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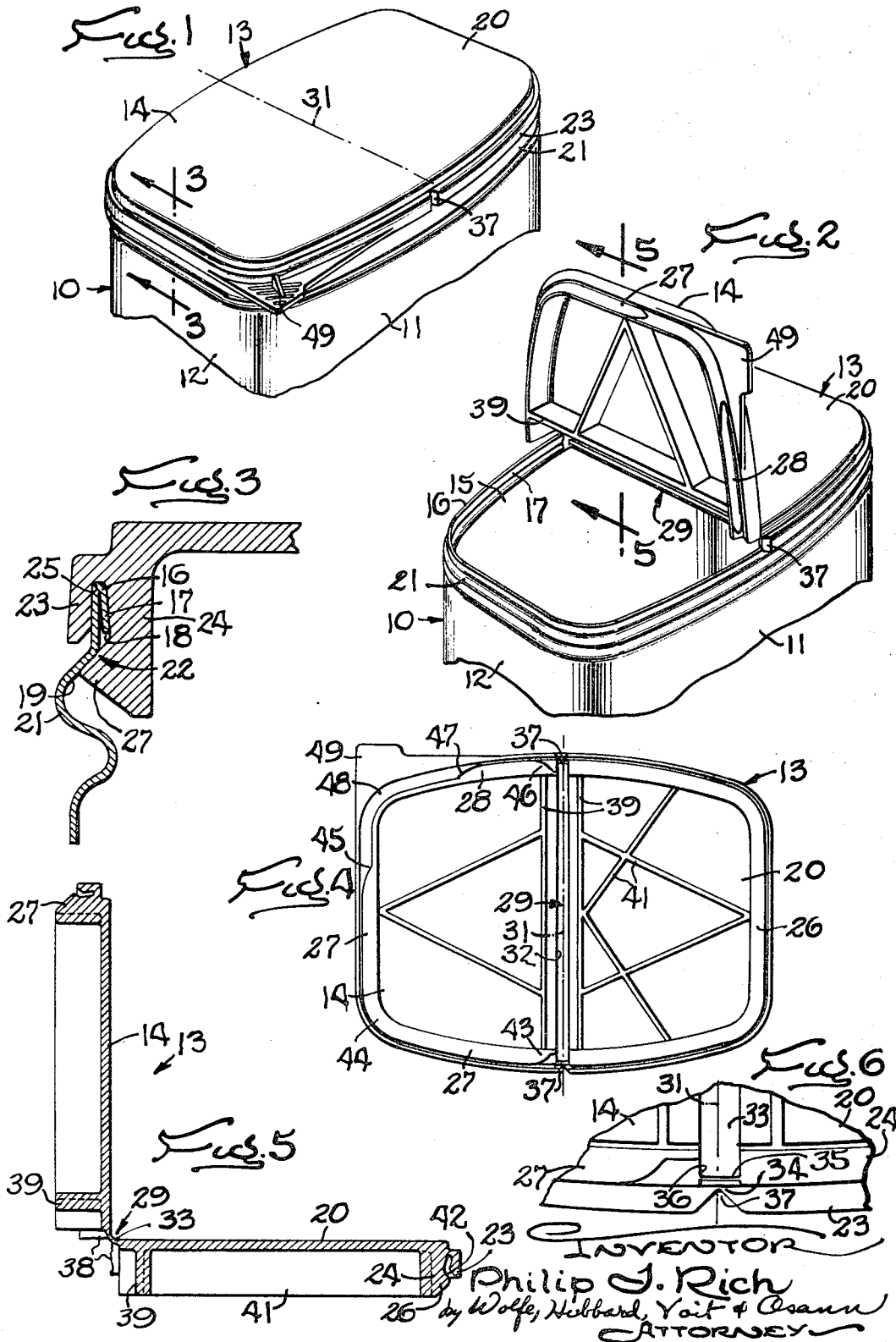
P. J. RICH

3,412,890

HINGED CONTAINER CLOSURE

Filed Dec. 22, 1967

2 Sheets-Sheet 1



INVENTOR
Philip J. Rich
by Wolfe, Hubbard, Yait & Osann
ATTORNEY

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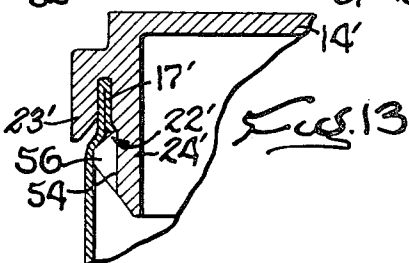
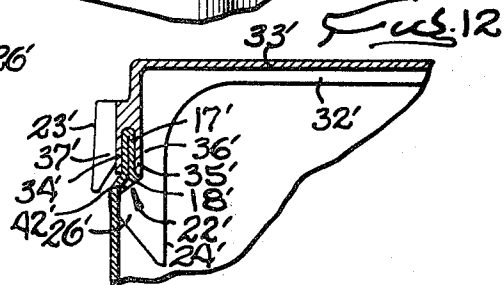
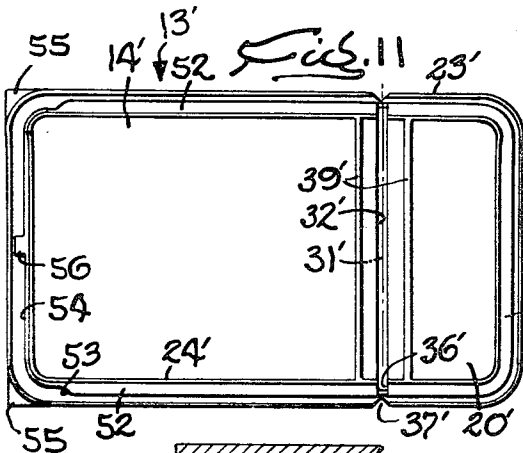
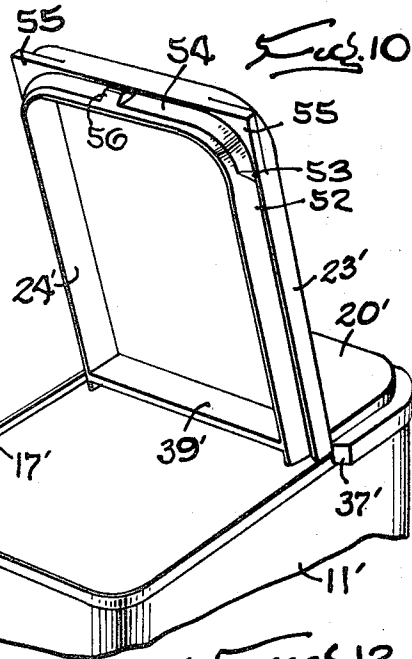
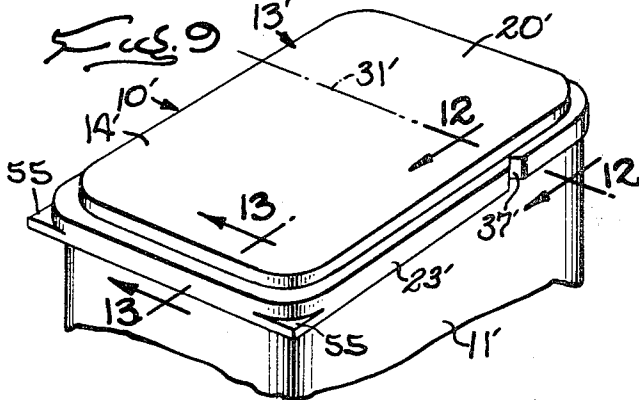
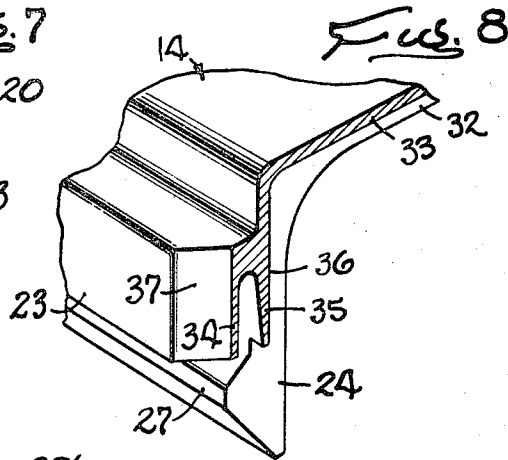
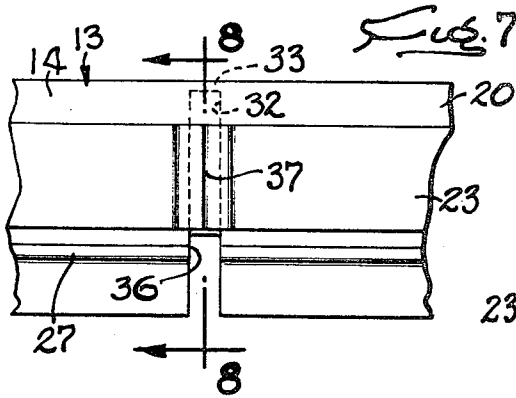
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2 Sheets-Sheet 2



INVENTOR
Philip J. Rich

By Wolfe, Hubbard, Vait & Osann
ATTORNEY

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HINGED CONTAINER CLOSURE

Philip J. Rich, Roscoe, Ill., assignor to J. L. Clark Manufacturing Co., Rockford, Ill., a corporation of Illinois

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ABSTRACT OF THE DISCLOSURE

A plate-like cover of resilient plastic is formed with depending and laterally spaced peripheral skirts receiving the lip of a sheet metal container body and interlocked therewith. The cover is weakened along a transverse line which defines a hinge for upward swinging of one end portion of the cover while the other end portion remains secured to the body.

BACKGROUND OF THE INVENTION

This invention relates to containers of the type in which a cover molded of resilient plastic with a depending peripheral skirt is interlocked with a curled or hemmed lip of a sheet metal body, a part of the cover being hinged and constituting a flap swingable upwardly to expose an opening through which the container contents may be dispensed.

SUMMARY OF THE INVENTION

The primary objective is to provide a plastic closure of the above character in which one end portion constitutes a flap and may, by manually lifting the free end, be released from the lip of the container body and swung to upright position about a hinge axis extending transversely of the cover intermediate the ends thereof. The dispensing opening thus uncovered extends across the full width of the body and from the hinge to the end of the body.

The hinge axis is formed by grooving, notching or otherwise weakening the cover in the molding thereof and so interlocking a depending peripheral skirt thereon with a downwardly facing peripheral shoulder on the sheet metal body such that the entire end portion to one side of the hinge axis may be released from the shoulder and swung upwardly by a lifting force manually applied to the free end of such flap while the end portion of the cover on the other side of the hinge remains fastened to the cover lip.

The invention also resides in the novel construction of the line of weakening to form the hinge and provide an effective seal all around the body lip while insuring easy release of the flap for upward swinging.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURES 1 and 2 are fragmentary perspective views of a container embodying the present invention with the dispensing opening thereof closed and opened.

FIG. 3 is a section taken along the line 3—3 of FIG. 1.

FIG. 4 is a bottom view of the plastic closure.

FIG. 5 is a section taken along the line 5—5 of FIG. 2.

FIG. 6 is an enlargement of a part of FIG. 4.

FIG. 7 is an enlarged and fragmentary side view along the cover hinge.

FIG. 8 is a fragmentary perspective view taken along the line 8—8 of FIG. 7.

FIGS. 9, 10 and 11 are views like FIGS. 1, 2 and 4 showing a modification.

FIGS. 12 and 13 are fragmentary sections taken along the lines 12—12 and 13—13 of FIG. 9.

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DESCRIPTION OF THE PREFERRED EMBODIMENT

In the form shown in FIGS. 1 to 8, a tubular container body 10 composed of thin sheet metal and having a generally rectangular cross-section with bulging and flat sides 11 and 12 is covered at one end by a relatively flat or plate-like closure 13 of molded resilient plastic secured to the lip end of the body as shown in FIG. 1 and adapted for release of one end portion 14 from the lip and upward swinging to uncover the corresponding area 15 (FIG. 2) of the body cross-section while the remaining end portion 20 of the cover remains fixed to the body. To fasten the cover onto the body with an effective peripheral seal, a short length of the metal at the end of the body is bent inwardly and then reversely and downwardly to curve the cross-section of the lip 16 and form a curl or, in the present instance, a relatively flat hem 17. The downwardly facing edge 18 of the hem alone or together with the inner surface 19 of the upper and downwardly and outwardly inclined part of a bead 21 formed around the body below the lip, form a downwardly facing shoulder indicated generally at 22 and adapted to interlock with parts on the cover to secure the latter to the body and form a seal around the lip. Various plastics of the polyethylene and polypropylene types may be used in molding the cover 13 in a single piece.

Depending from and molded integral with the cover around the periphery thereof are laterally spaced skirts 23 and 24 defining between them a downwardly opening groove 25 in which the lip 16 of the body is disposed in the final assembly and preferably becomes seated as shown in FIG. 3 when the cover is pressed onto the body. Herein, the outer skirt 23 is somewhat longer than the hem 17 with its outer surface substantially flush with the outer edge of the bead 21.

The inner skirt 24 is made somewhat deeper, projects below the shoulder 22 and is molded with integral projections 26, 27, 28 which extend outwardly beneath the shoulder 22 and interlock with the latter in the final assembly so as to hold the cover securely on the body with the lip 16 seated in the groove 25 so as to provide an effective seal all around the edge of the cover. The hold-down projections may take various forms and be of different peripheral lengths and thicknesses and spaced apart around the cover for purposes to be described later.

In accordance with the present invention, the plastic of the closure across a transverse line intermediate the ends of the closure is weakened to form a hinge 29 which defines an axis 31 about which the end portion or flap 14 is forced to fulcrum under a lifting force manually applied to the outer free end of the flap to release the latter from the shoulder 22 and swing the same to the position shown in FIG. 2 while the opposite end portion 20 of the cover remains fixed to the body. Such weakening of the plastic along the hinge axis may best be achieved in different ways as by molding a substantially continuous groove 32 across the full width of the cover to leave a thin section 33 (FIG. 5). Also and in order to extend the seal across the hinge, the skirts 23 and 24 are made thin enough as indicated at 34 and 35 (FIG. 8) at the ends of the hinge line to tear partially or completely under the force applied to swing the flap 14 upwardly. Such thinning of the inner skirt is achieved (see FIGS. 7 and 8) by forming upright notches 36 on the inner side of the skirt and extending downwardly from the ends of the groove 32. The outer skirt is notched at 37 in line with the notches 36 and the groove 32. The skirt webs 34, 35 thus formed are stretched and usually break as indicated at 38 (FIG. 5) by the time the flap 14 reaches this fully open position. Thus, the flap acts as a lever and at considerable mechanical ad-

vantage in effecting such breakage. In the original molding and before lifting of the flap to expose the opening 15, the continuity of the skirts across the hinge axis remains and, with the body lip seated in the groove 25, an effective seal is maintained all the way around the periphery body.

For large size containers or those for storing heavy materials, it is sometimes desirable to stiffen the end portions 14 and 20 of the closure 13. This may be accomplished by parallel ribs 39 integral with and depending from the underside of the cover and integrally joined at opposite ends to the inner skirt 24. If desired, further reinforcement of the cover ends may be achieved by molding ribs 41 on the underside of the plate forming the cover.

Preferably, the groove 32 which defines the hinge axis 31 is formed on the underside of the cover. In this location, the side walls of the groove are spread apart in the upward swinging of the flap to expose the dispensing opening. Thus, the groove may be made of relatively narrow width and the top surface of the cover 13 left uninterrupted and smooth so as to minimize the objectional collection of foreign matter thereon while the container remains on a store shelf. Such location of the groove also provides for breaking the skirt webs 34 and 35 as above described in the upward swinging of the flap 14.

In the present instance, the skirt projections 26, 27 and 28 which interlock with the body shoulder 22 are differently constructed to maintain the effective peripheral seal while providing for easy release and upward swinging of the flap 14 to expose the dispensing opening while the other end portion 20 remains fixed to the body. Considering first the end portion 20, this is held securely against the body lip by the projection 26 which in the present instance takes the form of a bead projecting outwardly from the inner skirt 24 and formed with an inclined upper surface 42 (FIG. 5) which, by virtue of the resiliency of the plastic and as an incident to pressing the cover onto the body, spring outwardly beneath the shoulder 22 and, in this instance, engages the inclined surface 19 of the body bead 21 as well as the edge 18 of the hem 17. As shown in FIGS. 2, 4 and 6, the bead 26 extends around the full periphery of the end portion 20 of the cover between the notches 37 above described. When the bead is interlocked with the shoulder and around the three sides of the end portion 20, the latter is held securely on the body during the releasing and upward swinging of the flap 14.

Because of such secure holding, the force provided by the projections 27 and 28 for holding the flap 14 on the body may be sufficient to achieve an effective seal of the cover against the lip 16 and around this portion. Herein, the projection 27 integral with the inner skirt is a bead similar in width and shape to the bead 26 above described but extending only partially around the flap 14 starting herein at a point 43 adjacent the hinge 29 and continuing around the corner at 44 and then partially across the free end of the flap to a point 45. The projection 28 on the opposite side edge of the flap is a similar but much shorter bead extending from a point 46 near the hinge to a point 47 well short of the corner 48 of the inner skirt 24. The interruption between the ends 45 and 47 of the beads 27, 28 provides a sufficient reduction in the hold-down force on the flap to enable the flap to be released from the body shoulder 22 by a lifting force exerted manually on a tab 49 formed integral with and projecting diagonally outward from the corner 48 in a plane near the lower edge of the outer skirt 23 of the cover so as to overhang the corresponding corner of the body 10.

By spacing the ends 45, 47 of the beads 27, 28 apart around the corner 48, the lifting force applied to the tab 49 is concentrated on a short arc of the cover periphery so that, with some interlocking of the inner skirt 24 and

the body shoulder 22 around this corner, the release is started easily and progresses under a force of relatively small magnitude and easily capable of being exerted without great manual effort. Once such release has been started, it will continue in opposite directions away from the corner 48 causing the body surfaces 19 or the hem edge 18 to act as cams on the beads 27 and 28 and release the same progressively starting at the ends 45 and 47. As the upward swinging of the flap 14 continues, the webs 34 and 35 are stretched and/or torn to permit this flap to reach the fully open position shown in FIG. 2. The container may be reclosed effectually simply by swinging the flap reversely and downwardly to its original position against the body lip 16.

The invention in the form shown in FIGS. 9 through 13 is especially adapted for use in containers of smaller size especially when the area of the dispensing opening 15 is the major part of the body cross-section. In this form, the parts corresponding to those described above are indicated by the same but primed reference numbers.

The body 11' is rectangular in cross-section and formed with a lip hem 17' adapted to fit snugly as shown in FIGS. 12 and 13 in the groove defined between the inner and outer skirts 24' and 23' depending as before from the plate-like cover 13' around the outer periphery thereof. Across the hinge axis 31', these skirts are notched at 36' and 37' to provide the webs 34' and 35' (FIG. 12) of reduced thickness connecting the ends of the skirts on the hinged flap 14' and the shorter end portion 20' of the cover. As before, the cover is weakened to define the hinge axis by molding in the underside thereof a groove 32' preferably flanked by depending cross-ribs 39'.

As in the form first described, the cover end 20' is fastened securely to the body lip by a bead 26' sprung outwardly beneath the downwardly facing shoulder 22' which in this instance is formed primarily by the free edge 18' of the hem 17', this edge being bent inwardly from the plane of the lip 16' to interlock effectually with the upper and downwardly inclined surface 42' of the bead. The bead extends between the ends of the hinge around the two sides and end of the cover portion 20' which is thus locked securely to the lip end of the container body.

Similar beads 52 (FIG. 11) are formed on the inner skirt 24' and extend from the hinge outwardly along the parallel sides of this skirt and interlock in the same way with the shoulder 22'. In this instance, these beads stop at points 53 short of the corners of the flap 14'. Across the free end of the flap, the skirt 24' is formed with a flat outer surface 54 (FIG. 13) disposed inside the vertical plane of the shoulder 22' and thus adapted to pass by the shoulder as the flap is swung upwardly by a lifting force exerted manually at the free end of the flap. Tabs 55 projecting outwardly at the corners of the flap facilitate gripping and lifting thereof to start the upward swinging and release of the beads 52 thereon from the shoulder 22'.

To insure proper seating of the flap against the lip 16' across the free end of the flap, a short projection or nib 56 similar in cross-section to the beads 52 is molded onto the inner skirt intermediate the ends of the free edge thereof. As shown in FIG. 13, this projection interlocks with the shoulder 22' and provides the desired hold-down action without preventing proper release and upward swinging of the flap when it is desired to uncover the dispensing opening 15'. After such opening by swinging the flap upwardly to the position shown in FIG. 10, the container may, as before, be reclosed simply by swinging the flap reversely and downwardly against the body lip, the beads 52 and the nib 56 becoming interlocked with and beneath the hem shoulder.

I claim:

1. A container having, in combination, a tubular body having a lip at its open upper end and a transverse peripherally extending shoulder disposed adjacent the lip and

facing downwardly, a closure covering said body and comprising a generally flat plate molded of resilient plastic substantially abutting said lip and a skirt molded integral with and depending from the periphery of the plate beyond said shoulder and closely telescoped with said lip and the shoulder, said closure being of reduced cross-section and thus weakened along a line extending transversely of said body and said plate intermediate the ends thereof so as to define a hinge axis about which a first end portion of the closure constituting a flap may be swung upwardly relative to said body about such axis while the remaining second end portion of the closure remains fixed in abutment with said body lip, a projection integral with said skirt on said flap and underlying said body shoulder to hold such flap against said lip while permitting release thereof from the shoulder and swinging of the flap by upward pressure applied manually to the free end of the flap, and a projection integral with said skirt around the periphery of said second end portion beneath said body shoulder and holding such end portion securely against said lip while said flap is being released from and swung upwardly to expose a corresponding area of the body end within said lip and thereby permit the dispensing of material contained in said body.

2. A container as defined in claim 1 including a second skirt molded integral with said plate and depending therefrom so as to telescope closely with the tube wall on the side thereof opposite said first skirt.

3. A container as defined in claim 1 in which said reduced cross-section of said plate is along a narrow and shallow groove molded in one face of said plate.

4. A container as defined in claim 1 in which said skirt extends uninterruptedly around the periphery of the closure, and said reduced cross-section of said plate includes parts of said skirt disposed at opposite ends of said transverse hinge line and sufficiently thin to permit the skirt to be severed in the upward swinging of said flap to open the container.

5. A container as defined in claim 1 in which said reduced cross-section of said plate along said hinge axis is provided by a groove extending substantially uninterruptedly across the full width of said closure plate.

6. A container as defined in claim 1 in which said reduced cross-section is provided by a groove extending across the full width of said plate and downwardly across said skirt at opposite ends of the hinge.

7. A container as defined in claim 1 in which the projection for holding said second end portion of said closure against said body lip is of substantially greater area and more effective in holding such portion against said body than said first projection is in holding the flap against the body.

8. A container having, in combination, a tubular body having a lip at its open upper end and a transverse peripherally extending shoulder disposed adjacent the lip and facing downwardly, a closure covering said body and comprising a generally flat plate molded of resilient plastic substantially abutting said lip and a skirt molded integral with and depending from the periphery of the plate beyond said shoulder and closely telescoped with said lip and the shoulder, said closure being weakened to form a hinge extending transversely of the plate intermediate the ends thereof so that the end portion of the closure on one side of the hinge constitutes a flap, means on said skirt interlocked with said shoulder and holding the other end portion of the closure securely against said lip, and means on the flap portion of said skirt engageable with said shoulder for holding the flap against said lip, but releasable to permit upward swinging of the flap about the axis of said hinge while said other end portion remains fixed.

9. A container as defined in claim 8 in which one of the engaged surfaces on said shoulder and said flap holding means is inclined downwardly and toward the body wall and acts to cam the skirt laterally and release the flap from the shoulder in response to upward pressure exerted on the free end of the flap to swing the latter upwardly about the hinge axis.

10. A container as defined in claim 9 in which said flap includes at its free end a projection overhanging the external surface of said body to receive the manual pressure exerted upwardly to release the flap from the lip.

11. A container as defined in claim 10 in which said projection is a tab projecting from the free end of the flap.

12. A container as defined in claim 8 in which the holding means on said flap and other end portion comprise beads integral with said skirt and underlying said shoulder.

13. A container as defined in claim 12 in which the bead on said flap is of shorter peripheral length than the bead on said other portion.

14. A container as defined in claim 13 in which said body and closure are rectangular and the flap bead is interrupted around one corner of the closure, said closure including a tab integral with and projecting outwardly from said corner for manual gripping to lift the flap.

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