

[54] PAIL 3,688,942 9/1972 Mitchell et al. 220/60 R
[75] Inventor: Harold S. Cloyd, Erie, Pa. 3,320,993 5/1967 Motsenbocker 150/5
[73] Assignee: Nosco Plastics, Incorporated, Erie, Pa.
[22] Filed: June 13, 1972
[21] Appl. No.: 262,934

Primary Examiner—Herbert F. Ross
Assistant Examiner—Steven M. Pollard
Attorney—Ralph Hammar

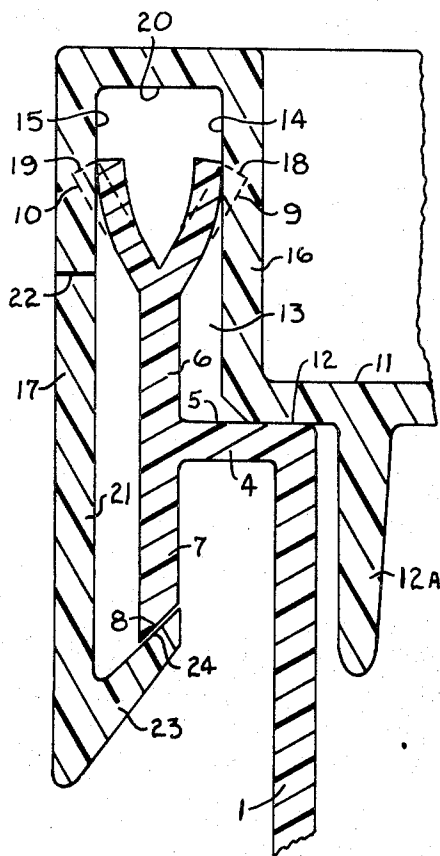
[52] U.S. Cl. 220/60, 150/5
[51] Int. Cl. B65d 43/10
[58] Field of Search 220/60; 150/5; 215/40

[57] ABSTRACT

A plastic pail having a rim with integral, upwardly diverging peripheral lips received in and compressed by a downwardly presented peripheral groove in a cover to make a fluid tight seal.

[56] References Cited
UNITED STATES PATENTS
2,768,667 10/1956 Hill 150/5

7 Claims, 3 Drawing Figures



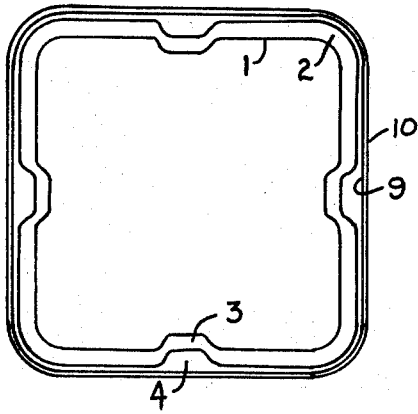


FIG. 1

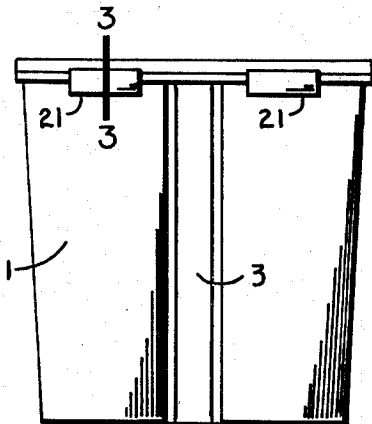


FIG. 2

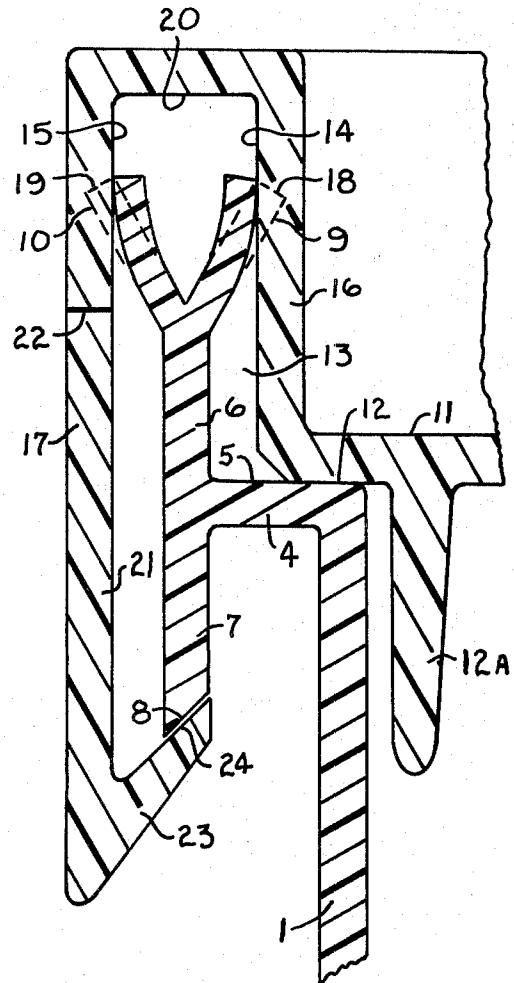


FIG. 3

1

PAIL

This invention is intended to produce a plastic pail in which a fluid tight seal is obtained by flexible lips integral with the rim of the pail which are compressed against the side walls of the groove in the cover to provide a seal primarily by deflection of the lips.

In the drawing, FIG. 1 is a top plan view of the pail without the cover, FIG. 2 is a side elevation of the pail with the cover in place, and FIG. 3 is a section on line 3—3 of FIG. 2 showing the seal between the cover and the rim of the pail and the lock for positively preventing removal of the cover.

The pail shown in FIG. 1 is designed to fit in a square outline so as to occupy a minimum space. The pail has four side walls 1 sloping downwardly and inwardly from top to bottom and each merging into rounded corners 2. At the mid section of each of the walls 1 is an inwardly extending vertical convolution 3 likewise sloping downwardly and inwardly from top to bottom. The convolutions 3 are open at the lower ends and at the top are closed by an outwardly extending rim 4 which is integral with the convolutions and with the upper ends of the walls 1. The convolutions 3 stiffen the side walls 1 and increase the load carrying ability. The portions of the rim 4 at the upper ends of the convolutions 3 provide hand grips for lifting the pail.

The rim 4 of the pail has an outwardly extending, horizontal, peripheral flange 5, the outer edge of which merges into upwardly and downwardly extending vertical flanges 6 and 7. The upper flange 6 is continuous and extends around the entire periphery of the pail. The flanges 7 are discontinuous, one flange being opposite each cover hold down member 21, hereafter described. The lower edge of each flange 7 has inwardly and upwardly inclined detent surfaces 8. The upper edge of the flange 6 is integral with the lower ends of upwardly diverging lips 9 and 10. The lips extend around the whole periphery of the rim of the pail as indicated by lines 9 and 10 in FIG. 1. As molded, the lips have the cross sectional shape indicated by dotted lines in FIG. 3. The location of the flange 6 is not critical. It need not extend from the center edge of the rim as shown. It could extend from the inner edge or from any other position.

The cover has a center wall 11 seated on a seat 12 at the inner edge of the rim 4. The center wall may be provided with integral stiffening ribs 12a. Around the wall 11 is an integral, downwardly presented groove 13 of substantially inverted U section. The groove has side walls 16, 17 connected by a top wall 20. The spacing between the vertical inner surfaces 14, 15 of the side walls 16, 17 is less than the as molded spacing between the outermost sections 18, 19 of the diverging lips 9, 10. When the cover is placed over the lips 9, 10, the outermost portions 18, 19 of the lips are compressed, thereby producing a sealing pressure due to the deflection of the lips. The lips are relatively thick so the static deflection of the lips is adequate to produce a fluid tight seal. As the cover is lowered into place, air is trapped between the lips 9, 10 and the top wall 20 of the groove 13, and the compression of the trapped air provides additional pressure tending to move the lips into sealing engagement with the surfaces 14, 15. Because fluid pressure of the contents of the pail tends to force the lip 9 away from the surface 14, lip 9 is made thicker than the lip 10 so as to develop more sealing pressure by deflection. If the contents of the pail should

2

develop enough pressure to force the lip 9 away from the surface 14, the pressure escaping past lip 9 would be applied to the inner surface of the lip 10 and tend to move the lip 10 outward into tighter engagement with the sealing surface 15.

The structure so far described results in a seal between the cover and the pail which maintains its integrity under all conditions. The seal is particularly effective in withstanding the shocks and vibration accompanying handling and shipment. The arcuate corner sections 2 are necessary for the seal provided by the lips 9, 10. The seal is adapted to either straight or curved sections but cannot be used for sharp corners. The rounded corner sections correspond to the curved sections present in pails of circular cross section.

The cover is held in place on the rim of the pail by eight hinge sections 21, two for each of the side walls 1, each hinged at its upper end at 22 to the lower edge of the wall 17 and each having at its lower end a hook section 23 with an upwardly and inwardly inclined hook surface 24 engaging the similarly inclined surface 8 on the flange 7 of the rim of the pail. The hook sections 23 positively hold the cover in place under the shocks and vibration encountered during shipment. The hinge sections 21 are located on the straight portions of the rim between convolutions 3 and the corners 2.

Both the pail and the cover are adapted to molding from one of the flexible plastics such as polyethylene.

The seal tolerates considerable variation in dimensions. The vertical position of the lips 9, 10 on the surfaces 14, 15 can be shifted up or down appreciably without destroying the seal. There can also be appreciable variation in the spacing of the surfaces 14, 15 and of the portions 18, 19 of the lips.

The relative diameter of the lips 9, 10 and of the surfaces 14, 15 can vary and the flange 6 need not be precisely centered in the groove without destroying the seal. This eliminates the need for a high degree of precision which is difficult to maintain in mass production.

What is claimed is:

1. A plastic pail having a rim with integral peripheral lips diverging upwardly from the rim, a cover having a downwardly presented peripheral groove telescoped over the upper edges of the lips, said groove having inner wall surfaces spaced closer together than the unstressed spacing of the uppermost outer edges of the lips which are compressed by said wall surfaces to effect a fluid tight seal between the cover and pail by static deflection of the lips, and said groove having a bottom wall spaced above said edges of the lips whereby the pressure of fluid trapped between said lips and said bottom wall aids in effecting said fluid tight seal by exerting a spreading force on the lips in the direction to move the lips into tighter engagement with said wall surfaces.

2. The pail of claim 1 in which the lips and groove in plan view consist of alternate straight and curved sections joined end to end around the periphery of the rim.

3. The pail of claim 1 in which the rim of the pail has at its outer edge a vertical peripheral flange with the lips diverging upwardly from the upper edge of said vertical flange.

4. The pail of claim 3 in which the rim of the pail has an outwardly extending horizontal flange and the vertical peripheral flange is at the outer edge of said horizontal flange.

3

5. The pail of claim 2 in which the cover has hold down members and the pail has detent means both located on said straight sections.

6. The pail of claim 5 in which the hold down members are hinged to the cover.

4

7. The pail of claim 2 in which at least one of the straight sections has an inwardly extending vertical convolution at its mid section.

5

* * * * *

10

15

20

25

30

35

40

45

50

55

60

65