Nov. 28, 1967 W. G. REYNOLDS ET AL 3,355,060

CONTAINER WITH IMPROVED LIFT-OFF END CLOSURE

Filed May 21, 1965 3 Sheets-Sheet 1

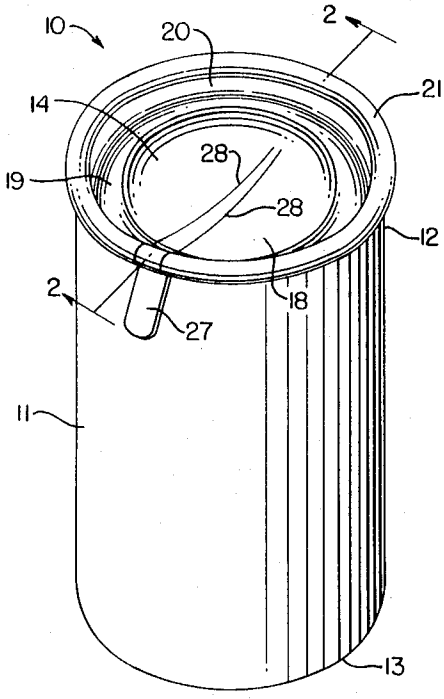


FIG.1

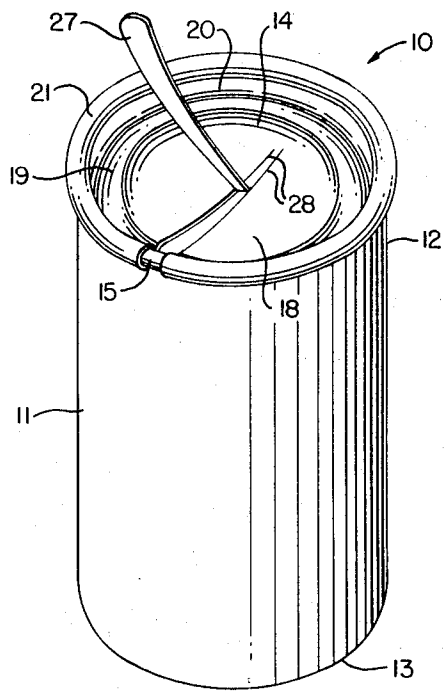


FIG.3

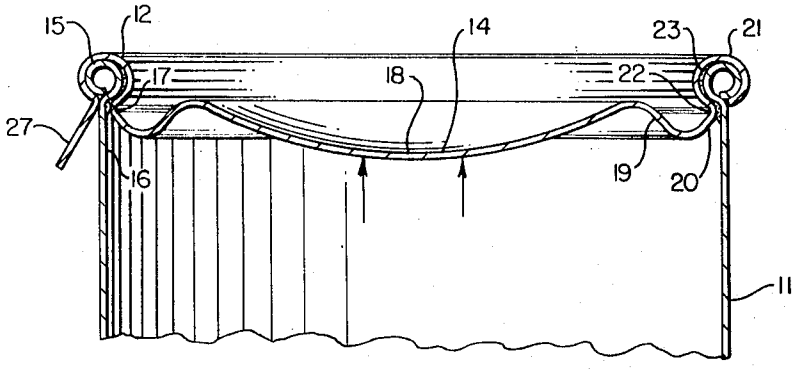


FIG.2

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CONTAINER WITH IMPROVED LIFT-OFF END CLOSURE

Filed May 21, 1965 3 Sheets-Sheet 2

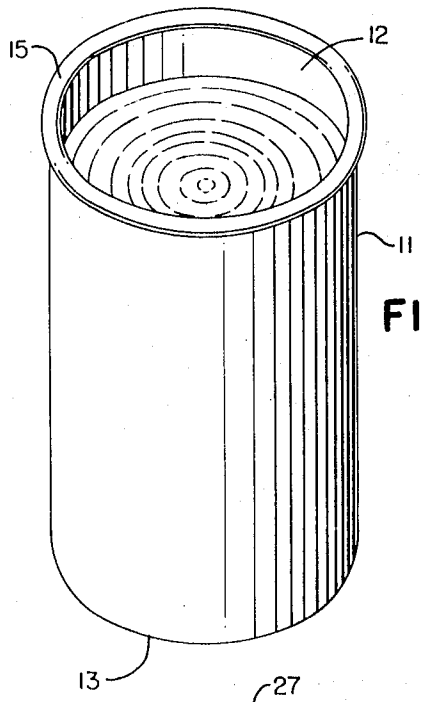


FIG.4

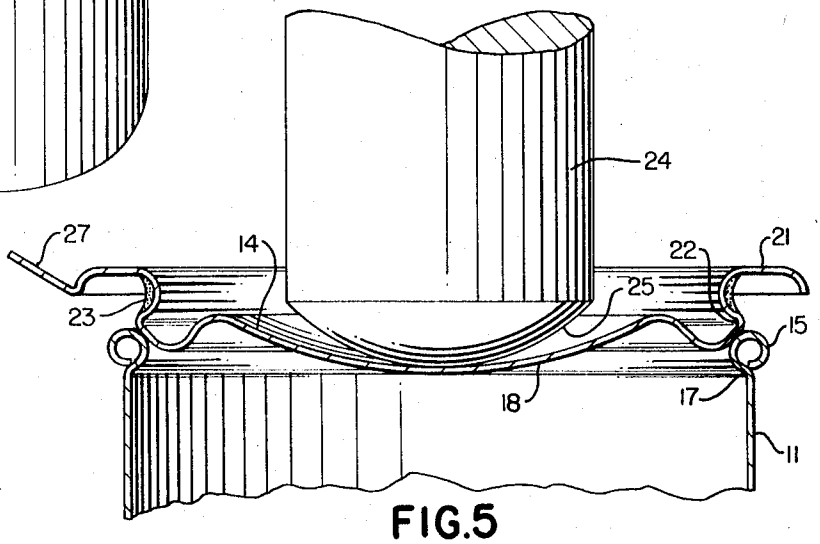


FIG.5

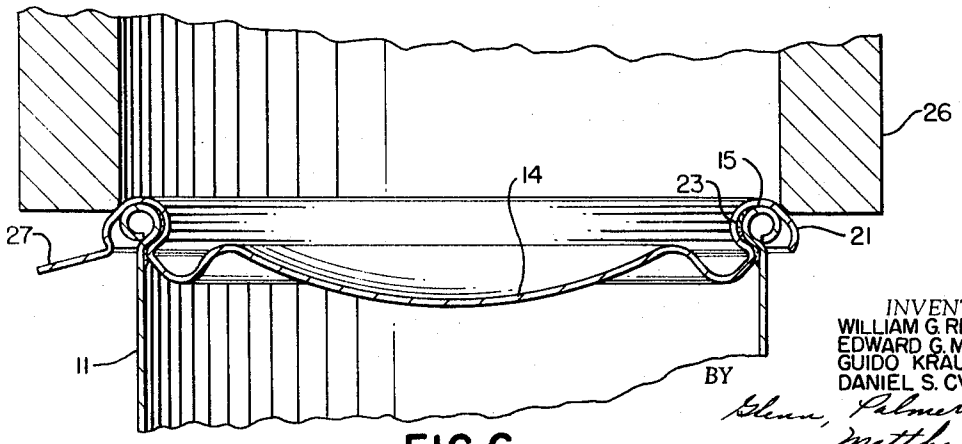


FIG.6

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CONTAINER WITH IMPROVED LIFT-OFF END CLOSURE

Filed May 21, 1965 3 Sheets-Sheet 3

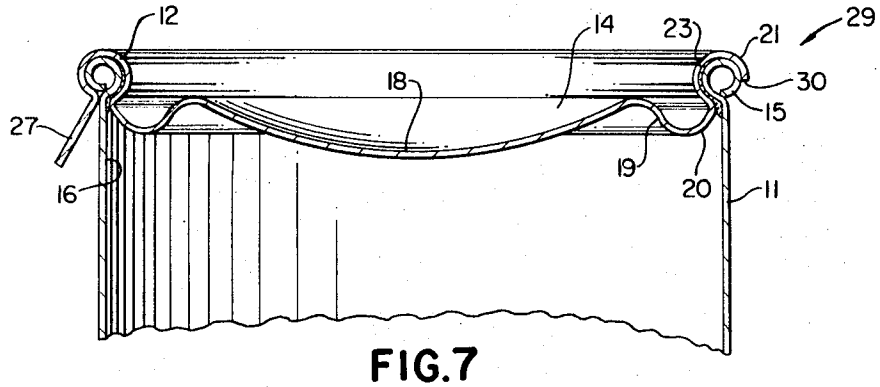


FIG.7

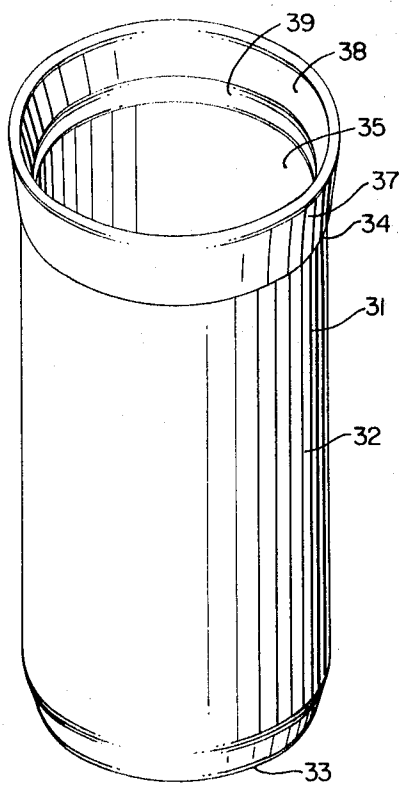


FIG. 8

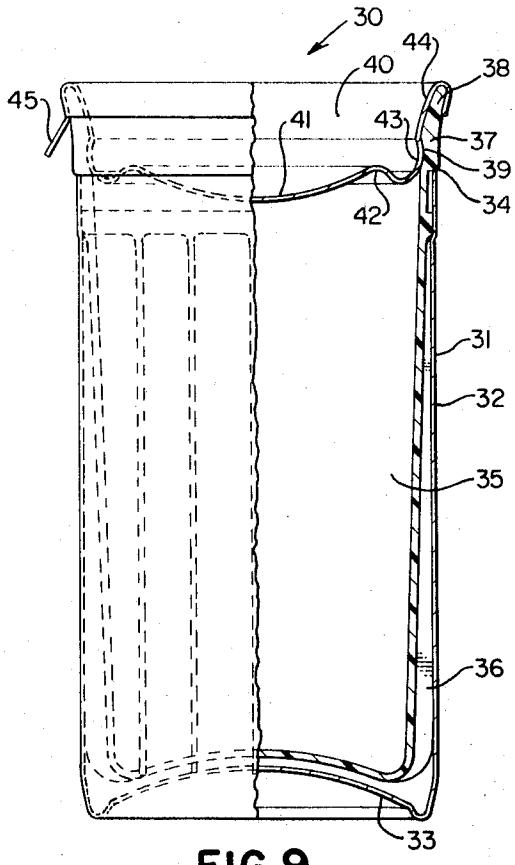


FIG.9

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3,355,060

CONTAINER WITH IMPROVED LIFT-OFF END CLOSURE

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13 Claims. (Cl. 220—54)

ABSTRACT OF THE DISCLOSURE

This disclosure relates to a container means having a container body provided with an annular recess in the inside surface of the container body adjacent the open end thereof and snap fittingly receiving an intermediate annular portion of an end closure having an outer portion secured around the open end of the container body, the annular intermediate portion of the end closure being substantially S-shaped in cross-section to provide a resiliency to the end closure to effect the snap fitting relation thereof with the container body and having an inwardly bowed central portion to cause the intermediate portion to be more firmly received in the recess of the container body as internal pressure is created within the closed container body by the contained product means or the like.

This invention relates to an improved container as well as to improved parts and methods for making such a container or the like.

In particular, this invention provides an improved end closure for effectively sealing closed the open end of a container body or the like so that the end closure has a natural tendency by itself, as well as with internal pressure in the container body, to more firmly secure the end closure in a sealed relation with the container body.

In addition, the end closure of this invention has an improved feature for permitting the same to be easily opened when desired by the ultimate consumer.

Also if desired the entire end closure may be removed exposing a desirable appearing tumbler.

In particular, the container body can be so constructed and arranged to be utilized with the end closure of this invention in such a manner that the container body itself will provide an attractive tumbler type of structure when opened so that the container body can be utilized as a drinking or serving receptacle.

Accordingly, it is an object of this invention to provide an improved container having one or more of the novel features of this invention as set forth above or hereinafter shown or described.

Another object of this invention is to provide an improved end closure for such a container or the like.

A further object of this invention is to provide an improved method of making such a container or the like.

Other objects, uses and advantages of this invention are apparent from a reading of this description which proceeds with reference to the accompanying drawings forming a part thereof and wherein:

FIGURE 1 is a top perspective view of the improved container of this invention with the end closure thereof in its closed position.

FIGURE 2 is a fragmentary, cross-sectional view taken on line 2—2 of FIGURE 1.

FIGURE 3 is a view similar to FIGURE 1 and illustrates one step in the method of opening the container of FIGURE 1.

FIGURE 4 is a view similar to FIGURE 1 and illustrates the container in its fully opened position.

FIGURE 5 is a view similar to FIGURE 2 and illustrates one of the steps of inserting the end closure of this invention in the container body of FIGURE 4.

FIGURE 6 is a view similar to FIGURE 5 and illustrates the final step in forming the completed container of FIGURE 1.

FIGURE 7 is a view similar to FIGURE 2 and illustrates another embodiment of this invention.

FIGURE 8 is a top perspective view of a tumbler type of container of this invention

FIGURE 9 is a side view partially in cross section and illustrates the tumbler-type container of FIGURE 8 closed by an end closure of this invention.

While the various features of this invention are hereinafter described and illustrated as being particularly adaptable to provide a container for beverages or the like, it is to be understood that various features of this invention can be utilized singly or in any combination thereof to provide other types of containers as desired.

Therefore, this invention is not to be limited to only the embodiment illustrated in the drawings, because the drawings are merely utilized to illustrate one of the wide variety of uses of this invention.

Referring now to FIGURE 1, the improved container of this invention is generally indicated by the reference numeral **10** and comprises a container body **11** having an open end **12** and a closed end **13** with the open end **12** being closed by an end closure **14** of this invention in a manner hereinafter described.

While the container body **11** of this invention has been illustrated as having an integral bottom **13**, it is to be understood that the container body **11** of this invention can be formed with a separate closure for the bottom thereof, if desired.

As illustrated in FIGURE 2, the open end **12** of the container body **11** is formed with an annular curled bead **15** which cooperates with the internal peripheral surface **16** of the container body **11** to define an annular recess **17** for a purpose hereinafter described. The annular bead **15** on the container body **11** is so constructed and arranged that the same provides an attractive and effective drinking lip for the opened container body **11** in the manner illustrated in FIGURE 4 whereby the container body **11** attractively simulates the appearance of a drinking tumbler or the like.

If desired, the container body **11** can be formed of metallic material, such as aluminum-containing metallic material or the like or can be formed of any desired and suitable material, such as plastic and the like.

The end closure **14** of this invention is best illustrated in FIGURE 2 and can be formed of metal, plastic or any other suitable material.

The end closure **14** has a central, inwardly bowed section **18** integrally joined to a downwardly turned annular portion **19**. The annular portion **19** is, in turn, integrally joined to an upwardly directed annular portion **20** which, in turn, is integrally joined to a bead forming section **21** by an arcuate portion **22** receivable in the recess **17** of the container body **11**.

If desired, either the container body **11** or the end closure **14**, or both, can carry a sealing compound or gasket means **23** which is disposed between the bead **15** of the container body **11** and the bead forming portion **21** of the end closure **14** when the container body **11** is closed by the end closure **14**.

In order to insert the end closure **14** in the container body **11**, the bead forming portion **21** of the end closure **14** is normally disposed in the uncurled position illustrated in FIGURE 5 whereby a suitable inserting tool **24**, having a rounded end **25**, can press against the central portion **18** of the end closure **14** to snap the portion **22** of the end closure **14** past the bead **15** of the container

body 11 so as to be received in the recess 17 thereof in the manner illustrated in FIGURES 5 and 6.

In the preferred embodiment, the rounded end 25 of the inserting tool 24 has a radius of curvature shorter than the radius of curvature defining the arcuate bowed portion 18 of the end closure 13 whereby downward movement on the tool 24 relative to the container body 11 will cause the portion 22 of the end closure 14 to be drawn inwardly because of the further bowing of the central portion 18 so that the portion 20 of the end closure 14 can be snap fitted past the bead 15 of the container body 11.

Thereafter, suitable die means 26 can curl the portions 21 of the inserted end closure 14 around the bead 15 of the container body 11 to complete the container 10 whereby it can be seen that the container body 11 can be simply and inexpensively closed with the end closure 14.

After the end closure 14 has been inserted in the manner illustrated in FIGURE 2, the natural tendency of the bowed portion 18 of the end closure 14 is to tend to flatten in an outwardly direction because of the snap fit arrangement of the end closure 14 and the container body 11 whereby the flattening forces on the central portion 18 of the end closure 14 tends to compress the end closure 14 against the bead 15 of the container body 11. In this manner, the natural resiliency of the end closure 14 compresses the caulking or gasket means 23 therebetween to provide a fluid-tight sealing relationship between the end closure 14 and the container body 11.

In addition, should the product disposed in the closed container 10 have internal pressure, such as is provided by a carbonated beverage or the like, this internal pressure tends to move upwardly in the direction of the arrows in FIGURE 2 to further tend to flatten the bowed portion 18 of the end closure 14 to further enhance the sealing effect of the sealing compound or gasket means 23.

Therefore, it can be seen that it is a relatively simple operation to effectively snap fit the end closure 14 of this invention in the open end 12 in a snap fit relationship therewith so that the end closure 14 has a natural tendency to seal itself against the bead 15 of the container body 11 whether internal pressure is provided in the container or not.

One method for opening the container 10 of this invention is to have a person place his thumbs on the exterior surface of the bowed portion 18 of the end closure 14 and push downwardly on the same to further bow the portion 18 inwardly so that the portions 22 of the end closure 14 will tend to pull inwardly away from the annular recess 17 of the container body 11. At the same time the central portion 18 is being pressed inwardly, the ultimate consumer raises upwardly on the outer curled portion 21 of the end closure 14 to free the same from the bead 15 whereby the end closure 14 can be removed therefrom.

In this manner, the end closure 14 can be utilized to reseal the opened container body 11 if a portion of the product is not consumed.

However, the end closure 14 of this invention can be readily provided with an easy open means in a manner now to be described.

In particular, it can be seen in FIGURES 1 and 2 that the curled portion 21 of the end closure 14 can be provided with an integral and depending pull tab 27 extending therefrom below the peripheral edge of the curled portion 21. The end closure 14 is either internally or externally scored from adjacent the pull tab 27 to substantially across the middle of the central portion 18 thereof. For example, such external scores 28 can be provided in the manner illustrated in FIGURE 1.

Thus, when the ultimate consumer desires to open the container 10, the ultimate consumer merely grasps the pull tab portion 27 in the manner illustrated in FIGURE 1 and pulls upwardly on the same whereby the end closure 14 is torn across the same in the manner illustrated in FIGURE 3. As the pull tab 27 tears across the end closure 14, the separated portion tends to cause the portion 20 of the end closure 14 to be drawn inwardly thus releasing the same from the recess 17 of the container body 11 whereby continued pulling of the pull tab 27 completely pulls the end closure 14 from the container body 11. Thus, the container body 11 is opened in a simple and effective manner.

After the ultimate consumer opens the end closure 14 in the above described manner, the end closure 14 can be thrown away and the container body 11 can be utilized as an attractive drinking container or serving receptacle in the manner illustrated in FIGURE 4.

Thus, it can be seen that easy open means can be provided for the container 10 of this invention to readily permit the ultimate consumer to open the same without requiring the conventional can or bottle openers.

While the container 10 of this invention has been previously described as containing beverages or the like, it is to be understood that the same can be utilized for other products such as jellies, jams, etc., whereby the container body 11 will provide an attractive serving container when opened. The end closure 14 being utilized with such a container body can be formed of plastic, metal or the like and can be snapped in the open end thereof to reclose the same in the manner previously described by merely pressing downwardly on the central portion 18 thereof whereby the end closure 14 need not have the easy open pull tab means 27 previously described.

Further, while the container 10 of this invention has been previously described as having the bead forming section 21 of the end closure 14 completely extending under the bead 15 at the end of the container body 11, it is to be understood that the bead forming section 21 can terminate just before passing under the bead 15 to more effectively permit the end closure 14 to be removed therefrom.

For example, reference is made to FIGURE 7 wherein another container construction of this invention is generally indicated by the reference numeral 29 and parts thereof similar to the container construction 10 of FIGURES 1 and 2 are indicated by like reference numerals.

However, it can readily be seen in FIGURE 7 that the bead forming section 21 of the end closure 14 terminates at a point 30 before the same would pass under the bead 15 of the container body 11 as in the embodiment illustrated in FIGURE 2.

This readily permits the end closure 14 to be removed from the container body 11 by means of a pull tab 27 in the manner previously described to completely open the container body 11 of the container construction 29.

As previously set forth, the container construction of this invention can utilize the various features of this invention to provide an attractive tumbler for drinking purposes and the like when the same has been opened in the manner previously described.

For example, reference is now made to FIGURES 8 and 9 wherein an improved container construction of this invention is generally indicated by the reference numeral 30 and comprises a tumbler type of container body 31 formed from a metallic sleeve 32 having a closed end and an upper open end 34. A plastic cup-shaped insert 35 is disposed in the metal sleeve 31 and has a plurality of outwardly directed ribs 36 press-fittingly engaging the interior surface of the sleeve 31 to frictionally hold the plastic insert 35 therein, the plastic insert 35 having an enlarged upper end 37 which engages the open end 34 of the sleeve 32 and defines an outwardly directed drinking lip 38.

The enlargement 37 of the plastic insert 35 has a recess 39 provided about the inner surface thereof.

An end closure 40 is provided for closing the container body 31 and is formed in a manner similar to the end closure 14 previously described. In particular, the end closure 40 has an inwardly bowed intermediate section 41

interconnected to a reversely curving portion **42** which, in turn, is interconnected to an arcuate portion **43** which is snap-fitted in the recess **39** of the enlargement **37** of the plastic insert **35**. A peripheral portion **44** extends from the end closure **40** and is looped against the outside of the enlargement **37** in the manner illustrated in FIGURE 9 to completely close the container body **31**, the end closure **40** having a pull tab **45** to tear across the end closure **40** in the same manner as the pull tab **27** of the end closure **14** previously described.

Thus, when it is desired to open the container construction **30** of this invention, the ultimate consumer grasps the pull tab **45** and pulls upwardly on the same and across the end closure **40** along tear lines similar to the scores **28** previously described whereby the end closure **40** is subsequently released therefrom and can be completely removed from the container body **31** to provide the attractive tumbler arrangement as illustrated in FIGURE 8 from which the ultimate consumer can drink or serve the product initially sealed in the container construction **30**.

Therefore, it can be seen that various types of container bodies can be closed by the end closures of this invention to effectively seal the product therein. However, the end closures of this invention are so constructed and arranged that the same can be readily opened to be completely removed, if desired, from the container bodies whereby the container bodies themselves can be utilized as the serving and drinking receptacles with the container bodies being decorated and designed in any suitable manner.

Accordingly, it can be seen that not only does this invention provide an improved container having many novel features over prior known containers, but also this invention provides an improved end closure and method for making such a container or the like.

While the form of the invention now preferred has been disclosed as required by the statutes, other forms may be used, all coming within the scope of the claims which follow.

What is claimed is:

1. In combination, a container body having an open end provided with a recess in the interior surface thereof, and a closure for said container body having a central portion spanning said open end and having an intermediate portion snap-fitted in said recess to close said open end, said intermediate portion being annular and having a substantially S-shaped cross-sectional configuration throughout its entire length to provide resiliency for said snap fitting relation with said container body, said S-shaped configuration being substantially normal to said interior surface of said container body, said closure having an outer portion interconnected to said intermediate portion and engaging the exterior surface of said container body.

2. A combination as set forth in claim **1** wherein said central portion of said closure is bowed inwardly into said container body.

3. A combination as set forth in claim **1** wherein said outer portion of said closure includes a depending pull tab for opening said closure.

4. A combination as set forth in claim **3** wherein said closure has a weakened section that tears away from said closure when said pull tab is pulled relative to said closure to release said intermediate portion from said recess.

5. In combination, a container body having an open end defined by a beaded portion of said container body, said container body having a recess in the interior surface thereof at a point spaced inwardly from said bead, and a closure for said container body having a central portion spanning said open end and having an intermediate portion snap-fitted in said recess to close said open end, said intermediate portion being annular and having a substantially S-shaped cross-sectional configuration throughout its entire length to provide resiliency for said snap fitting relation with said container body, said S-shaped configuration being substantially normal to said interior surface of said container body, said closure having an outer portion bent over said bead of said container body.

6. A combination as set forth in claim **5** wherein said central portion of said closure is bowed inwardly into siad container body and tends to flatten under internal pressure in said container body to further force said intermediate portion into said recess of said container body.

7. A combination as set forth in claim **5** wherein said outer portion of said closure includes a depending pull tab extending below said bead of said container body.

8. A combination as set forth in claim **7** wherein said closure has a weakened portion extending from said pull tab across said outer, intermediate and central portions so that said weakened portion will tear away from said closure when said pull tab is pulled relative to said closure.

9. A closure for an open end of a container body and having a central portion for spanning said open end of said container body, an intermediate portion for snap-fitting in an internal recess of said container body and an outer portion for engaging the exterior surface of said container body, said intermediate portion being annular and having a substantially S-shaped cross-sectional configuration throughout its entire length to provide resiliency for such snap fitting relation with said container body, said S-shaped configuration being adapted to be substantially normal to the internal recess of said container body.

10. A closure as set forth in claim **9** wherein said central portion of said closure is bowed inwardly.

11. A closure as set forth in claim **9** wherein said outer portion of said closure includes a pull tab integrally interconnected thereto.

12. A closure as set forth in claim **11** wherein said closure is weakened adjacent said pull tab so that said weakened portion can be separated from said closure when said pull tab is pulled away from said closure.

13. A closure as set forth in claim **12** wherein said weakened portion extends across said outer, intermediate and central portion of said closure.

References Cited

UNITED STATES PATENTS

2,141,184	12/1938	Hothersall	220—60
2,767,711	10/1956	Ernst	220—60 XR
3,204,813	9/1965	McCuskey et al.	220—60
3,223,279	12/1965	Wheaton	220—60

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