

March 16, 1937.

S. LOWEN

2,073,941

CONTAINER CLOSURE

Filed Nov. 7, 1935

2 Sheets-Sheet 1

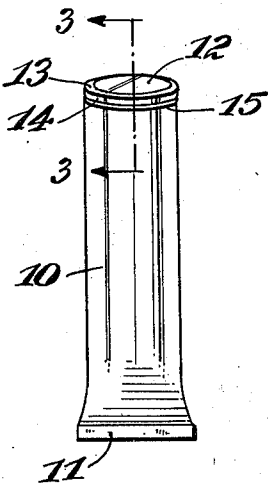


Fig. 1.

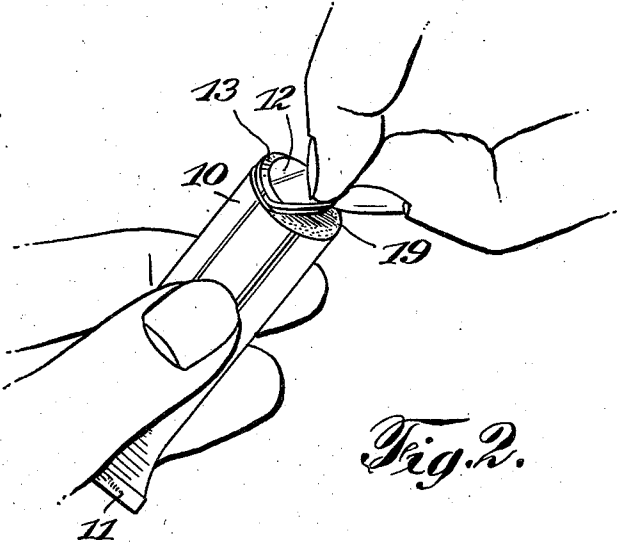


Fig. 2.

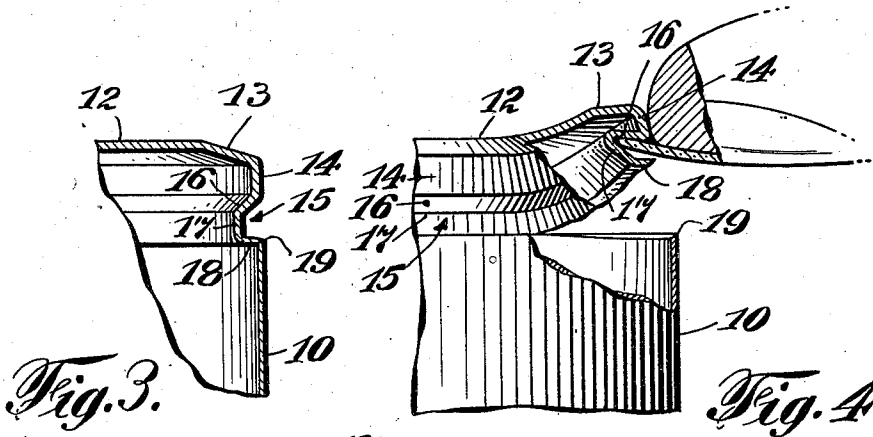


Fig. 3.

Fig. 4.

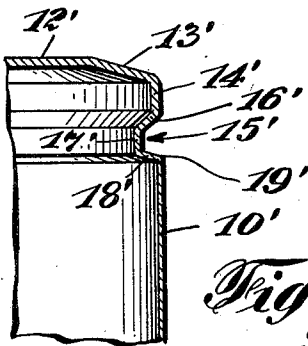


Fig. 5.

INVENTOR.

Stanley Lowen

BY

Harold Friedman  
ATTORNEY.

March 16, 1937.

S. LOWEN

2,073,941

CONTAINER CLOSURE

Filed Nov. 7, 1935

2 Sheets-Sheet 2

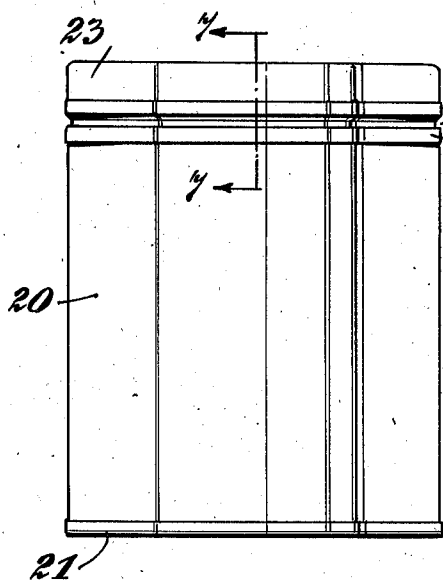


Fig. 6.

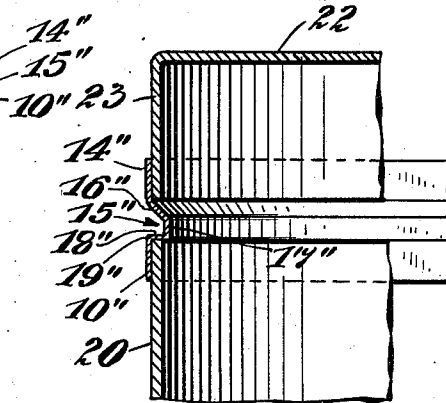


Fig. 7.

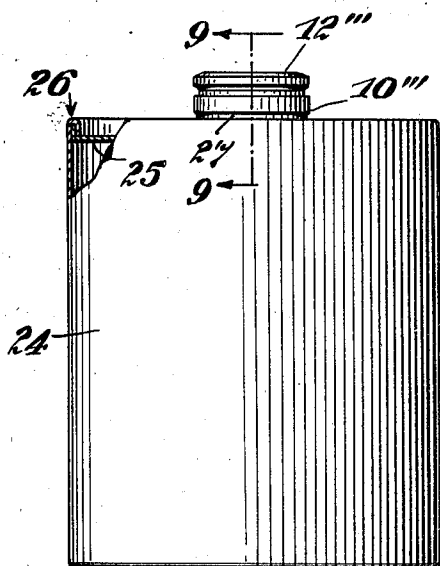


Fig. 8.

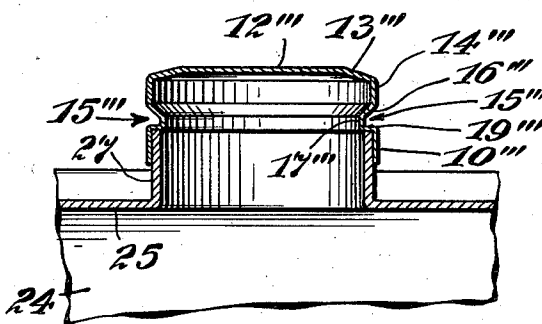


Fig. 9.

INVENTOR.  
Stanley Lowen  
BY *Murac Freeman*  
his ATTORNEY.

## UNITED STATES PATENT OFFICE

2,073,941

## CONTAINER CLOSURE

Stanley Lowen, Bronx, N. Y., assignor to Patent  
Tube Corp., New York, N. Y., a corporation of  
New York

Application November 7, 1935, Serial No. 48,642

4 Claims. (Cl. 220—48)

My invention relates to hermetically closed containers and refers particularly to a removable closure for such a container.

There is one type of such container to which my invention is especially well adapted, although it is not limited thereto.

These containers are in the form of cylinders or tubes, made of thin soft metal, being integrally closed at one end, the other end being left open, for filling the tube with the desired contents, after which this end of the tube is collapsed and permanently hermetically closed, by means of any suitable closure such as commonly employed for collapsible tubes in general.

Sealed tubes of his character have come into extensive use for marketing a large variety of products where deterioration may thus be prevented, including food products, coffee, for example.

However, a great disadvantage in the use of these thus hermetically closed and sealed cylinders or tubes as containers has been the difficulty and inconvenience experienced in opening them and in pouring out the contents.

Resort has been had to various methods of opening such containers. Sometimes they are punctured, sometimes the flattened end is sheared off, sometimes it is torn off by exerting a sufficiently strong force.

All such methods have proved undesirable and objectionable, because they are inconvenient and because the opening thus provided is of insufficient size for free discharge of the contents.

My invention overcomes the mentioned difficulties and objections, as well as others, and inexpensively provides simple and effective hermetic closure means by means of which such a container, as well as other types of containers, may be quickly and easily opened throughout its full diameter.

My invention, as particularly embodied in the mentioned type of container, comprises an indented annular groove encircling the cylinder or tube. The walls of this groove are of a special formation and configuration and include an annular frangible zone which, while providing security and a hermetic seal, is capable of being easily, quickly and conveniently fractured when desired, without the use of any tool or implement whatever.

This groove is desirably adjacent to the commonly substantially flat top closure.

By means of a thumb nail inserted into the groove the top closure may be torn off from the

container tube or cylinder, leaving the latter fully open.

A clear understanding of my invention is to be obtained from the following particular description of modified forms thereof, taken in connection with the accompanying drawings, in which similar parts are designated by similar numerals.

Figure 1 is an elevation of a container tube having at its upper end a detachable hermetic closure embodying one form of my invention.

Figure 2 is a perspective view showing the operation during the removal of the detachable hermetic closure.

Figure 3 is an enlarged broken vertical section indicated by the line 3—3 in Figure 1.

Figure 4 is an enlarged broken elevation partly in section showing what occurs during the tearing off of the hermetic closure.

Figure 5 is a view similar to Figure 3 but showing a modified form of my invention.

Figure 6 is an elevation showing my invention as embodied in a different type of container.

Figure 7 is an enlarged broken vertical section on the line 7—7 of Figure 6.

Figure 8 is an elevation partly in section showing my invention as embodied in a container differing from that shown in Figure 6.

Figure 9 is an enlarged broken central vertical section on the line 9—9 of Figure 8.

Figures 1, 2 and 3 illustrate one form of my invention as embodied in an otherwise usual form of hermetically closed, or sealed, container tube having a thin soft metal mostly cylindrical body 10 provided with a lower end closure 11 of usual form, by means of which this end is closed and hermetically sealed in the usual way after the tube has been filled through this originally open end.

As is usual in this type of tubular container, a hermetic closure for the upper end of the cylindrical tube body 10 is formed in the same piece of material therewith. The material commonly employed and which is well adapted to the carrying out of my invention is a soft, malleable, ductile, pliable, deformable metal. My invention has been embodied in this upper closure.

The illustrated upper closure comprises a central top disc 12, a beveled or sloping annular shoulder 13, and a downwardly extended short cylindrical skirt or flange 14, which is shown as longitudinally aligned with the tube body 10, in spaced relation therewith. It will be noted that the walls formed by the cover disc 12, its shoulder

13 and the skirt 14 of the latter are all joined in metallic continuity.

As will be noted from the enlarged sectional views in Figures 3 and 4, the cylindrical wall of the body 10 is quite thin, while the walls 12, 13 and 14 of the closure are considerably thicker, hence more rigid and less yieldable, this stiffness, particularly in the shoulder 13 and its skirt 14, being utilized in the practical carrying out of my invention, as will be evident later.

The cylindrical wall of the tube body 10 is joined in metallic continuity with the cylindrical wall of the closure skirt 14 by means of a metallic continuous intervening annular wall portion of the closure which is of a special formation embodying particular features of my invention, by which it is rendered readily rupturable along and throughout or entirely around a vulnerable and frangible annular zone or circular line.

This just mentioned annular wall portion of the closure forms a peripheral externally open annular groove 15, having an upper wall 16, an inner or bottom wall 17, and a lower wall 18. It will be noted that this groove-forming wall portion gradually tapers in thickness from the skirt 14 successively through the groove walls 16, 17 and 18 to the body 10, where it is even thinner than this tube wall 10.

In this form of my invention the upper wall 16 of the groove 15 is flaring and forms an obtuse angle with the skirt wall 14 and with the bottom wall 17, which is cylindrical, while the lower wall 18 is disposed at right angles to the bottom wall 17 of the groove 15 and to the cylindrical body or container wall 10.

This lower wall 18 is thinnest just at the line or in the zone of its right angular joining or juncture 19 with the tube wall 10. Also it has been found that the structure of the metal is appreciably weakened at this right angular turn or bend 19. However, it is not only amply strong for dependably securing the closure or cover upon the tube body 10, but it is of a texture to provide a perfect hermetic seal, having no openings or pores through it.

Thus, in this form of my invention, a secure but weakened and easily rupturable or frangible annular zone or line is provided along the right angular turn 19.

The operation of this form of my invention is as follows:—

The contents of the container tube will be securely maintained in an enclosed and hermetically sealed condition until desired for use.

When it is desired to open the container tube, it is merely necessary to insert the end of a thumb nail into the groove 15, pressing the nail inwardly and upwardly, at the same time grasping the top of the tube by one or two fingers placed at the back of the top, or in any other convenient manner.

The upward or lifting pressure against the upper wall 16 of the groove 15 starts a break or tear in the right angular bend 19 just beneath the thumb nail. As the nail is moved upwardly and toward the rear, the top closure will be torn completely off, as the line of break or fracture, which spreads in both directions, follows the weakened right angular bend 19 entirely around the container tube.

While the closure or cover is thus being detached and removed, it will be bent and deformed, substantially as shown in Figures 2 and 4, for the stage in removal there illustrated. Such deforma-

tion facilitates the easy detachment and removal of the cover.

The removal of the closure is accomplished very easily and quickly, with small effort. The upper end of the tube 10 will then be left fully open to the full extent of its diameter, with no irregularities or obstructions and with a smooth upper edge, as indicated in Figure 4. The contents of the opened tube 10 may thus be freely and easily simply poured out.

In discarding the empty shell 10 it is susceptible of being collapsed and crumpled into a small mass of practically insignificant size.

In manufacturing, so far as particular features of the device of my invention are concerned, there is, to start with, a usual form of tube, such as shown in the drawings but having its lower end open and cylindrical and devoid of the groove 15, the closure wall 14 and the tube body 10 then being joined together in cylindrical continuity.

This thus preformed tube is slipped over a rotatable mandrel. At the proper spacing from its free end this mandrel has therein a circumferential annular groove of suitable depth, width and shape.

An idler roll is mounted to run with proper pressure against the outer face of the tube opposite and adjacent to the mandrel groove. This roll has a properly dimensioned and shaped smooth annular peripheral ridge which forces the wall of the tube into the mandrel groove. This roll also has a smooth cylindrical face back of or inward from its ridge in the direction away from the outer closed end of the tube.

As the mandrel rotates and the ridge of the roll draws the ductile metal of the tube into the mandrel groove, the cylindrical face of the roll runs against the tube, holding it against the cylindrical face of the mandrel and keeping it smooth while the groove 15 is being made.

Due in part to the configuration of the groove in the mandrel and of the drawing ridge on the roll, as well as also in large measure to the thickness and stiffness of the skirt wall 14, which is braced by the shoulder 13 and disc 12, the metal for forming the groove 15 is drawn for the most part from below, inwardly and upwardly or in a direction away from the tube 10. The result of this is the formation of the tapering and successively thinner groove walls 16, 17 and 18, and of the thin and frail right angular frangible connection 19.

The thickness of the drawn metal, especially at the frangible point 19, can be accurately controlled, being dependent upon the depth of the groove 15, which may be varied.

The modified container tube of Figure 5 has enclosing walls 10', 12', 13', 14', 16', 17', and 18', groove 15', and angular frangible bend 19', respectively corresponding to the walls 10, 12, 13, 14, 16, 17, 18, groove 15, and angular frangible bend 19 of Figures 1, 2, 3 and 4.

The Figure 5 form of the device chiefly differs from that of the preceding figures in that the lower wall 18' of the groove 15' is slightly flaring or inclined and is thus disposed at an obtuse angle to the tube wall 10', and there forms the thin frangible bend 19'.

The method of manufacture and manner of operation are substantially the same as in the first described form.

In the further modified form of my invention shown in Figures 6 and 7 the entire container is not formed of soft metal.

This container has a cylindrical body 20 pro-

vided with a bottom 21. It is provided with a cover comprising a top plate or disc 22 having a downwardly extended cylindrical flange 23, shown as in alignment with the container body 20, but having its lower edge spaced from the upper edge of the body 20.

These parts of the container are relatively stiff or rigid as well as firm or hard. They may consist of any suitable material such as has been commonly employed for similar purposes, such as ordinary sheet iron, or steel, or they may be non-metallic.

The container body wall 20 and the cover flange wall 23 are securely hermetically connected together by means of a soft metal annular member forming a wall portion which bridges the space between them and in which above described features of my invention are more particularly embodied.

This annular member or part comprises metallic continuous walls 10'', 14'', 16'', 17'', 18'', groove 15'', and right angular frangible bend 19'', respectively corresponding to the walls 10, 14, 16, 17, 18, groove 15, and right angular frangible bend 19, already described.

In this form of my invention, the annular groove 15'' is formed between the spaced edges of the body 20 and cover flange 23, by means of the interposed annular groove walls 16'', 17'' and 18''. The cylindrical walls 10'' and 14'' which extend from the groove walls 18'' and 16'' respectively are shown as in alignment.

These cylindrical walls 10'' and 14'' form attaching flanges for the annulus having the intermediate wall portion forming the groove 15''. The lower flange wall 10'' overlaps the outer face of and is hermetically secured to the container body wall 20, while the upper flange wall 14'' similarly overlaps the outer face of and is hermetically secured to the cover flange 23.

These flange walls 10'' and 14'' may be thus firmly and hermetically secured in place by any suitable attaching means, such as by welding, soldering, a suitable adhesive, dependent in part upon the nature of the materials to be joined.

In this modified form of my invention, the method of manufacture of the soft metal groove-forming annulus or band, which embodies the described particular features of my invention, is similar to that already described, the manner of operation in use being similar to that already described.

The embodiment of my invention in this type of container specially adapts it for some products.

The container shown in Figures 8 and 9 illustrates yet another embodiment of my invention.

This container, as to its major parts, may be formed of any suitable commonly used material, similarly in that respect to the container shown in Figures 6 and 7, and thus this material may similarly be relatively rigid and hard.

This particular container has a cylindrical body 24 and a top 25 hermetically joined thereto by means of a usual form of joint 26. A container bottom may be similarly joined to the body 24 or otherwise formed. The top plate or wall 25 carries an upwardly extended reduced annular wall 27 forming a substantially usual neck or spout.

The cylindrical wall 27 of the tubular neck is provided with hermetic closure means in the form of a cap carried thereby and which embodies therein particular features of my invention, as above described, this cap being formed of soft metal.

This closure cap has metallic continuous walls 10'', 12'', 13'', 14'', 16'', 17'', 18'', groove 15'', and right angular frangible bend 19'', respectively corresponding to the walls 10, 12, 13, 14, 16, 17, 18, groove 15, and right angular frangible bend 19, as described with reference to Figures 1 to 4 inclusive.

In this form of my invention, the cylindrical cap wall 10'' forms an attaching flange which is telescoped over the cylindrical neck wall 27 and is fixedly and hermetically secured thereto.

The method of manufacture and the operation in use are substantially as in the first described form of my invention.

This form of my invention is especially adapted to some kinds of products.

It is to be understood that the scope of my invention is by no means limited to the specific examples thereof illustrated in the drawings and as particularly described.

In a soft metal tubular container similar to that shown in Figures 1 to 5, inclusive, it has been found in practice that, if so desired, an annular groove, having a readily rupturable annular frangible zone, may be similarly rolled into the tube body at any place, such as substantially midway of its length.

In such case, the groove is made deeper, since the metal will be drawn substantially equally in both directions away from the tube body and the angles of the opposite side walls of the groove will be substantially equal.

With such a groove, circumferential breakage may be caused at the outer angle of either of the groove side walls, depending upon the position and direction of pull of the thumb nail.

With one of the tube halves held in each hand, the contents of both may be emptied out simultaneously.

My invention is not limited to a cylindrical container, since it could be of other shape, for example, rectangular.

My invention is not limited to having the frangible zone of breakage, nor the groove, extend all of the way around the container. Especially in a rectangular container, an undetached portion could act as a hinge for the cover.

It is evident from Figures 6 to 9 that my invention is not limited to a collapsible tube form of container, nor to having the entire container consist of soft metal, or as being of metal.

It is to be noted as being evident from Figures 8 and 9 that the cylindrical wall 27, there shown as forming a neck, could be of more extended length, so as then itself to form a tubular container body.

It is obvious that various modifications may be made in the constructions shown in the drawings and above particularly described, within the principle and scope of my invention as defined in the appended claims.

I do not specifically limit myself as to materials, size, shape, proportions, arrangement, relationship, or inconsequential details, these being given simply as a means for clearly describing the device of my invention.

What I claim is:—

1. A receptacle in the form of a collapsible metal tube including integral end and body structure, said body structure being provided with an indented at least partially inclosing groove, said groove having a side wall thereof forming a sharp internal angle with the wall of said body structure, a weakened portion formed

at the apex of said angle forming a readily rupturable frangible zone.

2. A receptacle in the form of a collapsible metal tube including integral end and body structure, said body structure being provided with an indented at least partially inclosing groove, said groove having a side wall thereof forming a sharp internal angle with the wall of said body structure, a weakened portion formed at the apex of said angle forming a readily rupturable frangible zone, said side wall of said groove gradually tapering in thickness to said angle.

3. In a container, a hermetic closure means comprising a soft metal side wall portion provided with an indented at least partially inclosing

groove, said groove having a side wall thereof forming a sharp internal angle with said side wall portion, a weakened portion formed at the apex of said angle constituting a readily rupturable frangible zone.

4. In a container, a hermetic closure means comprising a soft metal side wall portion provided with an indented at least partially inclosing groove, said groove having a side wall thereof forming a sharp internal angle with said side wall portion, a weakened portion formed at the apex of said angle constituting a readily rupturable frangible zone, said side wall of said groove gradually tapering in thickness to said angle.

STANLEY LOWEN.