

Sept. 8, 1964

A. P. SCHOLTZ
CONTAINER

3,147,879

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2 Sheets-Sheet 1

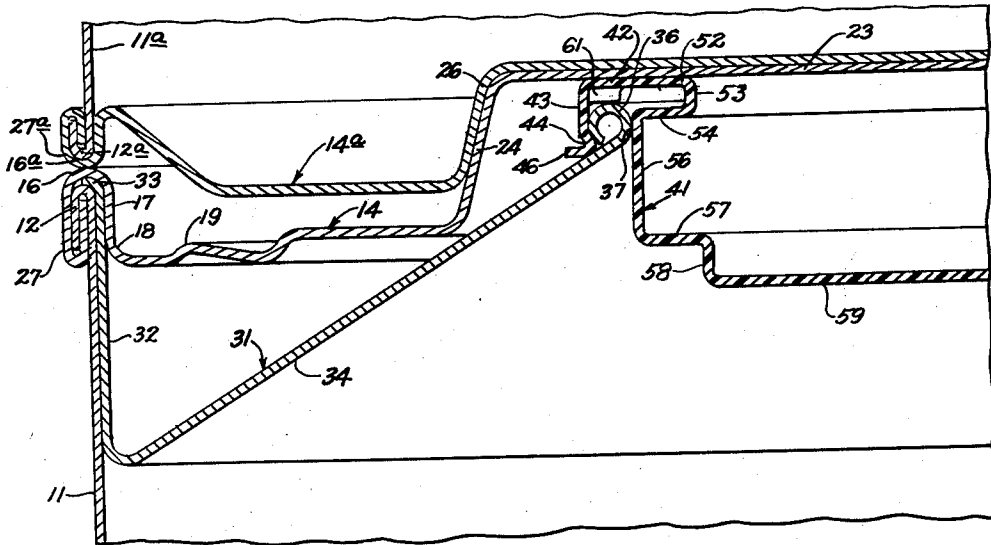


Fig. 1.

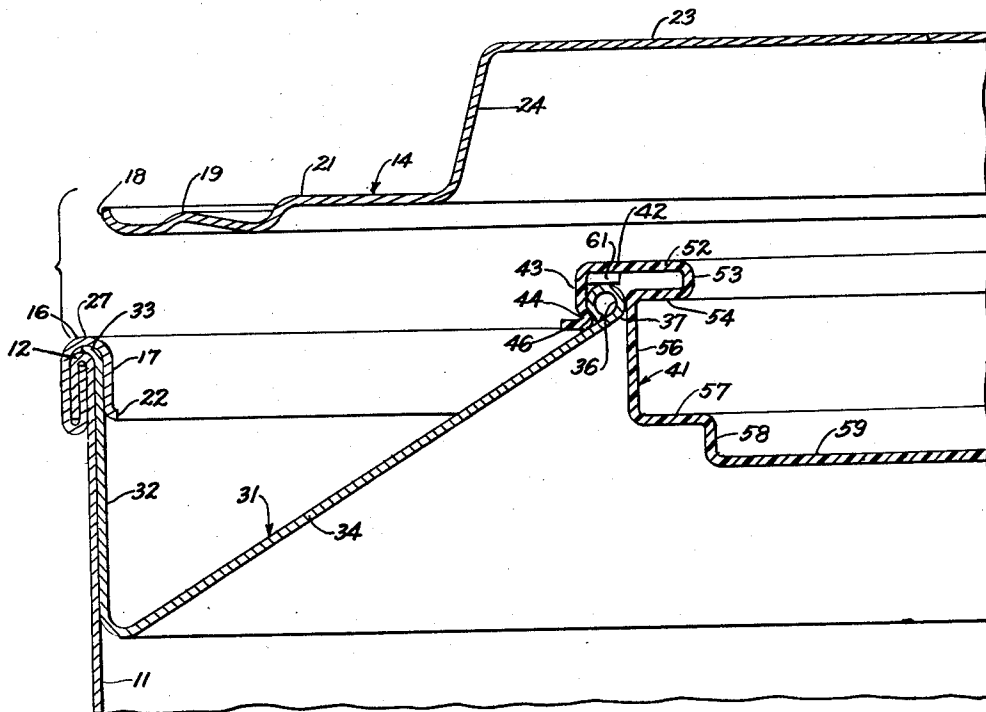


Fig. 2.

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2 Sheets-Sheet 2

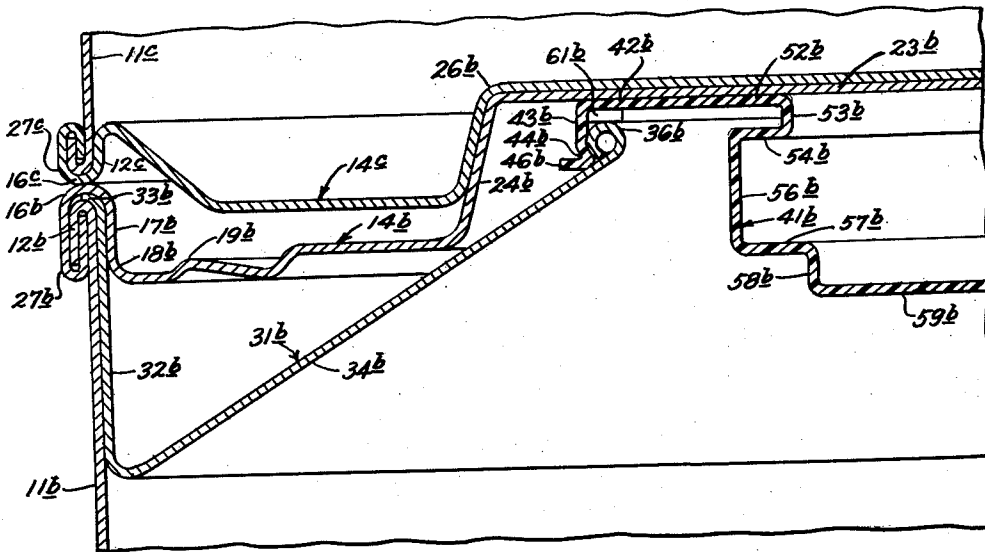


Fig. 3.

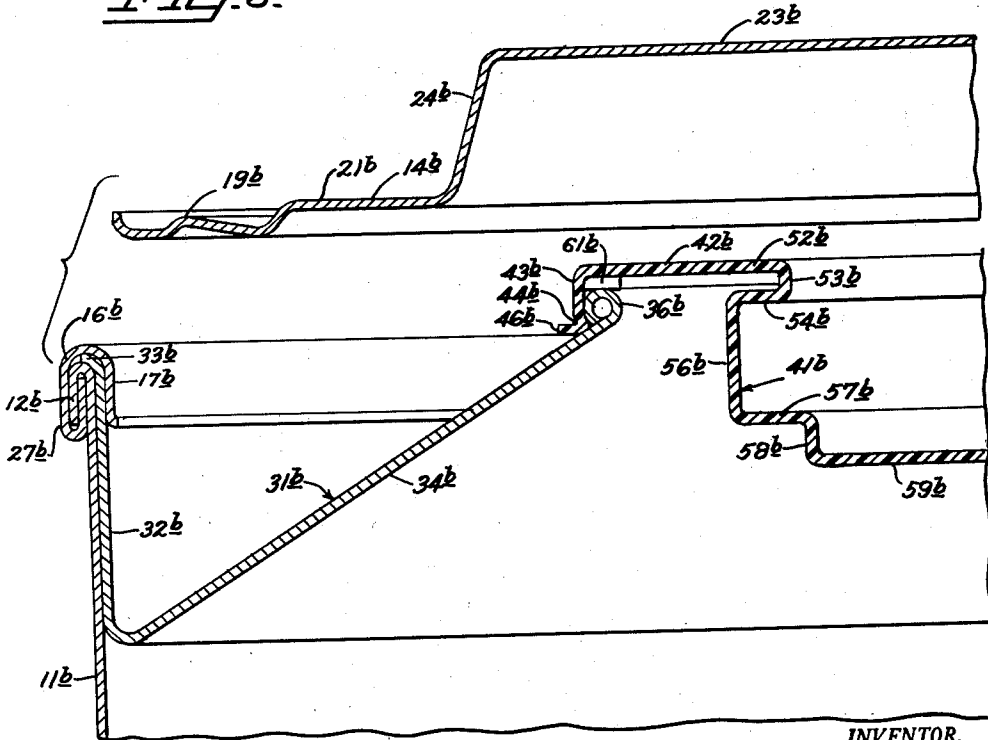


Fig. 4.

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This invention relates to a new and improved can with an inner replaceable closure and is characterized by the fact that the can is provided with a collar inside the can end, which collar has a neck sealed with a reclosable cap. A feature of the invention is the fact that an upwardly projecting dome is formed in the center of the top end of the can and the bottom end of the can is formed with a depression having a shape complementary to the upper projection of the upper end. Such complementary construction makes it possible to stack cans on top of each other with the end beads on the top and bottom cans resting on each other, the nesting of the projections and depressions of the top and bottom ends of the cans preventing the stack from shifting or tipping. One feature of the present invention is the fact that the collar heretofore described extends up into the projecting dome or stacking step of the upper end.

Reference is made to co-pending patent applications, Serial No. 43,574 filed July 18, 1960, and Serial No. 84,090 filed January 23, 1961, of which the present application is a continuation in part.

A still further feature of the present invention is the construction of the replaceable cap. It is desirable that such cap snap onto the neck of the collar and be conveniently removed and replaced. For such purpose, it is desirable that the cap be provided with a handle to be gripped by the fingers of the user. The present invention provides an improved integral handle construction and, more particularly, provides a recessed top having an overhanging rim. When the cap is to be removed the user's fingers curl under the rim thereby enabling the user to pull the cap upward. When the cap is to be replaced the user may press downwardly with the fingers either on the overhanging rim or in the central depression in the top.

Prior to original installation of the cap on the collar, the caps may be stacked on top of each other for convenient storage and further to facilitate feeding the caps onto the collars by machinery. A feature of the present invention is the formation of the lift portion with a step which nests into a top opening in the lift portion of the next lowermost cap. In this manner the caps stack on top of each other in a stable arrangement. Further, the caps are slightly spaced apart at their outer peripheries so that a detent may be interposed in the space between the peripheries of the caps to facilitate feeding the caps from a stack one at a time by the use of automatic machinery.

A further principal object of the present invention is to provide a can having an end closed in conventional manner, but which differs from conventional can construction in that, after the end has been removed, a replaceable closure is provided which may be used to reseal the contents as required.

One of the features of the present invention is the provision of a collar located immediately inside the can end so constructed that when the can end is applied and seamed onto the body the collar is secured in place. The collar has an inwardly directed portion which terminates in a curl, bead or hem of a diameter substantially less than the inside diameter of the can body. The curl, bead or hem preferably projects upwardly and outwardly. A flexible plastic cap, or the like, snaps over the curl, bead or hem and thus is removably positioned to protect the contents of the can from the atmosphere.

Still another feature of the invention is the provision of a space between the reclosure cap and the can end,

which space may be used for advertising circulars or premiums, directions for use of the contents of the can, or other purposes. A small package of additive such as a coloring material or flavor may be placed in the space between the cap and the end to be added to the contents of the can by the consumer as desired.

Further, it will be understood that a premium or the like may be inserted in the head space above the reclosure cap and need not be provided with a sanitary wrapping since it is isolated from the contents of the can.

A still further feature of the invention is the fact that a hermetic seal may be achieved between the headspace and the body of the can. Alternatively, communication may be maintained between the two areas so that the entire can may be vacuumized or gassed; on the other hand, only one of these areas may be so treated.

Pressure of the can end at the annular zone where the cap fits onto the collar tends to maintain a seal between the two areas where such seal is desired and, accordingly, this is another feature of the invention.

Still another object of the invention is to provide a can having reclosure means in which the entire interior of the can in contact with the contents may be enameled to prevent raw metal affecting the taste, odor or appearance of the contents.

A particular object and advantage of the invention is the fact that the can end may be severed easily and without leaving ragged, dangerous metal edges. The can may be opened with any known can opener. Even the punch-and-cut blade type can opener operates well with this construction. The angle at which the user holds the blade is not so critical for proper cutting because the shape of the end and the collar direct the blade toward the proper angle. Further, the blade does not tend to go too deep because it contacts the collar and this eliminates one of the principal reasons for ragged edges in the use of punch-and-cut can openers.

A still further advantage of the end construction herein described is the improvement in the end seam achieved by this construction.

A further object of the invention is to provide a container so constructed that when the can end is cut by conventional can opener, upward pressure is exerted on the severed end so that the end is lifted upwardly for easy access and the end may be discarded without danger of cutting the fingers on the sharp edge of the severed end.

Heretofore, various types of reclosure cans have been developed. In many of such constructions the cylindrical wall of the can is opened, as by means of a tear strip opened with a key, and cooperating means provided on the can body and the portion of the body originally above the tear strip and/or the can end itself for reclosure. Such constructions have the disadvantages inherent in key opening cans—such as high cost of manufacture and inconvenience to the consumer in opening the can. They have additional disadvantages in that sealing on reclosure is either ineffective or difficult from an operational standpoint.

In other prior constructions the top of the cylindrical body wall is deformed, as by the rolling of deep beads and the can end likewise deformed by stamping or drawing deep depressions which fit inside and seal against the bead. Thus when the end is cut by a can opener reclosure may be accomplished by pressing the end downwardly until the depression seats against the bead. Such constructions raise serious manufacturing obstacles. Further, because of lack of rigidity of the end, repeated reclosure of the end is not feasible. Another disadvantage of such constructions resides in the fact that the inside diameter of the bead must necessarily be almost as great as the can body diameter, which does not leave much room for the user to pry the end out of the bead and hence further contributes to the inconvenience of use.

Additionally, the exposure of the raw edge of the severed end is a hazard to the fingers of the user.

Other prior constructions employ snap-on or friction outer ends, which prevent hermetic sealing of the can and make sterilization of the contents after sealing impossible.

A still further prior construction employs a ring held in the double seam between the end and body and having a central perforation or aperture in which fits a friction plug-type reclosure cap. Removal of such caps requires use of a prying instrument of some type and is generally time and effort consuming. Further, if a tight seal is to be accomplished, considerable force is required to push the cap into the aperture which necessitates a rugged construction and increases the cost of materials and manufacture. The effectiveness of making an air-tight reclosure seal is also less in this type construction than in that hereinafter described.

Accordingly, the present invention affords important advantages over prior reclosure can constructions without material increase in the cost of construction thereof.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the several views.

In the drawings:

FIG. 1 is a fragmentary, vertical sectional view through the upper end of a can, formed in accordance with the present invention and showing the container in assembled condition.

FIG. 2 is a view similar to FIG. 1, showing the can end severed as by conventional can opener and about to be discarded.

FIG. 3 is a view similar to FIG. 1 of a modification.

FIG. 4 is a view similar to FIG. 3 and showing the can end therein separate.

The present invention is adapted for use with a standard can such as a sanitary can, or it may be adapted for use with other can construction, such as paint cans and other general line cans. A conventional can has a body 11, which is customarily cylindrical in shape and seamed and soldered together in a side seam (not shown). An outwardly directed flange 12 is formed on the top and a similar flange is formed on the bottom of the body. In conventional can construction, the upper end 14 of the can is a disc of sheet metal having a trough 16 formed at the outer periphery and containing sealing compound (not shown). Inwardly of the trough 16 is a vertical seaming chuck wall 17 which in the present instance is of slightly less than conventional diameter to provide space for a collar hereinafter described. The chuck radius 18 at the bottom of wall 17 is somewhat greater than in conventional can ends and a raised annular bead 19 is provided inwardly of radius 18. Large radius 18 and bead 19 tend to spring the severed end upward when it is cut by a can opener. Bead 19 further tends to localize the path of the blade of the can opener and prevent inward movement thereof, thereby improving the operation of the can opener. Further, bead 19 tends to reduce wrinkling of the disc 21 as it is cut and this feature is desirable in that if the end is wrinkled it tends to stick at various points under portion 22 of the can end which remains adhering to the body, which makes removal of the can end difficult at times.

As shown in the accompanying drawings, the shape of the upper can end 14 is different from conventional construction in that an upwardly projecting dome 23 is provided. The upward extending wall 24 or flank of dome 23 is so dimensioned as to nest in the complementary recess 26 in bottom end 14a of super-imposed can 11a.

The construction of the bottom end 14a corresponds in many features to that of the top end 14 and corresponding parts are designated with similar reference numerals followed by the subscript "a."

By means forming no part of the present invention and

well understood in the can manufacturing art, a closing machine is employed to form a double seam sealing the can ends 14, 14a to the body 11, resulting in conventional end beads 27, 27a. Such a conventional closing machine is employed to close the can of the present invention, and a feature of the present invention is the fact that no alteration of such machine is required other than shaping the closing machine chuck to fit the can end 14 or 14a. It will be noted that the elevation of the dome 23 is greater than that of the bead 27 on the outer periphery of the can in the assembled position as shown in FIG. 1.

As shown in the accompanying drawings, the bottom bead 27a of the super-imposed upper can 11a rests on the top bead 27 of the lower can 11 and the dome 23 of the lower can fits into the recess 26 in the bottom of the super-imposed can. Nesting facilitates stacking of the cans on end, a feature which is particularly important in displays and in storage.

The present invention employs a collar 31 inside the upper end of the can and secured thereto. In the form shown in the accompanying drawings, collar 31 has a vertical side wall 32 having a diameter to fit inside the can body with a friction fit. The depth of the side wall 32 is sufficient so that the collar is not severed when the upper can end 14 is removed by a conventional can opener. The upper end of the side wall 32 is formed with an outwardly directed flange 33 which is similar in shape but of lesser width than flange 12. Thus flange 33 rests on top of flange 12 and prevents collar 31 from being pushed downwardly into the can body. When end 14 is double-seamed onto body 11 collar 31 is permanently secured to body 11. It will be understood that other means may be employed to secure the collar to the wall, one such means being shown in FIGS. 5 to 7 of co-pending application Serial No. 43,574.

Collar 31 has a breast 34 slanting upwardly-inwardly from the bottom of wall 32 projecting into dome 23 or stacking step of upper end 14 and terminating in an outwardly rolled bead 36 which is spaced slightly downwardly from the underside of dome 23. It will be understood that the neck 37 of collar 31 may terminate in a curl, head or hem and the term "bead" is used herein to include all such constructions. Preferably, bead 36 projects upwardly and outwardly since in such construction there is no possibility of a raw edge of the metal coming in contact with the contents of the can, which might affect the color, odor or taste of the contents deleteriously.

Collar 31 receives a reclosure cap 41 which in the preferred embodiment of the invention is preferably formed of a relatively flexible inexpensive plastic material, such as high impact polystyrene. Reclosure cap 41 fits over neck 37 and may be constructed to seal the contents of the can both before and after the can end has been removed. For such purpose, cap 41 is formed with a horizontal shoulder 42, the underside of which rests upon the top of bead 36. Outwardly of shoulder 42 is a short vertical skirt 43 having a plurality of circumferentially spaced, inwardly-directed nibs 44 which engage under the outside of bead 36 to secure the cap in place. By reason of the nature of the plastic material of which the cap is made, however, when the cap is pulled upward nibs 44 spring outwardly far enough to enable the cap to be removed. The bottom edge of skirt 43 terminates in an outwardly directed terminus 46.

A particular feature of the present invention is the provision of a lifting handle, but it will be understood that means other than that disclosed in the present invention may be employed such as various forms of lifting means shown in co-pending patent applications, Serial No. 43,574 and Serial No. 84,090. In the form shown in the accompanying drawings, shoulder 42 merges with a horizontal annular rim 52 of a lesser diameter than that of shoulder 42. The inner edge of rim 52 is formed with a reverse bend 53 and a short distance below rim 52 is

an outwardly directed horizontal top wall 54 which terminates in a substantially vertical outer wall 56 having a diameter slightly less than the inside diameter of neck 37. At the bottom of vertical wall 56 is a step 57 which extends substantially horizontally inwardly and merges into a vertical riser 58 which, in turn, merges into a substantially horizontal bottom 59 at an elevation slightly below that of step 57.

It will be noted that rim 52 overhangs outer wall 56 and is reinforced by top wall 54. This enables the user to pry the cap off neck 37 by curling the fingers under the reinforced rim 52 and pulling upwardly until the cap flexes sufficiently to escape from bead 36. The cap is replaced by pressing downwardly on rim 52, or on step 57, or bottom 59, until the cap snaps onto the neck.

The cap construction heretofore described has certain advantages in that the lifting means for the cap does not diminish substantially the effective volume of the container available for packing contents. Expressed in other terms, the cap construction heretofore described enables a given volume of contents to be packed in a shorter container, thereby decreasing cost.

Other features of the invention are likewise apparent. The location of bead 36 in proximity to the underside of dome 23 reinforces the dome and also prevents the dome from concaving inwardly, particularly when the contents are packed under vacuum. Another feature of the construction is that by locating neck 37 inside the dome a smaller diameter neck results and this reduces the size of the reclosure cap 41 and decreases the quantity of plastic material required to form the cap. On the other hand, the cost of collar 31 is not ordinarily increased because if the collar is formed by punching out a ring of metal the outside diameter of the ring remains constant regardless of the size of neck 37 and the circle punched from the center of the ring is waste material.

The construction of cap 41 is of particular importance in handling the cap, particularly in connection with automatic machinery for feeding the caps in the assembly of the containers. Thus, when the caps are stacked on top of each other, bottom 59 of one cap fits within bead 53 of the cap underneath and step 57 rests upon rim 52. This results in a stable stack which is easily handled. Further, the peripheries are spaced apart vertically so that a detent of a feeding device may enter between consecutive caps to facilitate feeding the caps from the stack one at a time.

Nibs 61 may be formed on the surface of the underside of shoulder 42 which contact bead 36 for the purpose of easier removal and reclosure of the cap. Also, such nibs 61 or other means may function as vents so that air may be evacuated from the headspace between cap 41 and collar 31 and end 14 when the can body 11 is evacuated in packing such products as coffee under vacuum.

The can may be filled at either end, i.e., the cap 41 and end 14 applied either at the factory or cannery. Where the can is to be filled at the top the bottom end 14a is sealed onto the bottom of the can body in conventional manner at the can factory. Collar 31 is slipped onto the upper end of can body 11 and is held in place by friction. At the cannery or other location where the can is to be filled, the contents are filled through neck 37 and cap 41 applied, snapping into place over bead 36. Alternatively, the contents of the can may be filled first and then collar 31 and cap 41 applied. Advertising circulars, premiums, directions, or small packages of additives may be placed on top of collar 31 and closure cap 41. Cap 41 prevents such materials from coming in contact with the contents of the can prior to consumption. Thereafter, the upper end 14 is sealed onto the can body by conventional machinery, the seaming of the upper end locking collar 31 permanently in place.

As an alternate, where the can is to be filled at the bottom, collar 31, cap 41 and end 14 may be applied at the can factory. In such case the can is filled through the

open bottom end and bottom end 14a is applied by conventional closing machine at the cannery. If the contents of the can are to be filled under vacuum, the headspace above collar 31 is evacuated at the same time that the main body of the can is evacuated.

Where the containers are displayed at point of sale, they may be stacked end to end. At the destination, the consumer cuts off disc 21 of upper end 14 with a can opener in conventional manner. The depth of side wall 32 is such that the blade of the can opener does not sever the collar. In the form of the invention shown in FIG. 1, there is upward pressure exerted by the compression of rim 52 and this upward pressure tends to lift disc 21. Thus when the end is severed, disc 21 is lifted upwardly where it can be conveniently removed without danger of the fingers being cut by the sharp edge. The depressed radius 18 and raised bead 19 tend to locate the blade of the can opener in proper position, namely, at the bottom of the radius 18, and to prevent the blade from being displaced from such position as it traverses the can. Thus the angle at which the user holds the blade is not critical. Such positioning of the blade is particularly important where the "punch-and-lift" blade-type can opener is used. Further, the collar 31 is located in such position that it is not normally contacted by the can opener blade. However, if it is so contacted, the collar tends to prevent the blade from penetrating downwardly too deeply and puncturing the collar. The shape of the end 14 improves the seam which can be attained.

It will further be seen that there is a trough at the juncture of the wall 32 and slanted stretch 34 of the collar in which particles of metal which may be dislodged when the end is cut collect and which are thereby prevented from falling into the contents of the can.

A modified construction is illustrated in FIGS. 3 and 4. It will be noted that the diameter of vertical outer wall 56b is considerably less than the corresponding dimension of FIG. 1. Thus in FIG. 1 the lift hole may be of the order of 3/4" or larger, whereas in FIG. 3 the hole has 3/4" to 1 1/2" diameter for an opening of neck 37b of about 3/4". This feature is of considerable importance in that the volumetric capacity of the can is increased because, all other dimensions being held constant, more contents may be packed inside the container. In other respects the constructions of FIGS. 1 and 3 are similar and corresponding parts in FIGS. 3 and 4 have been assigned the same reference numerals, followed by the subscript b.

Although the foregoing invention has been described in some detail, by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be practiced within the spirit of the invention and scope of the appended claims.

What is claimed is:

1. A container construction comprising a body, an end seamed on said body and formed with an upwardly bulging dome, a collar having a wall fitting inside the upper end of said body, means cooperating with said end and body to retain said collar in said body, an upwardly-inwardly extending breast extending up into said dome, and a neck on the upper end of said breast within said dome, and a cap having an annular flange resting on said neck and interposed between said neck and said end, cooperating means for detachably holding said cap on said neck, said cooperating means including a skirt radially outwardly of the neck and having radially inwardly projecting nibs for snap-fitting engagement with the neck, and lift means for lifting said cap off said neck.

2. A construction according to claim 1, in which said lift means comprises a rim extending substantially horizontally-inwardly from said second cooperating means and positioned to enable the fingers of the user to curl under said rim to pry said cap away from said collar.

3. A construction according to claim 1, in which said

lift means is formed with a central depression under said dome and which further comprises a rim projecting inward to partially overhang said depression to enable the fingers of the user to curl under said rim to pry said cap off said collar.

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