

Feb. 7, 1950

W. TOMARIN
CAN BODY CONSTRUCTION

2,496,568

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2 Sheets-Sheet 1

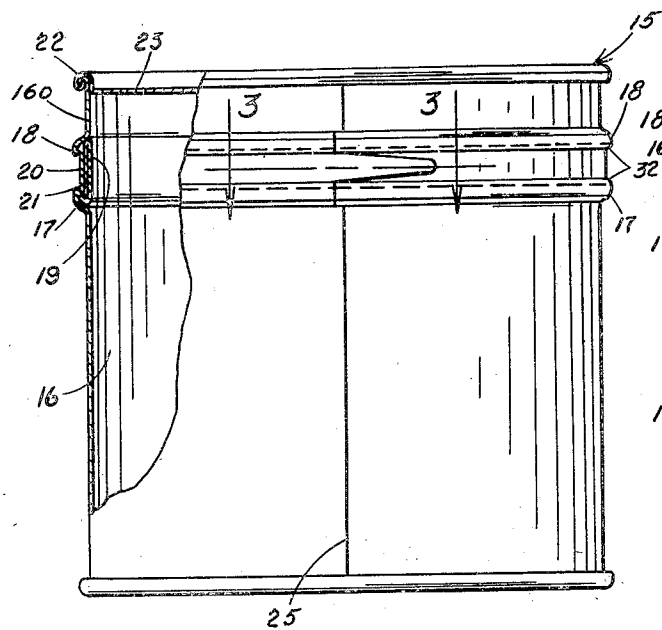


Fig. 1

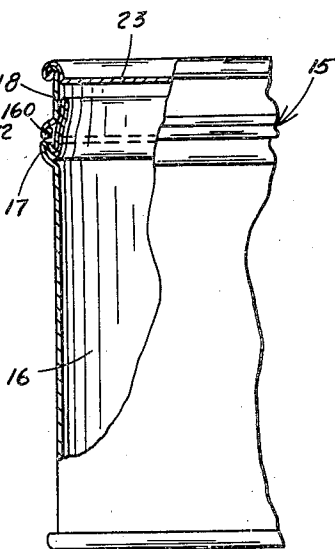


Fig. 2

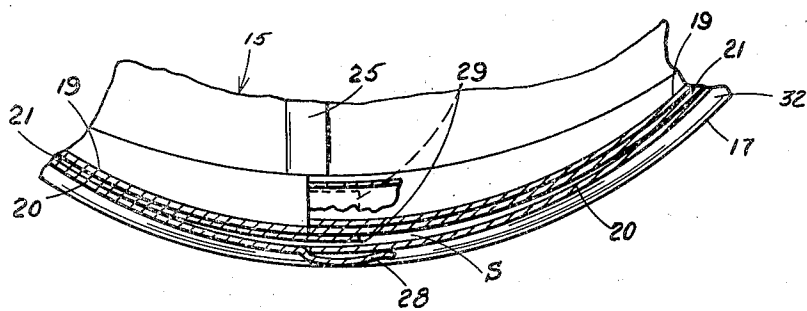


Fig. 3

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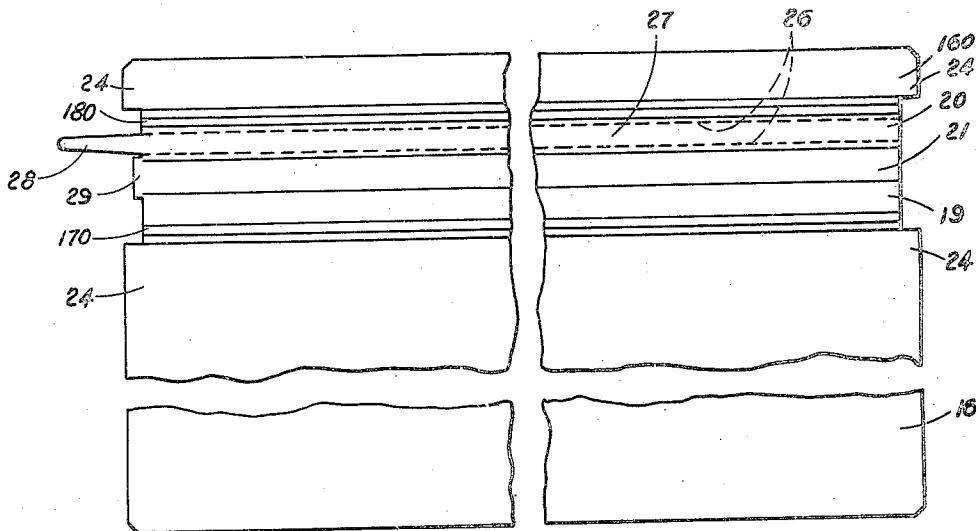


Fig. 4

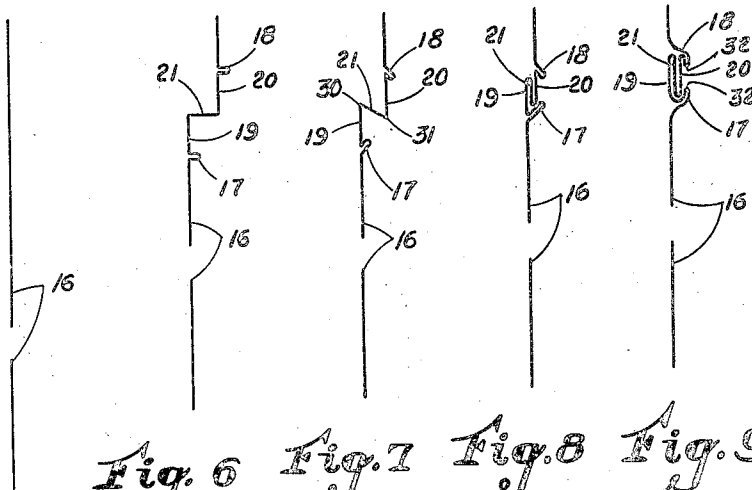


Fig. 5 Fig. 6 Fig. 7 Fig. 8 Fig. 9

Fig. 5

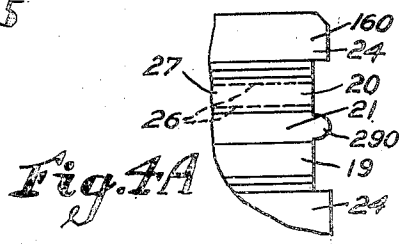


Fig. 4A

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UNITED STATES PATENT OFFICE

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CAN BODY CONSTRUCTION

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9 Claims. (Cl. 220—54)

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The present invention relates to can bodies for hermetically sealed, reclosable containers, particularly of the type which are initially openable by removal of a tear strip with the aid of a winding key.

An object of the invention is to provide a one-piece body for cans or containers of this type, which body includes the cylindrical wall of the container and of the cover together with the so-called collar portion and tear strip.

Another object of the invention is to provide a container body of this character which is strong, neat and attractive appearing, and subject to effective reclosure after the removal of the hermetic seal.

Still another object of the invention is to provide a one-piece construction of blanked and formed metal, using a minimum of so-called shrinkage metal to provide on the finished seamed can body a pair of circumferential, parallel, external beads or shoulders behind and between which are disposed a tear strip panel and a reenforced integral collar for the ultimately reclosable container.

Still other objects of the invention are to provide a container of the class described wherein the inside wall surface is smooth and straight from the bottom to the top and which, when separated forms a reusable container and an externally fitting slidable cover, both of which are free of raw metal edges which are characteristic of heretofore known containers of this general type.

The invention has as further objects the provision of a container of this kind which is economical of manufacture and adapted for a hermetically sealed and vacuumized closure for various products of fluid, plastic or powdered forms.

These and other important objects are attained by the means described herein and exemplified in the accompanying drawings in which:

Fig. 1 is a side elevational view of hermetically sealed container embodying the invention, part being broken away and part being shown in cross-section.

Fig. 2 is a fragmental elevational view of the container of the invention in a closed position after the removal of the hermetic seal, part being shown in cross-section.

Fig. 3 is an enlarged, fragmental, perspective view showing a section of the container of Fig. 1 taken on line 3—3 thereof.

Fig. 4 is a plan view showing a can body blank,

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with parts broken away, forming a detail of the invention.

Fig. 4a is a fragmental plan view of a modified form of body having on the right-hand side thereof an alternative form and location of a tongue or tab forming a detail of the invention.

Fig. 5 is a diagrammatic edge view of the blank shown in Fig. 4.

Figs. 6, 7, 8 and 9 are diagrammatic edge views of the can body blank at successive stages of the forming operation.

Heretofore hermetically sealed, metal containers provided with tear strips and adapted for a so-called vacuumizing process have been subject to objections as to safety in handling and to the effectiveness of the reclosure after the removal of the seal. Almost invariably the covers of heretofore known containers of this class have been poorly fitting and both the container and the cover have rough, raw metal edges produced thereon by the removal of the tear strip. The heretofore known and used containers of this kind have a separately formed and applied ring or collar designed to function as a flange for slidably receiving the cover after the seal is broken, but these separately made collars are usually structurally weak and insecurely attached and they become loose or separated at the time the tear strip is removed and thus make reclosure of the container unsatisfactory. The heretofore used containers embodying separately formed and attached collars provide an interiorly irregular surface of the container so that substances like fats and shortenings can not be removed in a cleanly, thorough fashion and so that fluid substances such as paints and the like can not be properly or completely poured and drained therefrom.

By the means of the present invention the use of a separately formed collar is eliminated along with the considerable amount of the operational cost involved in making them. The interior wall of the container embodying the present invention is smooth and substantially straight from the bottom of the container to the top of the cover. The removal of the tear strip in order to break the hermetic seal is effected in the conventional manner by the tear strip panel, and the external beads or shoulders on the body are so related that the heretofore unavoidable raw edges on the container and cover are smoothed outwardly against the inside of the beads and the dangerous raw edges are eliminated in the operation of initially opening the sealed container.

Referring now to the drawings, the completed container 15 has an integral side wall or can body wall 16 which is comprised of external shoulder beads 17 and 18 spaced apart by three superposed thicknesses of metal, namely an interior strip 19 which lies in the plane of the wall 16, a tear strip panel 20 on the outside of the container immediately behind and between beads 17 and 18, and an intermediate strip 21. The section or portion of metal 160 disposed above bead 18 is calculated to ultimately comprise the depth of the circular wall of the cover for the can and is inclusive of the necessary metal for forming part of the top seam 22 which joins the head or top disc 23 of the container.

It will be noted that the intermediate section of metal of the can body is formed and folded upon itself in a manner hereinafter more fully described which provides in the completed sealed container a very strong reinforcing band or section constituted by beads 17 and 18 and the metal between them. It will also be pointed out that this rigidity and structural strength is not materially reduced when the hermetic seal is broken and the integral body 16 becomes divided into a container body and a cover body which slidably fits over the mouth of the container until the shoulders 17 and 18 are brought into abutment.

A comparison of Figs. 1 and 2 will readily disclose that after removal of the tear strip panel these shoulders 17 and 18 approach each other and can now abut one with the other so that the height of the unsealed and reclosed container is decreased by approximately (but not quite) the width of the tear strip which was removed. It will be noted that at this point, and hereinafter explained that the circular wall portion 160 attached to the top disc 23 and the wall 16 of the container initially lie in a common plane when the sealed container is complete, but are snugly slidable one over the other for the purpose of reclosure after the tear strip is removed.

Reference is now made to Fig. 4 showing the can body blank from which the foregoing structure is derived. The portions or panels 19 and 20 are of a length which equals the circumference of the container to be made from the blank. The main body portion 16 below and the portion or strip 160 above this group of panels are slightly longer at each end to provide end marginal portions 24 which are ultimately folded, interlocked and soldered to form the can body seam 25 in conventional manner and by any approved method. Below the collar strip 19 and above the tear strip panel 20 are very narrow sections 170 and 180 which, in course of folding, forming and rolling are turned in the center to form double thicknesses of metal to form the shoulders 17 and 18 respectively. The tear strip panel 20 is scored in known manner slightly inwardly of its upper and lower boundaries as shown in dotted lines at 26 (see Fig. 4). The intermediate metal constituting the actual removable tear strip 27 is extended an appreciable distance at one end to form a key tab 28. The panel 21 which lies intermediate panels 19 and 20 (see Figs. 1, 4 and 9) is slightly extended, preferably on a common end with the tab 28 to form an overlapped lug 29 which, it should be noted, is actually slightly wider than panel 21. The can body blanks are stamped from sheet metal stock of the customary light gauge metal employed in producing the well-known vacuumized containers and have the outline defined in full lines in Fig. 4. This is schematically represented in end edge elevation by a

single line in Fig. 5. The blank is then subjected to the action of a compound metal brake which folds panels 170 and 180 respectively upon themselves in the direction of their width and at the same time offsets the metal from the bottom of tear strip panel 20 upwardly with relation to the panel 19, thus leaving the intermediate panel 21 at right angles to panels 19 and 20. By progressively rolling and forming the metal and reducing the angularity between the panels, panel 21 is folded to superposed relation with panel 19 with the connecting bend at the top as at 30 while the panels 20 and 21 are connected at the bottom as at 31. The bead folds 17 and 18 are initially bent so slightly as to permit panels 19, 20 and 21 to assume substantial superposition whereupon said bead folds 17 and 18 are compressed on the outside of tear strip panel 20. The edges 32 of shoulder beads 17 and 18 now conceal the score lines 26—26 in the tear strip panel. The compound fold, just described, is rolled to a substantially flattened, compressed condition as shown schematically in Fig. 9 and in cross-section in Fig. 1, with the tapered key tab 28 of the tear strip fully exposed and projecting beyond the end of the beads. The can bodies thus formed are now submitted to a bending and clamping mechanism. Here the left-hand end of panel 19 is brought into abutment with the squared-off, right-hand end of panel 21 and the lug 29 on the left-hand end of panel 21 overlaps behind the abutting joint of the panels (see Fig. 3). The opposite ends of bead 17 and of bead 18 respectively are brought into abutment at the same time, and the ends of tear strip panel 20 are brought together with the narrow tapered tab 28 overlapping and accessibly exposed on the outside of the cylinder. Due to the interposed, non-abutting lug 29 alone, or with the aid of compensating formation in the lock seaming hammer and its mandrel (not shown) a slight separation S occurs for a short distance on either side of the seam between the inner face of the tear strip and the remainder of the integral collar which is constituted by panels 19 and 20. Prior to the operation of the lock seamer, and while the parts are retained in the position just described, the end marginal portions 24 completely overlap one another ready for the lock seaming stroke and flattening of the conventional lock seam 25.

The lock seam is now ready for the soldering or sealing operation in conventional manner. It is to be noted at this point however that the solder follows the innermost exposed edge of panel 19 as it flows along the lock seam 25 above and below the formed circumferential panel section. The solder may thus run fully into the abutment joint at the ends of panels 19 and 21 but the solder is precluded from flowing further to the outside of the can by reason of the overlap occasioned by lug 29. Thus the tear strip panel can not become soldered to the adjacent face of collar forming panel 21. It will also be noted that the actual circumference of the collar has been slightly reduced due to the separation thereof from the tear strip, this reduction occurring within a narrow space in the vicinity of the lock seam 25.

Once the tear strip 27 has been severed from the completed can body, the cover flange portion 160 bound on its free edge by shoulder bead 18 becomes entirely free of the remainder of the can body. The container is now adapted for reclosure, and by reason of the slight reduction of

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the circumference of the collar 19-21, and due to the rigidity of the bead on the cover, the mere forcing together of the cover and collar will equalize and distribute the reduction throughout the circumference of the collar and allow the cover to snugly fit and be easily slid over the collar. It will be appreciated that such an exteriorly sliding cover forms a dust tight and a very snug reclosure for the container. It will also be noted that the top edge of the integral collar now exposed is formed of a fold along the boundary line between panels 19 and 21 so that it is entirely smooth and free from danger of cutting the user. It will be further noted that the slight bottom overhang of lug 29 will be carried into this fold and will avoid an abrupt break in the joint where the ends of the collar are brought together in the manner shown in Fig. 3. The slight upper projection of lug 29 which terminates just short of the tear strip tab and is separated therefrom, as will be seen in Fig. 4, extends downwardly and enters behind the fold of bead 17. These portions become solder coated and form a positive closure against any possible needle-point aperture that might otherwise result in the vicinity of the bead. The purpose of this refinement is to assure that every can body so formed and completed by conventional production methods will have a continuous air-tight seam and render the container formed therefrom suitable for a vacuumizing process. In this fashion there is in effect simultaneously attained in the soldering operation the sealing of the lock seam above and below the collar and bead section and also the solder and sealing of the abutting and overlapped joints in the integral collar while the tear strip portion is amply protected against accidental bonding by the solder in a manner which might impair the effectiveness of the tear strip removal operation when the can is to be opened.

As an alternative construction which would be effective for containers wherein a vacuum seal is not imperative but wherein the strength of the joint of the integral container body is to be established, the lug 29 may be omitted and in lieu thereof, on the same or on the opposite end of panel 21, a rounded tongue 290 which is not wider than the panel 21 may be employed (see Fig. 4a). This tongue 290 would be adapted to enter between panels 19 and 21 and be wholly concealed therein. It would serve a comparable function with that of lug 29 (previously described) in that the collar is reinforced and the flow of seam sealing solder would be precluded from reaching the tear strip.

In summary it will be noted that containers embodying the invention provide the unique feature of complete safety edges on all parts before and after breaking hermetic seal, that except for a very small circumferential portion adjacent the seam the inner side wall is flat and continues from the bottom disc to the top disc, and that the slight reduction of the circumference of the collar becomes automatically distributed throughout the circumference when the slip cover is forced onto the container collar. All these desirable features are attained at a minimum cost in manufacturing operations and in metal. It is preferred for all ordinary containers to allot a uniform one-inch section in the can body blank from which are developed the beads, the double thickness container collar and the tear strip and hence the folding operations can be performed on all blanks regardless of the circumference or the height of the container to be made according to the invention.

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This will be a further saving in tools and machinery and allows the production of containers of all sizes to proceed with a uniform width of shrinkage and a substantially identical cost of operation.

The safety-edge hermetically sealed can of the invention is advantageously used in one-gallon sizes or larger as a paint container. Large paint cans with conventional gutter type collars and snap-in type covers sometimes become leaky at the cover after storage in heated atmosphere due to pressures developed by expansion of the volatile content of the paint. Deterioration and/or loss of the paint as experienced in larger containers of conventionally packaged paints is eliminated by the use of my improved can. The strong hermetical seal resists tampering with contents and opening by internal pressures. Once opened the container presents a smooth straight inside wall that has a smooth top edge free of overhang so that the contents may be freely poured and completely drained without difficulty or loss of paint. The painter's brush may be drained of excess paint to the interior of the can and there is no accumulation of paint exteriorly to hinder reclosure by means of the smooth sliding cover with or without the use of an interposed waxed paper sheet to form a tight leak proof reclosure.

The can blank of the invention, when decorated by lithography is left free of coating on all seam forming margins in conventional manner. The bead forming panels 170 and 180 and the metal between them is also left bare and uncoated. The finished lithographed can body thus presents a pleasing and attractive appearance due to the outstanding parallel, bright metal beads 17 and 18 matching the appearance of the seams at the top and bottom of the can.

The cans embodying the invention are desirable as canisters after the seal is removed thus permitting safe handling for repeated dispensing of small amounts of the contents and snug reclosure to preserve the remaining content of the can.

What is claimed is:

1. A cylindrical body for a hermetically sealed, reclosable can, said body having intermediate its top and bottom edges an annular multi-folded section, said section comprising three superposed concentric panels, the intermediate panel being integrally connected at its top with the innermost panel and at its bottom with the outermost panel, and a pair of external narrow folds bent toward each other and respectively overhanging the top and bottom edges of said outermost panel and providing circumferential shoulder beads, said outermost panel having circumferential score lines near its edges and disposed in concealed relation respectively beyond the edges of said shoulder beads, the metal of said outermost panel intermediate said score lines being removable in known fashion as a tear strip effecting a remaining metal edge at the location of the lowermost score line disposed in positively inaccessible relation below the top of the lowermost circumferential bead and intermediate said bead and the intermediate panel.

2. A unitary can body for a hermetically sealed, reclosable sheet metal container provided circumferentially intermediate its top and bottom edges with a multi-folded section, said section comprising spaced apart, narrow folds turned toward each other exteriorly of the body to form shoulder beads, and three concentric, annular panels dis-

posed between and behind said shoulder beads, the intermediate panel being connected integrally along its top with the innermost panel and along its bottom with the outermost panel, said outermost panel having circumferential score lines closely adjacent its upper and lower edges and disposed in concealed relation beyond adjacent edges of the respective shoulder beads whereby removal of the metal intermediate the score lines in known manner serves to smooth the remaining severed edges against the insides of the respective shoulders and to provide an exterior slip cover and a container top having an integral smooth edge collar flange for receiving said cover, the edge of the remaining metal at the lower score line being inaccessibly disposed intermediate the base of said collar and the adjacent shoulder bead and below the top of said shoulder bead.

3. A unitary can body for a hermetically sealed, reclosable sheet metal container provided circumferentially intermediate its top and bottom edges with a multi-folded section, said section comprising spaced apart, narrow folds turned toward each other exteriorly of the body to form shoulder beads, and three concentric, annular panels disposed between and behind said shoulder beads, the intermediate panel being connected integrally along its top with the innermost panel and along its bottom with the outermost panel, said outermost panel having circumferential score lines closely adjacent its upper and lower edges and disposed in concealed relation beyond adjacent edges of the respective shoulder beads whereby removal of the metal intermediate the score lines in known manner serves to smooth the remaining severed edges against the insides of the respective shoulders and provides a safety-edge, external sliding cover and a safety-edge, externally shouldered container for receiving said cover the innermost and intermediate panels forming a smooth topped container flange rendering the lowermost severed edge inaccessible from one side while the adjacent shoulder bead encircling said container at the base of said flange renders said severed edge inaccessible from the opposite side.

4. A one-piece, cylindrical body for a hermetically sealed, reclosable metal container comprising a metal sheet transversely folded and formed intermediate its top and bottom edges to provide three concentric and vertically co-extensive panels, the outermost of which constitutes a conventional tear strip panel having a free tab for a winding key and provided adjacent its bottom and top edges respectively with score lines in parallelism defining a removable tear strip, a folded and exteriorly downwardly bent over shoulder bead connecting the body above said panels with the outermost panel at the top and overhanging the upper score line, a folded and upwardly turned shoulder exterior bead overhanging the lower score line of the tear strip panel and integrally connecting the innermost panel and the body of the container below said panels, said outermost panel being integrally connected at its bottom with the bottom of the intermediate panel, said intermediate panel being connected integrally along its top with the top of the innermost panel, said innermost panel being integrally connected along its bottom with the inside of the lower shoulder bead, the ends of said body above and below said shoulder beads being lock seam connected in conventional manner, the intermediate panel being provided at one end with an extended lug which is wider than said intermediate panel, said lug adapted to provide a combined overlapped

and edge abutting joint for said innermost and intermediate panels, the excess width of the lug at the bottom serving to extend the lap joint below the butt joint, the excess width of the lug at the top being turned inwardly and serving to conceal the top edge of the butt joint, said lug being interposed behind the juncture of the ends of the tear strip and serving to provide, on either side of the joint, a free separation of the tear strip panel from the adjacent sides of the intermediate panel.

5. A can body provided intermediate its top and bottom edges with three concentric panels connected at the top of the outermost panel and at the bottom of the innermost panel respectively by narrow double folds, said folds overlapping slightly the top and bottom exterior margins respectively of the outermost panel, said outermost panel being a tear strip panel having scored tear lines concealed behind said folds, the severed edge behind the lower overlapping fold occasioned by removal of the tear strip being completely inaccessible between said fold and the intermediate panel.

6. A can body as set forth in claim 5 wherein the opposite ends of the innermost and the intermediate panel are arranged and connected to form an edge butt joint and a lap joint covering the butt joint and separating said butt joint from the tear strip panel.

7. A cylindrical can body provided circumferentially at a distance below its top edge with a multi-fold integral section constituting a container collar, a tear strip panel, and shoulder beads disposed exteriorly in slightly overlapping relation to opposite edges of the tear strip panel, said container collar being constituted by two panels connected at the top by an integral fold, the innermost panel disposed in the plane of the can body and turned outwardly beneath all of the panels and connected with the lower shoulder bead, the tear strip panel having its lower scored tear-line concealed behind said lower shoulder whereby the removal of the tear strip in known fashion affords an inaccessibly located metal edge on the outermost panel protected on opposite sides by said lower shoulder and said container collar.

8. A unitary cylindrical container body and cover flange comprising initially spaced apart folded and turned upper and lower bead members and a triple fold of metal between them constituting a double walled collar having its innermost wall disposed in a common plane with said body and extending below all of said folds for integral connection with the inside of the lower bead member, and a single ply tear strip fold having score lines concealed behind said upper and lower bead members, the metal between the score lines being removable by means of a conventional tear strip winding key to sever the upper bead from the lower bead the metal edge resulting, upon opening of the container by removal of the tear strip, being inaccessibly disposed exteriorly at the base of said collar and internally of and below the top of the lower bead member.

9. In a hermetically sealed, reclosable container the combination of a can body folded intermediate its top and bottom edges into three coextensive, concentric panels connected at the top of the outermost panel and at the bottom of the innermost panel respectively by narrow double folds, said folds being turned toward each other and overlapping slightly the top and bottom ex-

terior margins respectively of the outermost panel, said panel having marginal scored tear lines disposed concealedly between the panels and said folds and adapted, upon removal of the metal between the score lines to provide an inaccessibly disposed metal edge on the container, a top disc and a bottom disc lock seamed to opposite ends of the body in conventional manner, and a double lock body seam extending from said top and bottom lock seams to the adjacent narrow double folds, the intermediate concentric panel having an end lug relatively wider than the panel and adapted to smoothly cover the top edge of a butt joint formed by an adjacent panel, said panels together forming a smooth top container collar, the opposite end of said lug serving to close the bottom of the butt joint.

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