Oct. 19, 1965 A. D. DUNCAN 3,212,665

CONTAINER CLOSURE

Filed Aug. 1, 1963

Fig. 1.

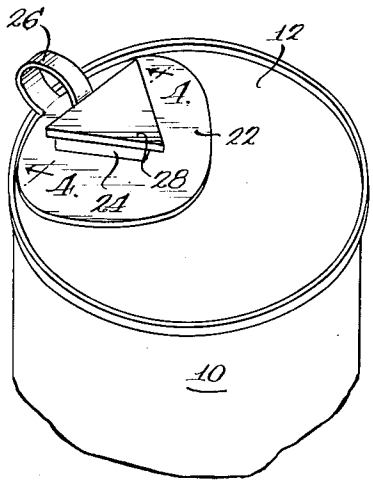


Fig. 2.

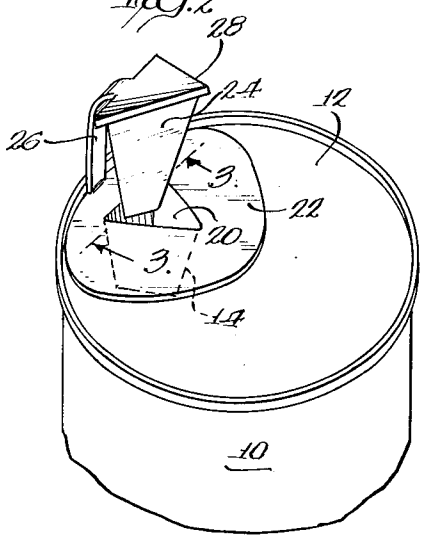


Fig. 3.

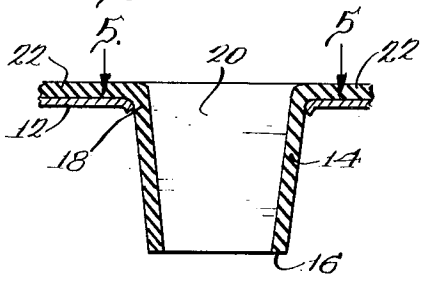


Fig. 4.

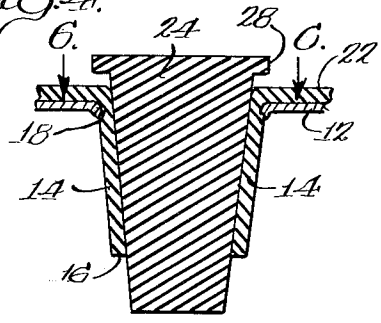


Fig. 5.

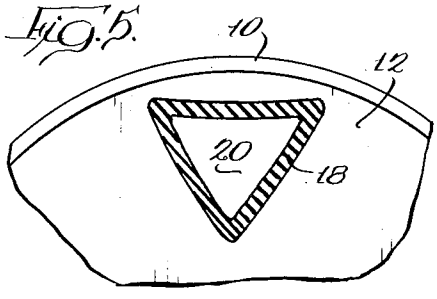
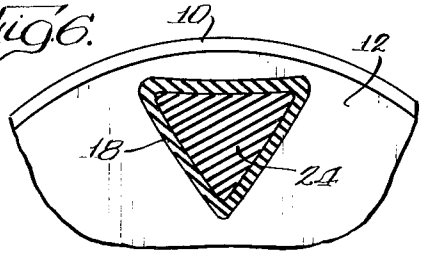


Fig. 6.



INVENTOR.

Alfred D. Duncan

BY

B. Gordon Aller

Atty

United States Patent Office 3,212,665 Patented Oct. 19, 1965

3,212,665

CONTAINER CLOSURE

Alfred D. Duncan, Elmhurst, Ill., assignor to Milton B. Brenner, Skokie, Ill.

Filed Aug. 1, 1963, Ser. No. 299,359
5 Claims. (Cl. 220—38.5)

The present invention relates to container closures. More particularly, it is concerned with the provision of a device for closing an irregular opening at the end of a sheet metal can, the opening primarily contemplated being of the triangular type which is made by what is commonly referred to as a beer can opener.

One of the objects of the invention is to provide a closure device for the opening formed in the end of a sheet metal can be a beer can opener.

An additional object is to provide a novel closure device which is particularly adapted for closing an irregular opening, such as the approximately triangular opening formed by a beer can opener for instance.

Yet another object is to provide a closure member of the type indicated above which remains in place, which is easy to insert, which is easy to remove, which seals well, and which is not substantially damaged by repeated use.

Other objects and advantages will become apparent from the following description of a preferred embodiment of my invention which is illustrated in the accompanying drawings.

In the drawings, in which similar characters of reference refer to similar parts throughout the several views,

FIG. 1 is a top perspective view illustrating an opened beer can or the equivalent, with the closure of the present invention in place so as to seal the opening;

FIG. 2 is a view similar to FIG. 1, but showing the closure member attached to the can in condition to provide an opening for pouring from the can;

FIG. 3 is a partial transverse vertical sectional view through the closure in pouring condition and a portion of the can top. The view may be considered as taken in the direction of the arrows substantially along the line 3—3 of FIG. 2;

FIG. 4 is a view similar to FIG. 3, but showing the closure in sealing relationship to the can. This view is taken substantially along the line 4—4 in the direction indicated by the arrows in FIG. 1;

FIG. 5 is a horizontal sectional view through a portion of the closure in pouring condition and a portion of the can in top elevation. This view may be considered as taken in the direction of the arrows substantially along the line 5—5 of FIG. 3; and

FIG. 6 is a view similar to FIG. 5, but showing the closure in sealing relation to the can. This view may be considered as taken in the direction of the arrows substantially along the line 6—6 of FIG. 4.

Sheet metal cans, commonly called tin cans in the vernacular, are usually made up of tin plated sheet steel, or of aluminum, or of steel having an organic plastics coating. A common opening arrangement for such cans, particularly when they contain liquids such as beer, fruit juice or the like, is to form an approximately triangular opening near one edge of the can lid. The opener used for this purpose is frequently referred to as a beer can opener. In operation, the beer can opener is hooked under the rib at the periphery of the can, and the handle thereof is levered upwardly so that a triangular portion having a cutting edge shears the can top to provide an approximately triangular opening, with the base of the triangle adjacent the periphery of the can lid. This shearing action tends to deform the top of the can downwardly slightly, and the sharp sheared edges which extend

outwardly from the apex of the triangle are turned downwardly somewhat. On the other hand, the portion of the can lid which is bent downwardly at the base of the triangle near the periphery of the can is smoothly rounded, there being no sharp edge at all at this location.

Many proposals in the past have been made for providing stoppers for sealing an opening which is formed in the end of a can in this manner, but none of these proposals have been particularlly successful, partially because there is no precise standard for beer can openers. Also, with use, as they become more and more dull at their cutting edges, their action tends to deform the can top somewhat differently and to cut an opening which is even less standard. Furthermore, a triangular opening is inherently difficult to seal, particularly when two of the edges are quite sharp, whereas the third edge of the opening is smooth.

One of the difficulties with prior stoppers is that when they are inserted, and even assuming they seal reasonably well, it will be appreciated that the downwardly turned sharp edge along two sides of the triangle tends to chew up the material of which the stopper is made when the stopper is removed, with the result that after it has been used a very few times it will no longer seal properly.

In the drawings which illustrate the present invention, a beer can or fruit juice can or the like is indicated at 10. This can has a top 12 in which a triangular opening of the type discussed above has been formed by the use of a beer can opener. The closure of this invention provided for this opening is molded from a single piece of soft rubber or equivalent plastic material, and this member is formed to provide an approximately triangular tapered spout 14 which extends downwardly from the top through the can opening. The external surface of this spout has such dimensions that its lower end, at 16 for instance, has approximately the same external shape as the shape of the opening, but is somewhat smaller. At its upper end, as at 18 for instance, the external dimensions of the spout are somewhat larger than the can opening. There is a triangular tapered passage 20 which extends through the center of the spout, such that the wall thickness of the spout is everywhere approximately the same.

Because of the resilient nature of the rubber or like material, the spout 14 can be inserted into the can opening and pressed downwardly until the side walls of the spout are deformed inwardly slightly by the wedging action of the external tapered spout surface against the edges of the can opening. So as to prevent the spout 14 from being pushed all the way through the can opening, I have found it advisable to form the spout 14 with an outwardly extending flange 22 at its upward end. Even with a loose fitting opening, therefore, when the spout 14 is pushed into the can, such inner movement of the spout will be arrested when the flange 22 engages the top of the can.

A plug 24, also formed of the resilient rubber or similar material, is provided, and is so contoured that its taper and its horizontal section at any point is approximately the same as that of the space 20 provided within the spout 14. In other words, the plug 24 is made so that it fits the tapered opening 20. This plug 24 is connected by a narrow flexible strip of the rubber material, indicated at 26, with the edge of the flange 22. This narrow strip 26 acts as a hinge which provides sufficient freedom of movement between the spout and plug while preventing them from becoming separated. Such an arrangement also has the advantage that the spout 14, the flange 22, the flexible strip 26, and the plug 24 can simultaneously be molded as a single piece. So as to provide a sort of handle for easy removal of the plug 24, it is preferred

that its upper end be provided as shown with an outwardly extending flange **28**.

The device is used in the following manner. The can of fruit juice or the like, which has sufficient contents such that it is not desired to empty the can completely in one operation, has its top perforated with the ordinary beer can opener. After the opening has been made, the spout portion **14** is pushed downwardly into the opening until it forms a comparatively firm fit. This action deforms the spout material inwardly slightly all the way around where the tubular portion engages the edges of the opening. This is, of course, an easy operation, requiring no particular skill or strength, since the relatively thin-walled tubular spout **14** is easily deformed.

After the spout portion **14** is comparatively firmly in place, the plug portion **24** is entered into the triangular passage **20** and pushed downwardly therein until the tapered surfaces of the plug **24** fill the opening **20** and wedge the material of the spout **14** outwardly into tight sealing engagement with the edges of the opening in the can top.

With the plug **24** thus in place, the can is tightly sealed. To pour from the can, the plug **24** is simply pulled out of the opening **20**, the flange **28** being helpful in facilitating grasping the upper end of the plug. With the plug **24** removed, the opening **20** is free to permit passage of the fluid from the interior of the can, and the flexible strip **26** prevents the plug **24** from becoming misplaced. To reseal the can the plug **24** is simply pushed back into the opening **20**.

When the can is empty and it is desired to remove the closure member from the can, the plug **24** is removed in the manner previously described, after which the edges of the flange **22** are grasped so as to pull the spout **14** out of the can opening. It will be appreciated that once the plug **24** has been removed from the opening **20**, the resistance to collapse of the spout **14** will be slight, and therefore even though the sharp edges of the can dig into the external surfaces of the spout **14** to some extent, the spout **14** nevertheless can be removed from the can without suffering substantial damage from the cutting action of these sharp edges.

Although I have described the can opening closure of this invention on the assumption that it will be used for closing an approximately triangular opening formed by an ordinary beer can opener, it will be appreciated that the essential feature of the invention is that it provides a closure for any sort of a can opening which is made in such manner that at least some of the edges are sharp, it being necessary merely to contour the external surfaces of the spout portion **14** so that it approximately fits the opening in the can when pressed into the can to some extent regardless of what form this opening may take, providing that the spout is additionally so formed that it is easily deformed, and that it has an opening through the center thereof into which a tapered plug is inserted which not only fills the opening, but in addition acts to wedge the material of the spout outwardly into firm sealing engagement with the edge of the opening through the can top.

Although I have described by invention in terms of a specific embodiment thereof, it will be appreciated that variations may be made in the structure without departing from the spirit and scope of the invention and that, therefore, the scope of the invention is to be measured by the scope of the following claims.

Having described my invention, what I claim as new and useful and desire to secure by Letters Patent of the United States is:

1. A reusable closure member for temporarily closing a triangular pouring opening cut through the end of a sheet metal can by an instrument which forms two sharp cut edges and a rolled smooth edge which comprises a soft resilient tapered tubular member having an external tapered contour adapted substantially to fit the triangular opening in the can in wedging relation as the tubular member is pressed into the can opening, said tubular member being formed to provide a tapered passage therethrough which reduces the wall thickness of the tubular portion sufficiently to enable the resilient material of the tubular portion to be temporarily deformed slightly inwardly into the passage when the tubular portion is temporarily wedged into the triangular can opening, a tapered resilient plug having substantially the contour of the tapered passage through the tubular member when the tubular member is in the free state, said tapered plug being adapted to be pressed into the tapered passage through said tubular member so as temporarily to wedge the resilient material of which the tubular member is formed outwardly into firm sealing engagement with the edges surrounding the can opening, the resilient material of which the tubular member is formed being adapted to spring back to its original undeformed tubular shape when the temporarily deformed tubular member is pulled out of the can opening.

2. A closure member as called for in claim **1** in which there is provided a flexible strip of material interconnecting the tubular member at its outer end with the outer end of the plug, said tubular member, said flexible strip, and said plug being provided as a single molded element of a resilient deformable material.

3. The article as called for in claim **1** in which the outer end of the tubular member is provided with an outwardly turned flange the plane of which is substantially perpendicular to the axis of the passage.

4. The article as called for in claim **1** in which the plug is provided with an outwardly turned flange at the outer end thereof.

5. The article as called for in claim **3** in which the plug is provided with an outwardly turned flange at the outer end thereof and in which the edge of the plug flange is connected to the edge of the spout flange by an integrally formed strip of the resilient material.

References Cited by the Examiner

UNITED STATES PATENTS

718,659	1/03	Ruffin	215—52
2,821,323	1/58	Lee	220—24.5
2,841,307	7/58	Yoder	220—24
3,021,976	2/62	Tracy	220—38.5

THERON E. CONDON, *Primary Examiner.*