

June 10, 1969

E. L. SMITH ET AL

3,448,888

DENESTABLE CONTAINER COVER

Filed March 15, 1968

Sheet 1 of 2

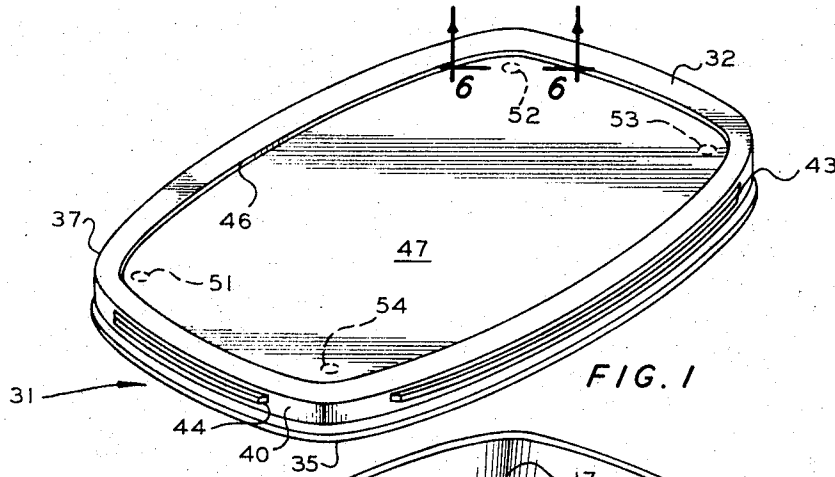


FIG. 1

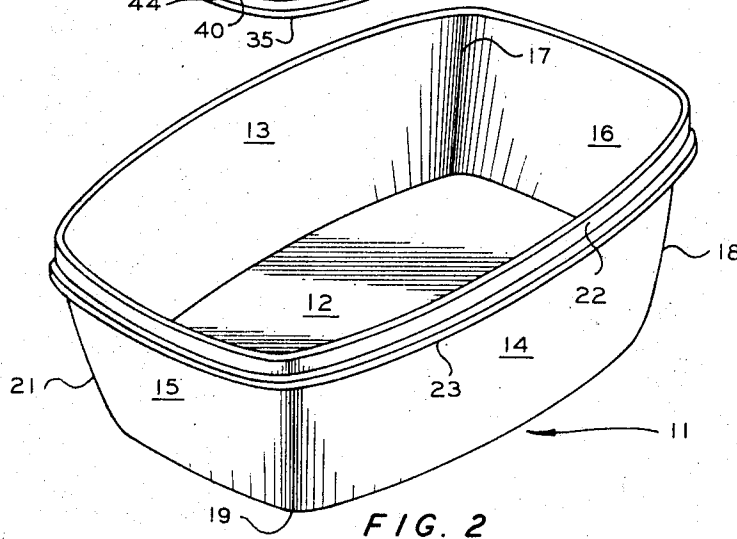


FIG. 2

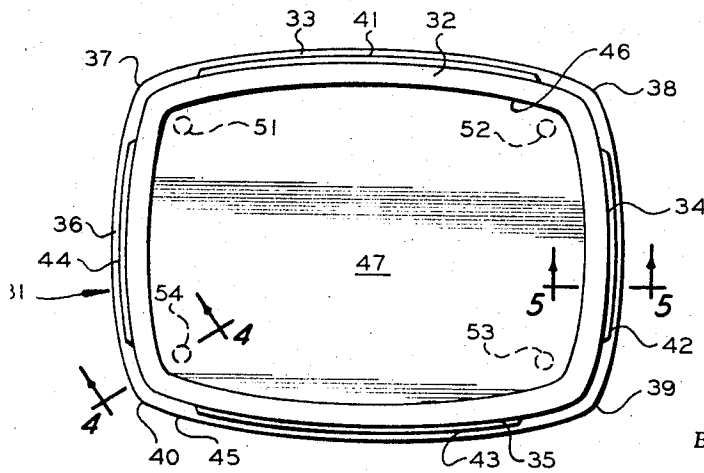


FIG. 3

INVENTORS  
E.L. SMITH  
S.D. COLLIE

BY

Young & Lugg  
ATTORNEYS

June 10, 1969

E. L. SMITH ET AL

3,448,888

DENESTABLE CONTAINER COVER

Filed March 15, 1968

Sheet 2 of 2

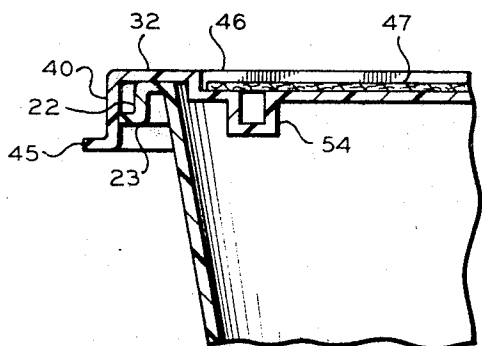


FIG. 4

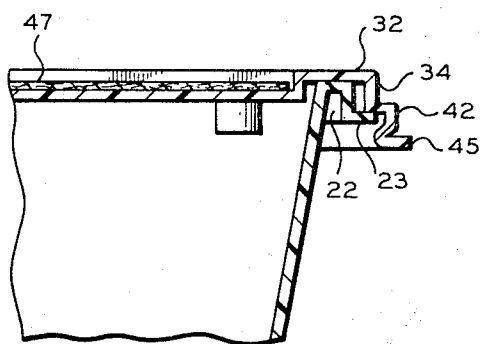


FIG. 5

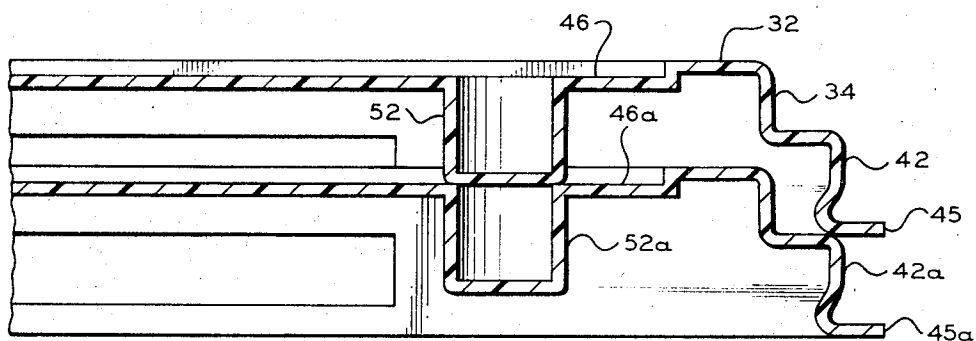


FIG. 6

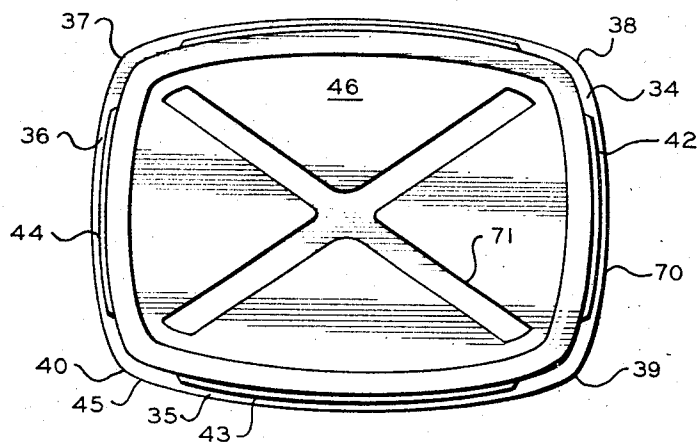


FIG. 7

INVENTORS  
E. L. SMITH  
S. D. COLLIE

BY

Young & Dugg

1

3,448,888

## DENESTABLE CONTAINER COVER

Ernest L. Smith and Stafford D. Collie, Kansas City, Mo.,  
assignors to Phillips Petroleum Company, a corporation  
of Delaware

Filed Mar. 15, 1968, Ser. No. 713,434

Int. Cl. B65d 43/10, 21/04, 41/18

U.S. Cl. 220—60

10 Claims

### ABSTRACT OF THE DISCLOSURE

A cover, for cornered containers having an inverted U-shaped rim with a lip extending outwardly from the bottom of the outer leg of the U, is provided with a top surface member and a depending rim flange. The rim flange has outwardly extending indentations therein, except at the corners, to receive the container lip. Vertical walled depressed areas are provided in the top surface wall to serve as stacking lugs.

This application relates to a denestable, flexible, thermoformed cover.

Thermoformed plastic containers and covers of the type disclosed in J. O. Motsenbocker, U.S. 3,320,993 issued May 23, 1967, have become increasingly useful for packaging various products. It is the general practice to ship empty containers of this type in a nested condition and similarly to separately ship the covers in nested stacks. In the past the outwardly extending indentations in the depending rim flange of the cover have served as stacking shoulders. However, difficulties have been encountered when a vertical eccentric force is applied to a stack of covers, resulting in the outward indentation in a corner of one cover snapping over the outward indentation in the corner of the next lower cover in the stack and locking in this position. The relative stiffness of the corner structures render such a stack of over-snapped covers very difficult to denest. These difficulties are particularly evident in covers and containers thermoformed from thermoplastic materials having a small shrinkage factor, for example acrylonitrile-butadiene-styrene, polystyrene and the like. The low shrinkage factor limits the maximum amount of undercut in the mold to form the outwardly extending indentations and thus the width of the stacking shoulder.

It has now been discovered that the foregoing difficulties can be minimized or avoided by eliminating the outwardly extending indentations in the corner areas of the covers and providing depressed areas in the top surface of the covers, the depressed areas having substantially vertical side walls so that the distance across the lower surface of the bottom of the depressed area is greater than the corresponding distance across the opening at the top of the depressed area, the vertical distance between the lower surface of the bottom of each depressed area and the upper surface of the top surface adjacent the depressed area being at least as great as the distance between the lower surface of any other portion of the cover to the upper surface of another portion of the cover which said other portion in a second cover resting on the first cover would be directly above said another portion of the first cover.

Accordingly, it is an object of the invention to provide a new and improved flexible, thermoformed plastic cover which is denestable from a stack thereof. Another object of the invention is to minimize or eliminate the locking of the depending flange of one cover to the depending flange of another cover. Another object of the invention is to strengthen a stack of nestable covers.

Other objects, aspects and advantages of the invention

2

will be apparent from a study of the specification, the drawings and the appended claims to the invention.

In the drawings, FIGURE 1 is a perspective view of a cover in accordance with one embodiment of the invention, FIGURE 2 is a perspective view of a container with which the cover of the invention can be utilized, FIGURE 3 is a plan view of the cover of FIGURE 1 attached to the container of FIGURE 2, FIGURE 4 is a partial cross-sectional view along line 4—4 of the cover and container of FIGURE 3, FIGURE 5 is a partial cross-sectional view along line 5—5 of the cover and container of FIGURE 3, FIGURE 6 is a partial cross-sectional view of a stack of the covers of FIGURE 1 taken along a line represented by line 6—6 in FIGURE 1, and FIGURE 7 is a plan view of a cover in accordance with another embodiment of the invention.

Referring now to the drawings and to FIGURE 2 in particular, container 11 is a thermoformed plastic container having a substantially rectangular horizontal cross section, with a bottom member 12, and upstanding wall members 13, 14, 15 and 16 connected by corners 17, 18, 19 and 21. A rim 22 extends outwardly in a substantially horizontal direction from the upper end of wall members 13, 14, 15 and 16 and corners 17, 18, 19 and 21, and then downwardly, terminating with an outwardly extending lip 23.

As illustrated in FIGURES 1 and 3, the flexible, thermoformed plastic cover 31 has a top surface member 32 adapted to cover the opening or mouth at the upper end of container 11 with side edges corresponding in number and horizontal length to the upstanding walls of container 11. Cover 31 has flange members 33, 34, 35 and 36 connected to the top surface member 32 along the side edges thereof and extending downwardly therefrom. The adjacent flange members 33, 34, 35 and 36 are connected by downwardly extending corner members 37, 38, 39 and 40 to form a depending flange continuously around the periphery of top surface member 32. Flange members 33, 34, 35 and 36 are provided with outwardly extending substantially horizontal indentations 41, 42, 43 and 44, respectively, adapted to engage lip 23 of container 11 so that a snap-action arrangement is provided to releasably hold cover 31 on container 11. Indentations 41, 42, 43 and 44 are positioned within the respective flange members and do not extend into corner members 37, 38, 39 and 40, the latter being substantially straight between the top and bottom edges thereof, as illustrated in FIGURE 4. A lip 45 can be provided around the lower periphery of the flange members 33, 34, 35 and 36 and corner members 37, 38, 39 and 40 extending substantially horizontally outwardly to aid in manually grasping the edge of a cover 31 for removal from a container 11. A shallow depression 46 can be provided in top surface member 32 to receive and protect a label 47 or other indicia. Columnar projections 51, 52, 53 and 54 are positioned in depression 46 so as to be covered by label 47. Columnar projections 51, 52, 53 and 54 extend downwardly from the adjacent surface of depression 46 to form depressed areas which serve as stacking members. Depressed areas 51, 52, 53 and 54 are positioned adjacent corner members 37, 38, 39 and 40, respectively, to provide greater stability in a stack of covers. The vertical distance X in FIGURE 6, between the lower surface of the bottom of projections 51, 52, 53 and 54 and the upper surface of the adjacent portion of top surface member 32 in the depression 46 is at least as great as the distance between the lower surface of any other portion of the cover 31 (for example, lip 45) to the upper surface of another portion of the cover positioned thereabove (for example, the upper surface of indentation 42), which latter lower surface in a stack of covers would rest on the latter upper surface of the next lower cover.

In the parenthetical example, this latter distance can be the distance Y in FIGURE 6. In a presently preferred embodiment of the invention the distances X and Y are equal and the upper surface of each of indentations 41, 42, 43 and 44 is substantially horizontal so that projections 51, 52, 53 and 54 and indentations 41, 42, 43 and 44 serve as spaced stacking members to provide vertical strength to a stack of covers as well as maintaining the covers at the desired spacing.

While depressed areas 51, 52, 53 and 54 have been illustrated as individual columnar projections having substantially circular horizontal cross sections, other configurations can be utilized. For example, the depressed areas can be interconnected as illustrated by cover 70 in FIGURE 7 wherein elements corresponding to the cover of FIGURES 1 and 3-6 have been designated with the respective reference numeral. A depressed area 71 in the form of two intersecting channels extends to points adjacent each of corners 37, 38, 39 and 40. Again, depressed area 71 has substantially vertical side walls and a stacking height in the manner of the depressed areas 51, 52, 53 and 54. Additional depressed areas can be employed in other areas of top surface member 32.

While container 11 and covers 31 and 70 have been illustrated as having substantially rectangular horizontal cross sections, other configurations such as triangular, pentagonal, hexagonal, and the like can be utilized.

Reasonable variations and modifications are possible within the scope of the foregoing disclosure, the drawings, and the appended claims to the invention.

We claim:

1. In a flexible thermoplastic cover for a container having at least three upstanding walls, adjacent upstanding walls being joined by corners, a rim extending outwardly from the upper end of each of said upstanding walls and then downwardly and terminating with an outwardly extending lip; said cover comprising a top surface member adapted to cover the opening in the upper end of said container and having a plurality of side edges corresponding in number and horizontal length to said upstanding walls of said container, a plurality of flange members corresponding in number to said plurality of side edges, each of said flange members depending downwardly from a respective one of said side edges, adjacent flange members being connected by downwardly extending corner members to form a depending flange continuously around the periphery of said top surface member, the improvement comprising each of said flange members having an outwardly directed indentation therein adapted to engage said outwardly extending lip of said container so that a snap action arrangement is provided between said cover and said container, each of said indentations terminating short of the adjacent corner

members, said corner members being substantially straight between the top and bottom edges thereof, a depressed area in said top surface member adjacent each of said corner members, each depressed area having substantially vertical side walls so that the distance across the lower surface of the bottom of the depressed area is greater than the corresponding distance across the opening at the top of the depressed area, the vertical distance between the lower surface of the bottom of each depressed area and the upper surface of said top surface member adjacent the depressed area being at least as great as the distance between the lower surface of any other portion of the cover to the upper surface of another portion of the cover which said other portion in a second cover resting on the first cover would be directly above said another portion of the first cover.

2. A cover in accordance with claim 1 wherein said container and said cover are substantially rectangularly shaped.

3. A cover in accordance with claim 1 wherein the depressed areas are interconnected with one another.

4. A cover in accordance with claim 1 wherein each depressed area is in the form of a columnar projection.

5. A cover in accordance with claim 1 wherein the distance from the upper surface of said indentations to the lower surface of said flange members is equal to the height of said depressed areas.

6. A cover in accordance with claim 1 wherein said top surface member has a shallow depression to receive a label.

7. A cover in accordance with claim 6 wherein said depressed areas are located within said shallow depression.

8. A cover in accordance with claim 7 further comprising a label positioned in said shallow depression and covering the openings of said depressed areas.

9. A cover in accordance with claim 8 wherein said container and said cover are substantially rectangularly shaped and each depressed area is in the form of a columnar projection extending downwardly.

10. A cover in accordance with claim 9 wherein said columnar projections have substantially circular horizontal cross sections.

#### References Cited

##### UNITED STATES PATENTS

|           |         |              |           |
|-----------|---------|--------------|-----------|
| 3,320,993 | 5/1967  | Motsenbocker | 220—60 XR |
| 3,321,104 | 5/1967  | Edwards      | 220—97    |
| 3,351,227 | 11/1967 | Collie       | 220—60    |

GEORGE T. HALL, *Primary Examiner*.

U.S. Cl. X.R.

150—.5; 220—97