

[54] **PLASTIC CONTAINER**  
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3,263,724 8/1966 Mojonnier ..... 215/31 X  
 3,632,004 1/1972 Grimes..... 215/31 X

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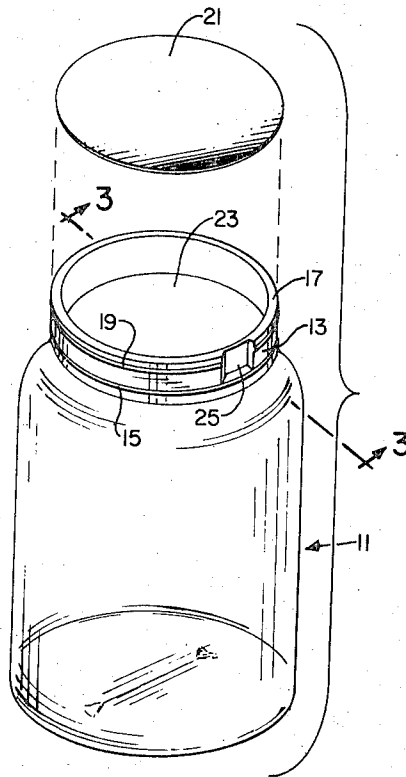
[52] U.S. Cl. .... 215/31  
 [51] Int. Cl. .... B65d 1/02  
 [58] Field of Search ..... 215/31, 232, 295, 298, 215/302

[57] **ABSTRACT**

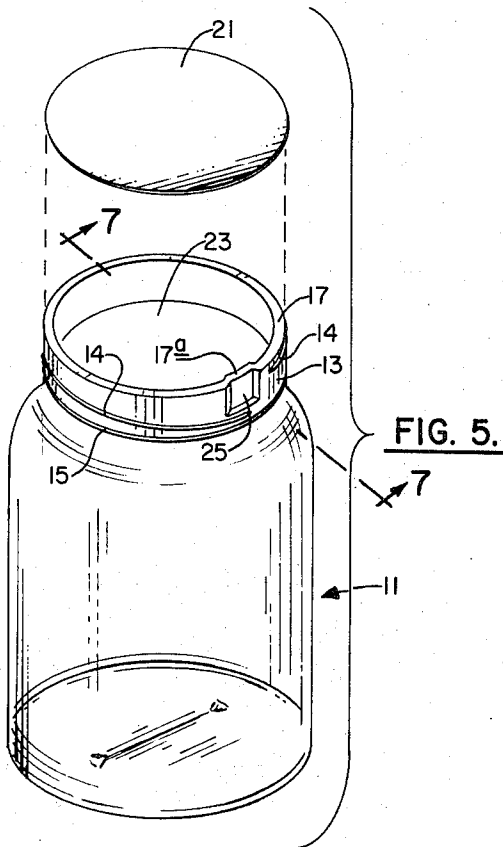
In a hollow, thin-walled, plastic mouthed container having at the outer extent of its mouth an annular, inwardly extending sealing web for hermetically receiving a peelable sealing diaphragm wherein the container has an indentation in its neck for facilitating removal of the diaphragm.

[56] **References Cited**  
**UNITED STATES PATENTS**  
 3,229,841 1/1966 Bailey ..... 215/31

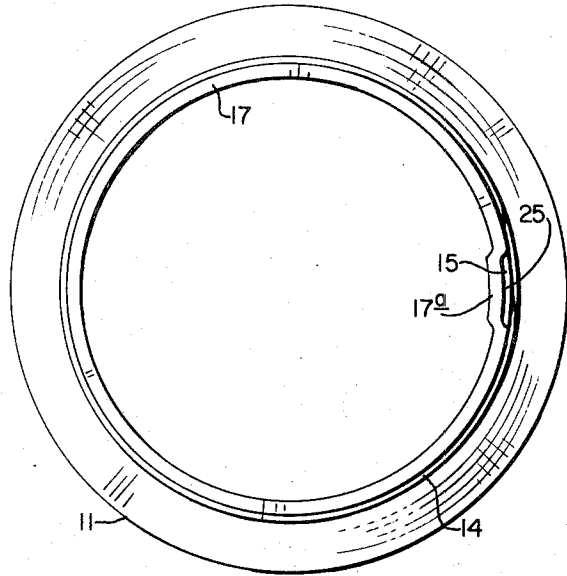
**5 Claims, 8 Drawing Figures**



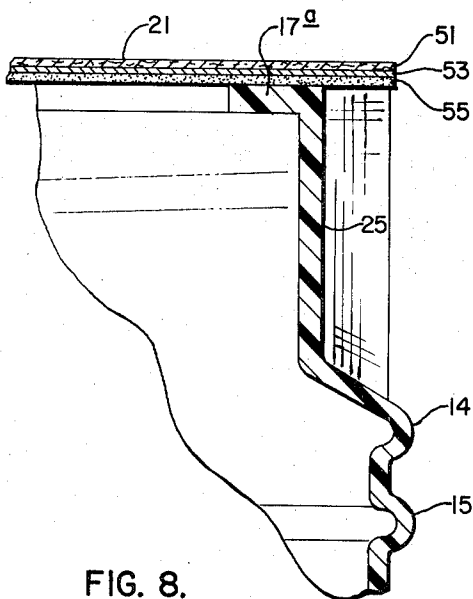




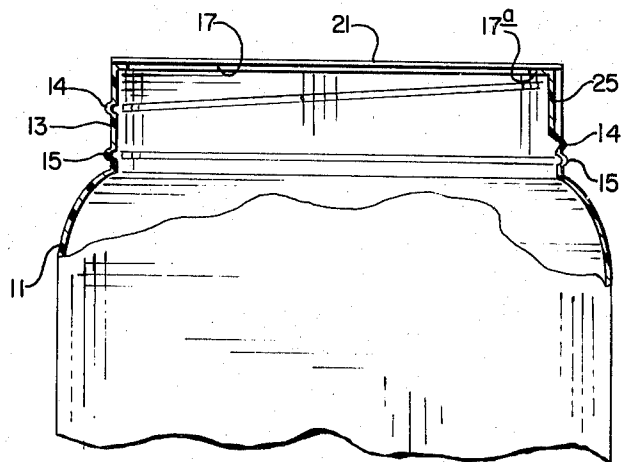
**FIG. 5.**



**FIG. 6.**



**FIG. 8.**



**FIG. 7.**

## PLASTIC CONTAINER

## BACKGROUND OF THE INVENTION

It is becoming increasingly common to package and market materials such as foods or liquids in plastic bottles or jars designed for a single trip so that the container can be thrown away after use. For reasons of economy, the container wall should be one of minimum thickness. Desirable as a thinwalled container may be from an economical standpoint, it unfortunately has one drawback in that the mouth of the container is easily flexed thus making the formation of a leak-proof seal over the mouth difficult.

A solution for maintaining an over-the-mouth, leak-proof seal in thin-walled containers is to provide the containers with a mouth-covering, peelable, sealing diaphragm attached to the periphery of the container mouth. Especially useful diaphragms are those which have sufficient flex so that upon distortion of the container mouth the seal would not be torn. Exemplary of peelable sealing diaphragms are those disclosed in U.S. Pat. No. 2,937,481.

Despite the usefulness of such peelable sealing diaphragms for overcoming the problems due to container mouth deformation in thin-walled containers, the diaphragms themselves present problems to the housewife. The housewife, when presented with a container sealed with a diaphragm, can generally only remove the diaphragm by puncturing and tearing it from the container mouth as the diaphragm has dimensions almost identical to the container mouth dimensions. This tearing and/or puncturing is undesirable as it is time-consuming and may result in pieces of the diaphragm falling into the food product.

A solution to this removal problem is presented in U.S. Pat. No. 3,632,004. The solution comprises cutting a portion of the neck wall and lip away so that a grip on the diaphragm with the fingers is easily accomplished. This solution however is not adaptable to thin-walled containers, i.e., containers having a wall thickness no greater than about 0.025 inches, as any attempt to diminish the neck thickness will render the neck extremely weak at that point.

Therefore it is an object of this invention to provide a container receivable of peelable sealing diaphragms at its mouth which facilitates removal of the diaphragms without endangering the strength of the container and neck.

This invention relates to a hollow, thin-walled, plastic container having at the outer extent of its mouth an annular inwardly extending sealing web for hermetically receiving a peelable sealing diaphragm wherein the container has an indentation in its neck which intersects the sealing web for facilitating removal of the diaphragm and wherein the neck has a substantially uniform wall thickness. Preferably, to provide a uniform sealing area throughout the extent of the sealing web, the sealing web may be additionally extended inwardly at the intersection of the indentation and sealing web.

These and other features of the invention contributing to its use and economy will be more fully understood from the following description of two preferred embodiments of the invention when taken in connection with the accompanying drawings wherein identical numerals refer to identical parts, and in which:

FIG. 1 is an exploded perspective view of one embodiment of this invention;

FIG. 2 is a top elevational view of the embodiment shown in FIG. 1;

FIG. 3 is an elevational sectional view taken along line 3—3 of FIG. 1;

FIG. 4 is an enlarged fragmentary view of the indentation shown in FIG. 3;

FIG. 5 is an exploded perspective view of a second embodiment of this invention;

FIG. 6 is a top elevational view of the embodiment shown in FIG. 5;

FIG. 7 is an elevational sectional view taken along lines 7—7 of FIG. 5; and

FIG. 8 is an enlarged fragmentary view of the indentation shown in FIG. 7.

Referring now to FIG. 1 it can be seen that a container of this invention, designated generally by the numeral 11, has a neck portion 13. In this illustrated embodiment, neck portion 13 has an optional hollow, outwardly extending structural bead 15 about its lower circumference. Structural bead 15 functions as a means for providing rigidity to neck portion 13. Another hollow, outwardly extending bead about neck portion 13 is snap-on bead 19. As can be seen in FIGS. 1 and 3, snap-on bead 19 is about the upper circumference of neck portion 13. Snap-on bead 19 is for receiving conventional snap-on caps (not shown in the drawing) which are well known to those skilled in the art. It is to be understood that other closing arrangements are within the scope of this invention, i.e., the use of hollow, outwardly extending, helical threads to receive threaded closure tops in place of the snap-on arrangement just described.

From FIGS. 1 and 2 it can be seen that the uppermost extent of mouth 23 is provided with an integrally formed, inwardly extending sealing web 17. Sealing web 17 receives a peelable sealing diaphragm 21 to provide a leak-proof closure of the container over its mouth 23. Sealing web 17 is shown in the drawings to be generally in a plane which is perpendicular to the center axis of container 11. However, sealing web 17 may be angled upwardly with respect to the perpendicular plane to form an angle with the plane of no more than about 10°, if desired. Sealing web 17 may be of any conventional width suitable for receipt of diaphragm 21 to provide a leak-proof seal. For example, when the sealing web of container 11 forms a 5° angle with a plane perpendicular to the center axis of the container and the container has a diameter of about 3 inches measured at mouth 23, a sealing web width at all points about its periphery of at least 0.035 inches is suitable. It can be seen from FIGS. 1 and 2 that sealing web 17 has a greater width at points other than at the point of intersection of indentation 25 and sealing web 17. The width at these points may be from about 0.035 to about 0.300 inches for the above-described container having a 3 inch mouth. Other widths for these points may of course be used as the need requires.

Inward indentation 25 shown in FIGS. 1—4 is generally rectangular. Of course, other shapes may be used, the only requirement being that the indentation be of sufficient size to enable a human finger to achieve a grip upon peelable sealing diaphragm 21. FIGS. 3 and 4 illustrate that neck 13 has a substantially uniform wall thickness, i.e., the wall thickness is substantially the same for the entire neck even at indentation 25. This

feature is most important for thin-walled containers as diminishment of the neck thickness will result in compromising neck strength.

FIGS. 3 and 4 show container 11 with a peelable sealing diaphragm 21 attached to sealing web 17. It can be clearly seen that peelable sealing diaphragm 21 overlaps at indentation 25 to provide a portion for gripping with the human finger to facilitate removal of sealing diaphragm 21 from container 11. Sealing diaphragm 21 illustrated in FIGS. 3 and 4 is of the laminated type. The laminate shown comprises a metal layer 51, a paper layer 53 and a sealing bottom layer 55. Metal layer 51 is generally of aluminum. Sealing layer 55 may be of any of the commonly available sealing materials which are used with peelable sealing diaphragms for maintaining a leak-proof seal. It is to be understood that the peelable sealing diaphragm may be of other construction than the three-layer type. Any peelable sealing diaphragm which will maintain a leak-proof seal with plastic is suitable for the purpose of this invention.

The second embodiment of this invention is illustrated in FIGS. 5-8. As can be seen from the drawings this embodiment is identical to the first described embodiment except that the sealing web has a constant, uniform width about its entire extent and instead of a snap-on bead, this embodiment has a hollow, outwardly extending helical thread 14 about the neck. In this embodiment a sealing web of constant width is achieved by providing an additional inwardly extending portion 17a of the sealing web 17 at the intersection of indentation 25 and sealing web 17. By so doing a uniform sealing area is achieved throughout the circumferential extent of sealing web 17 thus insuring that no weak spots in the seal between sealing web 17 and peelable sealing diaphragm 21 will occur.

The showing of a hollow, outwardly extending helical thread 14 on neck 13 is only for the purpose of showing a different arrangement for receipt of a top other than the type shown in the embodiment of FIGS. 1-4. It is preferable that thread 14 have its lowermost portion terminate beneath indentation 25 and have its uppermost portion terminate prior to intersection indentation 25. By so doing there is no break in the continuity of the contact between the thread of the container and the thread on the top. This continuity provides a second barrier to the leakage of goods should the peelable sealing diaphragm be accidentally ruptured in shipping.

It should also be noted that in the embodiment of FIGS. 5-8, as in the embodiment of FIGS. 1-4, the wall thickness of the neck is uniform, thus insuring integrity in neck strength. This is true even at the indentation.

The container of this invention may be made of any suitable plastic material of construction. Various thermoplastic materials, e.g., high, medium or low density polyethylene, polypropylene, polystyrene, styrene-acrylonitrile polymers, polycarbonates, nylon, acetal polymers or copolymers, polyvinyl chloride polymers or copolymers, or the like, are suitable.

The container of this invention may be made by blow-molding, injection molding, extrusion and the like.

What is claimed is:

1. A hollow, thin-walled, plastic container having
  - a. a neck portion defining a mouth for said container, said neck having a substantially uniform wall thickness;
  - b. an inwardly extending sealing web at the uppermost extent of said mouth for hermetically receiving a peelable sealing diaphragm; and
  - c. an inward indentation on said neck which intersects said sealing web for aiding the removal of said diaphragm upon its being sealed to said sealing web.
2. The container of claim 1 wherein said sealing web is in a plane substantially perpendicular to the center axis of said container.
3. The container of claim 1 wherein said sealing web has at the intersection with said indentation an additional inwardly extending portion whereby the width of said sealing web is substantially constant over its entire extent.
4. The container of claim 1 wherein said indentation is rectangular.
5. The container of claim 1 wherein said sealing web is in a plane substantially perpendicular to the center axis of said container, wherein said sealing web has at the intersection with said indentation an additional inwardly extending portion whereby the width of said sealing web is substantially constant over its entire extent, and wherein said indentation is rectangular.

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