

[54] **SEALABLE AND RESEALABLE
CONTAINER**

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[58] Field of Search **220/60 R, 27, 42 F, 55 AN; 217/77, 91, 92**

[56] **References Cited**

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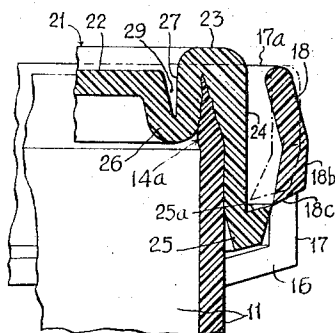
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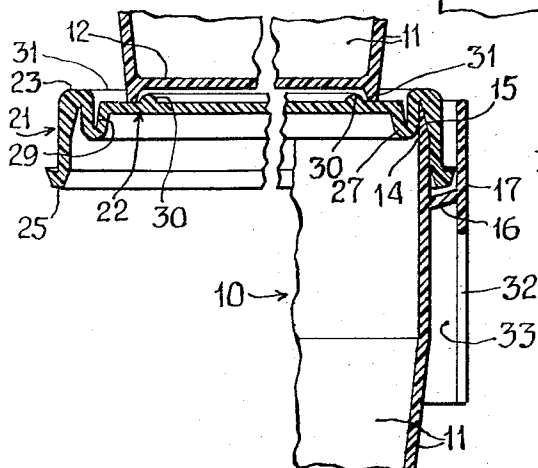
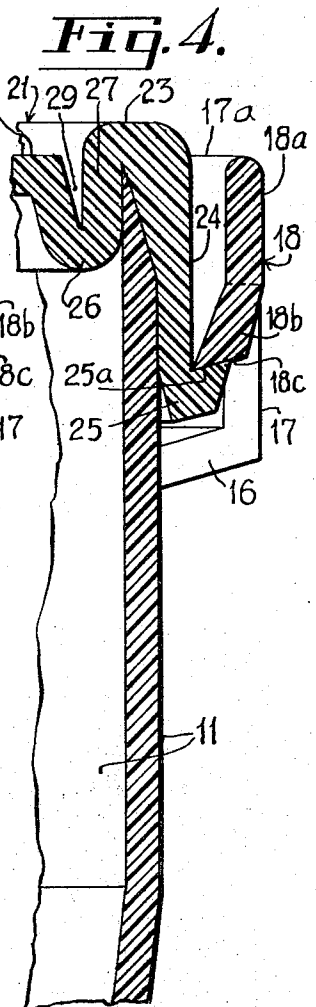
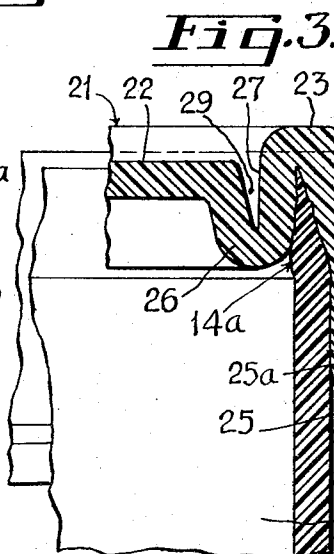
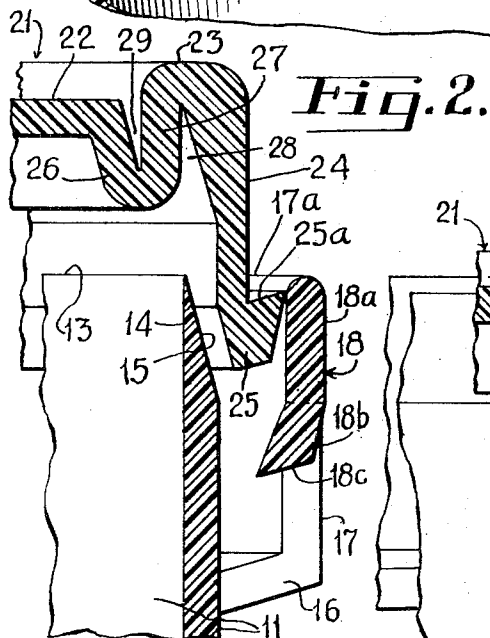
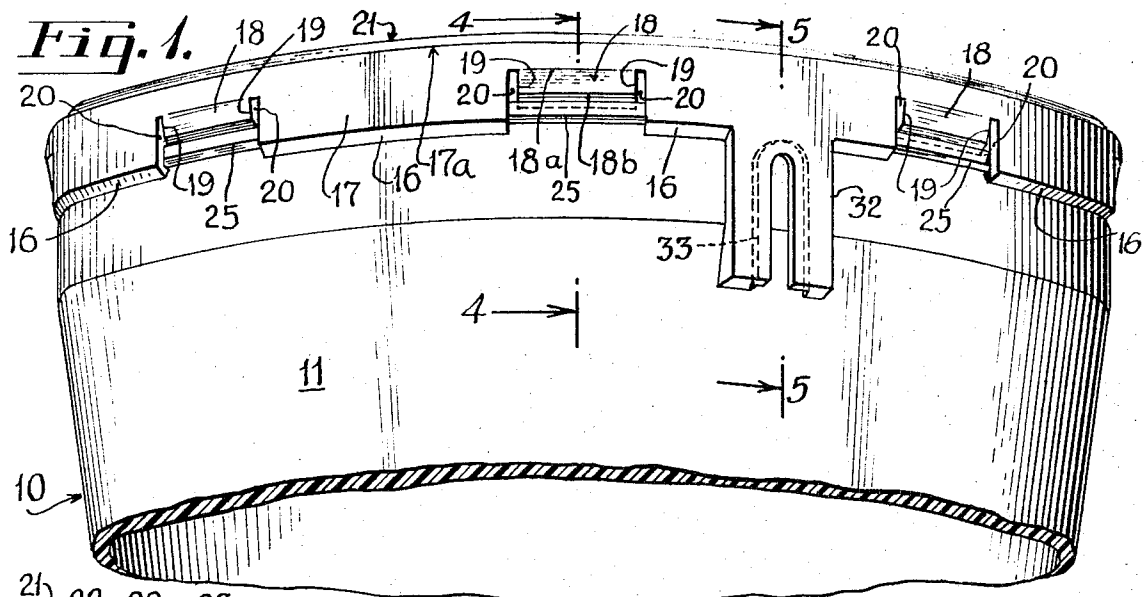
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[57] **ABSTRACT**

A sealable and resealable container is provided having a novel locking means, a portion of which is carried by the lid part and the other portion of which is carried by the body of the container. The portion carried by the body comprises a plurality of flexible lock tab members integrally formed in a peripheral band which is attached to but circumferentially spaced from the side wall of the body adjacent its open top. The other portion is carried by the lid and comprises a depending circumferential flange which terminates in a radial, outwardly extending rib. In securing the lid to the body, the flange is inserted between the peripheral band and the side wall of the body, and pressure is applied until the rib first clears and then is engaged by the lower ends of the lock tab members. To remove the lid, the lock tab members are first disengaged from locking engagement with the rib and upward pressure is applied on the rib until the lid is removed. The upper edge of the side wall of the body is preferably tapered to snugly fit into a convergent groove on the lid part in firmly sealing the lid to the body.

9 Claims, 5 Drawing Figures





SEALABLE AND RESEALABLE CONTAINER

This invention relates to a sealable and resealable container having a lid and body part and a novel locking means, a portion of which is carried by the lid part while the other portion is carried by the body part.

BACKGROUND OF THE INVENTION

The prior art contains numerous disclosures directed to closure or locking means for various types of buckets, containers, and the like. Exemplary of the types of such closure or locking means which have been developed are those such as are illustrated in U.S. Pat. Nos. 3,080,087 to Cloyd; 3,222,299 to Foster; 3,285,464 to Boydman; 3,358,875 to Ekstrom; and 3,383,009 to Weikert. These patents are mentioned to point out that use of various types of locking means and closure means to secure a cover or lid on a container is well known to the art. While these prior art references, as well as others not mentioned, are germane to the container of this invention, none reveal or suggest the novel locking means of this invention.

THE INVENTION

In general, the sealable and resealable container of this invention comprises a lid part and a body part and cooperating lock means on each of said parts, the lock means on the body part comprising a peripheral band attached to and circumferentially spaced from the side wall of the body adjacent its open top; a plurality of flexible lock tabs circumferentially spaced about the peripheral band and formed integrally with it, the lower portions of the lock tabs being separated from the peripheral band by vertical slots; and, the lock means on the lid part comprising a raised shoulder at the outer circumferential edge of the lid having a downwardly extending circumferential flange which terminates in a radial, outwardly extending rib, the length of the flange and the extension of the rib being such that the flange can be inserted between the side wall of the body and the inner wall of the peripheral flange forcing the flexible lock tabs outward from the side wall until the rib has cleared the lower ends of the lock tabs permitting the lock tabs to snap back to their rest position such that the rib engages the lower ends of the lock tabs in securing the lid to the body. The upper edge of the side wall at the open top of the body part is tapered so that it can be snugly interfitted with a convergent groove in the lid part thereby firmly and securely sealing the container when locking the lid to the body.

Both the lid and body parts of the container are preferably made from moldable, commercially available, thermoplastic materials. The structure of the lid and body parts, together with the locking means carried by each part, permits both the body and the lid to be readily and easily formed by simple two-part molds resulting in an economic savings of labor and material and increased productivity. In addition, plastic molding of the two parts permits them to be formed within close dimensional tolerances to obtain a snug, tight seal while imparting a combination of compressibility, flexibility and rigidity to the lid and body that enables them to withstand the pressures exerted on them from automatic closing devices. These properties also permit the lid and body parts of the container to be subjected to frequent opening and closing operations without becoming weakened or distorted.

The novel lock means respectively carried by the lid and body parts of the container readily lends itself to automatic, mechanical closure apparatus such as commercial jig assemblies. After the lid has been properly positioned with respect to the body for automatic closure, a downward pressure on the lid of about 50 to 60 pounds is sufficient to simultaneously engage all of the lock tabs. During the application of such pressure there is slight compressive distortion in the engagement between the tapered upper edge of the body and a convergent groove in the lid, and this compressive distortion is partially relaxed as the pressure is removed.

Manual sealing of the lid to the body can also be accomplished quite readily by exerting downward pressure on the lid at each lock tab location on the body until each lock tab engages the rib. To unseal the container and remove the lid, each lock tab is first released from locking engagement with the rib and upward pressure is then exerted on the rib until the lid is removed.

Thus, the novel locking means of the container of the invention permits it to be readily utilized in commercial filling and sealing operations as well as be manually sealed and unsealed quickly and easily. Since the container is made from plastic and its locking means provides a tight, snug seal, it can be employed in a variety of ways such as for liquids, gels, powders, and the like, over wide temperature ranges and under different atmospheric conditions. Furthermore, the novel locking means permits the container to be sealed and opened repeatedly without losing the effectiveness of the tight, snug seal nor damaging the locking means, lid and body comprising the container.

The novel features of the container of the invention will become more clear and will be more fully appreciated when considered together with the following description of the drawing in which the several views illustrate preferred embodiments thereof and wherein:

FIG. 1 is a fragmentary perspective view showing the lid of the container locked in place on the body thereof;

FIG. 2 is a fragmented view in section taken on a plane through one of the lock tabs on the body part of the container illustrating the relative positions of the rib on the lid and the lock tab on the body prior to locking engagement of the rib with the lock tab;

FIG. 3 is a view similar to that of FIG. 2 illustrating the relative positions of the lock tab and the rib after downward pressure has been applied on the lid in securing it to the body;

FIG. 4 is a view taken substantially on the line 4—4 of FIG. 1 illustrating the lock tab on the body in locked engagement with the rib of the lid; and,

FIG. 5 is a fragmentary view taken substantially on line 5—5 of FIG. 1 illustrating the lid in locked engagement to the body and further illustrating means for receiving a bale for carrying the container.

As illustrated in FIGS. 1, 2 and 5, it can be seen that the body part 10 of the container comprises a side wall 11 which is closed at its lower end by bottom wall 12 and which has an open top 13 at its upper end. The upper edge 14 of side wall 11 terminates in an inwardly tapered edge 15 (FIG. 2). Circumferentially spaced, horizontal connectors 16 secured to side wall 11 support a peripheral band 17 adjacent the upper edge 14 of and circumferentially spaced from the side wall 11. Preferably, the upper edge 17a of peripheral band 17

extends no higher than the upper edge 14 of side wall 11 and the horizontal connectors 16 are disposed at a slight upward angle with respect to side wall 11 to facilitate stacking of empty buckets by inserting them in one another.

A plurality of circumferentially spaced, flexible lock tabs 18 are provided about peripheral band 17 and are formed integral with peripheral band 17. The side edges 19 of the lock tabs 18 are spaced from the adjacent wall of the peripheral band 17 by vertical slots 20. (FIG. 1.) Slots 20 begin at a point about one-fourth the way down from the top 17a of peripheral band 17 and this point defines the upper extremity of the lock tabs 18 and their first flexure point. The upper portion 18a of the lock tabs 18 are disposed substantially vertical and in alignment with peripheral band 17 while the lower portions 18b of lock tabs 18 are disposed at a slight inward angle of about 10° - 20° toward the side wall 11 of the body 10. This angular portion 18b comprises about one-third of the overall length of lock tab 18 and the point at which portions 18a and 18b meet defines a second flexure point. Preferably, the lower face 18c of lock tab 18 is inclined downwardly at a slight angle from the horizontal as clearly seen in FIGS. 2-4 to insure firm engagement with the lock means on the lid as more fully described hereinbelow. Generally, eight lock tabs 18 are provided about the circumference of peripheral band 17, although more or fewer lock tabs can be provided depending upon the size and intended use of the container.

The lid part 21 of the container generally comprises a planar surface 22 having a raised shoulder 23 at its circumferential edge. The outer edge of raised shoulder 23 extends downwardly forming a peripheral flange 24 which terminates in radial, outwardly extending rib 25. The upper face 25a of rib 25 is preferably inclined upwardly at a slight angle from the horizontal as seen in FIGS. 2-4 to insure firm locking engagement with the inclined lower face 18c of lock tab 18. A lowered or depressed shoulder 26 is provided adjacent to and circumferentially spaced from raised shoulder 23 by means of common wall 27. A convergent annular groove 28 is formed in raised shoulder 23 between flange 24 and common wall 27 as shown in FIG. 2, and its configuration is adapted to receive the tapered upper edge 14 of side wall 11 to facilitate insertion therein of tapered edge 14. Preferably, a divergent annular groove 29 is also provided in lowered shoulder 26 between common wall 27 and the planar surface 22 of lid 21. Divergent groove 29 permits flexing of common wall 27 when pressure is exerted on lid 21 in securing it to the body 10, thereby compensating in part for deformation and compression of upper edge 14 of side wall 11 when it is subjected to closure pressures upon being inserted in convergent groove 28.

A raised annular bead 30 can be provided on planar surface 22 circumferentially spaced inward from divergent groove 29 and an annular extension 31 of side wall 11 can be formed at bottom wall 12 to facilitate stacking of sealed containers as shown in FIG. 5.

To facilitate carrying the container, means can be provided diametrically opposed from each other on the side wall 11 in the form of a narrow, inverted U-shaped member 32 having a grooved inner wall as at 33 to receive one end of a carrying bale. (FIGS. 1 and 5)

In securing the lid 21 to the body 10, the lid 21 is first placed over the open top 13 of the body 10 and rib 25

is positioned in the space between tapered upper edge 14 and the upper edge 17a of the peripheral band 17 as shown in FIG. 2. Upon application of downward pressure on lid 21, either manually or by automatic closing apparatus, lid 21 is forced downwardly inserting flange 24 between side wall 11 and peripheral band 17. As this downward pressure is continued, tapered edge 14 slides into divergent groove 28 and is slightly deformed under the compressive force exerted upon it as shown at 14a in FIG. 3. Concurrently, the lower portion 18b of the lock tab 18 is forced outwardly as a result of its vertical contact with rib 25 so that it is flexed from the broken line position to the full line position shown in FIG. 3. At this point, the lower face 18c of lock tab 18 is substantially co-extensive with the upper face 25a of rib 25. Upon exertion of further downward pressure on lid 21, the lower face 18c of lock 18 clears the upper face 25a of rib 25 permitting lower portion 18b of lock tab 18 to snap back to its normal rest position shown in broken line in FIG. 3. At this time, downward pressure on lid 21 is released, permitting it to rise upwardly as compressive deformation of the tapered edge 14a is at least partially relaxed and upper face 25a of rib 25 is permitted to engage lower face 18c of lock tab 18 in planar contact thereby firmly securing lid 21 to body 10 as shown in FIG. 4.

To remove the lid from the body is a relatively simple operation and can be accomplished with any thin, flat, metal object such as a screwdriver, coin or the like. The flat metal object is first inserted in a slot 20 adjacent the side edge of a lock tab 18 and positioned between the surface of the lock tab 18 and the side wall 11 of body 10. With the instrument in this position, the lock tab 18 can be easily, flexibly forced outward thereby disengaging the lower face 18c of the lock tab 18 from engagement with the upper face 25a of the rib 25. After all the lock tabs 18 have been thus disengaged, the flat metal object is next inserted between the disengaged lock tabs 18 and side 11 until it contacts rib 25 of lid 21. Upward pressure is then exerted on rib 25 at each lock tab location until lid 21 is removed from body 10.

The durability of the bucket and the tightness of the seal obtained by the lock means were determined by dropping closed buckets filled with paint from a height of about five feet onto a cement floor. In no instance did any of the buckets split or rupture nor were any lids dislodged from locking engagement with the body.

While the container of the invention has been described in some detail and with particularity, it should be understood that various changes and modifications can be made therein by those skilled in the art, and to the extent that such changes and modifications fall within the scope of the appended claims, they are considered to be part of the invention.

What is claimed is:

1. A plastic sealable and resealable container having a lid part and a body part, said body part comprising a bottom, a side wall, and having an open top; a peripheral band adjacent said open top circumferentially spaced from and secured to said side wall by a plurality of circumferentially spaced radial members extending from said side wall to the lower edge of said band; a plurality of flexible lock tabs integrally formed with and circumferentially spaced about said peripheral band between said radial members, the lower portions of said lock tabs being separated from said peripheral band by

vertical slots and inclined toward the side wall of said body; said lid part comprising a planar surface having a raised shoulder at its outer circumferential edge; a circumferential flange depending from said raised shoulder and terminating in an outwardly extending radial rib; and a convergent annular groove formed in said raised shoulder adjacent said circumferential flange adapted to receive the upper edge of said body part as the depending flange of said lid slides between said body part and peripheral band for engagement by said lock tabs.

2. The container of claim 1 wherein eight radial members are provided about said side wall and eight lock tabs are disposed between said radial members.

3. The container of claim 2 wherein said radial members are inclined upwardly away from said side wall.

4. The container of claim 1 wherein said lock tabs are inclined toward said side wall at an angle of about 10° - 20°.

5. The container of claim 1 wherein the upper edge of the side wall of said body is tapered inwardly and the configuration of said convergent annular groove is adapted to closely receive said tapered upper edge such that a snug fit is provided between said lid and said body in sealing the container.

6. The container of claim 5 wherein said lid has a downwardly extending shoulder adjacent said raised shoulder, said downwardly extending shoulder having a downwardly extending annular groove formed therein which, together with said convergent groove, forms a common wall facilitating compressive deformation in engagement between said convergent groove and the upper edge of said container.

7. The container of claim 1 wherein the lower faces of said lock tabs and the upper face of said rib have a slight downward inclination in the direction of said side wall such that said locking engagement of said lock tabs with said rib is enhanced by axial pressures tending to separate the parts.

8. The container of claim 1 wherein means are provided diametrically opposed on the side wall of said body to receive a bale for carrying said container.

9. The container of claim 1 wherein said body has an annular downward extension of said side wall adjacent said bottom wall and said lid has an annular raised bead spaced inwardly from said raised shoulder, said annular extension and said raised bead providing means for stacking sealed containers.

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