

March 5, 1968

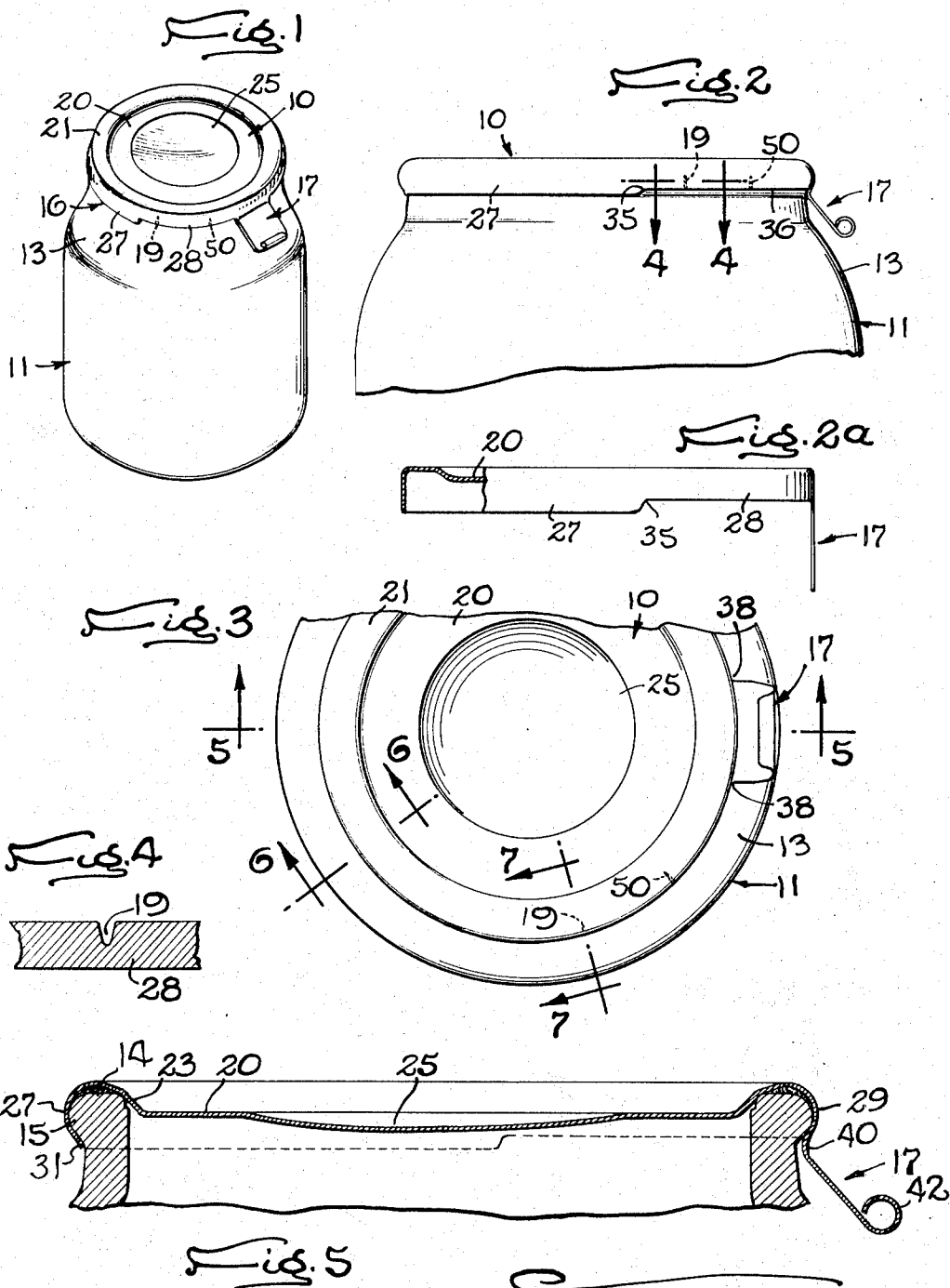
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3,371,812

BEADED CONTAINER WITH LIFT TAB COVER

Filed Dec. 14, 1966

3 Sheets-Sheet 1



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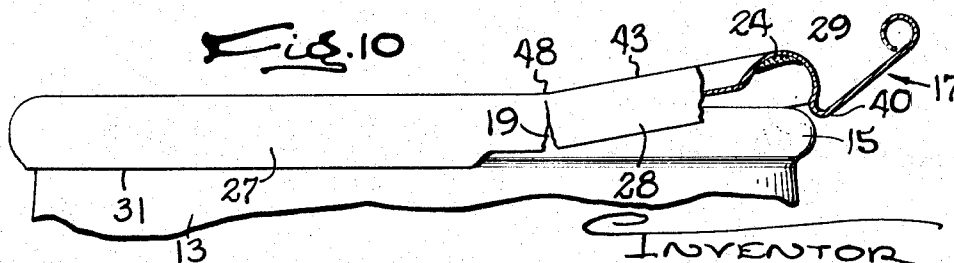
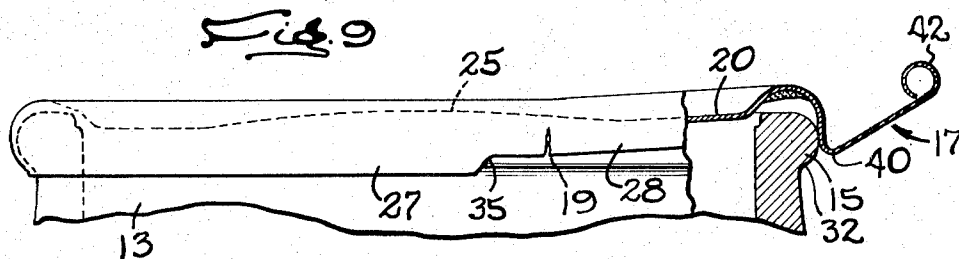
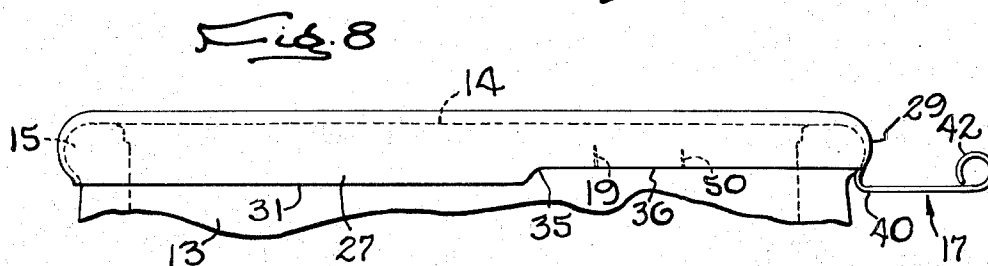
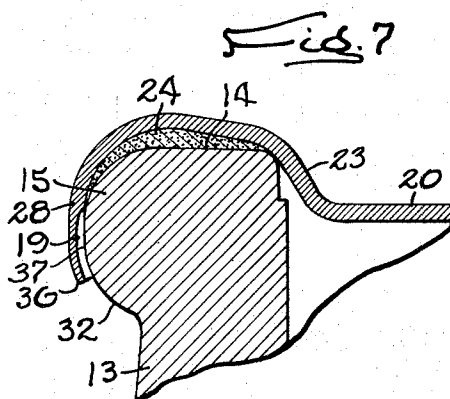
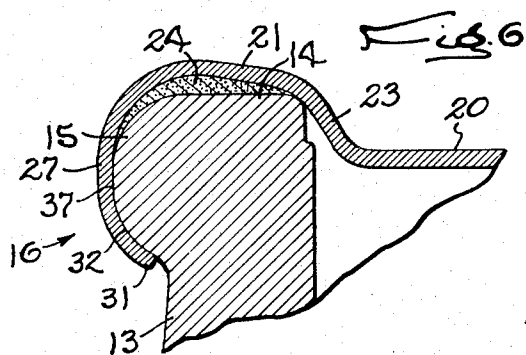
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3 Sheets-Sheet 2



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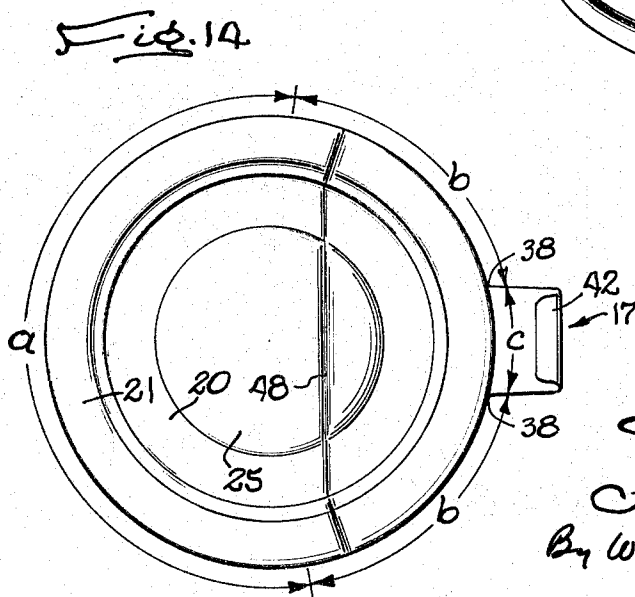
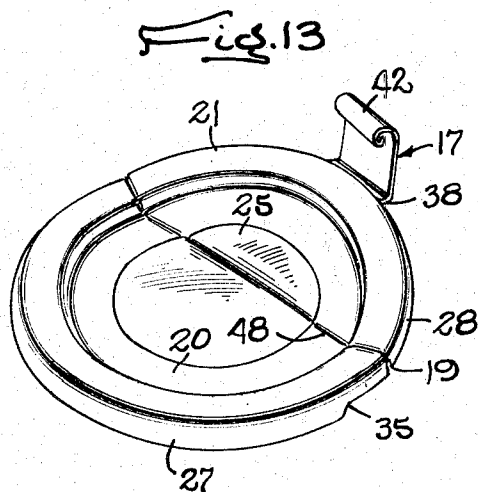
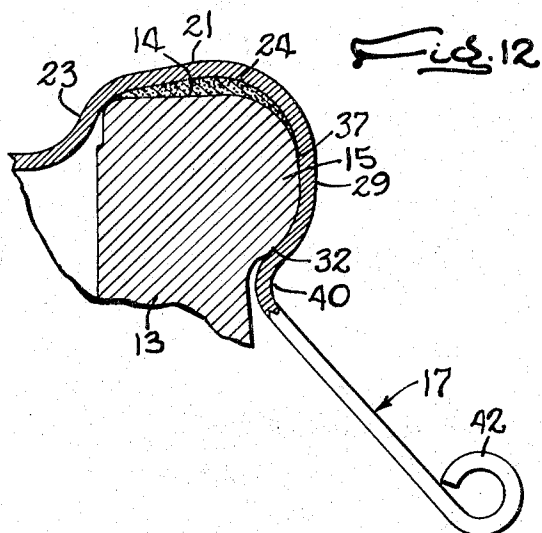
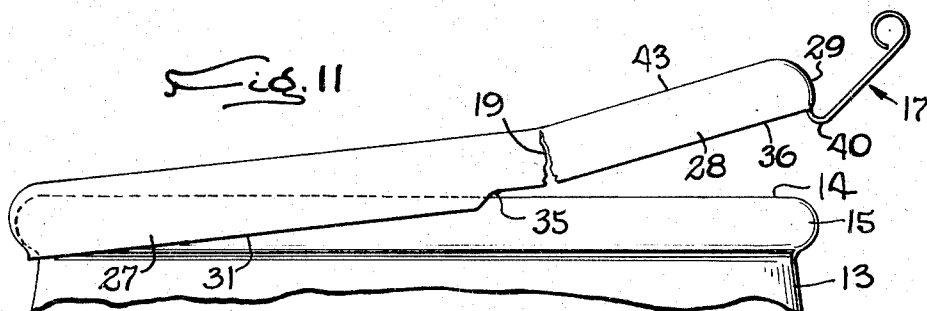
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BEADED CONTAINER WITH LIFT TAB COVER

Filed Dec. 14, 1966

3 Sheets-Sheet 3



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3,371,812

BEADED CONTAINER WITH LIFT TAB COVER
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5 Claims. (Cl. 215—39)

This invention relates to a container having a tubular body formed with an annular lip bead and closed by a cover having a depending skirt crimped around and hooked under the bead. The skirt is formed with upright score lines on opposite sides of a flexible tab which may be pulled outwardly and upwardly to tear the skirt along the lines and facilitate removal of the cover.

The primary object of the present invention is to provide a container of the foregoing character with a relatively simple and inexpensive cover which effectively seals and reseals the container and, at the same time is more easily removable by an upward pull applied manually to the tab than prior covers of the same general type.

A more detailed object is to provide a covered container of the above type in which substantial arcuate lengths of the cover skirt disposed on opposite sides of the tab are shortened and hooked only partially around the bead and coact with the score lines to provide for easy and reliable removal of the cover when the tab is pulled upwardly while the remainder of the skirt is hooked fully around the bead and coacts with the tab in a novel manner to maintain the initial seal and to provide for effective reclosure in spite of such easy removability of the cover.

The invention also resides in the novel placement of the score lines between the tab and the ends of the partially hooked arcs of the skirt to induce bending of a substantial segment of the cover upwardly and away from the bead in response to an upward and outward pull applied manually to the tab.

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 container and cover embodying the novel features of the present invention.

FIG. 2 is an enlarged fragmentary side elevation of the cover and the container.

FIG. 2a is a fragmentary side elevation of the cover as initially formed and before being crimped on the jar, parts of the cover being broken away and shown in section.

FIG. 3 is an enlarged fragmentary plan view of the cover and the container.

FIG. 4 is an enlarged fragmentary cross-section taken substantially along the line 4—4 of FIG. 2.

FIG. 5 is an enlarged fragmentary cross-section taken substantially along the line 5—5 of FIG. 3.

FIG. 6 is an enlarged fragmentary cross-section taken substantially along the line 6—6 of FIG. 3.

FIG. 7 is an enlarged fragmentary cross-section taken substantially along the line 7—7 of FIG. 3.

FIGS. 8, 9, 10 and 11 are views similar to FIG. 5 and illustrating the manner of removing the cover, parts of the cover and the container being broken away and shown in section for purposes of clarity.

FIG. 12 is an enlarged view of parts shown in FIG. 5.

FIG. 13 is a perspective view of the cover after it has been removed.

FIG. 14 is a plan view of the cover after it has been removed.

As shown in the drawings for purposes of illustration,

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the invention is embodied in a removable cover 10 for hermetically sealing a container 11 which may be a rigid glass jar having a tubular body 13 formed at its upper end with an open mouth defined by a lip 14. Surrounding the lip is a downwardly rounded and out-turned annular bead 15 around which a continuous skirt 16 (FIG. 2) depending from the full periphery of the cover is deformed from its initial cylindrical form shown in FIG. 2a and crimped inwardly and hooked around the bead to seal the cover tightly against the container lip. Integral with and projecting downwardly from the lower edge of the skirt around a short arc thereof is a tab 17 adapted to be gripped manually and pulled outwardly and upwardly as illustrated in FIGS. 7 and 8 to tear the skirt along upright score lines 19 formed in the skirt to facilitate removal of the cover from the container.

Herein, the cover 10 is made of relatively thin and flexible material such as ten gauge sheet aluminum and is formed with a substantially flat top panel 20 bordered by an upwardly offset peripheral rim 21 defining an internal annular wall 23 (FIG. 6). The latter coacts with the skirt 16 to form a downwardly opening groove receiving a yieldable ring of sealing compound 24 which is compressed between the rim and the container lip 14 as an incident to crimping the skirt around the bead 15 thereby to establish an air-tight seal between the cover and the jar 11. The sealing compound may be a plastisol such as sold by the Bradley Vrooman Company. Since jars of this type usually are filled with food or other product maintained under vacuum, a raised button 25 is formed at the central portion of top panel 20 to indicate the presence or absence of vacuum in the jar as finally processed. The button is held in a depressed position (FIG. 5) as long as vacuum is present in the jar and then pops upwardly (FIG. 9) as the seal is broken to produce an audible sound indicating that vacuum was present prior to removal of the cover.

In accordance with the present invention, substantial arcuate lengths of the skirt 16 are shortened and arranged to interlock or hook only partially around the bead 15 and coact in a novel manner with the score lines 19 to provide for easy release of the cover 10 by manual lifting of the tab 17 while the remainder of the skirt coacts with the tab to provide full interlocking with or hooking around the bead to hold the initial sealing pressure and also to permit effectual resealing by pressing the cover back onto the jar 11. To these ends, the cylindrical skirt on the cover as initially formed and shown in FIG. 2a is divided circumferentially into four arcuate lengths, namely, a deep section 27 which is adapted for full interlocking with the bead, and which extends around about half of the periphery of the top 20, two similar intermediate sections 28 of lesser depth and length between the tab and the ends of the deep section, and a deep section 29 integral with and including the arc of the tab 17 and adapted, like the section 27, to hook around the full depth of the bead at the edge of the cover opposite the center of the section 27.

In this instance, the deep skirt section 27 extends slightly more than half way around the outer periphery of the rim 21 (as indicated by the arc *a* in FIG. 14) and is crimped outwardly, downwardly and then inwardly around the downwardly rounded outer surface of the bead 15. As shown most clearly in FIG. 6, the lower free edge portion 31 of the deep skirt 27 is hooked fully around the lower portion of the bead and extends substantially across the full width of a downward and axially facing shoulder 32 formed by the lower edge portion of the bead adjacent the junction with the body 13 of the jar 11. With the deep skirt 27 hooked fully around the bead and with the upwardly facing surface of the free edge portion 31 hugging the downwardly facing

shoulder 32 in this manner, the deep skirt is locked securely on the bead to hold the segment of the cover encircled by the arc *a* tightly on the jar. Such secure interlocking between the deep skirt 27 and the bead may be achieved by a conventional seaming operation in which rolls (not shown) are employed to bend the initially cylindrical skirt around the bead and crimp the free edge portion 31 inwardly across the shoulder 32. During the seaming, the cover is pressed downwardly against the lip 14 thus compressing the sealing compound 24 so as to leave a tight hermetic seal after deformation and contraction of the skirt.

While the deep skirt section 27 is hooked fully around the bead 15, the intermediate and shallower skirt sections 28 are hooked only partially across the shoulder 32 of the bead so that the cover 10 may be released easily from the jar 11 by an upward pull exerted on the tab 17. As shown most clearly in FIGS. 8 to 11, each shallow skirt section 28 is joined integrally at one end 35 to the adjacent end of the deep skirt 27 and extends circumferentially around the rim 21 through an arc *b* (FIG. 14) of slightly less than seventy-five degrees. The shallow sections are rolled and crimped around the bead in the same manner as the deep skirt 27 in the seaming operation but the free edge portions 36 (FIG. 7) thereof extend downwardly just beyond the major diameter 37 of the bead and then inwardly and only partially across the shoulder 32 with the result that the free edge portions 36 of the shallow skirt sections 28 are offset upwardly from and spaced about $\frac{1}{32}$ of an inch above the plane of the free edge portion 31 of the deep skirt 27. Accordingly, the intermediate sections 28 are hooked sufficiently far around the bead 15 to maintain the sealing pressure between the jar lip 14 and the cover rim 21 around the full circumferential lengths of these sections and yet are easily releasable from the bead upon expanding radially and outwardly through a short distance to enable the free edge portions 31 to slip upwardly past the major diameter 37 of the bead.

To compensate for any decreased holding force resulting from the partial hooking of the intermediate skirt sections 28 with the bead 15 and to insure that the segment of the rim 21 encircled by the arcs *b* will remain firmly sealed against the lip 14 in spite of the upwardly directed force exerted by the compressed sealing compound 24, the deep skirt section 29 along the arc of the tab 17 is hooked fully around the bead to the same extent as the longer deep skirt 27 thereby increasing the holding force afforded by the intermediate sections 28. Herein, the tab skirt section 29 is disposed at the periphery of the rim 21 opposite the deep skirt 27 and extends circumferentially between the adjacent ends 38 of the intermediate sections 28 through an arc *c* (FIG. 14) of about thirty degrees. As shown most clearly in FIGS. 5 and 12, the lower portion 40 of the tab skirt section 29 extends below the free edge portions 36 of the intermediate sections 28 and is hooked around the bead 15 and across the full radial width of the shoulder 32 a substantial distance below the maximum diameter 37 of the bead. With the tab skirt section 29 thus fully interlocking with the bead 15 between the partially hooked intermediate sections 28, the latter may be shortened and adapted to coact in a unique way with the score lines 19 in facilitating removal of the cover while maintaining adequate holding force between the jar and the segments *b* and *c* of the cover.

As shown in FIGS. 4 and 12, the tab 17 is an extension of the tab skirt section 29 and extends circumferentially around the full arc thereof. The upper end of the tab is integral with the lower hooked portion 40 of the tab skirt section 29 while the remainder of the tab flares downwardly and away from the body 13 of the jar 11 and terminates in a lower free end portion 42 which preferably is curled outwardly, upwardly and then inwardly to facilitate firm gripping between the user's thumb and forefinger.

I have discovered that by properly spacing the score lines 19 angularly around the cover and away from the tab 17, the metal at the junctions 38 (FIG. 14) of the skirt sections 28 and the tab will remain unbroken as the tab is bent outwardly away from the jar to release the deep skirt section 29 from the bead 15 and then pulled upwardly with a force of sufficient magnitude to force upward tearing of the metal along the score lines 19 as shown in FIGS. 8 to 11. Herein, the score lines extend upwardly from the free edges 36 of the intermediate skirt sections 28 to a point just short of the rim 21 of the cover and reduce the metal of the intermediate sections to about one half its original thickness as illustrated in FIGS. 4 and 7. Preferably, the lines are spaced angularly a short distance, about fifteen degrees in the present instance, away from the junctions 35 of the intermediate sections 28 and the ends of the deep section 27. With the score lines thus positioned, the stretching of the metal of the cover at these junctions occurring during formation and seaming of the cover does not result in stresses which would cause the score lines to tear prematurely and thus destroy the hermetic seal.

To release and remove the cover 10 described above after the latter has been seamed onto the jar 11, the curled end 42 of the tab 17 is first gripped between the user's thumb and forefinger and is swung upwardly and outwardly to a substantially horizontal position as shown in FIG. 8 to facilitate firm gripping of the tab. As the outward and upward pull is continued, the lower hooked portion 40 of the tab skirt section 29 is pulled out from beneath the shoulder 32 and then, the adjacent portion is cammed upwardly and outwardly by the shoulder (see FIG. 9) thereby causing the intermediate sections 28 to be placed in circumferential tension as a result of which the metal is broken first at the lower ends of the score lines as shown in FIG. 9 after which the upward tearing continues as shown in FIG. 10. As an incident to this tearing upwardly into the sealing area, the vacuum within the jar 11 is released and the indicating button 25 pops upwardly. At the same time, the intermediate skirt sections 28 expand radially and circumferentially because of the torn lines 19 thus enabling the lower hooked portion 40 of the tab skirt section 29 to slip upwardly around the maximum diameter 37 of the bead 15.

Continued upward pulling of the tab 17 after the hooked portion 40 thereof has been released from the bead causes upward bending of the cover segment 43 (as shown in FIG. 10) away from the bead and along a generally chordal line 48 (FIGS. 13 and 14) extending across the top panel 20 and intersecting the upper ends of the tear lines 19 adjacent the rim 21. With the cover segment 43 thus hinged away and released from the bead, further pulling of the tab 17 results in the upward force being applied to the cover along the chordal line 48 so that the short portions of the intermediate skirt sections 28 disposed between the score lines 19 and the skirt ends 35 thus are cammed outwardly and released from the bead. This camming action, as illustrated in FIG. 11, then progresses circumferentially around the deep skirt 27 until about a third of the deep skirt has been released. Thereafter, the cover may be lifted off of the jar easily.

Owing to the resiliency of the skirt sections 27, 28 and 29, their cross-sectional shapes are substantially preserved during removal of the cover 10 in the manner described above even though a cover is bent somewhat as shown in FIGS. 10 and 13. As a result, the jar 11 may be re-closed simply by replacing the cover with the deep skirt section 27 hooked around the bead 15 and then pressing the bent segment 43 downwardly against the jar lip 14. The intermediate skirt sections 28 and the tab section 29 thus telescope downwardly over the bead and the lower hooked portion 40 of the tab section 29 snaps in and under the shoulder 32 not only to prevent the top segment 43 from flexing upwardly but also to draw

the deep skirt section 27 into relatively tight engagement with the bead 15. The two deep skirt sections 27 and 29 thus coact to hold the cover on the jar even though the two intermediate sections 28 engage the bead relatively loosely due to their expansion caused by the torn score lines 19.

In some instances, it is desirable to form a second set of score lines 50 (FIGS. 2 and 8) in the intermediate skirt sections 28 between the score lines 19 and the tab 17 to insure release of the cover 10 in case the score lines 19 fail to tear properly or in case the intermediate skirt sections 28 are crimped abnormally tightly around the bead 15 during the seaming operation. Herein, the additional score lines 50 are located about midway between the score lines 19 and the ends 38 of the intermediate sections 28. In this position and if the score lines 19 fail to tear or if the skirt sections 28 fail to release, the score lines 50 also will tear upwardly to allow the skirt sections 28 to expand still further thus enabling the lower hooked portion 40 of the tab skirt section 29 to be pulled upwardly past the major diameter 37 of the bead 15.

From the foregoing, it will be apparent that the initially smooth and unbroken skirts 27, 28 and 29 provide an air-tight seal around the bead 15 of the jar 11 and, at the same time, the advantageously located score lines 19 coact with the shortened intermediate sections 28 to provide for easy removal of the cover in spite of the circumferential continuity of the skirts. The fully hooked tab skirt section 29 provides the necessary hold-down force at the edge of the cover opposite the deep skirt 27 thus compensating for the reduced force provided by the shallower skirt sections 28. At the same time, the increased hold-down force by the tab portion 40 is easily releasable by virtue of the short arcuate length of the tab.

I claim as my invention:

1. A container having, in combination, a cylindrical tubular body having an out-turned annular lip bead extending around its open end and defining a downwardly rounded peripheral surface terminating in a downward and axially facing shoulder; a cover of relatively thin and resilient sheet metal having a generally flat top and having an integral continuous skirt depending from the periphery of the top and telescoped down over said bead; said skirt including a first arcuate section extending approximately half way around said bead, a second arcuate section disposed at the periphery of said top opposite said first skirt section and centered relative thereto and extending around a short circumferential arc of said bead, and two intermediate arcuate sections of lesser arcuate length than said first section but of greater arcuate length than said second section each extending angularly between adjacent ends of said first and second sections; said first skirt section having a lower free edge portion hooked fully around said bead and securely interlocked with and under said shoulder to hold said cover firmly on said body, said intermediate skirt sections each extending only partially across said shoulder and thus being hooked only partially around said bead, and said second skirt section having a lower portion hooked around and fully interlocked with said bead below the free edge portions of said intermediate sections and substantially across the full width of said shoulder; a pull tab integral at its upper end with and constituting an extension of said second skirt section over the full arc thereof, said tab extending downwardly and outwardly from said bead to present a free end portion adapted for manual grasping whereby the hooked portion of said second skirt section is cammed outwardly and upwardly by said shoulder

in response to an outwardly and upwardly directed pull manually exerted on said free end portion; and a pair of upright score lines angularly spaced in opposite directions from said tab and each formed between the ends of one of said intermediate sections, said intermediate sections along said lines being sufficiently thin to cause upward tearing along the lines as an incident to said camming and said outward and upward pull, and said score lines being angularly spaced from said tab sufficiently far to induce, after tearing of said lines and during continuance of said pull, upward bending away from said bead of a segment of said top along a generally chordal line substantially intersecting the ends of the tears and substantially longer than the arcuate length of said tab and said second skirt section.

2. A container as defined in claim 1 in which the arcuate distance between each score line and the adjacent side of the tab is greater than the arcuate distance between said score line and the adjacent end of said first section.

3. A container as defined in claim 1 in which the arcuate distance between each score line and the adjacent side of the tab is at least three times greater than the arcuate distance between said score line and the adjacent end of said first skirt section.

4. A container as defined in claim 1 further including a second pair of score lines each formed in one of said intermediate skirt sections between said first score line and the adjacent side of said tab.

5. A container having, in combination, a cylindrical tubular body having a downwardly rounded lip bead extending around its open end, a cover of relatively thin and resilient sheet metal having a generally flat top and having an integral skirt depending from the periphery of the top and telescoped down over said bead; said skirt including a first arcuate section extending circumferentially around a relatively long arc of said bead, a second arcuate section disposed at the periphery of said top opposite said first section and extending around a shorter arc of said bead, and two intermediate arcuate section of lesser arcuate length than said first section but of greater arcuate length than said second section each extending angularly between adjacent ends of said first and second sections; said first skirt section having a lower free edge portion hooked fully around said bead to hold said cover firmly on said body, said intermediate skirt sections each being hooked only partially around said bead and having free edge portions offset upwardly from and spaced above the plane of the free edge portion of said first skirt section, and said section skirt section having a lower portion hooked around said bead below the free edge portions of said intermediate sections; a pull tab integral at its upper end with and constituting an extension of said second skirt section, said tab extending downwardly and outwardly from said bead to present a free end portion adapted for manual grasping; and a pair of upright score lines angularly spaced in opposite directions from said tab and each formed between the ends of one of said intermediate sections with the angular distance between each score line and the adjacent side of the tab being at least as great as the arcuate length of said second skirt section.

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