

[54] **METAL CONTAINER WITH
REMOVABLE CLOSURE**

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[56] **References Cited**

UNITED STATES PATENTS

2,864,528	12/1958	Henchert.....	220/42 A
3,411,650	11/1968	Mumford.....	215/40
2,384,810	9/1945	Calleson et al.....	220/1 BC
1,474,601	11/1923	Miller.....	220/74
2,551,615	5/1951	Maher.....	220/46 R
3,305,120	2/1967	Owen.....	215/40
1,214,899	2/1917	Curran.....	220/60 R

FOREIGN PATENTS OR APPLICATIONS

471,119 8/1937 Great Britain 220/60 R

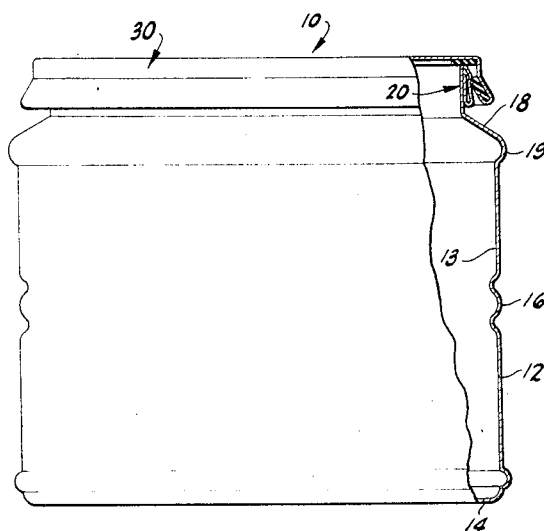
Primary Examiner—Raphael H. Schwartz

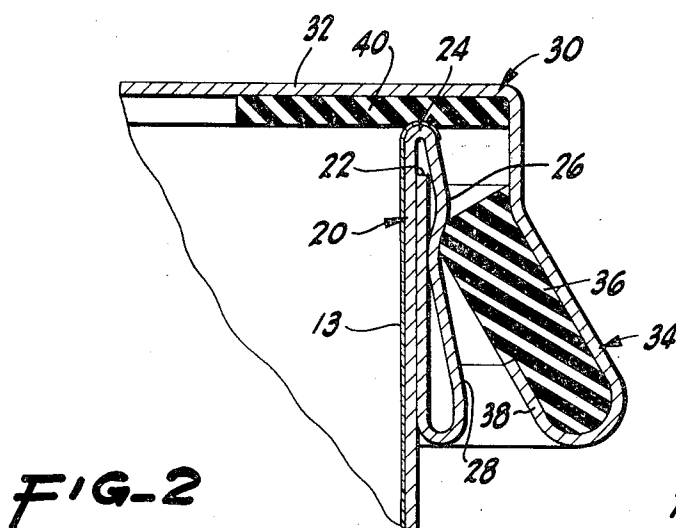
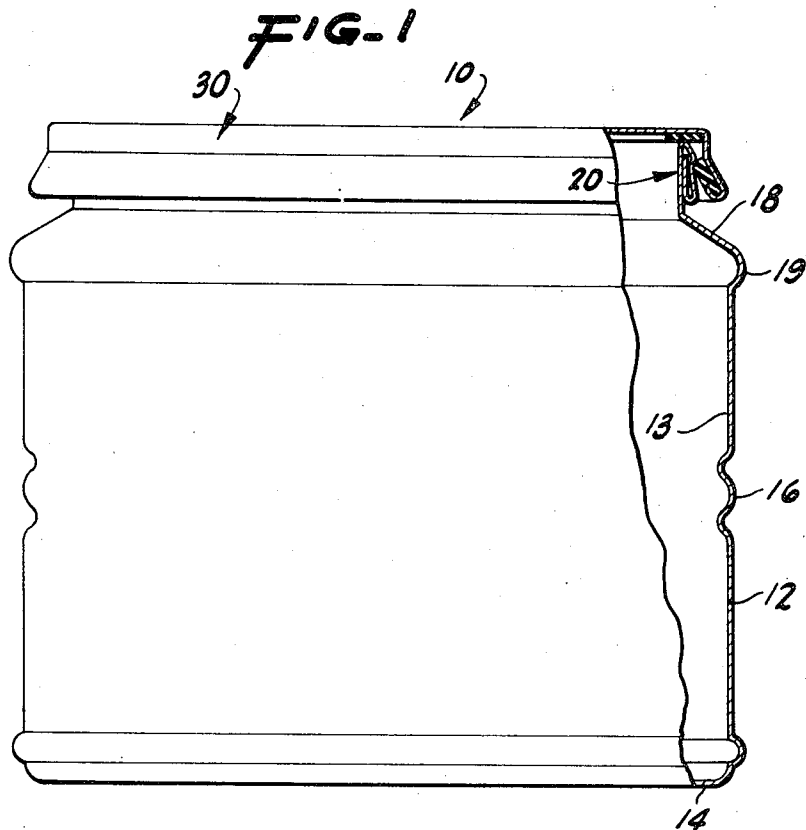
Attorney—Flehr, Hohbach, Test, Albritton & Herbert

[57] **ABSTRACT**

A metal container having a vacuum sealed closure adapted for convenient and safe removal and which is reclosable. A container shell is formed at its open end with an intrusive shoulder and an annular rim formed by folding back the raw metal shell edge. The rim defines an outwardly and downwardly inclined ledge to cooperate with an annular gasket on the closure member for effecting a hermetical seal under the force of atmospheric pressure acting against a vacuum within the container. An annular bead on the rim functions to retain the closure member in place during the capping and sterilizing operations. One preferred embodiment provides a flat gasket on the inside surface of the closure member to cooperate in sealing relationship with the upper edge of the shell rim and in another preferred embodiment the annular gasket is used without the flat gasket.

7 Claims, 4 Drawing Figures





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METAL CONTAINER WITH REMOVABLE CLOSURE

BACKGROUND OF THE INVENTION

This invention relates in general to containers for the food industry and in particular relates to containers for comestibles with reclosable closure lids.

The food industry has increasingly adopted metal containers for comestibles in which a pull-open type metal lid is provided for quick opening convenience. The container is opened by gripping and pulling on a key, ring or tab secured to the lid so that the lid is torn open along a weakened or scored line. The torn-away portion of the lid is then discarded.

The advent of the pull-open type metal lids as described has presented a variety of problems. The tearing of the metal along the scoring leaves a sharp, raw edge on both the residual part of the lid remaining with the container and on the throw-away lid portion. This presents a safety hazard to consumers whose fingers, lips and tongues may be easily cut or gashed on either the lid or container edge. Children in particular are prone to accidents of this nature and they have been known to cut their tongues when licking food from the opened container lid.

Another problem encountered with the pull-open type container lids is that the sudden separation of the lid tends to flip or splatter the product, which may be thrown onto one's clothing. Foods which have the tendency to adhere to the lids, such as pudding, may be easily dislodged and splattered in this manner.

The pull-open type containers are thrown away and discarded after the product is removed. The very nature of the residual raw metal edge after lid removal results in the container's being non-reclosable. Where it is desired to temporarily store any of the unused product, such as in a refrigerator, the product is either transferred to a closable container, such as a glass jar, or a separate closure member such as an elastic lid or plastic film must be placed over the open end.

The key, gripping ring, or tab commonly provided for tearing open the lid is attached on the lid top by various means, such as riveting or by spot welding. The space taken up by these keys and any accompanying embossing reduces the stacking ability of the containers. Furthermore, the presence of the key severely limits using the lid surface for opening, promotional or anti-litter messages, which otherwise would require a relatively smooth surface for their application. Moreover, the projection of the key, ring or tab above the lid surface increases the probability of damage to the lid closure in catching or hanging up on various types of processing equipment.

SUMMARY OF THE INVENTION AND OBJECTS

It is an object of the invention to provide a metal container for comestibles having a removable closure which, when opened, is completely safe for the user.

Another object is to provide a metal container of the type described having a reclosable lid.

Another object is to provide a metal container having a removable closure which retains the product through vacuum sealing.

Another object is to provide a metal container for comestibles having a closure which is retained in place by vacuum and which is easily opened by the consumer through use of a pry tool.

Another object is to provide a metal container for comestibles having a removable closure which, when opened, is safely usable without presenting sharp metal edges which otherwise may cut, gash or injure the user.

Another object is to provide a metal food container having a removable closure provided with a gasket urged into hermetical sealing engagement with an inclined ledge on the rim of the closure shell through the force of atmospheric pressure.

The foregoing and other objects and advantages of the invention are provided by a container for comestibles comprising an open-ended metal shell or body of either seamed or seamless metal construction, containing the product and which is sealed by a removable closure. The open edge of the shell is folded over to form a rim having a downwardly and outwardly inclined ledge. The closure is provided with an annular gasket secured in place by an inwardly folded bead formed on the closure edge. Atmospheric pressure acting on the closure as a result of a vacuum formed when the product is filled in the container functions to urge the gasket against the rim ledge in tight sealing engagement. In another preferred embodiment a flat annular sealing gasket is provided on the inside surface of the closure for sealing engagement with the rim edge with the closure in place on the container.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view, partially cut away, of a container for comestibles according to the invention;

FIG. 2 is a fragmentary cross-sectional view to an enlarged scale of the container of FIG. 1.

FIG. 3 is a view similar to FIG. 1 of another preferred embodiment of the invention;

FIG. 4 is a view similar to FIG. 2 of still another preferred embodiment of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the drawings, FIG. 1 illustrates one preferred embodiment of the invention including a container 10 for such comestibles as puddings, fruits, drinks, vegetables, meats or condiments and the like. Container 10 comprises an open-ended shell or body 12 fabricated as a unitary body from a suitable ductile metal. The inside of the shell may be lined with a coating 13 of a suitable organic material such as enamel or lacquer. Shell 12 is formed through conventional drawing or drawing and redrawing or extrusion operations to develop an integral bottom 14 and annular recessed strengthening bead 16. The open end of the container is formed with an intrusive upwardly inclined shoulder 18 for a pry tool, an outer bead 19 for protecting the container from injury, and a rim 20 of reduced diameter with respect to the outer diameter of shell 12. Rim 20 is developed through a conventional rolling operation which progressively outwardly and reversely folds the upper margin of the shell to provide a three-layer thickness. The relatively sharp shell edge 22 is thereby tightly enclosed between the folded sides which define a top edge 24, as best illustrated in FIG. 2. This insures that no raw metal edges are exposed to cut or injure the user. The outwardly facing segment of rim 20 is formed with an upper annular locking bead 26 and an outwardly and downwardly inclined annular ledge 28, the functions of which are explained hereafter.

A removable closure 30 is provided for sealing the desired product within shell 12. Closure 30 preferably is fabricated from a suitable metal such as aluminum to define a flat lid 32 and sealing bead 34. An annular gasket member 36 of a suitable elastomeric material such as rubber or a synthetic polymer is mounted at a downwardly and outwardly inclined angle on the inside surface of the bead 34. The gasket material should have sufficient softness to conform with the shell rim, and yet have sufficient strength to provide adequate hermetic sealing. The outer edge 38 of the lid bead is rolled back to imbed into the mid body of gasket 36 securely locking it in place and at the same time eliminating undesirable exposure of the sharp lid edge.

An annular flat gasket 40 of a suitable elastomeric material of the type described above is mounted to the inside surface of lid 32 by suitable means such as cement. Gasket 40 may alternatively be formed integral with gasket 36.

With closure 30 in place on container rim 20 the gasket 40 acts against rim edge 24 providing an hermetical seal for the contained product. Gasket 36 also provides sealing along the outer periphery of the rim. The inner diameter of the edge of gasket 36 is sized in relation to the outer diameter of rim 20 so that the closing force of atmospheric pressure resulting from vacuum within the container presses the gasket against rim ledge 28. The resulting outward flexing of the gasket of bead 34 provides a secure hermetical seal.

In applications where the shell and lid are of disparate metals, e.g., an aluminum lid and a tin-plated steel shell, gaskets 36 and 40 will function as a barrier between the two metals precluding the electro-chemical action which could result with a product containing salt, such as a pudding.

The steps in filling, capping and sterilizing the containers 10 are as follows. With the container shells moving along the processing line the product, such as pudding or a fruit/syrup mixture, is filled to the desired level and then moved to the capping station. A closure 32 is pressed over rim 20 with the inner edge of gasket 36 initially snapping or locking over rim bead 26. Bead 26 precludes unintended or accidental displacement of the closure from the shell prior to a full vacuum being developed for holding the closure in place. Any conventional process may be employed to develop the vacuum. The shell may be filled with a heated product, capped and then cooled, or a steam jet may be employed as the heated product is filled into the container to wash out the air and create the vacuum upon cooling and condensation. For a product such as a pudding, the processing is performed Aseptically, and for a product requiring sterilization, such as a fruit/syrup mixture, subsequent sterilization processing can be performed in a retort or continuous pressure cooker with a slight overriding air pressure.

A consumer intending to open and use a filled container 10 may easily pry off closure 30 through a simple lever action with a coin, key, knife or other flat object inserted between bead 34 and shell shoulder 18. This action breaks the sealing engagement between the closure and rim to dissipate the vacuum and permit the closure to be easily lifted from the container. The product is then removed, or the closure may be again pressed on with gasket 36 locking over rim bead 26 to re-close the container for storage of any remaining

product or even for storage of some other food or object, as desired. In using the container in this manner there are no sharp edges on either the shell or closure which could injure the user in any manner. Container 10 may be easily stacked for storage and shipment without interference from a key or tab. Furthermore, the outer bead 34 of the closure is recessed from shell bead 19 to protect the closure from injury, as from being struck by another container or object.

FIG. 3 illustrates another preferred embodiment of the invention including a container 42 comprising a closure 44 and shell 46 predominantly of a steel construction, such as a tin-plated steel or tin-free steel (conventionally known as TFS) comprising a steel core having a coating of chromium and chrome oxide. Steel containers of this construction are not fabricated as an integral body as in the case of an aluminum container, but are rolled into the desired cylindrical shape and joined, lapped or butted at side seam 48 by suitable means, such as welding, soldering or gluing. The open, bottom end of the shell is then sealed by a bottom closure 50, which may be of tin-plate steel or TFS material, joined to the shell edge through a conventional double seam joint 52. An annular protective bead 54 is formed at the upper margin of the steel shell and an intrusive upwardly inclined shoulder 56 is formed for receiving a pry tool. A rim 58 is formed in the manner explained in the embodiment of FIGS. 1 - 2 to provide an annular locking bead 60 and inclined ledge 62.

Closure 44 is similar in construction to the closure of the embodiment of FIGS. 1 - 2 and is formed with a bead 64 carrying an annular gasket 66, and a flat annular gasket 68 mounted on the inside surface of the closure lid for sealing engagement with the upper edge of rim 58.

The seam 48 of the steel shell construction can be lapped or butted. With a lapped seam a double thickness of the folded rim at the seam portion results. Thus, instead of a continuous three-layer rim thickness the rim is formed with a six-layer thickness at its seam portion. The resulting bulge or discontinuity of the rim seam portion when in sealing engagement with gasket 66 thus develops a weakness in the sealing ability at this point. However, flat gasket 68 is effective throughout the circumference of the rim even at the seam portion to thereby insure that sufficient hermetical sealing is maintained.

The filling, capping and sterilizing steps with a container 42 of the embodiment of FIG. 3 are similar to that described above for the embodiment of FIGS. 1 - 2. The closure 44 is also opened and re-closed in a similar manner.

In FIG. 4 another preferred embodiment of the invention is illustrated. A closure member 70 is provided without the top annular gasket of the embodiments of FIGS. 1 - 3. Closure member 70 comprises an annular gasket 72 mounted in outer bead 74 of lid 76. Container shell 78 is fabricated of a suitable metal and is identical in construction to that of the foregoing embodiments. A rim 80 is formed at the shell open end with a locking bead 82 and inclined ledge 84 to cooperate in sealing relationship with gasket 72. The embodiment of FIG. 4 is used in a manner similar to that of the previously described embodiments and would find particular application for use in packaging

containers where the hermetical seal provided by the single, outer gasket 72 is sufficient. Containers of aluminum which would be fabricated without a side seam, for example, could effectively be sealed in this manner.

While the embodiments herein are at present considered to be preferred, it will be understood that numerous variations and modifications may be made therein by those skilled in the art and it is intended to cover in the appended claims all such variations and modifications as fall within the true spirit and scope of the invention.

I claim:

1. A container for a comestible product comprising an open-ended metal shell for holding the product, the shell including an annular rim at said open end, the rim including an outer margin defined by an outwardly and reversely folded shell edge, the rim outer margin including an annular locking bead projecting outwardly from said rim and an annular ledge disposed below said bead, said ledge including means forming a downwardly and outwardly inclined annular sealing surface, a closure member to close the shell open end including a lid having at its outer periphery an annular, downwardly projecting bead, and gasket means carried by the lid, the gasket means including an annular member of an elastomeric material disposed below the peripheral margin of said lid, the annular member being formed with an inwardly projecting portion disposed in sealing relationship with said sealing surface to provide an hermetical seal therewith under the

influence of a vacuum within the shell.

2. A container as in claim 1 wherein said annular member is mounted adjacent the inside margin of the lid bead and said inwardly projecting portion comprises an inner peripheral edge of said annular member, said edge being seated against said sealing surface.

3. A container as in claim 2 wherein said annular member is adapted to flex over the rim locking bead for retaining the closure member during a container capping operation, and said edge of the annular member is adapted to be urged against said inclined sealing surface responsive to atmospheric presence closing force on the closure member.

4. A container as in claim 1 wherein the gasket means includes a flat annulus of an elastomeric material mounted on the bottom side of the lid for circumferential engagement with the upper edge of the shell rim to provide an hermetical seal therewith.

5. A container as in claim 1 wherein the shell is formed with a seamless construction.

6. A container as in claim 1 wherein the shell is formed with a butted seam construction.

7. A container as in claim 1 wherein the shell is formed with a side seam, and the gasket means includes a flat annulus of an elastomeric material mounted on the bottom side of the lid for circumferential engagement with the upper edge of the shell rim to provide an hermetical seal therewith.

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