

Feb. 27, 1968

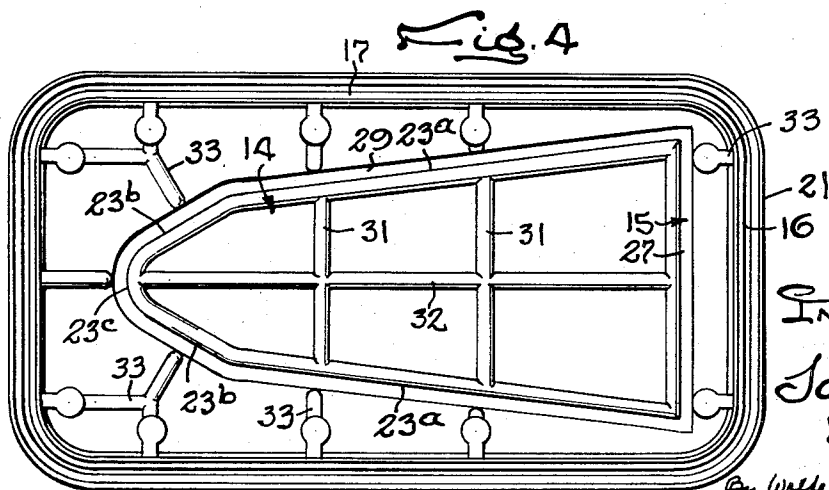
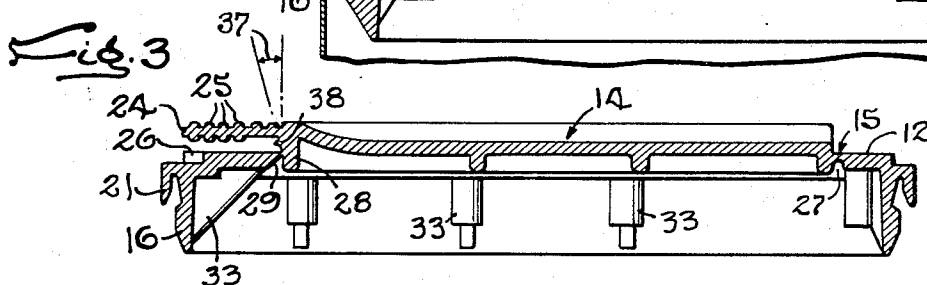
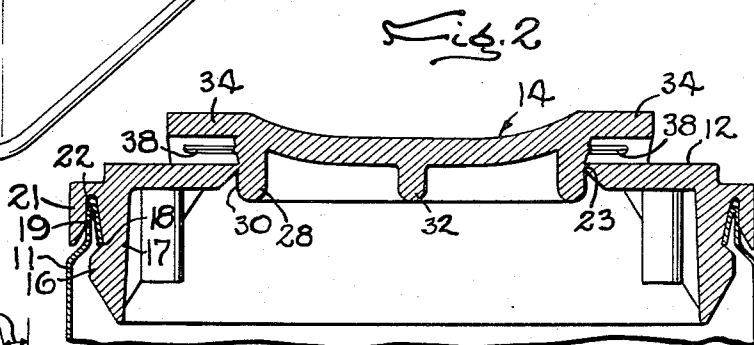
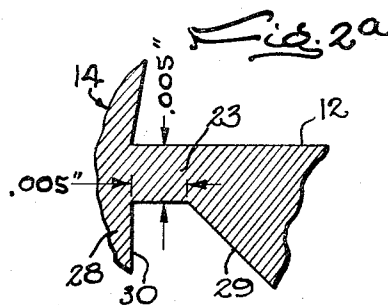
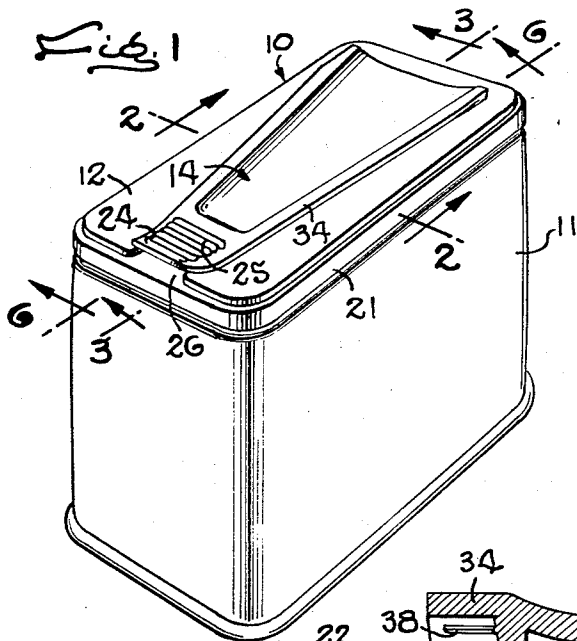
J. A. FOSTER

3,370,757

PLASTIC COVER FOR DISPENSING CONTAINER

Filed Sept. 6, 1966

4 Sheets-Sheet 1



INVENTOR
John A.
Foster

By Wolfe, Hubbard, Vint & Osborn
ATTORNEY

Feb. 27, 1968

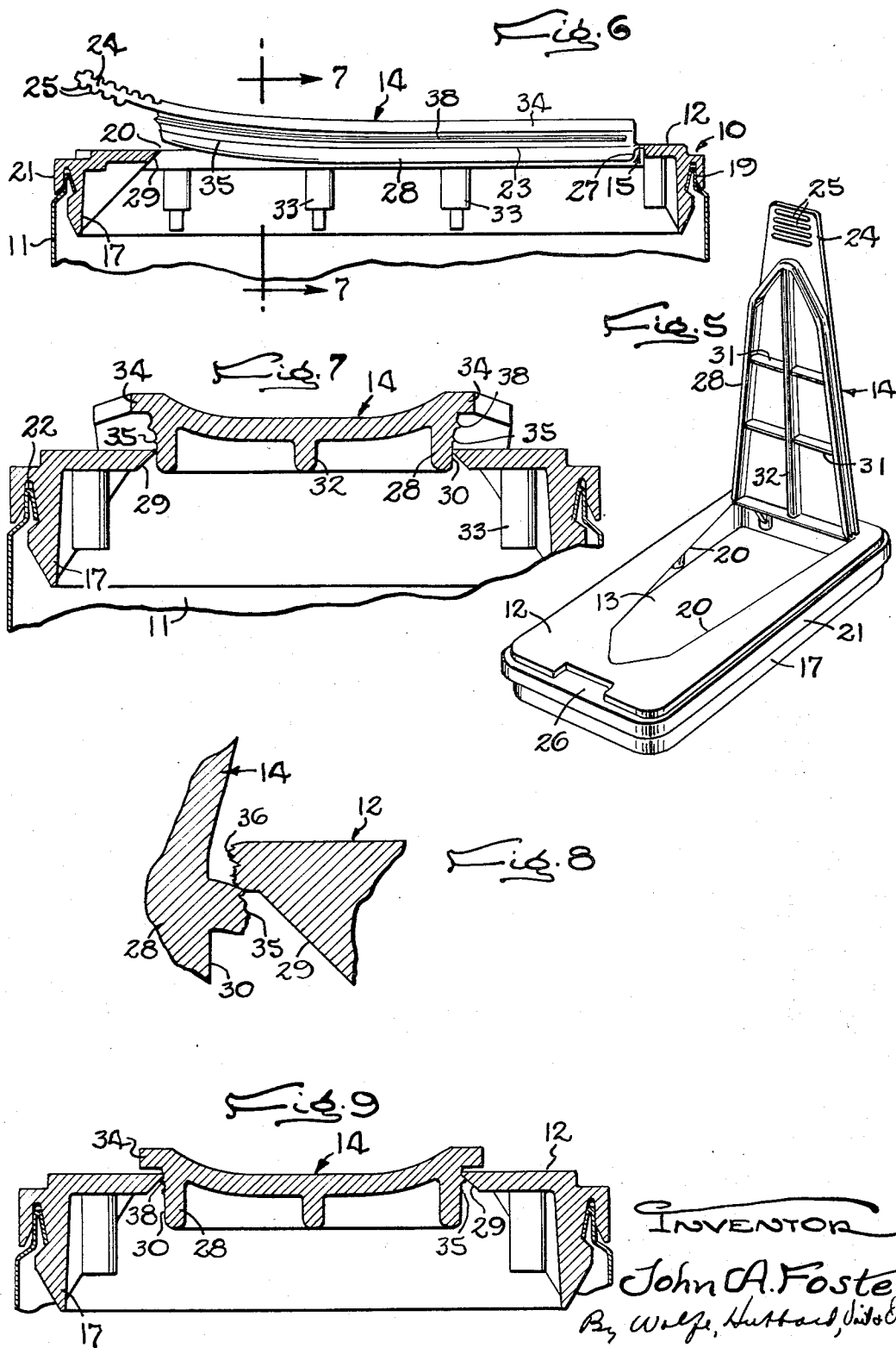
J. A. FOSTER

3,370,757

PLASTIC COVER FOR DISPENSING CONTAINER

Filed Sept. 6, 1966

4 Sheets-Sheet 2



INVENTOR
 John A. Foster
 By Wolfe, Hubbard, Little & Co.
 ATTORNEY

Feb. 27, 1968

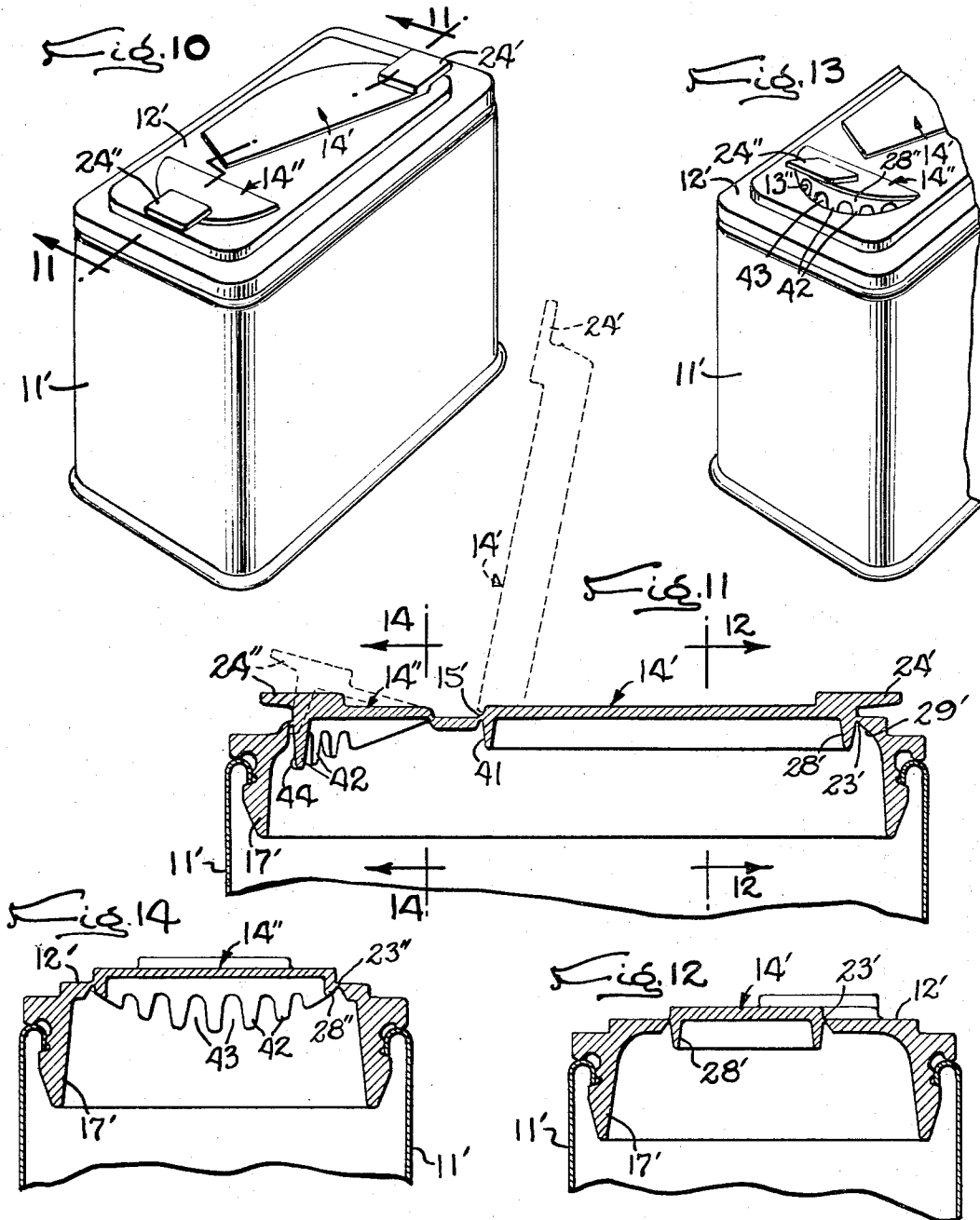
J. A. FOSTER

3,370,757

PLASTIC COVER FOR DISPENSING CONTAINER

Filed Sept. 6, 1966

4 Sheets-Sheet 3



INVENTOR
John A. Foster
By Wolfe, Hubbard, Vinton & Osborn
ATTORNEY

Feb. 27, 1968

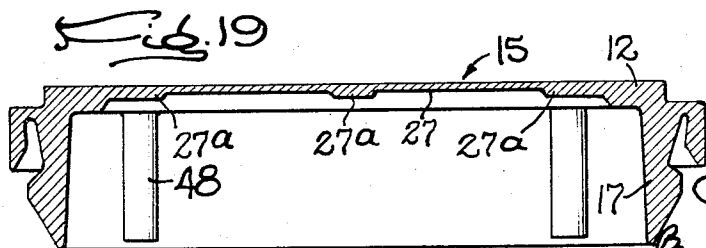
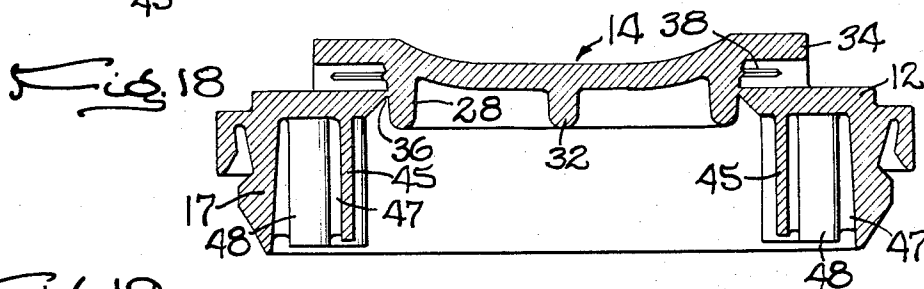
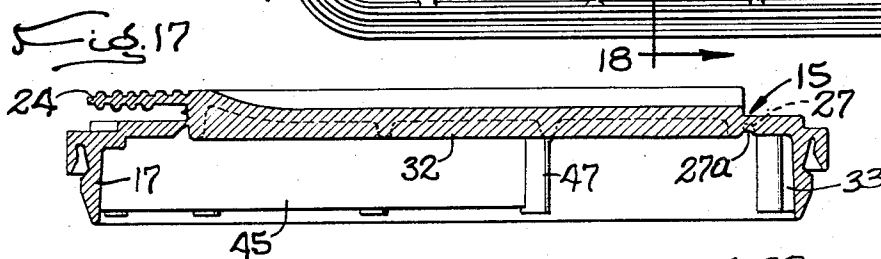
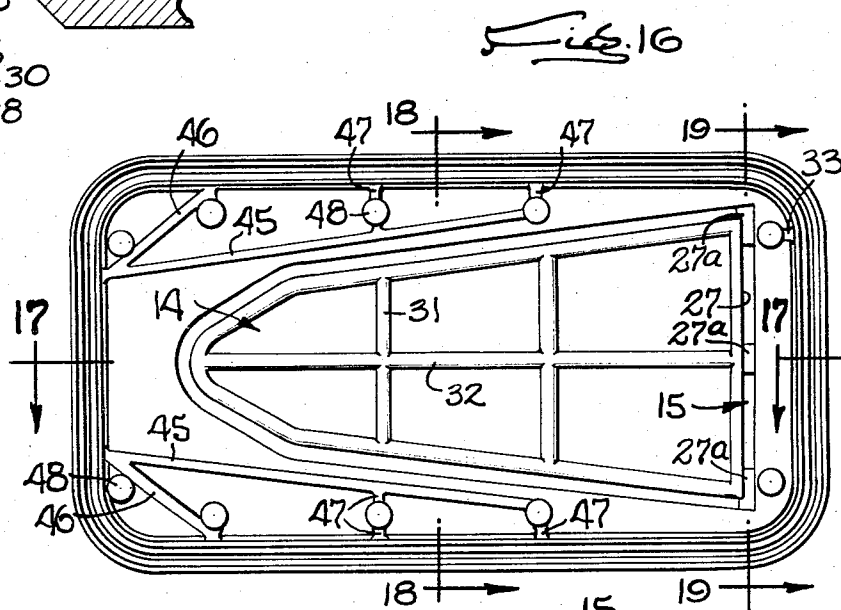
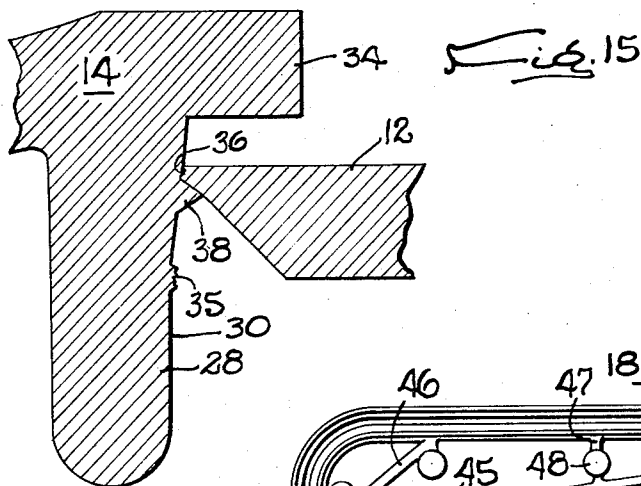
J. A. FOSTER

3,370,757

PLASTIC COVER FOR DISPENSING CONTAINER

Filed Sept. 6, 1966

4 Sheets-Sheet 4



INVENTOR
 John A. Foster
 By *Wolfe, Hubbard, Vicks & Co.*
 ATTORNEYS

1

3,370,757

PLASTIC COVER FOR DISPENSING CONTAINER

John A. Foster, Rockford, Ill., assignor to J. L. Clark Manufacturing Co., Rockford, Ill., a corporation of Illinois

Continuation-in-part of application Ser. No. 447,466, Apr. 12, 1965. This application Sept. 6, 1966, Ser. No. 586,903

10 Claims. (Cl. 222—153)

ABSTRACT OF THE DISCLOSURE

A generally rectangular single piece container cover is molded of resilient plastic and formed with an oblong central flap joined at one end by an integral hinge to one end of a dispensing opening in a flat top plate. Around the remaining peripheral edge, the flap is joined integrally to the top plate by a web of no substantial width and sufficiently thin to break and be torn all the way to the hinge ends by an upward pull manually applied to the free end of the flap to swing the latter upwardly and uncover the plate opening. By virtue of the resiliency of the plastic, no permanent deformation of the plastic occurs during breaking or tearing of the web so that the flap telescopes back into the torn edge of the plate opening and fits closely therein to provide tight resealing. An overhanging flange around the flap and underside ribbing of the flap and plate provide the rigidity for limiting the reclosing movement while providing uniform plastic cross-sections to permit of high production molding.

This application is a continuation-in-part of my prior application Serial No. 447,466, filed April 12, 1965, now abandoned.

This invention relates to dispensing containers and particularly to a molded plastic cover therefor providing a hinged closure for an opening through which the container contents may be removed or dispensed.

The primary object is to provide a plastic container cover of the above character and novel construction which is molded in a single piece with the closure integrally joined to the cover by a molded hinge across one edge and around the remaining periphery by a molded tear web adapted to be torn easily by an upward swinging of the closure out of its molded position to effect the initial uncovering of a dispensing opening, the closure being left hinged to the cover and adapted for repeated tight reclosure and reopening.

A further object is to provide a tear web of the above character which adapts the closure for tight reclosure along the torn edges simply by swinging the closure to or beyond its initial molded position.

Another object is to control the extent of the reclosing movement in a novel manner so as to insure relatively tight sealing of the dispensing opening.

Still another object is to achieve a snap-like action in the reclosing of the closure.

The invention also resides in the novel construction of the coupling between the hinged closure and its support to facilitate the initial tearing of the closure seal by a manually exerted pulling force.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings, in which

FIGURE 1 is a perspective view of a dispensing container having a cover embodying the novel features of the present invention.

FIG. 2 is a four times actual size section taken along the line 2—2 of FIG. 1.

2

FIG. 2a is an enlargement of a part of FIG. 2.

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

FIG. 4 is a bottom view.

FIG. 5 is a perspective view of the improved cover after opening the closure.

FIG. 6 is a section taken on the line 6—6 of FIG. 1 with the closure partially open.

FIGS. 7, 8 and 9 are sections taken along the line 7—7 of FIG. 6 but showing different conditions of partial opening and reclosure.

FIG. 10 is a perspective view similar to FIG. 1 showing a modification.

FIGS. 11 and 12 are fragmentary sections taken respectively along the lines 11—11 and 12—12 of FIGS. 10 and 11.

FIG. 13 is a fragmentary perspective view of a part of FIG. 10 with the closure open.

FIG. 14 is a section taken along the line 14—14 of FIG. 11.

FIG. 15 is an enlarged view of part of FIG. 9.

FIG. 16 is a view like FIG. 4 showing a modified and preferred construction of the cover bottom.

FIGS. 17, 18 and 19 are sections taken respectively along the lines 17—17, 18—18 and 19—19 of FIG. 16.

While the invention is shown for purposes of illustration incorporated in a cover 10 for a conventional container for spices, food flakes and the like having a metal body 11 of generally rectangular cross-section and rounded corners, it will be understood that the cover may take various other shapes and be secured in various ways to other kinds of dispensing containers.

The cover is composed of resilient plastic and comprises a generally flat top plate 12 defining a dispensing opening 13 (FIG. 5) closed by a relatively flat flap 14 hinged at 15 on the plate across one end of the opening for swinging between closed and open positions (FIGS. 1 and 5). The hinge is formed by a relatively thin web or membrane integrally joining the plate 12 with one end of the flap 14 which is elongated in the preferred form shown in FIGS. 1 to 9 to correspond to the desired size and shape of the dispensing opening.

Herein, the cover is coupled to the end of the body 11 by interlocking a bead 16 on a skirt 17 depending from the periphery of the plate with the downwardly facing edge 18 of a hem 19 at the end of the body. The skirt coacts with a second and shorter skirt 21 to form a groove in which the lip 22 of the body is wedged to form an airtight seal all around the cover.

The plate 12, the skirts 17 and 21, the closure flap 14, and the hinge 15 are all formed in a single molding operation using a relatively resilient thermoplastic material. One suitable material is ordinary polyethylene, such for example as that sold by Du Pont under the trade name Alathon-20.

In accordance with the present invention, the closure flap is molded in the closed position (FIGS. 1, 2 and 3) and, around the free end and sides all the way to the ends of the hinge 15, is integrally joined in the molding operation to the edge 20 of the top plate 12 defining the opening 13 by a tear web or membrane 23 which has no substantial width and is of sufficient thinness to be torn and broken by an upwardly directed pull manually applied while gripping a tab 24 which may be attached to the flap near the free end thereof. Thus, the tear web coacting with the hinge 15 completely closes the dispensing opening 13 between the ends of the hinge 15 while allowing the flap to be released automatically in the lifting of the flap to effect the initial opening of the container. Thereafter the flap remains attached to the cover by the hinge and thus is swingable reversely and guided into the opening to tightly reclose the opening.

3

While the tab may be integral with the top of the flap and project upwardly therefrom while being pulled upwardly, it is formed in the present instance as an integral extension of the free end of the flap and lies substantially in the plane thereof. To facilitate gripping of the pull tab 24, a series of shallow parallel ribs 25 are molded on its top and bottom surfaces. The tab terminates near one edge of the cover and is spaced a short distance above the top of the plate 12 to afford easy access to the user's thumb in the initial gripping of the tab while enabling the tab in its molded position to be disposed substantially in the plane of the closure flap. In the preferred form, such spacing is achieved by recessing the top of the plate below the tab and at the edge of the plate as indicated at 26. The tab is relatively thin and easily bent or swung upwardly to allow for firm finger gripping over relatively large areas. For the same reason, the tab is of substantial length as permitted by spacing the narrow end of the dispensing opening 13 a substantial distance from the end of the cover.

The hinge 15 is disposed close to and extends across the opposite end of the cover and comprises a narrow web formed in the present instance by grooving the under side of the cover as indicated at 27 (FIGS. 3 and 4) and across the full width of the closure flap at the wide end thereof. Preferably and at spaced points 27^a along its length, as shown in FIGS. 18 and 19, the hinge is thickened somewhat to provide in the mold passages large enough in cross-section to allow the molten plastic to flow through freely and to the remote parts of the mold cavity. The readily flexible web thus formed in the initial molding is integrally joined to the end of the flap, locates the hinge axis close to the side end of the dispensing opening and permanently closes this end of the opening.

To enable the tear web 23 to be broken and torn easily by a force of the magnitude that can be exerted by manually gripping and pulling upwardly on the tab 24, the portions thereof along opposite sides of the flap 14 preferably converge longitudinally of the flap toward each other first gradually as indicated at 23^a (FIG. 4), beginning at the ends of the hinge 15, then more sharply near the free end portion of the flap as indicated at 23^b and finally merge with each other at a narrow but somewhat rounded apex 23^c. Thus, in the initial upward pulling of the tab, the entire force is applied to a very short length of the tear web at this apex and this is easily stretched edgewise and then broken under the force capable of being exerted manually. After this initial break, rupture of the remainder of the web occurs with a true tearing action and progresses along the side portions 23^b and 23^a of the web under a somewhat lesser pulling force. Such tearing is continued all the way to the ends of the hinge in order to effect full uncovering of the opening 13, the flap remaining joined to the cover only by the hinge web 15.

The tear web 23 and the closure flap and top plate edges joined thereby are dimensioned and shaped in a novel way to facilitate the initial opening by a true tearing action along well defined lines, permit low cost molding using modern high production techniques, and leave the opposed edge surfaces of the flap and plate conditioned after tearing for easy and tight reclosure of the dispensing opening. For this purpose, the flap and the surrounding portions of the plate 12 are constructed to possess substantial rigidity and the web is joined to the flap around an outwardly facing upright surface or wall 30 which extends around the periphery of the flap between the ends of the hinge and is of substantial vertical width greater than the thickness of the surrounding edge portion 20 of the top plate 12. While the periphery of the flap may take various cross-sectional shapes to provide this wall, the latter, in the present instance, is the outer upright face of a peripheral rib or shallow skirt 28 which, in order to enable the top of the flap to be left smooth and of attractive contour, is formed around the under

4

side of the flap, depends from the outer edge thereof and projects somewhat below the tear web and the top surface of the plate. The rib is sized and shaped to telescope closely within the dispensing opening 13 upon reclosure of the flap after the initial tearing and opening of the latter, the rib tapering downwardly somewhat and being beveled along its lower edge to guide its entry into the dispensing opening as the flap, after tearing away from the top 12, is swung reversely into the plane of the opening.

To insure proper tearing while minimizing the irregularity of the resulting torn edges, the web 23 is made as narrow as possible to avoid stretching and insure smooth tearing and thin enough to insure easy tearing while permitting uniformity in high speed molding and insuring continuity around the full periphery of the closure flap. Thus, in the present instance, the web is only a few thousandths, for example, 0.005 of an inch wide and about 0.005 of an inch thick as indicated in FIG. 2a. Minimum thickness at the apex 23^c is desirable to insure easy breaking to start the tearing action by upward pulling of the tab 24.

The inner edge of the web 23 is integral with the rib surface or wall 30 and the outer edge is integral with the defining edge 20 of the dispensing opening 13 and substantially in the plane of the top surface of this plate. Formation of such a web with tools capable of withstanding long service use is facilitated by inclining, as indicated at 29 (FIG. 3), the bottom surface of the plate 12 around the edge 20 of the dispensing opening, the web being formed in the molding operation by virtue of the slight spacing of the rib surface 30 inwardly from the substantial intersection of this inclined surface 29 and the top of the plate 12. Thus, the web, although of no substantial width and so thin that it may be broken and torn easily, may be formed accurately and uniformly in high speed plastic molding operations.

By spacing the web 23 somewhat above and beveling the lower edge of the rib 28, the latter coats with the edge 20 of the dispensing opening to guide the flap into this opening as it is swung downwardly to reclose the opening. The rib thus becomes telescoped closely with the edge of the opening thus producing a tight seal all around the latter as more fully described later.

The desired overall rigidity of the closure flap is achieved by the rib 28 and a plurality of cross-ribs 31 and a crossing longitudinal rib 32 on the under side of the flap with the tops and ends of these ribs molded integral with the flap and the rib 28. The area of the top plate 12 surrounding the dispensing opening is made relatively rigid by molding spaced ribs on the underside of the plate within and integral with the peripheral skirt 16. The ribs may extend transversely and longitudinally of the plate as indicated at 33 in FIG. 4.

FIGS. 16, 17 and 18 show another rib arrangement which imparts greater and adequate rigidity to the flap end of the cover so as to prevent the skirt from flexing inwardly and slipping past the hem 19 under the upward pull applied to the tab 24 to tear the flap free. In this form, elongated and substantially straight ribs 45 disposed close to the sides of the opening 13 are extended along the major length of the opening, past the apex thereof and to the short side of the skirt 17. Similar and shorter ribs 46 extend across the corners of the skirt and merge with the outer ends of the ribs 45. Short cross-ribs 47 and knock-out pins 48 are spaced along the ribs 45, 46 and join these integrally with the long and short sides of the skirt. The truss-like structure thus formed by the ribs, the top 12 and the skirt 17 imparts the desired rigidity to the cover while maintaining all sections of the plastic of substantially uniform thickness. Thus, the cover, in spite of the complexity of its shape, may be formed with the required accuracy and without distortion in accordance with modern high production molding techniques.

It will be observed that the top of the closure flap 14 is somewhat wider than the dispensing opening 13 so that edge portions 34 thereof constitute flanges which project beyond and overlie the depending skirt 28 and are spaced somewhat above the top surface of the plate 12 in the initial molded position of the latter (FIG. 2). These portions 34, which could take the form of lugs, are adapted to engage the cover top and limit the downward movement of the flap during reclosure of the opening. Thus, the flap cannot under an abnormal downward pressure applied during reclosing be bent and forced through the opening 13.

Tearing of the web 23 by pulling the flap upwardly as above described leaves minute and slightly irregular projections 35 (FIG. 7) spaced along the rib 28 and similar projections 36 at the edge 20 of the opening 13. These irregularities, in spite of their short length due to the well defined lines of tearing of the web, are used to advantage in effecting a snap-like reclosure of the flap and effective holding thereof in closed position. Thus, with the stop flanges 34 spaced somewhat above the web, the flap may be depressed slightly below its original position during which the irregularities 35 along the rib 28 flex and pass by the irregularities 36 on the edge 20 of the cover as illustrated in FIG. 8. Such interlocking, especially at or near the free end of the flap, effectually holds the same closed but permits easy reopening during which the irregularities 35, 36 bend reversely and pass each other as the flap is swung upwardly.

With the flanges 34 of the closure flap spaced above the tear web 23 as above described, the sealing pressure attainable on reclosure of the flap may be increased by providing a small downward taper, for example 10 degrees as indicated at 37 (FIG. 3) all around that upright portion of the rib 28 which is disposed between the tear web 23 and the stop flanges 34. Thus, by continuing the application of downward pressure to the flap after it reaches its original position, the tapered surface is wedged into the dispensing opening 13.

More positive snap reclosure of the flap may be achieved if desired by molding shallow projections such as beads 38 along the outer surface 30 of the rib 28 between the flanges 34 and the tear web 23. In this position and under sufficient pressure applied to the free end portion of the flap in closing the latter, some parts of these projections will, due to the yieldability of the edge 20 and the rib 28, pass through the opening 13 and snap outwardly beneath the torn edge 36 as shown in FIGS. 9 and 15. The flap is thus held more effectually in closed position but may be swung upward easily when it is desired to reopen the container.

For closures which are somewhat smaller or narrower than that above described, sufficiently effective reclosure may be achieved by the interengagement of the torn edges as explained above. Such alternative constructions are shown in FIGS. 10 to 14 in which the parts corresponding to those previously described are indicated by the same but primed numbers. As initially molded, the parts are shaped as shown in FIGS. 10, 11 and 12 with an elongated closure flap 14' joined to the top plate 12' by a hinge web 15', the peripheral edge of which is joined integrally to the cover by a tear web 23' which in this instance is disposed substantially flush with the top surface of the cover at the upper edge of a rib 28'. The latter extends around the sides and end of the flap and is formed around its exterior with a small downward taper indicated at 41.

As the projecting pull tab 24' is gripped and pulled upwardly from the molded position shown in full in FIG. 11 and to the position shown in phantom, the web 23' is first stretched and broken at the free end of the flap 14' and beneath the pull tab. Then, as the upward swinging is continued, the web is torn progressively along opposite side edges of the flap and to the ends of the hinge 15' the dispensing opening is thus uncovered.

To reclose the opening, the flap 14' is swung reversely and downwardly, the lower end of the rib 28' being guided into the opening. As the flap comes into the plane of the top plate 12', the irregularities on the torn edges on the rib and plate pass by and interlock with each other just before the pull tab comes into contact with the top. Such a narrow closure flap will stop in closed position (FIG. 10) under the reclosing pressure applied by the average user.

The tear web 23'' may be of the same construction and similarly arranged relative to the closure flap 24'' when the dispensing opening 13'' is of relatively small size as shown in FIGS. 11, 13 and 14. In this instance, the outer end of the dispensing opening is of arcuate shape and the corresponding portion of the rib 28'' is deepened and formed as laterally spaced depending teeth 42. The spaces 43 between adjacent ones of these are sized to form openings through which the container contents may be sifted after the tear web 23'' has been torn and the closure flap swung upwardly to the position shown in FIG. 13 and in phantom in FIG. 11. The lower ends of one or more of the teeth at the free end of the flap are formed with a lug 44 positioned to engage the cover at the edge of the dispensing opening thus limiting the opening movement of the flap to the sifting position.

It will be apparent from the foregoing that the easy opening of the closure flap and the tight sealing on reclosure is attributable to several of the above mentioned features including the molding of the closure in a single piece of resilient plastic thus avoiding any permanent deformation that would interfere with telescoping of the torn edges back together and effectual resealing of the flap around the dispensing opening. Such effective resealing is also achieved by making the tear web 23 without substantial width and disposing the same above the lower edge of the rib 28. This provides for clean and accurate tearing of the web and the elimination of torn edges that would become rolled over and wedged between the opposed surfaces of the flap and plate and thus prevent tight reclosure. The lower beveled edge of the rib 28 guides the entry of the torn flap back into the dispensing opening to achieve close telescoping resealing. By forming the rib 28 around the periphery of the flap and ribbing the undersides of the plate and the flap as indicated at 46, 47 and 48, the desired uniform cross-sections of the molded piece are provided to permit of high production molding while maintaining the rigidity of the flap and plate required for enabling the overhanging flange 34 to be used to prevent the flap, during reclosure, from being pushed down through the dispensing opening.

While various forms of the term "telescope" have been used in the specification and the claims to describe the interfitting action of the hinged closure flap 14 and the opening 13 upon reclosure of the cover, it is to be understood that the use of the term "telescope" herein contemplates hinged telescoping of the parts rather than relative bodily movement or bodily sliding of the parts as the term "telescope" denotes in its true sense.

I claim as my invention:

1. A container cover molded of a single piece of resilient plastic and comprising an apertured top plate having an internal edge defining an opening adapted, when uncovered, for the dispensing of the container contents therethrough, a flap covering said opening, a flexible web molded integrally with and permanently joining one end of said flap and said plate edge and forming a permanent hinge across the corresponding edge of said opening, the remaining periphery of said flap being molded with an outwardly facing upright surface corresponding in shape to and adapted for close telescoping within the remaining peripheral length of said plate edge between opposite ends of said hinge, a tear web integrally joining said surface and said remaining plate edge continuously around the latter and cooperating with said hinge web to completely

close said opening in the cover as molded, a pull tab integral with said flap at the end opposite the hinge, said tear web having no substantial width and being sufficiently thin to be broken by an upwardly directed pull capable of being applied by manual gripping of said tab and then to tear along opposite sides of the flap and to said hinge ends as such pull and upward swinging of the flap is continued to uncover said dispensing opening, said hinge web being thicker than said tear web and sufficiently strong to remain untorn during such upward swinging, said breaking and tearing of said tear web occurring without permanent deformation of said resilient plastic and leaving around said flap surface and said opening torn edges which, by virtue of the resiliency of said plastic, remain in their originally molded shape and sufficiently flexible to interengage or pass each other as the flap after tearing is swung reversely to or beyond its original molded position.

2. A container cover as defined in claim 1 in which said tear web is spaced above the lower edge of said upright flap surface and such lower edge coacts with the torn edge of the plastic around said opening to guide the entry of the torn edge of the flap back into interengagement with the opening edge as the flap is swung back to its untorn position.

3. A container cover as defined in claim 2 in which the guiding of said flap into the torn edge of said opening is facilitated by a bevel along said lower edge of said upright flap surface.

4. A container cover as defined in claim 1 in which the width and thickness of said tear web is on the order of a few thousandths of an inch.

5. A container cover as defined in claim 1 in which the top and bottom surfaces of said plate defining said dispensing opening converge inwardly to the thickness of said web at said upright flap surface.

6. A container cover as defined in claim 1 including a short projection disposed above and extending outwardly from said upright side surface of said flap and adapted upon reclosure of the flap to pass the torn edge of said

opening and engage beneath the latter to hold the flap releasably in closed position.

7. A container as defined in claim 1 in which said side surface of the flap above said tear web converges downwardly and inwardly and is sized to wedge within the torn edge of said opening as said flap is swung reversely and the torn edge of the flap is moved past the torn edge of said opening and beyond its original molded position.

8. A container cover as defined in claim 1 in which said peripheral flap surface is the external face of a rib integral with, depending from, and extending around the flap periphery between the ends of said hinge, and including cross-ribs integral with and spanning said peripheral rib to impart substantial rigidity to the flap while maintaining substantial uniformity in all cross-sections of the latter.

9. A container cover as defined in claim 8 including a skirt extending around and depending from the outer periphery of said top, elongated ribs integral with and depending from said top along opposite sides of said opening and integral with said skirt beyond the end of said opening, and cross-ribs spaced along said first ribs and integrally joining the latter with said skirt.

10. A container cover as defined in claim 1 in which a rib depending from and extending around the free end of said flap below said tear web is formed with a plurality of depending projections laterally spaced to provide a plurality of downwardly opening recesses which cooperate with said top edge to define sifter holes after tearing of said web and upward swinging of said flap to expose such holes.

References Cited

UNITED STATES PATENTS

2,574,720	11/1951	Trout et al.	220—27
3,083,858	4/1963	Biedenstein	220—27
3,144,180	8/1964	Phillipps et al.	222—480
3,250,436	5/1966	Kurtz	222—528

40 STANLEY H. TOLLBERG, *Primary Examiner.*