PLASTIC CONTAINER

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Filed: Apr. 17, 1972

Appl. No.: 244,438

U.S. Cl. ........................................ 220/60 R, 220/94 A
Int. Cl. ........................................... B65d 43/10
Field of Search ......................... 220/60 R, 94 A, 85 P; 215/42, 46 R

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ABSTRACT
An improved plastic container and cover in which the container is an open cup-shaped member and the cover comprises a web with a peripherally depending skirt. The container and skirt on the cover are provided with a first cooperating closure means and a second cooperating reclosure means, while the skirt has access areas for permitting access of the tool therethrough whereby the first closure means may be disengaged.

20 Claims, 8 Drawing Figures
PLASTIC CONTAINER

BACKGROUND OF THE INVENTION

This invention relates to the container arts and more particularly to open ended containers with removable covers of the type commonly used in transporting or storing liquid, semi-liquid and granular materials or other substances.

THE PRIOR ART

Prior development of plastic containers has encountered numerous problems which relate primarily to the interlock between the closure and the container as well as the seal for precluding the loss of fluids. Such containers, when utilized to store materials such as paint, grease or granular materials, must be of a substantial thickness so as to afford sufficient rigidity to maintain the sealing contact between the closure and the container. However, this rigidity presents removal problems since it may preclude the manufacture of a container and closure having sufficiently flexible characteristics as to facilitate opening.

Examples of prior art patents would include U.S. Pat. No. 2,717,619 which issued to Whitman on Sept. 13, 1955 and which depicts a dual interlocking means between the closure and the container. U.S. Pat. No. 3,474,923 which issued to Hurtle on Oct. 28, 1969 also depicts a plastic container which has a single interlock between the closure and a bead extending circumferentially about the upper end of the container. Finally, U.S. Pat. No. 3,519,163 issued to Bardell on July 7, 1970 discloses a plastic container alleged to permit the desired rigidity for sealing purposes and yet facilitate the opening of the container by the utilization of release means in the form of weakened areas in portions of the skirt. These prior art patents illustrate the problem of obtaining a good seal between the closure and the container and yet facilitating removal of the closure.

SUMMARY OF THE INVENTION

In contrast to the above prior art disclosures, the instant invention relates to a container and a closure therefor in which a substantial amount of leverage is made available for releasing the closure from the container. The invention includes a cup shaped open ended container having two vertically separated locking ribs adjacent the open end thereof and located on the exterior surface. Cooperating with the container is a cover having a web portion surrounded by a depending skirt which carries dual locking members for meshing with the locking ribs on the container wall. Additionally, between these locking members is an access or open area within the skirt for permitting the entry of a tool to act as a lever against the top of the container so as to distort and disengage the lower locking members.

Accordingly, it is an object of the instant invention to provide a plastic container having sufficient rigidity to meet the requirements of a shipping and storage container and which has means to facilitate the opening thereof. Another object of the instant invention is to provide a container and closure therefor which have a first locking means for normally sealing the closure to the container during transportation, but which is adapted to be distorted so as to permit removal of the closure. Additionally, however, it is an object of this invention to provide a reclosure means which does not substantially interfere with the initial opening of the container, but does possess sufficient locking characteristics as to maintain the cover on the container during subsequent storage. Another object of the instant invention is to provide a closure for a container which permits opening in a manner similar to that normally used on metal containers so as to facilitate the commercial acceptance thereof.

DESCRIPTION OF THE DRAWINGS

The manner in which these and other objects of this invention is obtained will be made clear by consideration of the following specification and claims when taken in conjunction with the drawings in which:

FIG. 1 is a side elevation view in section taken through a center line of the container with the closure thereon;

FIG. 2 is an enlarged side elevation view in section of the cooperating locking means of the container and the closure;

FIG. 3 is a perspective view of the closure;

FIG. 4 is a perspective view of a section of the closure;

FIG. 5 is a side elevation view in section illustrating two containers in stacking relation to one another;

FIG. 6 is a side elevation view of the container disclosing the attaching means for a bell-shaped carrying handle;

FIG. 7 is a side elevation view in section similar to FIG. 2 which illustrates the manner of opening the instant invention; and

FIG. 8 is a plan view of a portion of the closure taken along the line 7-7 of FIG. 2.

DETAILED DESCRIPTION

In order to provide a more acceptable storage and shipping container, our invention includes an open cup shaped member and a closure therefor of sufficient rigidity as to permit the desired sealing engagement. However, our invention overcomes the disadvantages of the prior art with respect to the opening of the container through the provision of a primary locking means arranged to permit the use of substantial leverage in its disengagement and intentional distortion. Additionally, a secondary locking means is provided to permit reclosure for storage purposes.

As shown in FIG. 1, a preferred container 10 takes the shape of a cup 10 having annular diverging sidewalls 18 closed at the lower end by a bottom wall 12. Preferably, the bottom wall 12 is spaced upwardly from the lower end of the sidewalls 18 such that the bottom is supported by an annular flange or extension 16 of the sidewalls 18 as well as an annular reinforcing ring 14 in the center. The open end of the sidewall 18 preferably terminates in an annular bead or rib 20 which preferably circumscribes the top sidewall 18. Spaced below this rib 20 are two reinforcing flanges 22 and 24, with the upper flange 22 being of a substantial thickness so as to serve as a locking rib. A closure or cover 30 is adapted to sealingly engage the open end of the container 10 and may comprise a web section 32 which joins an inverted U-shaped marginal portion 36 which is adapted to receive the bead 20. This inverted U-shaped portion (see FIG. 2) may comprise a first upstanding member 38, a horizontal
section 40, and a downwardly depending skirt 42. Between the recess formed by the U-shaped portion and the annular bead 20 is placed a sealing means 44, here shown in the form of an annular elastic tubular member which is in a depressed and tight sealing engagement when the closure is locked to the container.

An important aspect of our invention relates to a first closure means 60. As depicted in FIGS. 2, 7 and 8, this closure means comprises the reinforcing annular rib 32 about the exterior of the container, and members 62 in the form of inwardly turned flanges which are supported and molded internally with the annular skirt 42. As shown in FIG. 8, the members 62 are intermittently spaced about the lower circumferences of skirt 42. Above this primary closure means 60 are access areas 70 which facilitate the entry or passage therethrough of a tool 99 to be utilized as a lever to disengage the flange 62 from the annular rib 22. These access areas 70 may be open areas or may merely comprise thin portions of the skirt 42 above the members 62 and may be formed by the utilization of protrusions on the male die or mold half utilized to form the closure. Additionally, this area may be visually defined on the exterior of the skirt 42 by upstanding ridges 73 on each side thereof (see FIGS. 4 and 8). Just below the access area 70 is a reinforced portion 72 of the skirt 42. Such reinforcing provides additional strength to the skirt to preclude its tearing, and permits the use of the tool or lever 99 acting adjacent the interior portion of the skirt about a fulcrum which comprises the upper bead 20, and the inverted U-shaped portion 36. Thus, clockwise movement of the tool 99 about the marginal portion 36 will cause the lower locking flange 62 to be disengaged from the reinforcing web 22. Preferably, it is anticipated that the user of this pail will supply sufficient force through the tool to stretch the lower portion of the skirt 42 beyond its elastic limit so as to effect a permanent deformation of the annular skirt to preclude the locking flange 62 from re-engaging the reinforcing web 22.

Above the primary closure means 60 and the access window 70 is a secondary or reclosure means 50. This locking means may comprise an interlocked flange 52 which is adapted to engage the upper locking bead 20.

Thus, a consideration of FIG. 2 will disclose a primary locking means 60 normally used for purposes of transporting goods within the pail, and a second locking means or reclosure means 50 which provides a sufficient engagement between the skirt 42 and the locking bead 20 so as to serve as a secondary or reclosure means after the primary closure means 60 has been so distorted as to be of little value.

Further novel features of our container would include handle attaching members 75 which include vertical reinforcing members 76 supporting and carrying a vertical plate 78. The vertical plate has an aperture 79 therein to which may be attached a bail-like carrying device. At the top of the plate 78 is an upper web 80 which joins the plate to the body or sidewall of container 18, while the area between the sidewall and the lower portion of the vertical plate remains open. Preferably, the vertical plate has a substantial width such as four inches so as to permit lifting of the container by placing one’s fingers between the plate 78 and the sidewall 18.

Reference to FIG. 5 discloses the stacking capability of these containers when in an empty condition. The two outermost vertical reinforcing members 76 of the handle attaching members 75 may be semi-circular in form so as to support the upper pail upon the locking bead 20 of a lower pail. The tapered sidewalks 18 in conjunction with this stacking arrangement thus precludes a travelling engagement between the sidewalks of the vertical containers and permits easy removal for filling thereof.

MODE OF OPERATION

As indicated in FIGS. 2 and 6, it is contemplated that the container will be filled with the cover 30 being urged downwardly so as to compress the annular seal 44 at which time the lower locking flange 62 will be cammed over the reinforcing rib 22 to obtain an inner-lock. At this time, it is anticipated that the reclosure means 50 comprising the smaller flange 52 will not be engaged. The compressive force from the seal will tend to urge the cover 30 upwardly so as to maintain the primary closure 60 tightly engaged.

When it is desired to open the container, a tool 99 may be inserted through the access windows 70. As shown, these access windows comprise a very thin area within the skirt 42 which is punctured by the tool. However, the access area may be formed as an open window by the addition of core material to the mold. As the tool is inserted, it is rotated in a clockwise manner so as to permanently distort the lower portion of the skirt whereby the locking flanges 62 will remain away from the locking rib 22. At this point, all that is necessary to open the container is to lift upwardly, the secondary closure means 50 causing some resistance. When it is desired to reclose the container after an initial opening, the closure is merely placed upon the container and pushed downwardly sufficiently for the flange 52 to engage the lower side of the annular bead 20.

Accordingly, applicants have preferred a plastic container having a primary and a secondary locking means between the closure and the container body. Additionally, means are provided for obtaining substantial leverage with a tool and the opening of the container, while secondary closure means are provided which permit a sealing engagement between the two and facilitate subsequent reopening.

We claim:
1. An improved plastic container and closure comprising:
   a. an open end container having a bottom and a sidewall extending upwardly therefrom;
   b. a closure having a central web portion circumcribed by an inverted U-shaped marginal portion adapted to engage the upper portion of the sidewall, said marginal portion including a skirt depending downwardly;
   c. vertically displaced dual cooperative locking means between the container sidewall and the skirt for locking the cover to said container, said dual locking means including skirt portions and container sidewall portions; and
   d. disengaging means for facilitating disengagement of the skirt portions of said dual locking means from the container sidewall portions, said disengaging means including access areas in said skirt spaced radially outwardly of said skirt and located between said locking means for facilitating the entry of a tool for disengaging said closure from said container.
2. An apparatus as recited in claim 1 in which said dual cooperative locking means comprises two circumferential ribs on said container sidewall and said skirt.

3. An apparatus as recited in claim 1 in which said access area is a section of said skirt having a reduced cross-section.

4. An apparatus as recited in claim 1 in which said access area is a section of said skirt having a reduced cross-section and said skirt having an outwardly extending and upwardly facing shoulder immediately below said access area and spaced above the lowermost of said locking means to facilitate rupture of said access area by use of a tool.

5. An apparatus as recited in claim 1 together with a reinforcing flange projecting radially outwardly from said container sidewall substantially immediately below said skirt preventing normal manual grasping of said skirt to release said dual locking means.

6. An apparatus as recited in claim 1 in which said access area is a section of said skirt having a reduced cross-section, and reinforcing means on opposite sides of said access area for circumferentially restricting rupture of said skirt to said access area.

7. An apparatus as recited in claim 1 in which said access area is a section of said skirt having a reduced cross-section, said access area being defined by a radially outwardly directed projection on said skirt.

8. An apparatus as recited in claim 1 in which said access area is a section of said skirt having a reduced cross-section, including abutments arranged in a generally U pattern defining said access area.

9. A plastic closure for a container comprising:
   a. a web portion and a depending skirt portion attached thereto;
   b. two locking means on said skirt for engaging cooperative locking means on a container; and
   c. disengaging means for facilitating disengagement of said two locking means from said container cooperate locking portions, said disengaging means including an access area between said locking means for facilitating the entry of a tool for disengaging said cover from an associated container.

10. The closure of claim 9 wherein said closure is of a size and said skirt is of a stiffness wherein manual deformation of said skirt for the releasing of said locking means is generally precluded in the absence of a tool.

11. An apparatus as recited in claim 9 in which said access area is a section of said skirt having a reduced cross-section.

12. An apparatus as recited in claim 9 in which said access area is a section of said skirt having a reduced cross-section and said skirt having an outwardly extending and upwardly facing shoulder immediately below said access area and spaced above the lowermost of said locking means to facilitate rupture of said access area by use of a tool.

13. An apparatus as recited in claim 9 in which said access area is a section of said skirt having a reduced cross-section and reinforcing means on opposite sides of said access area for circumferentially restricting rupture of said skirt to said access area.

14. An apparatus as recited in claim 9 in which said access area is a section of said skirt having a reduced cross-section, said access area being defined by a radially outwardly directed projection on said skirt.

15. An apparatus as recited in claim 9 in which said access area is a section of said skirt having a reduced cross-section, said access area being defined by a radially outwardly directed projection on said skirt, including abutments arranged in a generally U pattern defining said access area.

16. An improved plastic container and closure comprising:
   a. an open end cup-shaped container;
   b. a closure having a central portion and a depending skirt;
   c. a primary and secondary locking means carried by the closure and the container, said dual locking means including skirt portions and container sidewall portions; and
   d. disengaging means for facilitating disengagement of the skirt portions of said locking means from the container sidewall portions, said disengaging means including interrupted areas in said skirt above said primary locking means for facilitating the passage of a tool therethrough for disengaging said primary locking means.

17. An apparatus as recited in claim 16 in which said primary and secondary locking means are vertically displaced from one another, and the interrupted areas are located between these locking means and radially spaced from said container.

18. An apparatus as recited in claim 16 in which said interrupted areas are a section on said skirt having a reduced cross-section.

19. An apparatus as recited in claim 16 in which said access area is a section of said skirt having a reduced cross-section and said skirt having an outwardly extending and upwardly facing shoulder immediately below said access area and spaced above the lowermost of said locking means to facilitate rupture of said access area by use of a tool.

20. An improved plastic container and closure comprising:
   a. an open end cup-shaped container having a bottom and upstanding sidewall;
   b. a closure having a central portion and a depending skirt;
   c. locking means carried by the closure and container and located below the top of said sidewall, said locking means including a closure portion and a container portion; and
   d. disengaging means for facilitating disengagement of the closure portion of said locking means from the container portions, said disengaging means including interrupted access areas in said skirt above said locking means for facilitating the passage of a tool for disengaging the closure portion of said locking means from the container portion.

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