

Sept. 22, 1964

A. P. SCHOLTZ
SECONDARY CLOSURE

3,149,743

Filed Jan. 23, 1961

3 Sheets-Sheet 1

Fig. 1.

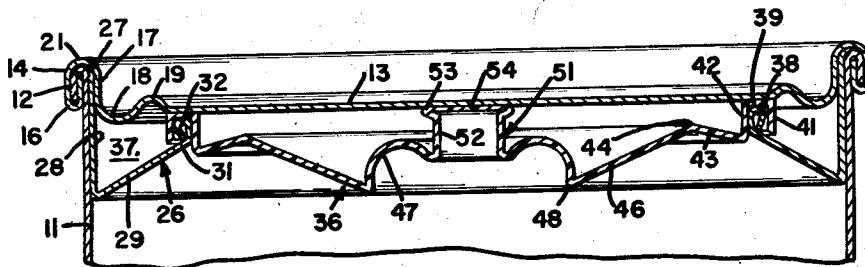
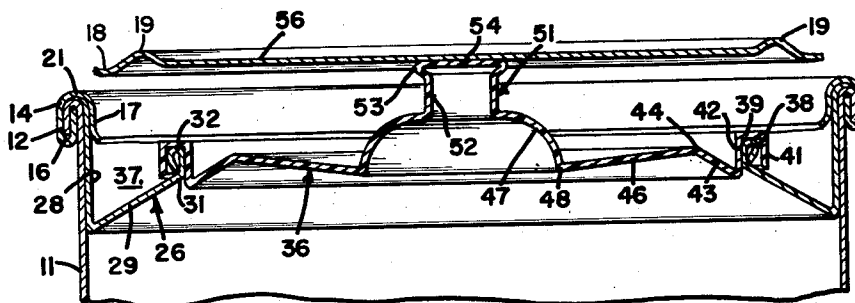


Fig. 2.



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Fig. 3.

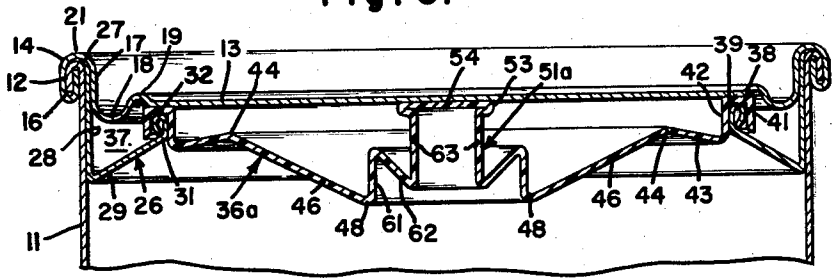
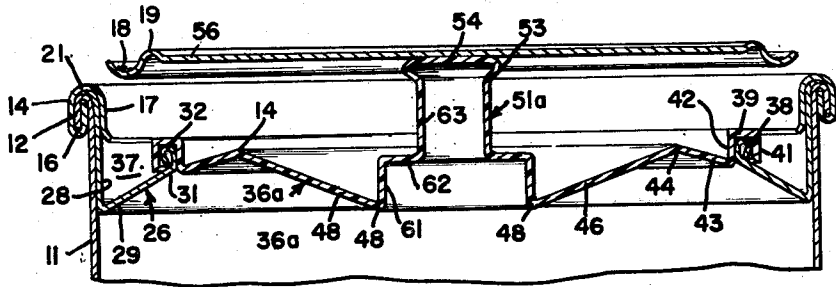


Fig. 4.



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Fig. 5.

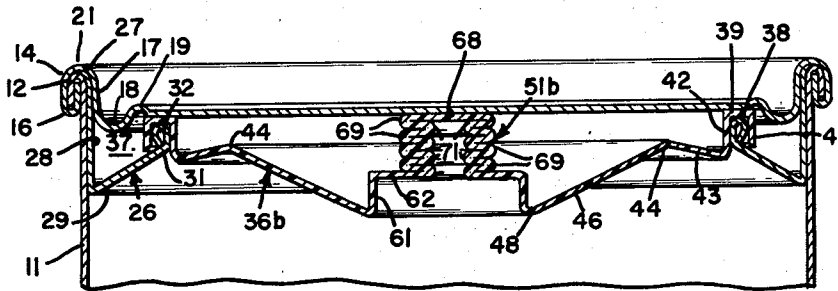
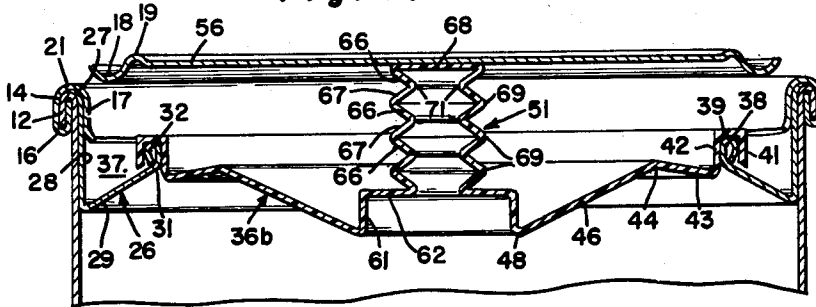


Fig. 6.



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SECONDARY CLOSURE

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5 Claims. (Cl. 220-29)

This invention relates to a new and improved can construction where there is provided a resilient reclosure cap having a lift knob which engages a collar fixed to the can body preferably at the end seam. A can end is applied and sealed to the body in conventional manner, this action causing the lift knob to be compressed and the cap itself to be deformed. When the can end is removed in usual fashion by a can opener, the compressive force theretofore applied to the knob by the can end is removed, allowing the lift knob to rise to its original shape where it is readily accessible to the user.

Accordingly, it is a principal feature of the present invention to provide a reclosure can construction wherein a flexible reclosure cap is compressed by the can end and which provides, after the end has been removed, a convenient and readily accessible means for lifting the cap.

Still another feature of the invention is the fact that the resiliency of the cap and lift knob exerts an upward force on the can end. Such force prevents distortion of the end by maintaining a steady pressure thereon at a number of localities spaced from each other.

A still further feature of the invention is the fact that when the can end is cut by a can opener blade, the pressure exerted by cap and knob tend to lift the end so that it may be removed without danger of cutting the fingers of the user. This feature of the invention is of particular advantage where can openers of the non-magnetic type are used.

Accordingly, the principal object of the present invention is to provide a can having an end closed in a conventional manner, but which differs from such 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 sealed 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.

A further feature of the invention is the formation of an integral lifting knob on the cap. The construction of the cap, and particularly the knob and flexible nature of the cap facilitates removal and replacement of the cap. The knob may project upwardly from a depression in the center of the cap to enhance the natural flexibility of the plastic material of which the cap is constructed so that it snaps on to the bead of the collar and may be removed therefrom, but sufficient tension is imparted to the cap so that the contents are sealed by the cap gripping the bead of the collar.

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

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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.

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 cap requires use of a prying instrument of some type and is generally time and effort consuming. Further, if a tight seal is to

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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 a can constructed in accordance with the present invention showing the parts in assembled position prior to removal of the can end.

FIG. 2 is a view similar to FIG. 1 showing the can end cut by a can opener and showing the cap expanded to normal position.

FIGS. 3 and 4 are views similar to FIGS. 1 and 2, respectively, of a modification.

FIGS. 5 and 6 are views similar respectively to FIGS. 1 and 2 of a further modification.

As herein illustrated, there is provided a cylindrical can body 11 having a side seam (not shown) and having at its upper end an outward flared flange 12. The lower end of the can is closed in conventional manner by an end (not shown). The upper end is closed by a can end 13 having at its periphery an inverted trough 14 normally filled with sealing compound (not shown) which initially fits over the flange 12 and is then double seamed thereto by a can closing machine to form end bead 16, as well understood in the can manufacturing art. End 13 has a short, downward extending wall 17 which fits inside the wall of body 11 and, in accordance with the present invention, has a depression or ring 18 immediately inside wall 17 which merges into an upwardly curved bead 19 spaced inwardly from wall 17. Inwardly of bead 19 the end is preferably formed in a flat disk which is depressed slightly from the level of the upper edge 21 of the end bead.

In accordance with the present invention, there is provided an annular collar 26 which may be attached to the can by various means. A preferred form shown in the drawings and described herein has a flange 27 around the periphery which extends outwardly and which fits between flange 16 and trough 14 so that when end 13 is double seamed onto body 11 the collar 26 is locked in place. Inwardly of body 11 is a cylindrical wall 28 fitting immediately inside the upper end of the can body and having a sufficient depth so that when a can opener blade is used to cut end 13 the blade does not penetrate collar 26. From the lower end of wall 28, collar slants upwardly-inwardly in a stretch 29 which terminates in a neck 31 which is rounded off along its edge in an outwardly turned bead 32, curl or hem. The term "bead" is used throughout this specification to include hems and curls. The foregoing described shape of the end 13 and collar 26 has certain advantages in the opening of the can and permits use of a variety of can openers without likelihood of leaving a ragged edge. The depressed ring 18 and raised bead 19 tend to locate the blade of the can opener in proper position, namely, at the bottom of the ring 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 26 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 punc-

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turing the collar. Further, by reason of the slant of surface 29 the blade is directed toward the outside of the can and thus directed away from the plastic cap 36 which is more readily injured than the collar 26. The shape of the end 13 improves the seam which can be attained.

It will further be seen that there is a trough 37 at the juncture of the wall 28 and slanted stretch 29 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 feature of the foregoing construction is that all metal parts may be inside enameled so that bare metal does not come in contact with the contents. There is provided a plastic cap 36 for reclosure which is initially compressed inside the can (FIG. 1) and which is released when end 13 is cut by can opener (FIG. 2). The cap 36 is preferably formed of a resilient plastic material such as polyethylene.

Cap 36 engages the bead 32 on collar 26 and serves as a reclosure cap for the contents of the container. In the accompanying drawings various shapes of caps are illustrated. In all of the shapes illustrated essentially the same means is provided for attaching the cap to the collar, but it will be understood that there may be wide variations in such means of attachment.

Cap 36 may thus be formed with a peripheral downwardly facing channel 38 which snaps over the bead 32. Thus there is provided a horizontal ledge 39 fitting over the top of bead 32 and an outer short skirt 41 fitting around the outside of the bead and a short wall 42 fitting inside the neck 31. Where an airtight seal is desired, the fit of the various surfaces of channel 38 against the bead 32 may be fairly tight. However, where it is desired to vacuumize or gas, both the space above and below the cap 36, means may be provided to maintain a channel of communication between the head space above the cap and the interior of the body. This is particularly desirable where gas packing or vacuum packing is used, or where a hermetic seal is not desired for other reasons. Another feature of the invention is apparent from FIG. 1, where it is seen that the ledge 39 fits relatively snugly against the underside of end 13 and this restrains any tendency of the end 13 to curve inwardly. On the other hand, end 13 exerts pressure on ledge 39 of the end 13 to curve inwardly to prevent leakage.

Considerable flexibility is desirable in the cap 36 herein illustrated because of the fact that it is compressed. For such purpose the top of the cap inwardly of channel 38 may be formed of slanted, although relatively horizontal, surfaces. The surface 43 immediately inside wall 42 slants upwardly-inwardly and merges at juncture 44 with a downwardly-inwardly slanted surface 46. Near the center of the cap is an annular yieldable section, such as a bell-shaped protuberance 47 which merges at juncture 48 with the inner edge of surface 46. Projecting upwardly from bell 47 is lift knob 57 having a vertical wall 52, an outwardly projecting bead 53 at the upper end and a top 54. This shape is conveniently grasped by the fingers of the user and yet may be molded without the use of a split cavity.

In the compressed form the cap 36 shown in FIG. 1, the knob 51 is pressed downwardly by the center of end 13 and this causes a downward distortion of the bell 47, as illustrated. Furthermore, surface 46 hinges at juncture 44 and hence slants downwardly at a greater angle. The compression of cap 36 exerts an upward force on the center of the end 13 immediately above knob 51.

When the end 13 is cut, bell 47 resumes its normal position and surface 46 hinges upwardly so that the edge 48 at the bottom of the bell is substantially higher in FIG. 2 than in FIG. 1. Release of the compressive forces on the cap results in lifting of the severed disk 56 of the end 13 up where it is readily accessible for removal. Further, the lift knob 51 is quite high, extending in fact above

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the top edge 21 of the can and thus is readily accessible when the user wishes to grip the knob to remove the cap or to replace the cap.

Cap 36 may be removed and replaced as often as desired and snaps onto the bead 32 so that it is not readily dislodged in case the can is tipped.

The modification of FIGS. 3 and 4 resembles that of FIGS. 1 and 2 in many particulars. Corresponding elements of this modification have been given the same reference numerals as in FIGS. 1 and 2. In the modification of FIGS. 3 and 4 the central portion of the cap 36a adjacent the lift knob 51a has a substantially vertical wall 61 in expanded position of the cap extending upwardly from the juncture 48 with the downwardly-inwardly slanted portion 46 of the cap. Wall 61 has a substantially horizontal shoulder 62 which merges into the vertical wall 63 of the lift knob 51a. In the compressed condition of the cap (FIG. 3), shoulder 62 bends downwardly to a slanted position and at the same time stretch 46 hinges about juncture 44 so that edge 48 in the compressed condition is below the level of the bottom of the wall 61 in expanded position. It will be seen that in the expanded position, after the end 13 has been severed, the lift knob 51a has been elevated above the top edge 21 of the can and in rising to this position lifts the severed disk 56 of the end to a position where it is conveniently accessible.

The modification of FIGS. 5 and 6 is also generally similar to that of FIGS. 1 and 2, except that the compression of the cap 36b is accomplished by forming the lift knob 51b in corrugated form. When the cap 36b is compressed, knob 51b compresses like a bellows, as shown in FIG. 5. Sufficient flexibility in the knob 51b makes it unnecessary for the cap to hinge at juncture 44, although a combination of both movements may be combined if desired. In the form of the invention shown in FIGS. 5 and 6, corresponding reference numerals are used where the parts are identical or substantially identical with that shown in FIGS. 1 to 4, inclusive. The lift knob 51b comprises a series of adjacent outwardly and inwardly slanted surfaces 66, 67 terminating in a top 68. When the can end 13 is applied the junctures 69, 71 of the outwardly and inwardly directed surfaces 66, 67 serve as hinges allowing the knob to compress as shown in FIG. 5. When the end is severed the knob expands to the position shown in FIG. 6.

I claim:

1. In a reclosure can construction, a body, an end sealed to said body, said can end having means below the top of the seam for defining an area of cut for a can opener, a collar having an annular wall the outer surface of which fits snugly in the body at the upper end thereof, the uppermost part of said annular wall of the collar bearing against the can end at the seam, said annular wall of the collar terminating below the top of the seam and above the defining area of cut of the can end, said collar having an enlarged opening for access to the interior of said can, a resilient cap for said opening, the cap being supported at its periphery by the collar, and cooperating means on said collar and cap for detachably retaining said cap on said collar; said cap being formed with a lift knob and said cap immediately surrounding said knob being formed with an annular section yieldable so that said knob is downwardly compressible, and when said end is in place said end displacing said knob below its normal level with respect to the part of the cap that is supported by said collar so that when said end is severed said knob rises above the level at which it was held by said end, for convenient access to said knob to facilitate manual removal of said cap from said collar, said cap being formed between said means and said annular yieldable section in angularly related annular stretches and said cap is flexible at the juncture of said stretches whereby said cap may flex downwardly at said juncture to augment the compressibility of said knob.

2. In a reclosure can construction, a body, an end

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sealed to said body, said can end having means below the top of the seam for defining an area of cut for a can opener, a collar having an annular wall the outer surface of which fits snugly in the body at the upper end thereof, the uppermost part of said annular wall of the collar bearing against the can end at the seam, said annular wall of the collar terminating below the top of the seam and above the defining area of cut of the can end, said collar having an enlarged opening for access to the interior of said can, a resilient cap for said opening, the cap being supported at its periphery by the collar, and cooperating means on said collar and cap for detachably retaining said cap on said collar; said cap being formed with a lift knob and said cap immediately surrounding said knob being formed with an annular section yieldable so that said knob is downwardly compressible, and when said end is in place said end displacing said knob below its normal level with respect to the part of the cap that is supported by said collar so that when said end is severed said knob rises above the level at which it was held by said end, for convenient access to said knob to facilitate manual removal of said cap from said collar, said annular yieldable section being formed in a bell shape and said knob projecting upward from said bell shape.

3. In a reclosure can construction, a body, an end sealed to said body, said can end having means below the top of the seam for defining an area of cut for a can opener, a collar having an annular wall the outer surface of which fits snugly in the body at the upper end thereof, the uppermost part of said annular wall of the collar bearing against the can end at the seam, said annular wall of the collar terminating below the top of the seam and above the defining area of cut of the can end, said collar having an enlarged opening for access to the interior of said can, a resilient cap for said opening, the cap being supported at its periphery by the collar, and cooperating means on said collar and cap for detachably retaining said cap on said collar; said cap being formed with a lift knob and said cap immediately surrounding said knob being formed with an annular section yieldable so that said knob is downwardly compressible, and when said end is in place said end displacing said knob below its normal level with respect to the part of the cap that is supported by said collar so that when said end is severed said knob rises above the level at which it was held by said end, for convenient access to said knob to facilitate manual removal of said cap from said collar, said annular yieldable section being formed by a short upward extending wall and a substantially horizontal shoulder inward of said wall and said knob projects upward from said shoulder.

4. A can construction according to claim 3 in which said knob is formed with a plurality of accordion pleats.

5. In a reclosure can construction, a body, an end sealed to said body, said can end having means below the top of the seam for defining an area of cut for a can opener, a collar having an annular wall the outer surface of which fits snugly in the body at the upper end thereof, the uppermost part of said annular wall of the collar bearing against the can end at the seam, said annular wall of the collar terminating below the top of the seam and above the defining area of cut of the can end, said collar having an enlarged opening for access to the interior of said can, a resilient cap for said opening, the cap being supported at its periphery by the collar, and cooperating means on said collar and cap for detachably retaining said cap on said collar; said cap being formed with a lift knob and said cap immediately surrounding said knob being formed with an annular section yieldable so that said knob is downwardly compressible, and when said end is in place said end displacing said knob below its normal level with respect to the part of the cap that is supported by said collar so that when said end is severed said knob rises above the level at which it was held by said end, for convenient access to said knob to facilitate manual removal of said cap from said collar,

said knob being formed with a plurality of accordian
pleats.

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