United States Patent

Davis

[15] **3,677,435**

[45] **July 18, 1972**

[54] CONTAINER

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[73] Assignee: **Sweetheart Plastics, Inc.**, Wilmington, Mass.

[22] Filed: **July 6, 1970**

[21] Appl. No.: **52,587**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 875,605, Oct. 30, 1969, abandoned.

[52] U.S. Cl. ..... **220/60 R**, 220/44 R, 220/97 C, 229/43

[51] Int. Cl. **B65d 43/10**, B65d 21/02, B65d 51/16

[58] Field of Search ..... 220/60 R, 44 R, 44 A, 97 C, 220/97 F; 229/43, 1.5 B

[56] **References Cited**

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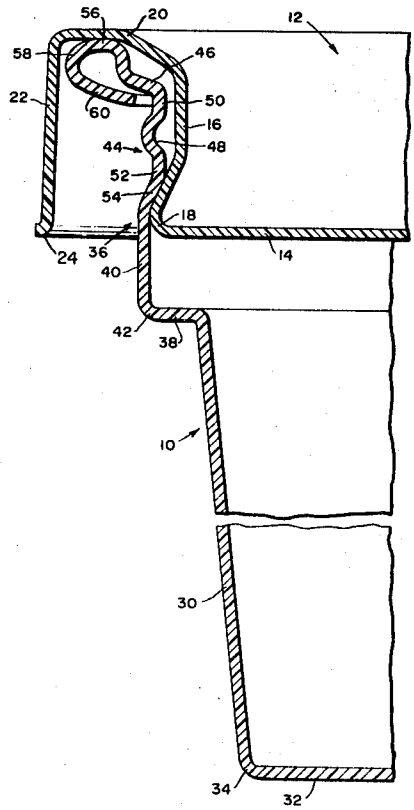
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[57] **ABSTRACT**

A container with a combination lid retaining bead and nesting ring disposed at the top of the container side wall with the bead being axially interrupted to facilitate positioning of the lid on the rim without permanently distorting the lid.

5 Claims, 6 Drawing Figures



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2 Sheets-Sheet 1

FIG. 1

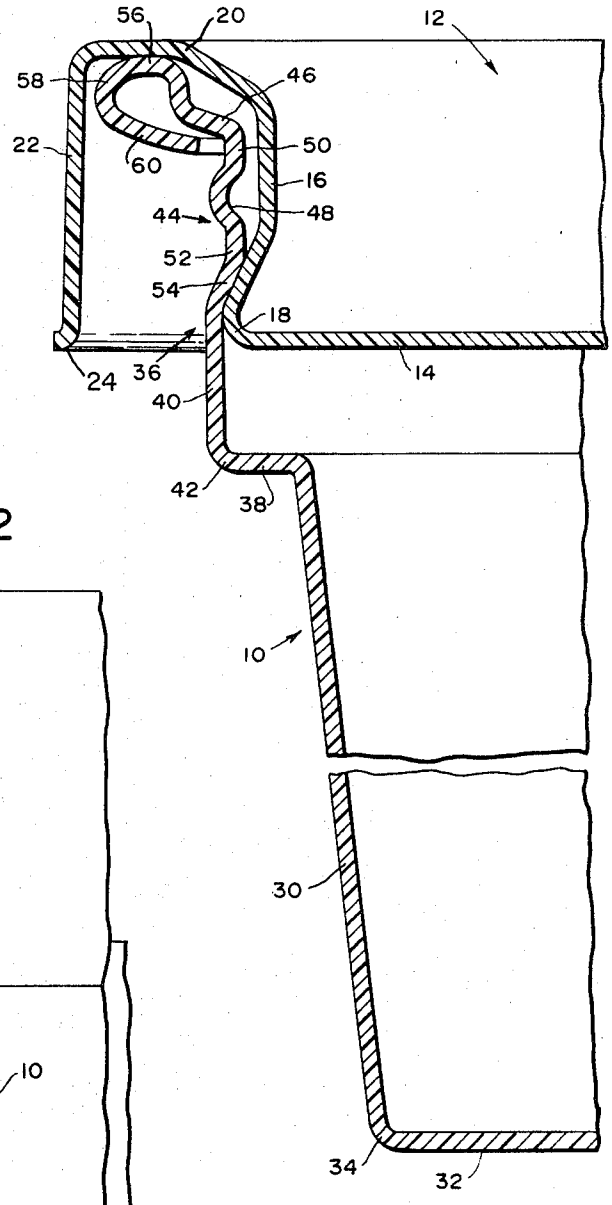
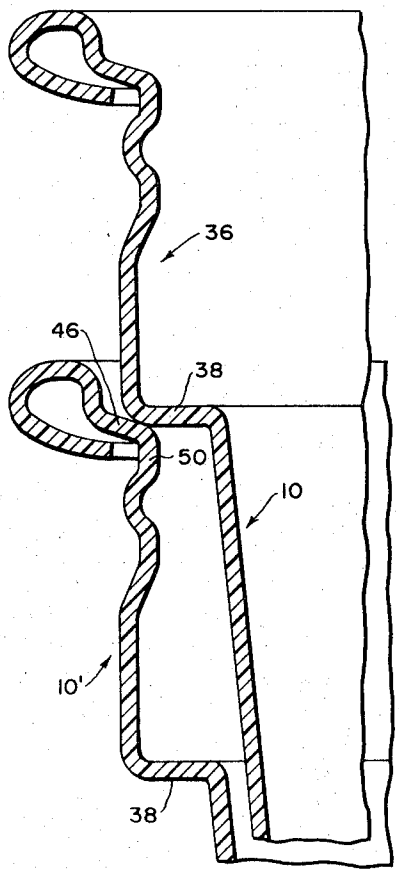
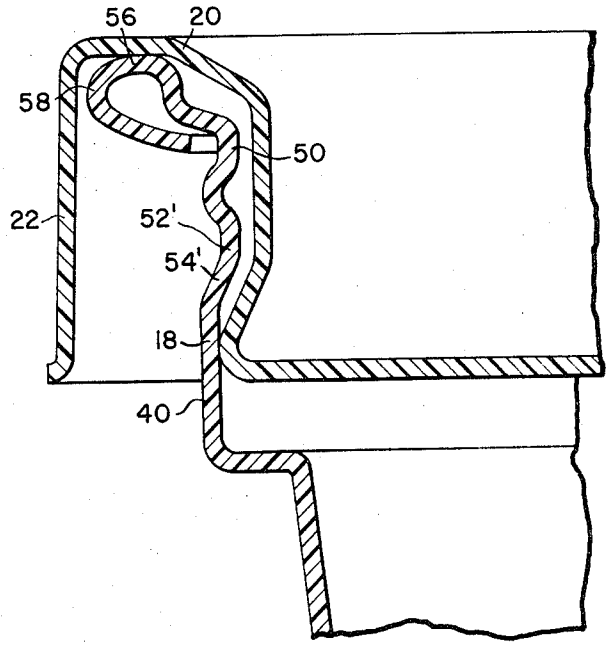


FIG. 2



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FIG. 3



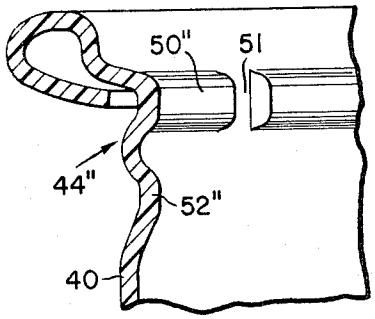
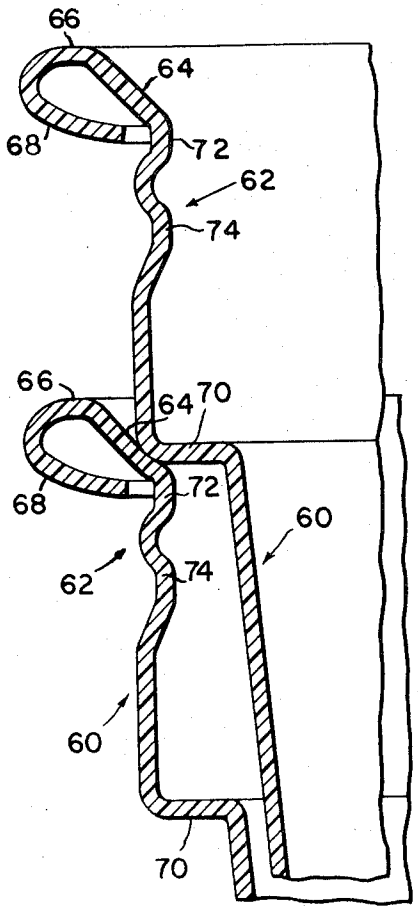


FIG. 4

FIG. 6



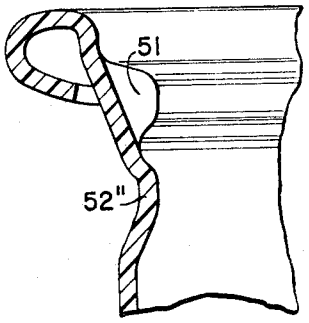


FIG. 5

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CONTAINER

This application is a continuation-in-part of my earlier application Ser. No. 875,605 filed Oct. 30, 1969 now abandoned.

This invention relates to thin wall, disposable plastic containers and more particular comprises a new and improved lid retaining and nesting configuration embodied in the container's side wall.

Conventionally plastic containers used in the food industry are provided with a nesting ring to allow identical containers to be stacked in closely associated relationship without sticking. They are also provided with means for retaining a lid on the container mouth so that the container may be closed and sealed to protect its contents. In some containers the nesting ring and lid retaining means are one and the same, that is, the lid retaining means forms part of a stacking ring in the container's side wall. A typical example of that arrangement is shown in U.S. Pat. No. 3,396,868 owned by Dow Chemical Company. In the present invention, the lid retaining means and the nesting rings are also structurally combined, and the lid retaining function performed by the structure is improved so as to avoid any permanent distortion of the lid when it is seated on the container mouth.

One object of this invention is to provide a lid retaining means adjacent the mouth of the container, which serves both as a part of the nesting ring and simultaneously firmly holds the lid in place to protect the container rim and its contents.

Another object of this invention is to provide a lid retaining protuberance on the inside of a container adjacent its rim, which avoids permanent distortion of a lid when the lid is snapped in place over the container mouth.

Yet another object of this invention is to provide a double lock for retaining lids on containers.

To accomplish these and other objects, the container of this invention includes among its features an axially interrupted lid retaining bead formed on the inside of the container side wall adjacent the rim which allows the lid to snap in stages into place over the container rim. The container bead may also be so disposed that its lower extremity is spaced from the rim crown a distance which holds the lid firmly in place without any play provided in the fit. Alternatively the container bead may allow some play between the lid and crown while maintaining a seal between the lid and container.

In the drawings:

FIG. 1 is a fragmentary cross sectional view of a container with a lid sealing the container mouth;

FIG. 2 is a fragementary cross sectional view showing the manner in which two such containers stack when nested telescopically together;

FIG. 3 is a fragmentary view similar to FIG. 1 and showing a slightly modified embodiment of the invention;

FIGS. 4 and 5 are cross sectional views of yet another embodiment of this invention; and

FIG. 6 is a fragmentary cross sectional view similar to FIG. 2 and showing still another embodiment of this invention.

In FIG. 1, a container **10** constructed in accordance with my invention is shown closed by the lid **12** which may be of conventional design. The lid **12** includes a horizontal closure wall **14**, a side wall **16** extending upwardly from the horizontal wall **14** and joined with it by a bead **18**. An outwardly extending flange **20** joins the top of the side wall **16**, and the flange **20** in turn carries downwardly extending skirt **22** which may be provided with a curl **24** at its lower end to facilitate nesting with other identical lids. The curl **24** preferably is in the plane of the closure wall **14** so that when stacked the lids may be slid one at a time sideways from the stack by automatic handling equipment. The lid may vary and the details of the configuration shown do not per se form this invention.

The container **10** includes a side wall **30** and a bottom wall **32** joined thereto at lower edge **34**. Bottom wall **32** may be bowed upwardly as suggested in the drawing in accordance with well known design practice to prevent dishing when the container is filled. At the top of the side wall **30** a nesting ring and lid retaining means **36** is provided, which configuration embodies this invention.

The structure **36** includes a lower generally horizontal and outwardly extending external shoulder **38** which functions as the lower shoulder of the nesting ring when two identical containers are stacked together in the manner shown in FIG. **2**. A generally vertical wall section **40** extends upwardly from the outer edge **42** of the lower shoulder **38**, which merges into an inwardly extending lid retaining bead structure **44** that also defines an upper shoulder **46** for the nesting facility.

The bead **44** is shown to be interrupted axially by a groove **48** so that effectively two beads, upper bead **50** and lower bead **52**, are provided to retain the lid **12** in place. The lower side **54** of the lower bead **52** is inclined upwardly and inwardly from wall **40** to generally conform to the contour of the bead **18** which joins the walls **14** and **16** of the lid. In this embodiment the lower side **54** of the bead **52** is spaced from the crown **56** of the rolled rim **58** of the container **10** a distance sufficient to cause the upper flange **20** of the lid to sit firmly against the crown **56** of the rim **58** when the bead **18** of the lid is retained by the lower side **54** of lower bead **52**. Consequently in this form there is no play between the lid **12** and the container **10** when the lid is seated as shown and effectively two seals are formed between the lid and container, one at the rim crown **56** and a second at the lid bead **18**.

The upper shoulder **46** of the structure **36**, which forms the upper side of the upper bead **50** is disposed immediately below the crown **56** of the rim **58**, but is positioned substantially above the lower edge of the rim curl **60**. The flange **46** is inclined slightly to serve as a guide for the bead **18** of the lid **12** when the lid is impressed on the mouth of the container. It will be appreciated that as the bead **18** of the lid slips off the shoulder **46** and over the upper bead **50**, it is placed under maximum compression, but this compression is relieved as soon as the lid bead **18** registers with the groove **48** between the two beads **50** and **52** of the container. To seat the lid in its proper position, the bead **18** of the lid is compressed a second time so as to slip over the lower bead **52** in the container side wall to engage the lower side **54** of bead **52** and the inside of wall **40**. The groove **48** between the container beads reduces the stress placed upon the container and lid so as to avoid permanent distortion of both when the lid is snapped in place. It will be appreciated that if the groove **48** were not present, the load placed particularly on the bead **18** of the lid which is normally made of a thinner stock than the container would be substantial and continuous throughout the period required for the bead **18** to pass from the shoulder **46** to the bottom side **54** of the bead **52**. The interrupted or double bead **44** also serves as a double lock to hold the lid in place. Thus, if the lid is accidentally raised on the container rim, the upper of the two beads will catch the lid bead and retain the lid in place. The bead **44** in this embodiment is circumferentially continuous to engage the rim about its entire periphery.

In FIG. **2**, the manner in which the configuration **36** provided in the side wall functions as a stacking ring is clearly shown. The lower external shoulder **38** of the upper container **10** rests on the upper side **46** of bead **50** of lower container **10'**. Thus, the pitch of the stack is determined by the axial extent of each container between the upper shoulder **46** and the lower shoulder **38**.

In FIG. **3**, a slight modification of the embodiment of FIG. **1** is shown. In this embodiment the bead **18** of the lid is spaced below the lower side **54'** of bead **52'** which permits limited vertical play of the lid on the rim after it is seated. This arrangement does not effect the performance of the lid in sealing the container, but provides a snap action when the lid is seated, which has a desirable "feel" to the user. When the lid bead **18** passes by the lower bead **52'** on the container, it expands relatively freely below it and the "feel" is that of a locking action which suggests a particularly firm fit between the lid and container rim.

In the embodiments thus far described, the two beads in the container are shown to be circumferentially continuous. However, either or both may be interrupted.

Thus in FIGS. **4** and **5** the upper bead **50''** is interrupted circumferentially about the container mouth. In this arrange-

ment the axial extent of the double bead 44'' may be such that the lid is permitted either no play or a limited play on the container when seated. In either case the interruptions in the upper bead 50'' will allow air to bleed from the container as it is being capped until the bead 18 of the lid engages the lower bead 52''. Consequently less air entrapment occurs and pressure in the container is somewhat less than that which occurs with the other embodiments of this invention. Obviously while the bead 18 is in contact with the upper bead 50'' gas may flow from the container interior through the interruptions 51.

The embodiment of the invention shown in FIG. 6 differs from that of FIGS. 1 and 2 only in the configuration of the upper shoulder of the combined nesting ring and lid seat. Thus, in the embodiment of FIG. 6, the container 60 includes a double bead 62 very similar to the double bead 44 in FIG. 1, but the upper shoulder 64 defined by the upper portion of bead 62 merges smoothly into the crown 66 of the rolled rim 68. Thus, there is no step or vertical section between the shoulder 64 and the crown 66 as is present in FIG. 1.

As a lid seat, the bead 62 functions in precisely the same manner as the bead 44. However, the inclination of the shoulder 64 may be greater than the shoulder 46, and therefore it may serve to guide the lid into position somewhat more effectively than does the shoulder 46. When two containers are nested together, lower shoulder 70 rests on the inclined upper shoulder 64 in the same manner as described in connection with FIG. 2, and the containers my be separated one from the other readily as the bead 62 and shoulder 70 cooperate to avoid compacting.

It should be recognized that the embodiment of FIG. 6 may be further modified so that the upper and/or lower halves 72 and 74 of bead 62 may be interrupted in the manner shown in FIGS. 4 and 5.

The configuration of the combination stacking ring and lid retaining bead in each embodiment enables the container and lid to provide certain characteristics which are deemed desirable in the industry. For example, the location of the nesting ring adjacent the container rim provides maximum axial height in the side wall of the container for printing. The smooth exterior configuration of the container side wall between the lower edge 34 and the lower shoulder 38 may bear advertising or other printed indicia. The pitch of the stack is dictated by the stock thickness of the container side wall and the angle of the side wall. Thus, in FIG. 1 the container side wall stock thickness and angle dictate the axial extent between the upper shoulder 46 and the lower shoulder 38. It is also desirable to employ a lid of standard depth, and if the lid is to be kept in place without play or a limited amount of play between it and the container rim, then the lower side 54 of the lower bead 52 of the container should be spaced a selected distance below the crown 56 of the container rim. It will also be appreciated that in each of the embodiments, the lid could be sized so that its bead 18 could engage and rest upon the shoulder 70 of the container, and in such case the lid flange 20 may engage or be spaced above the crown 56 of the rim. In each instance, the double bead above the shoulder would perform the functions attributed to it above. In order to accommodate all of these dimensions and minimize distortion of the lid when it is snapped into place over the container mouth, the axially interrupted bead configuration in the container side wall is provided. Typically such containers have an average stock thickness of between 0.015 and 0.040 inch, while the average lid stock thickness is 0.005 to 0.025 inch. The angle of the container side wall 30 with the vertical is approximately 5½°.

What is claimed is:

1. A thin wall, disposable plastic container and a container lid therefor,

said container comprising a side wall, a rim having a rim crown, and an integrally formed bottom wall,

a lid retaining bead provided adjacent the top of the side wall and extending radially inwardly therefrom,

said lid retaining bead being interrupted axially to include two circumferentially extending portions separated by a groove for reducing distortion of a lid which fits into the container as said lid is slipped into place,

a shoulder extending outwardly from the container side wall and spaced below the lid retaining bead,

said shoulder forming the lower shoulder of a nesting ring in the side wall,

the outer diameter of said shoulder being larger than the inner diameter of the upper of said two circumferentially extending portions of said lid retaining bead,

said shoulder being adapted to rest on the upper portion of the lid retaining bead of an identical container disposed below in nested relationship,

said lid having a closure wall joined by a lid bead to a lid side wall with a lid top flange extending outwardly from the top of the lid side wall,

said lid bead having a maximum diameter exceeding the inner diameter of said lid retaining bead in said container side wall,

said lid bead lying below the lower side of the lower portion of said lid retaining bead when said lid is mounted on the container rim with the lid flange engaging the crown of the container rim,

a portion of said container side wall extending downwardly from and below said lid retaining bead and being generally cylindrical and of a diameter adapted to engage the lid bead in snug fit with the lid closure wall axially spaced from said container lower shoulder.

2. The plastic container and container lid in accordance with claim 1 wherein an upper side of the upper portion of the container lid retaining bead is spaced just below the crown of the rim of the container and above the bottom of the rim,

said container rim being a rolled rim.

3. A plastic container and container lid in accordance with claim 2 wherein said lid bead alone interengages said two circumferentially spaced portions of said container successively when said lid is positioned to close said container, without any other portion of said lid side wall engaging either of said two portions.

4. A plastic container and lid in accordance with claim 1 wherein,

the upper portion of the lid retaining bead above said groove being circumferentially interrupted to allow air to bleed the container as it is being closed.

5. A plastic container and lid in accordance with claim 1 wherein said two circumferentially extending portions of said lid retaining bead are circumferentially interrupted to allow air to bleed the container as it is being closed.

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