

April 29, 1969

R. L. LA BARGE ET AL

3,441,163

CONTAINER CLOSURE HAVING ATTACHED PULL TAB

Filed Nov. 14, 1967

Sheet 1 of 3

FIG. 1.

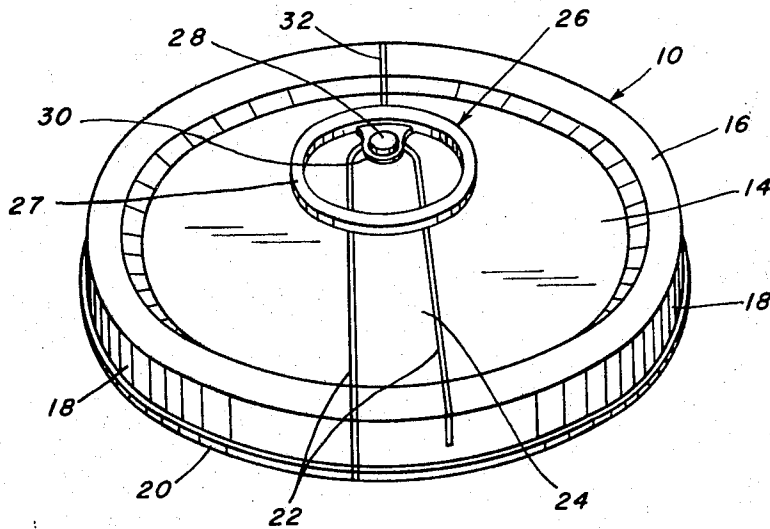
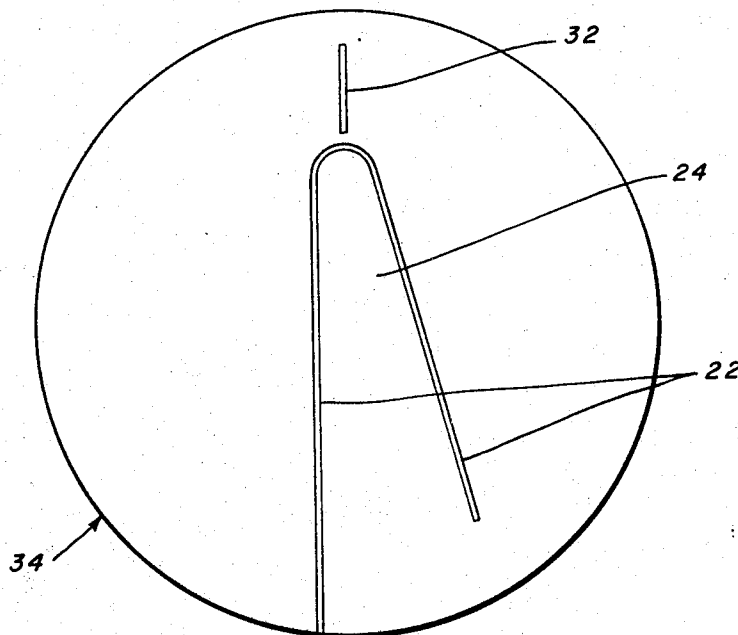


FIG. 2.



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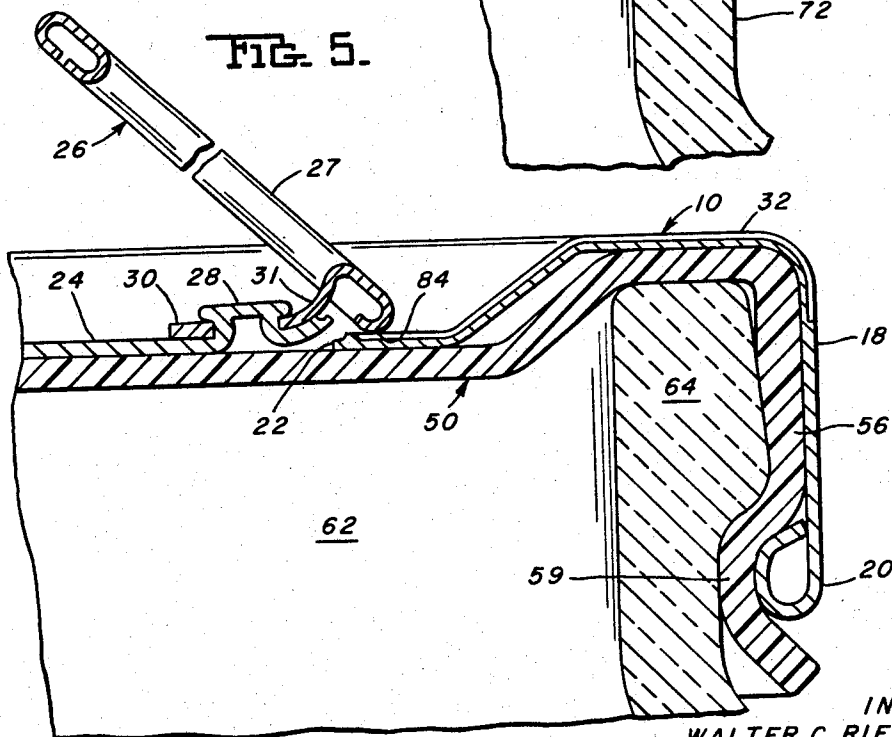
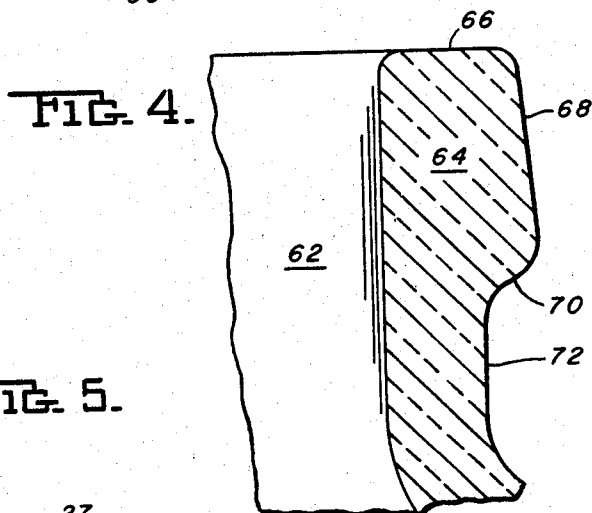
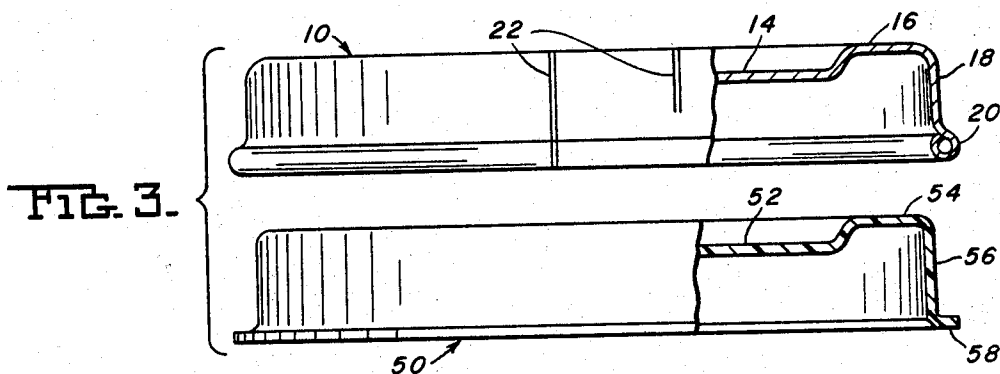
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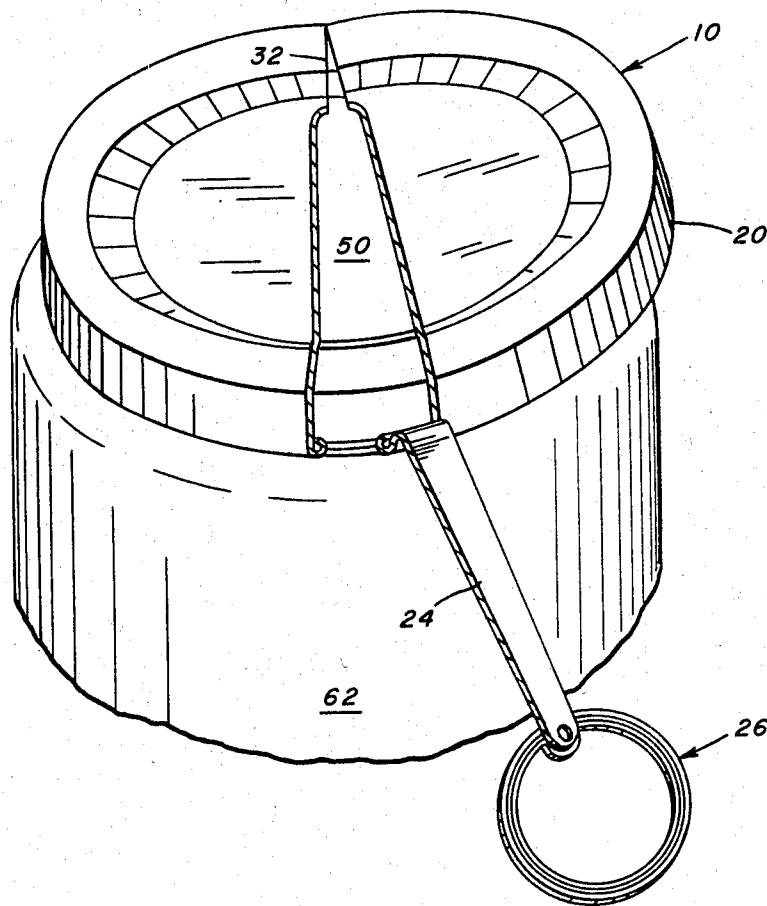
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Sheet 3 of 3

FIG. 6.



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CONTAINER CLOSURE HAVING ATTACHED PULL TAB

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U.S. Cl. 215—46

9 Claims

ABSTRACT OF THE DISCLOSURE

A closure assembly is provided including a closure fitment and a sealing liner therewithin, the fitment being made of sheet metal and having an indentation defined tear strip divisive of the fitment top with a lever type pull tab attached thereto in a tongue integral with the tab, the tab being pivotable about a fulcrum located outside the tear strip so that when the tab is manipulated to sever the tear strip, the starting end of the tear strip is lifted rather than depressed, and damage to the inner liner is thereby avoided. The closure fitment may also have a curled bead at the lower edge of its depending skirt with the indentation defining at least one side of the tear strip extending all the way to the edge of the fitment material through the bead.

Background of the invention

Heretofore, it has been known to provide a frangible metal closure fitment and an inner sealing liner, with the fitment being removable by severance of a tear strip across its top. It is also known to make such inner sealing liner with a complete top and a depending skirt and adapted for use as a reclosure upon removal of the overlying fitment. It is further known to provide a curled bead around the lower edge of closure fitment, such bead being deformed and constricted to affix the closure fitment on a container entrance mouth.

Summary of the invention

This invention provides a closure assembly comprised of a frangible closure fitment made from permanently deformably sheet material, preferably aluminum, having a tear strip with a pull tab of a double lever type affixed thereto in a manner affording a fulcrum point located outside the tear strip, and a sealing liner within the closure fitment so that when the pull tab is manually manipulated to rupture the tear strip, the starting end of the tear strip is initially lifted rather than initially depressed to avoid damage to the inner sealing liner. Preferably, the closure fitment has a circumferential bead at the lower edge of the fitment skirt and has a tear strip divisive of the fitment top with the score line defining at least one side of the tear strip extending all the way to the edge of the fitment material through the fitment bead.

Accordingly, an object of this invention is to provide an improved closure fitment and a sealing liner therewithin and having in the fitment top a tear strip with a lever type pull tab attached thereto and manipulated about a fulcrum point located outside the tear strip.

Another object of the invention is to provide an improved closure fitment and sealing liner therewithin and having a tear strip divisive of the fitment top with the weakening defining at least one side of the tear strip extending all the way to the edge of the fitment material through a bead at the lower edge of the fitment skirt and with a lever type pull tab attached to the tear strip.

A further object is to provide a package sealed with a fitment and a sealing liner therewithin incorporating a

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tear strip with a lever type pull tab having a fulcrum point outside the tear strip attached thereto.

Other objects and advantages of the invention will be understood from the following description of the invention with reference to the accompanying drawings.

Brief description of the drawings

FIG. 1 is perspective view of a closure fitment with a pull tab attached thereto;

FIG. 2 is a plan view illustrating a scored blank from which the closure fitment in FIG. 1 may be formed;

FIG. 3 is a vertical view of the closure fitment in FIG. 1 and a cup-like liner for use in the closure fitment, showing both members in partial cross section;

FIG. 4 is an enlarged, fragmentary, vertical, cross sectional view of a container mouth suitable for affixation of the closure fitment and liner of FIGS. 1 and 3;

FIG. 5 is an enlarged, fragmentary, vertical, cross sectional view of the closure fitment and liner of FIG. 3 secured on the container entrance mouth of FIG. 4 and showing opening of the tear strip initiated;

FIG. 6 is a perspective view of a unitary sealed package similar to that shown in FIG. 5, with the tear strip torn open.

Description of embodiment

In the several illustrations appended hereto, a closure fitment has been selected in the form of a permanently deformable, drawn, metallic shell having a top and a depending skirt terminating in a circumferential bead, and with a tear strip with a lever type pull tab affixed thereto divisive of the closure fitment to facilitate removal of the fitment. A cup-shaped liner of resilient plastic material is provided within the fitment to form a closure assembly. The container with entrance mouth thereto has been illustrated as a conventional open top jar, bottle, or the like, made of glass, plastic, or like material, and suitable to have the closure assembly sealingly affixed thereto.

Referring now to the illustrations, FIG. 1 is representative of a closure fitment 10 formed from sheet metal or other permanently deformable material, and preferably from a thin sheet of aluminum or aluminum alloy, which is adapted to be secured over the entrance mouth of a container. Closure fitment 10 is comprised of a complete spanning top portion having a recessed central panel 14 and a raised rim 16 therein, and having a depending skirt 18 terminating in a circumferential bead 20. The closure fitment 10 is weakened or scored along line 22 to form or define a tear strip 24 divisive of the closure top from a starting location adjacent or towards the periphery of the top relative to its center to a generally opposite location, and from there divisive of the closure fitment along one side of the tear strip 24 all the way to the edge of the sheet material of the fitment, and along the other side of the tear strip 24 to a location short of the edge of the sheet material leaving a bridge or ligament of unscored metal between its end and the bottom of the skirt 18.

A pull tab 26 is attached to the tear strip 24 in its starting end by an integral hollow rivet 28. Pull tab 26 is of the reverse acting, double lever, type of centrally open ring configuration having a rigid tab body 27 and a tongue 30, for affixation of the rivet 28. The tongue 30 is preferably bendable at its junction with the tab body 27, and if desired may be there weakened, so that the tab can be easily initially lifted from the surface of the fitment top for severance of the tear strip, and to produce the double lever action to rupture the score line at the starting end of the tear strip. As best seen in FIG. 5, pull tab 26 is preferably formed from sheet material which is edge curled in the desired centrally open configuration

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to provide a rigid lever and has tongue 30 extending inwardly from the curled ring at which the tab is affixed to the tear strip 24. As affixed to the tear strip 24, pull tab 26 lies substantially flush with the surface of the recessed central panel 14. The recessed central panel thereby provides clearance or accommodation for the tab 26 so that its upper surface and its means of affixation are not higher than the top of the rim 16 of the fitment. The easy opening structure is thereby protected from accidental opening or fracture of the score lines while on a container, and the closures are readily stackable.

Closure fitment 10 is also weakened or scored outwardly of and adjacent to the starting end of the tear strip 24 by means of score line 32. Score line 32 is preferably located approximately opposite the skirt portion of the tear strip 24, and extends from adjacent the point of attachment of the tab 26 to the tear strip outwardly and into the closure skirt but preferably ends short of the bottom edge of the skirt 18 to leave a bridge or ligament of unscored metal to serve as a hinge for spreading the closure sectors and removal of the closure from a container.

FIG. 2 is representative of a scored blank 34 from which the closure fitment of FIG. 1 may be formed, and shows the bridge of metal at the outer end of score line 32 as well as the bridge of metal between the end of the short leg of score line 22 and the edge of the sheet material from which the closure fitment is formed. Preferably, score line 22 is bichordal, and the chord which defines the tear strip all the way to the edge of the sheet material is substantially parallel to a diametric line through the center of the starting end of the tear strip and the center of the blank. The chord of the score line 22 which terminates short of the edge of the sheet metal diverges from such diametric line from the starting end of the tear strip towards the edge of the sheet material of the fitment. The tear strip 24 defined by score line 22 is thereby angled towards the bridge of metal between the end of the short side of the score line and the edge of the sheet material so that there will be less likelihood of tearing or destruction of this bridge and separation of the tear strip from the remainder of the fitment during removal of the fitment from the container.

Turning to FIG. 3, the closure fitment is seen in partial cross section showing the curled bead 20 at the lower edge of the fitment skirt. Preferably, the bead 20 is inwardly curled and is formed by a known edge curling practice. In the form shown, the long leg of score line 22 which extends all the way to the edge of the sheet material of the fitment extends through the curled fitment bead 20. It has been found desirable in indenting score line 22 to indent shallower and therefore leave more residue material in the straight wall portion of the skirt 18 than at the end of the score line which is rolled into the fitment bead 20. In the instance of forming the fitment from aluminum container sheet of nominal 0.009 inch gage, a residue of 0.005 inch in the score line in the straight wall portion of the skirt and 0.004 inch in the area of the bead have been used satisfactorily. With these dimensions, both easy opening and formability are achieved without rupture of the score lines during forming of the fitment and curling of the bead.

A liner 50 for use with closure fitment 10, that also serves as a reclosure, is seen in the bottom half of FIG. 3. Liner 50 may be formed from any of a variety of materials that will provide the desirable gasketing qualities and resilience with reasonable stiffness, of which rubber, paper, cardboard, and the synthetic plastics such as polyethylene, polypropylene and polyvinyl chloride are non-limiting examples. The liner 50 has a complete spanning top portion including recessed central panel 52 and raised rim 54, and a depending skirt 56, and is dimensioned to fit or nest in closure fitment 10. Preferably, on assembly with the closure fitment, the liner 50 is retained or secured within the fitment by an interference fit therewith so that the assembly will not accidentally separate during

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routine handling prior to affixation of the assembly to a container. The skirt 56 of the liner 50 is preferably dimensioned so that it will extend below bead 20 on the closure skirt 18, but may also terminate above the closure bead 20. The liner skirt 56 also preferably has a slight draft on its inner surface corresponding to an opposed negative draft on the outer sealing surface of the container top to which it is to be secured to improve the side seal therebetween. In the embodiment shown, the liner skirt 56 terminates in an outwardly extending flange 58 to aid in grasping the liner for removal from a container and replacement as a reclosure. For service as a reclosure the liner skirt has a rib 59 (FIG. 5) formed in it by permanent plastic deformation between the under surface 70 of the container bead 64 and the inwardly pressed filament bead 20 that serves to retain the liner 50 when used as a reclosure. If desired, the liner may be provided with premolded inwardly projecting detents for the same purpose.

The container mouth entrance illustrated in FIG. 5 is representative of structure suitable for affixation of the closure fitment 10 and liner 50. It will be observed that the container structure provides an entrance mouth 62 defined by an outwardly projecting closure securing bead 64 having an upwardly facing sealing surface 66, a laterally facing side sealing surface 68, and a shoulder having an undersurface 70 blending into the container wall 72 therebelow.

In sealing the container entrance mouth 62, the liner 50 is preferably first fitted in the closure fitment 10 and retained therein in readily separable manner by an interference fit or by any other means such as a spot of adhesive. The assembly of the fitment 10 and liner 50 is then placed on the container entrance mouth, and downward pressure is applied to the top of the fitment to compress the liner against the upwardly facing sealing surface of the container bead. The bead 20 is then constricted by swaging, rolling, crimping or the like to deform it into securement relation with the undersurface 70 of the container bead, and thereby lock the liner in compression between the closure fitment 10 and the container bead. The closure assembly is thereby sealingly secured to the container entrance mouth with the metal fitment covering the liner over the open top of the container.

In a container sealed with a closure fitment and liner as shown in FIG. 5, opening is effected by grasping the pull tab 26 which is attached to the tear strip 24 to be torn free at its starting end. Upon lifting, the pull tab 26 pivots about a sliding fulcrum point 84 that is and remains outwardly of score line 22, causing tongue 30 on the pull tab 26 to bend or flex at its juncture with the body of the tab, creating two levers, one in the tab body 27 and one in the tongue portion 31, and a resultant double lever action. Thus, when lifted, the lever provided by the tab body exerts a downward force on the metal lying outwardly of the scoring around the starting end of the tear strip 24, and the lever action of the tongue portion 31 exerts an upward force on the rivet 28 and the tear strip 24. Consequently, this double lever action produces nearly perfect opposed shearing forces on opposite sides of the score line 22 at the starting end of the tear strip to effect initial rupture thereof with a minimum of effort. Moreover, the location of the fulcrum 84 of the tab body lever outside the score line 22 avoids two problems attending a fulcrum located within the score line which would result in downward plunging of the tear strip at its starting location, namely, resistance of the liner top to the downward shearing to be initiated and damage to the liner top if such shearing is accomplished. In the present invention, the material in tear strip 24, being relatively less restrained than the material of the fitment top therearound, is physically lifted by the upward force of the lever action of tongue portion 31, while the material of the fitment top outside the tear strip 24 under the fulcrum point 84 deflects only slightly, if any, in-

wardly against the liner 50. Consequently, the underlying liner 50 is not pierced or otherwise damaged and does not resist rupture of the tear strip during opening thereof.

After the initial rupture of the end of the score line as shown in FIG. 8, continued pulling of the tab 26 ruptures score line 22 along both sides of the tear strip 24 across the closure top and into the fitment skirt 18. The tearing stops at the end of the short leg of scoring along one side of the tear strip 24 but continues along the length of the other leg of scoring which extends all the way to the edge of the skirt through the fitment bead to convert the fitment into a still unitary, partially split member with the tear strip attached to the skirt of the fitment by a ligament or bridge of metal between the end of the short leg of scoring and the bottom of the skirt. This results in confronting ends of the severed sectors of the closure fitment. Spreading such confronting ends will rupture the single score line 32 adjacent the starting end of the tear strip and cause hinge-like opening of the fitment sectors as shown in FIG. 6 without dismemberment of the fitment. By making the skirt hinge bridge suitably weak and the tear strip bridge suitably strong, the spreading may be done by further pulling of the tab to move the fitment sector to which it remains attached far enough away from the opposite fitment sector to permit easy removal of the severed fitment. The presence of the bead 20 produces little if any increase in the resistance to severance of the tear strip 24 along the long leg of scoring that extends through the bead, and adds strength to the tear strip bridge at the end of the short leg of scoring to resist severance of such bridges.

It will be apparent to those versed in the art to which the invention is addressed that the particular embodiment has been selected for purposes of specific illustration and description; and it will be further understood that numerous variations of the structural details of the selected embodiment herein described may be made within the intended scope of the invention without departing from the appended claims. Exemplary of such variations would be the modifications to accommodate the well known vacuum-loss detection button in the top portion of the fitment. In such case, the tear strip configuration divisive of the top portion preferably would become generally arcuate to encompass the button, and the central opening of the tab would be of such size and configuration that the tab would not be higher than the peripheral rim of the fitment top.

What is claimed is:

1. A closure assembly for a container entrance mouth comprising a sheet metal closure fitment including a top portion and a depending skirt, and a sealing liner retained therewithin having a complete spanning top portion, said fitment being provided with a tear strip divisive of the fitment top from a starting location towards the depending skirt with at least one side of the tear strip extending throughout said depending skirt all the way to the edge of the fitment material for severing the fitment into a split member that may be easily spread apart for release of the split member from the container, with a tab connected to the tear strip to facilitate severance thereof, said tab being a lever connected to the tear strip in a tongue integral with the tab, and having a tab fulcrum located outside the tear strip near the attachment of the tab to the tear strip.

2. A closure assembly in accordance with claim 1 in which said tab is a rigid lever of centrally open configuration formed of edge curled sheet material and is provided with an inwardly extending integral tongue for attachment of the tab to the tear strip.

3. A closure assembly for an open top container comprising a closure fitment made from sheet metal and having a top portion and a depending skirt terminating in a curled bead, and a sealing liner retained therewithin with a complete spanning top portion, said fitment being weakened in line configuration to form a tear strip divisive

of the fitment top from a starting location towards the periphery of said top relative to its center to a generally opposite top location and therefrom divisive of the fitment along one side of the tear strip all the way to the edge of the sheet material of the fitment through the bead, and along the other side of the tear strip to a location short of the edge of the sheet material, and having a lever type tab attached to the tear strip near its starting location in a tongue integral with the tab, with a tab fulcrum located outside the tear strip near its starting location for manual manipulation to rupture the sheet material along the tear strip for nearly complete severance of the tear strip thereby to convert the fitment into a one-piece partially split member with confronting ends that may be easily spread apart for release of the partially split member from the container with the partially severed tear strip attached to one of the two confronting ends of the partially split member.

4. A closure assembly in accordance with claim 3 in which the sealing liner has a depending skirt of a length sufficient that the liner is serviceable as a reclosure.

5. A closure assembly in accordance with claim 3 in which said tab is a rigid lever of centrally open configuration formed of edge curled sheet material and is provided with an inwardly extending integral tongue for attachment of the tab to the tear strip.

6. A closure assembly in accordance with claim 3 in which the tear strip to the extent located in the top portion of the fitment is bichordal in principal configuration.

7. A unitary sealed package comprising a container having an entrance mouth, a sheet metal closure fitment affixed to the container entrance mouth, and a sealing liner having a complete spanning top portion interposed between the container entrance mouth and the fitment, said closure fitment including a top portion and a depending skirt and being provided with a tear strip divisive of the fitment top from a starting location towards the depending skirt with at least one side of the tear strip extending throughout said depending skirt all the way to the edge of the fitment material for severing the fitment into a split member that may be easily spread apart for release of the split member from the container, with a tab connected to the tear strip to facilitate severance thereof, said tab being a lever connected to the tear strip in a tongue integral with the tab, and having a tab fulcrum located outside the tear strip near the attachment of the tab to the tear strip.

8. A unitary sealed package in accordance with claim 7 in which said tab is a rigid lever of centrally open configuration formed of edge curled sheet material and is provided with an inwardly extending integral tongue for attachment of the tab to the tear strip.

9. A unitary sealed package comprising a container having an entrance mouth, a closure fitment affixed to the container entrance mouth, and a sealing liner with a complete spanning top portion interposed between the container entrance mouth and the fitment, said closure fitment being weakened in line configuration to form a tear strip divisive of the fitment top from a starting location towards the periphery of said top relative to its center to a generally opposite top location and therefrom divisive of the fitment along one side of the tear strip all the way to the edge of the sheet material of the fitment through the bead, and along the other side of the tear strip to a location short of the edge of the sheet material, and having a lever type tab attached to the tear strip near its starting location in a tongue integral with the tab, with a tab fulcrum located outside said tear strip near its starting location for manual manipulation to rupture the sheet material along the tear strip for nearly complete severance of the tear strip thereby to convert the fitment into a one-piece partially split member with confronting ends that may be easily spread apart for release of the partially split member from the container with the partially severed

tear strip attached to one of the two confronting ends of the partially split member.

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U.S. Cl. X.R.

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