5) which is preferably although not necessarily circular in horizontal section, and is defined by an annular, downwardly extending flange 22 having a sharp bottom edge 23. The flange 22 at its upper end merges into a conical wall section 24 which projects upwardly above the countersunk panel 26 of the upper end member 16.

The dispensing opening 20 is closed by a plastic plug closure 30 which is made from a suitable flexible plastic such as polyethylene and is formed with an annular, vertically extending side wall 32, which closely engages against the annular end wall 22 and forms a tight friction seal therewith, and an imperforate bottom wall 34, which spans the opening 20. At its upper end, the closure 30 is formed with a narrow horizontal flange 36 which engages against the upper end member 16 at the juncture of the frusto-conical wall 24 and the annular wall 22 and limits the depth of insertion of the closure 30 into the dispensing opening 20.

The flange 36 is enlarged on one side of the closure to form a pull tab 38, the free end of the pull tab 38 being formed with a short depending flange 40 to enable the consumer to firmly grasp the tab 38 to pull upwardly upon it to remove the closure 30 from the opening 20.

The major portion of the bottom edge of the plug wall 32 is provided with an outwardly projecting shallow bead 42 which snaps beneath the sharp bottom edge 23 of the end wall 22 to hold the closure 30 in position in the opening 20. The major portion of the bead 42 is rounded and projects laterally only a short distance outwardly beyond the outer periphery of the closure wall 32 and thus offers only little resistance to a straight, vertically upward movement of the closure 30.

However, the bead 42, on the side of the closure 30 opposite the pull tab 38, is enlarged to form a sharp-edged, laterally extending shelf or ledge 44 which projects for a considerable distance laterally of the plug wall 32 and locks firmly beneath the sharp edge 23 of the closure wall 22 and prevents removal of the closure 30 in any manner other than by an upward pull exerted against the pull tab 38 in the direction of the arrow, as seen in FIG. 3.

To prevent the closure 30 from being removed from the container without detection, and to thus provide a tamperproof feature for the container, a small locking pin 50 is formed integral with the pull tab 38 so that it projects downwardly from the undersurface thereof and is insertable into a small hole 52 which is formed in the countersunk panel 26 of the upper end member 16. The locking pin 50 is somewhat larger than the hole 52, but its bottom end 54 is tapered so that the pin 50 readily enters the hole 52 when a straight downward pressure is exerted upon it, the inherent flexibility of the plastic material of which the pin is made permitting the pin to be squeezed and distorted as it enters the hole 52 and until such time as the annular edge of the panel 26 which surrounds the hole 52 is received in a sharp edge groove 56 which is formed in the pin 50 intermediate its ends and which thereafter permanently secures the pin 50 in place in the upper end member 16. The relative dimensions of the pin 50, the groove 56 and the hole 52 are such that once the pin is pressed home to the position shown in FIG. 2, it cannot thereafter be pulled out of the hole

52 without the application of excessive force. Thus as long as it remains attached to the pull tab 38, the pin effectively prevents upward movement of the pull tab 38 and thus prevents removal of the closure 30.

When removal of the closure is desired, the pull tab 38 is pulled upwardly by the consumer to break the pull tab 38 from the pin 50. As seen in FIG. 3, the upper end of the pin is narrowed at 60 in order to permit the tearing out of the pin to be effected without the application of excessive force. After the pull tab 38 has thus become detached from the pin 50, it is pulled upwardly in the direction of the arrow in FIG. 3 to effect a rocking action of the closure 30 around the upper edge of the end wall 22 at a point above the plug ledge 44 diametrically opposite the pull tab 38. This results in the progressive removal of the closure 30 from the opening 20, the rocking movement of the closure 30 resulting in the lateral withdrawal of the ledge 44 from beneath the end wall 22 so that the ledge 44 no longer prevents removal of the closure 30. After the initial removal of the closure, the detached pin 50 remains in the opening 52 and presents mute evidence that the container has been tampered with.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A tamperproof container, comprising in combination a container body having a dispensing opening, a flexible closure for sealing said opening, said closure having locking means on one side thereof projecting beneath a portion of said container body adjacent said opening for preventing removal of said closure member from said dispensing opening by lifting force exerted on said closure adjacent said one side, said closure having pull means on the other side thereof exteriorly of the container, said pull means being liftable to remove said closure from said dispensing opening by a rocking action to withdraw said locking means from beneath said container portions, and a break-off pin formed integral with said pull means and permanently secured to said container adjacent said closure other side to prevent the lifting of said pull means until said break-off means is ruptured.

2. The container of claim 1 wherein said break-off pin projects outwardly from said pull means, said pin being received within a hole formed in said container body adjacent said dispensing opening, said pin further being oversized with respect to said hole and having a groove which receives the portion of said container body around said hole to permanently secure said pin to said container body.

3. A tamperproof container having a dispensing opening in a wall thereof, a flexible plug closure for sealing said opening, said closure having manually graspable pull means extending laterally from one side thereof exteriorly of said container, the other side of said closure having a locking ledge extending laterally therefrom interiorly of said container and snugly beneath a portion of the container wall adjacent said dispensing opening for positively preventing removal of said closure by lifting force exerted thereagainst adjacent said other side thereof, and frangible means for securing said pull means to said container, whereby removal of said closure can only be effected by grasping and lifting said pull means to rupture said frangible means.

4. A tamperproof container having a dispensing opening in a wall thereof, a flexible plug closure for sealing said opening, said closure having manually graspable pull means extending laterally from one side thereof exteriorly of said container, said closure including a continuous peripheral bead engaged snugly beneath the container wall adjacent said dispensing opening, locking means thereon comprising an enlarged ledge portion of said bead extending laterally from the other side of said closure for preventing closure removal by lifting force exerted thereagainst adjacent said closure other side, and frangible means for securing said pull means to said container, whereby removal of said closure can only be effected by grasping and lifting said pull means on said one side of the closure to rupture said frangible means and withdraw said ledge on the other side of said closure from beneath the adjacent container wall.

5. A one-piece container closure for insertion into a product dispensing opening of predetermined size and configuration formed in the top of a product container, said closure including a depending stopper shank of resilient material having a cross sectional size and configuration at a predetermined location which is generally the same as that of said dispensing opening so that said shank completely fills said opening in said container top and precludes leakage of product from said container when said closure is in operative engagement with said container top, said stopper shank having a shank retaining lip thereon projecting therefrom which is to be engaged with said container top at the underside thereof when said stopper shank is positioned in said dispensing opening to fill the same, said lip extending only part way around the periphery of said stopper shank and being adapted to preclude removal of said shank from said dispensing opening in a direction generally axially of said opening, removal of said shank from said opening being effectible by tilting said shank relative to the axis of said dispensing opening so that said lip may be disengaged from said container top, said peripherally incomplete lip permitting such shank tilting.

6. The one-piece closure of claim 5 which includes a body portion above said stopper shank for overlying and contacting the upper surface of said container top when said shank is positioned in and fills said dispensing opening, said body portion being generally flat so that another container may be stacked on said container top when said closure is engaged with said top.

7. The one-piece closure of claim 5 which includes a lifting tab body portion integral with said stopper shank, said tab portion projecting laterally relative to said shank in a direction generally opposite from that in which said lip projects from said shank so that said shank is tilted for removal automatically from said dispensing opening when said tab portion is raised.

References Cited in the file of this patent

UNITED STATES PATENTS

2,013,605	Greenison	Sept. 3, 1935
2,213,932	Rehfeld	Sept. 3, 1940
2,619,255	Bricout	Nov. 25, 1952
2,761,583	Morse	Sept. 4, 1956
2,909,228	Connors	Oct. 20, 1959
2,974,824	Mansho	Mar. 14, 1961