Sept. 2, 1969 M. GREITZER ET AL 3,464,582

RELEASABLE CONTAINER LID LOCK

Filed Oct. 9, 1968

FIG. 1.

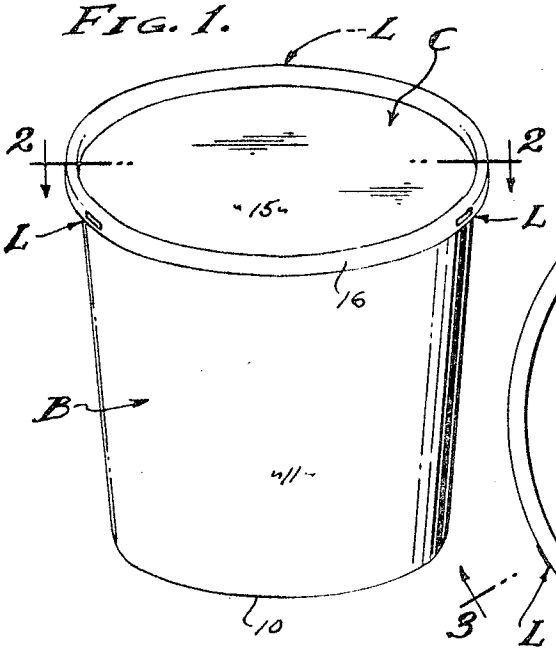


FIG. 2.

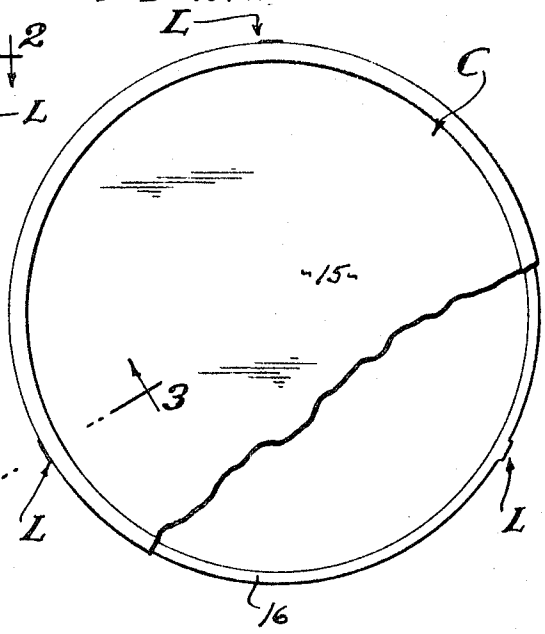


FIG. 3.

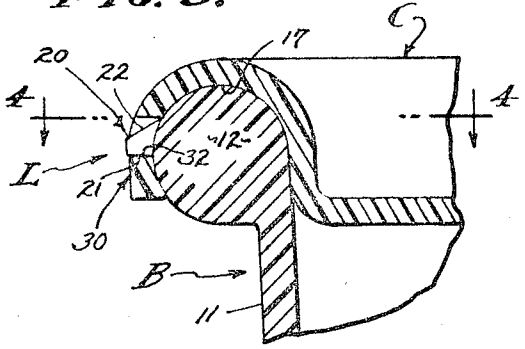


FIG. 4.

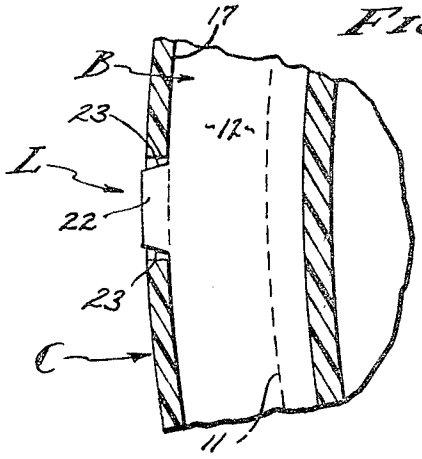
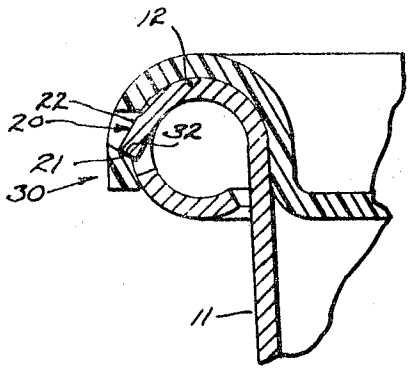


FIG. 5.



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RELEASABLE CONTAINER LID LOCK

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U.S. Cl. 220—60 13 Claims

ABSTRACT OF THE DISCLOSURE

This invention relates to containers that are closed by a removable lid that is adapted to snap over and/or clinch onto the peripheral lip of the container vessel. Permanent deformation of the mating configurations is virtually eliminated while providing a reliable lid to vessel lock that is positive when installation is made. With the present invention at least one and preferably a plurality of cam-lug and lock means are incorporated in the vessel lip and lid perimeter, to either supplement or replace the usual frictional engagement of the mating lid to vessel engagement. Also, it is a sealed engagement that is maintained when the lid is locked to the vessel, the lip of the vessel being a bead or rolled edge that is embraced in a complementary channel in the mating lid. The channel is undercut so as to hook over the lip and have a snap-on action, and the cam-lug and lock means enhances the mating engagement of the lid and vessel by affording positive retention until the application of deliberate manual deflection of the lock means and which in the preferred form involves the use of resilient material in the formation of the lid so as to enable reuse.

The prior art containers of the type under consideration involve a vessel with a reinforced lip and a lid with a channeled periphery to mate onto said lip. The vessel is either fabricated of metal with a rolled lip, or it is molded of plastic with an enlarged bead for a lip, and in either case the lip is convexly rounded to merge with the inside diameter of the container. The lid is fabricated of metal with a formed channel, or is molded of plastic with an undecut channel for snap-on embracement onto the lip of the vessel. The present invention has application to all containers of the above general description and is particularly utilitarian with containers that employ lids of resilient material, such as plastic lids; the advantage being that unlimited reuse is then made possible. However, the use of deformable material is not precluded when circumstances require that a lid not be resealed when once removed from the vessel, in which case a lid of malleable metal or the like can be employed thereby reducing the possibility of reuse. In all cases the vessel can be made of any suitable material, the cam-lugs thereon being static in nature, the lock means on the lid being movable relative thereto.

An object of this invention is to provide a removable lid on a vessel that is normally locked thereto in a positive manner, and subject to removal through manual deliberation only. Accidental displacement of the lid from the vessel is precluded, while deliberate removal of the lid is facilitated even to the extent that supplemental tools and/or implements are not imperatively necessary.

Another object of this invention is to provide a container vessel and lid combination wherein securement in sealed engagement is positive, all without the addition of parts and with all necessary features incorporated in the existing two elements that are made for use one with the other. With the present invention, the necessary features comprise a cam-lug on one element and a lock means on the other element and in each case formed integrally

with the element with which it is associated and carried.

It is still another object of this invention to provide a container vessel and lid having the features and advantages hereinabove referred to and which is removable. With the present invention the lid in particular is made of a resilient material having the necessary memory so as to return to its originally fabricated shape, and being sufficiently deflectable or bendable so as to be manipulated into a releasing condition, all as hereinafter described.

The various objects and features of this invention will be fully understood from the following detailed description of the typical preferred forms and applications thereof, throughout which description reference is made to the accompanying drawings, in which:

FIG. 1 is a perspective view of a typical container and lid combination incorporating the lid lock of the present invention. FIG. 2 is a plan view taken as indicated by line 2—2 on FIG. 1. FIG. 3 is an enlarged fragmentary section taken as indicated by line 3—3 on FIG. 2. FIG. 4 is a sectional view taken as indicated by line 4—4 on FIG. 3. And, FIG. 5 is a view similar to FIG. 3 showing a second form of the invention.

The releasable container lid lock L is shown applied to a typical unit volume bucket or pail-type container B. In the preferred form the lid or closure C is reuseable on the container B, in which case the lid C is made of a resilient plastic material. Likewise it is preferred that the container B be made of a like or the same plastic material. However, it is to be understood that the bodies of material from which the container and lid are made can vary widely as circumstances require, the invention comprising generally the lid lock L involving a cam-lug **20** on the container body and a lock means **30** on the lid body.

The bucket vessel or container body B is of the usual cylindrical configuration, having a disc-shaped bottom **10** and an upstanding side wall **11**. The side wall **11** can be flared as it extends upward toward the open top of the container where the wall terminates in a lip **12** that reinforces the open end of the container and that provides the mating configuration to receive the lid C with sealing engagement. A typical and most practical lip **12** is roll-shaped or a bead that extends tangentially from the inner diameter of the container wall **11**. In the case of a sheet metal construction the lip **12** is a rolled formation of the container wall **11** that uniformly curves upwardly and outwardly, then outwardly and downwardly, and further downwardly and inwardly, and sometimes inwardly and upwardly to approach the outside diameter of the wall **11** (see FIG. 5). In the case of a molded construction the lip **12** is a bead continuing from the container wall **11**, curved as above described, and either solid or cored (see FIG. 3). In either case the lip **12** is essentially toroidal in configuration with a smooth uninterrupted and uniformly rounded exterior.

The container closure or lid C is of the usual disc configuration having a circular top **15** and peripheral rim **16** to overlie the lip **12** of the container B. The rim **16** is provided with a downwardly opening annular channel **17** complementary to and adapted to closely fit and embrace the lip **12**. The channel **17** is undercut by extending it inwardly from its outer diameter, and so that its outer peripheral extremity depends and underlies the lip **12** to have clinching engagement thereover. Consequently some frictional securement is established by a snap-on engagement of the lid C with the lip **12** of container B.

In accordance with the invention we provide the cam-lug **20** and lock means **30** comprising the lid lock L, and these elements are features integrally incorporated in the

container B and lid C respectively, although a reverse position of these elements can be practiced. Preferably, the cam-lug and cooperative lock means comprising the lid lock L is repeatedly employed at intervals around the lid C, for example at three equally spaced positions and each of which is alike or identical so that a description of one suffices for all others. As a consequence the lid C is positively locked down at circumferentially spaced intervals 120° apart in addition to the ordinary clinching action hereinabove described.

The cam-lug **20** is a static element preferably formed as part of the container B and is a radial projection extended laterally from the lip **12**. The cam-lug **20** can radiate either inwardly or outwardly and is shown as projecting outwardly so as to be outside the sealing engagement of the sealing lip **12** in the channel **17**. In practice, the cam-lug **20** extends from the outermost peripheral extremity of the lip **12** intermediate and preferably midway between the top and bottom thereof. The cam-lug **20** is of nominal but substantial circumferential extent as shown and is characterized by its downwardly disposed shoulder **21** immediately adjacent to the major diameter of the lip and at said intermediate midway point above referred to. In the case of sheet metal construction the cam-lug **20** and its shoulder **21** is formed by striking a tab out of the wall of metal forming the lip, and in which case the normal end of the tab is inclined outwardly and upwardly to establish the shoulder **21** while the outer side **22** of the tab is inclined to merge with the rolled lip **12**. The outer side **22** thereby establishes a downwardly and outwardly inclined cam face. In the case of a molded container construction the cam-lug **20** and its shoulder **21** is formed by casting a projecting extension forming the lip, and in which case the shoulder **21** is a horizontally and downwardly faced step immediately adjacent to the major diameter of the lip **12**, and the outer side **22** is an inclined face convexly curved to merge with the rounded bead of lip **12**. The radial projection of the cam-lug **20** can be equal to the wall thickness of the lid C as shown, or it can be more or less as circumstances require, depending upon the amount of deflection permitted by the lid C to move the lock means **30**. In any case, the shoulder **21** presents a substantial downwardly faced stop shoulder while the side **22** presents an inclined cam face. The ends **23** of the lug **20** can be normal and suitably merged with the lip as shown.

The lock means **30** is a movable element preferably formed as part of the closure or lid C and is established by a radial opening entering laterally into or through the depending peripheral portion of the rim **16**. The opening is complementary to the cam-lug **20** and accommodates said lug so as to permit it to enter into or through the opening. In accordance with the invention the opening of lock means **30** has an upwardly faced step **32** engageable with the shoulder **21** when the lid C is in sealed engagement with the lip **12**. In FIG. 3 the engagement is parallel to the plane of the lid C whereby locking force is normal to said plane; while in FIG. 5 the engagement is inclined to the plane of lid C whereby locking force is increased by cam action as the rim **16** is pulled radially inward.

In accordance with the invention the lock means **30** as it is hereinabove described is incorporated in the depending rim **16** of the lid C without enlargement of the same. The cam-shaped side **22** assures a spreading action of a portion of the rim **16** as and when the lid C is depressed onto the lip **12**, after which the rim **16** snaps over the lip **12** and the opening of lock means **30** engages over and accommodates the cam-lug **20**. In the event that a malleable lid C is used then the rim **16** is reformed onto the cam-lug **20** as by a hammering process. Or preferably in the event that a resilient lid C is used, then the rim **16** is snapped over and into locking position as above described.

When three lid locks L are employed it is a simple matter to install a lid C by hooking one or two lid locks and by then snapping the remaining one or two into positive engagement. In order to remove a lid C the reverse process is practiced wherein the rim **16** at and surrounding one lid lock L is manipulated to shift the lock means radially outward and upward to disengage from the cam-lug **20**, whereupon the lid C is simply lifted off of the remaining two lid locks L, thereby separating the lid C from the container B.

Having described only the typical preferred forms and applications of our invention, we do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to ourselves any modifications or variations that may appear to those skilled in the art:

Having described our invention, we claim:

1. A releasable container lid lock for a removable lid having a depending periphery engageably encompassing a circumferential lip defining the open end of a container, and including, a lug incorporated in the lip and projecting radially from the circumference thereof, and lock means comprised of a complementary opening in the depending periphery of the lid and engageably receiving the lug, the depending periphery being outwardly bendable for removal of the lock means opening from the lug and releasing the lid from the container.

2. The releasable container lid lock as set forth in claim **1**, wherein the said lug presents a shoulder faced away from the open end of the container, and wherein the said opening in the depending periphery of the lid presents a seat faced toward the open end of the container for locking engagement with the lug shoulder.

3. The releasable container lid lock as set forth in claim **1**, wherein the said lug has an outer side inclined radially outward and terminating at a shoulder faced away from the open end of the container, and wherein the depending periphery of the lid engages the inclined outer side of the lug until the said complementary opening registers with the lug and presents a seat faced toward the open end of the container for locking engagement with the lug shoulder.

4. The releasable container lid lock as set forth in claim **1**, wherein the said lug presents a shoulder faced away from the open end of the container and inclined radially outward and toward the open end of the container, and wherein the said opening in the depending periphery of the lid presents an inclined seat faced toward the open end of the container for flat locking engagement with the lug shoulder.

5. The releasable container lid lock as set forth in claim **1**, and wherein the removable lid is made of resilient material and the bendable depending periphery returned to its initial form in locking engagement with the lug.

6. The releasable container lid lock as set forth in claim **1**, wherein the said lug presents a shoulder faced away from the open end of the container, and wherein the said opening in the depending periphery of the lid presents a seat faced toward the open end of the container for locking engagement with the lug shoulder, and wherein the removable lid is made of resilient material and the bendable depending periphery returned to its initial form in locking engagement with the lug.

7. The releasable container lid lock as set forth in claim **1**, wherein the said lug has an outer side inclined radially outward and terminating at a shoulder faced away from the open end of the container, and wherein the depending periphery of the lid engages the inclined outer side of the lug until the said complementary opening registers with the lug and presents a seat faced toward the open end of the container for locking engagement with the lug shoulder, and wherein the removable lid is made of resilient material and the bendable depending periphery returned to its initial form in locking engagement with the lug.

8. The releasable container lid lock as set forth in claim **1**, wherein the said lug presents a shoulder faced away from the open end of the container and inclined radially

outward and toward the open end of the container, and wherein the said opening in the depending periphery of the lid presents an inclined seat faced toward the open end of the container for flat locking engagement with the lug shoulder, and wherein the removable lid is made of resilient material and the bendable depending periphery returned to its initial form in locking engagement with the lug.

9. A releasable container lid lock for a removable lid having a downwardly opening channeled rim embracing a circumferential lip defining the open end of a container, and including, a lug incorporated in the lip and projecting radially from the circumference thereof, and lock means comprised of a complementary opening in the depending outer periphery of the channeled rim and engageably receiving the lug, the said depending periphery of the channeled rim being outwardly bendable for removal of the lock means opening from the lug and releasing the lid from the container.

10. The releasable container lid lock as set forth in claim 9 and wherein the removable lid is made of resilient material and the bendable depending outer periphery of the channeled rim returned to its initial form in locking engagement with the lug.

11. The releasable container lid lock as set forth in claim 9, wherein the said lug presents a shoulder faced away from the open end of the container, and wherein the said opening in the depending outer periphery of the channeled rim presents a seat faced toward the open end of the container for locking engagement with the lug shoulder, and wherein the removable lid is made of resilient material and the bendable depending outer periphery of the channeled rim returned to its initial form in locking engagement with the lug.

12. The releasable container lid lock as set forth in claim 9, wherein the said lug has an outer side inclined radially outward and terminating at a shoulder faced away from the open end of the container, and wherein the depending outer periphery of the channeled rim engages the inclined outer side of the lug until the said complementary opening registers with the lug and presents a seat faced toward the open end of the container for locking engagement with the lug shoulder, and wherein the removable lid is made of resilient material and the bendable depending outer periphery of the channeled rim returned to its initial form in locking engagement with the lug.

13. The releasable container lid lock as set forth in claim 9, wherein the said lug presents a shoulder faced away from the open end of the container and inclined radially outward and toward the open end of the container, and wherein the said opening in the depending outer periphery of the channeled rim presents an inclined seat faced toward the open end of the container for flat locking engagement with the lug shoulder, and wherein the removable lid is made of resilient material and the bendable depending outer periphery of the channeled rim returned to its initial form in locking engagement with the lug.

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GEORGE T. HALL, Primary Examiner

U.S. Cl. X.R.

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