May 24, 1966 P. A. MARCHANT 3,252,492

CONTAINER AND PIVOTED CLOSURE

Filed June 1, 1964 2 Sheets-Sheet 1

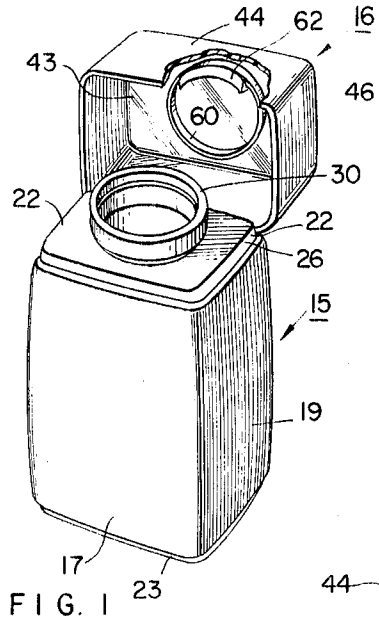


FIG. 1

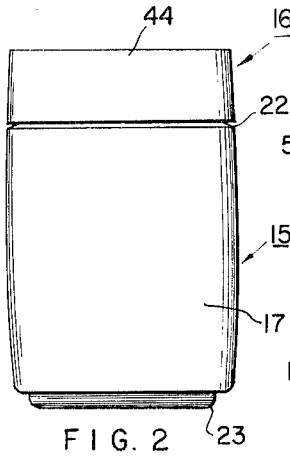


FIG. 2

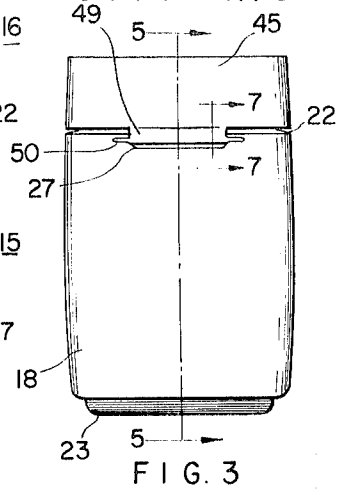


FIG. 3

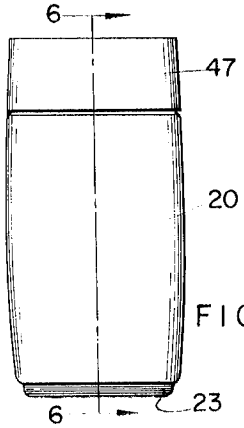


FIG. 4

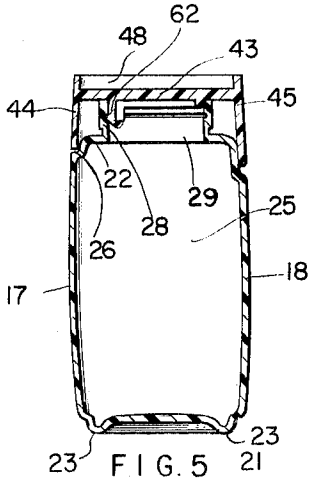


FIG. 5

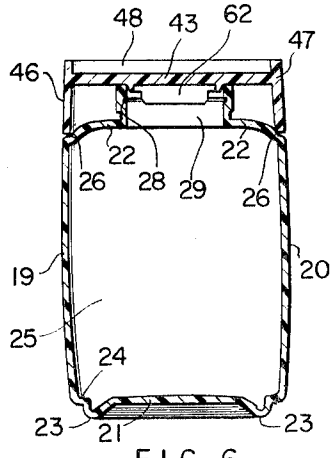


FIG. 6

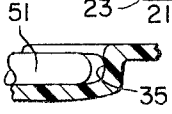


FIG. 13

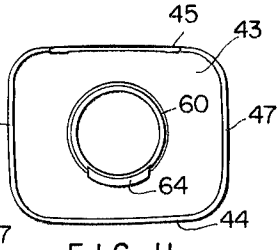


FIG. 11

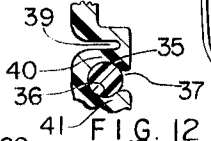


FIG. 12

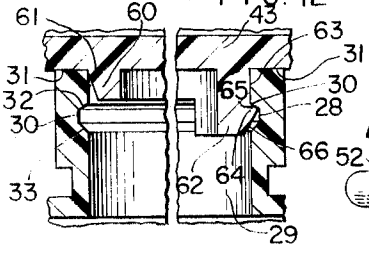


FIG. 9

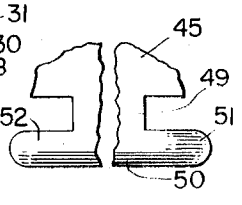


FIG. 10

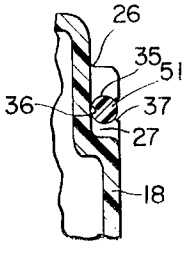


FIG. 8

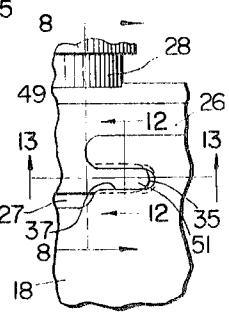


FIG. 7

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CONTAINER AND PIVOTED CLOSURE

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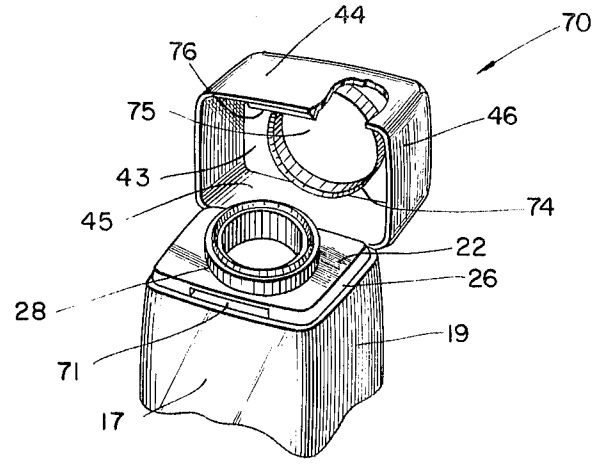


FIG. 14

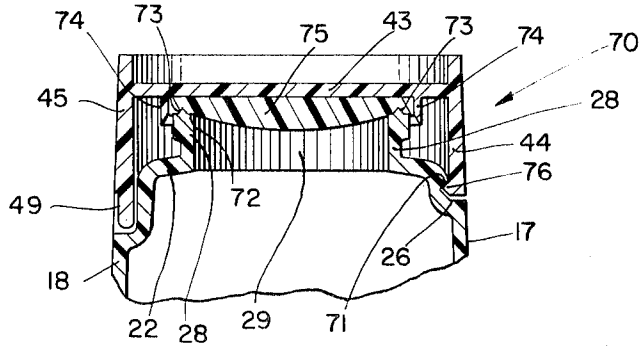


FIG. 15

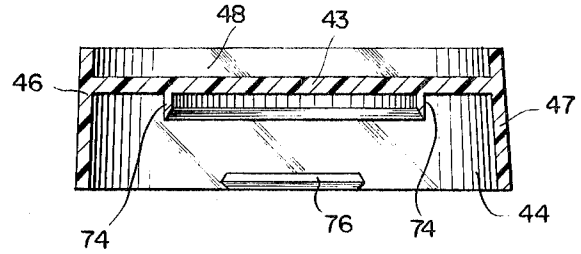


FIG. 16

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3,252,492

CONTAINER AND PIVOTED CLOSURE

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Filed June 1, 1964, Ser. No. 371,393
3 Claims. (Cl. 150—.5)

The present invention is directed to a container and closure fabricated from plastic materials, such as polyethylene, polypropylene, polyvinyl chloride, polycarbonate, etc., and is designed to provide an inexpensive, but aesthetically appealing, container.

The present trend in the packaging field indicates that the most desirable containers are ones having a large capacity in proportion to the quantity of plastic material therein, and having a captive snapon closure. Preferably the closure should form a continuation of the container walls to provide a unitary package appearance. The package must be of simple inexpensive construction, both from the standpoint of quantity of material used and the cost of the molds for producing the package. Ideally, the closure is captive with the container so that the container may be opened without completely removing the closure therefrom. The structure of the closure must provide a positive seat against the upper end of the dispensing opening of the container thereby sealing the container to minimize the ingress and egress of vapors and air which may have a detrimental effect upon the contents of the container. The cap and its relationship with the container must be arranged so that the cap, after opening the container, remains in the open position and in a position which is not obstructing the dispensing opening of the container. Many of the captive caps presently on the market are hingeably connected to the container by an integral resilient plastic member; however, these caps require substantial manipulation to position them away from the dispensing opening of the container.

A desirable attribute for a container used in modern merchandising techniques requires that the containers be stackable vertically. It is not sufficient that the containers be fabricated such that they can be positioned one above the other but rather they must be specifically constructed so that they lock when stacked vertically. This locking feature prevents the inadvertent tumbling of an entire display of containers due to the slight jarring of one or more of the containers.

The hingeable connection between the closure and container must provide an assemblage which is simple and inexpensive to assemble by automatic equipment.

Ideally, containers usable in the merchandising trade today must be adapted to a variety of surface configurations. Thus according to the present invention the container portion of the package is blow molded so that it may be readily adapted for various surface configurations.

In blow molding of containers it is important that the container design provide for a mode of affixation of the closure to the container but that the design does not result in a large number of imperfect containers on the production line. Thus, if the design of the container is such that the usable thickness of the walls is difficult to maintain in production due to the manner of affixing the closure, technical production difficulties arise with a resulting increase in scrap rate or decrease in production rate.

The container and closure according to the present invention contains all of the desirable features noted above and avoids the difficulties frequently encountered with containers of this type.

The drawings illustrate a present preferred embodiment of the invention in which:

FIGURE 1 is a perspective of a container and closure according to the present invention, with the closure in the open position, and parts broken away for clarity;

FIGURE 2 is a front elevation view of a container and closure according to the present invention, with the closure in a closed position;

FIGURE 3 is a rear side elevation view thereof;

FIGURE 4 is a side elevation view thereof;

FIGURE 5 is a cross section taken on line 5—5 of FIGURE 3;

FIGURE 6 is a cross section taken on line 6—6 of FIGURE 4;

FIGURE 7 is an enlarged fragmentary view of the hinge portion of the container shown in FIGURE 3;

FIGURE 8 is a cross section taken on line 8—8 of FIGURE 7;

FIGURE 9 is an enlarged fragmentary view of the container neck and closure;

FIGURE 10 is a side elevation view of the hinge structure for the closure;

FIGURE 11 is a bottom plan view of the closure;

FIGURE 12 is an enlarged cross section taken on line 12—12 of FIGURE 7;

FIGURE 13 is an enlarged cross section taken on line 13—13 of FIGURE 7;

FIGURE 14 is a perspective of a modified form of the present invention;

FIGURE 15 is a fragmentary vertical cross section of the modified form of the invention, similar to FIGURE 5; and,

FIGURE 16 is a vertical cross section of the modified form of cap, with parts removed for clarity.

Briefly the present invention is directed to a plastic container and closure wherein the container is blow molded in the form of a single unit and has side, bottom and top walls providing a hollow chamber for housing a commodity, an upstanding neck is provided on the top wall and has a central dispensing opening extending axially through the neck, and the closure is hingeably mounted to the container and adapted to be swung to and from a position closing the dispensing opening with an attaching member engageable with the upstanding neck to maintain the closure in a closed position over the dispensing opening. The hingeable mounting is integral with the closure and has a pintle portion engageable and pivoted in a slot in the container wall. Preferably the pintle is assembled into the slot in the container wall by a snapping action wherein the walls of the slot are elastically and resiliently deformed outwardly away from each other to admit the pintle and thereafter return to their original position which substantially encloses the pintle but provides a bearing surface for rotation of the pintle and its associated closure. Ideally the slot is key-hole shaped with a circular portion which receives the pintle and a longitudinal opening providing ingress and egress from the circular portion. In the preferred embodiment the pintle is circular in cross section, which aids in introducing the pintle into the slot in the container wall and insures a simple and efficient snap-together assembly of the closure to the container.

Referring specifically to the drawings, the container, generally designated **15**, has a swingably (or pivotally) mounted closure, generally designated **16**. The container includes front and back walls **17** and **18**, side walls **19** and **20**, bottom wall **21**, and top wall **22**. The bottom wall is preferably recessed in its central portion and is provided with a continuous rectangular leg **23** joined to the side walls **17–20** by an inwardly directed shoulder **24**.

The dimensions of the outside periphery of the leg **23** are such that the leg is positionable within the top of the closure in the manner to be described hereinafter. This provides the locking feature between a vertical stack of the packages.

The walls of the container are integral with each other and provide a hollow chamber **25** which contains the desired commodity which is stored or sold in the package.

The container top wall **22** has a continuous depression **26** around its periphery with the exception of a depressed area **27** on the rear of the container for receiving portions of the hinge member of the closure. The depressed portion **26** receives the lower edge of the closure in the manner to be described hereinafter.

A neck **28** is integral with, centrally disposed on, and upstands from the top wall **22** and has a central dispensing opening **29**. A groove **30** (FIGURE 9) is provided concentrically in the inner face of the neck **28** and slightly below the upper end **31** of the neck. This groove **30** has an upper surface **32** disposed between about 20°–40°, and preferably 30°, from the horizontal and a lower surface **33** which is disposed at about 30°–50°, and preferably 40°, from the horizontal.

Referring specifically to FIGURES 3, 7, 8, 12 and 13, the recessed portion **27**, on the rear of the container, extends downwardly below the recessed portion **26** and is provided with key-hole shaped openings **35** extending transversely out each side of the depressed portion **27** in the manner shown in FIGURE 7. These key-hole shaped openings include a circular portion **36** and a slot portion **37**. The openings are generally referred to as slots or key-hole shaped slots herein. As shown in FIGURE 13,, the slots are formed by portions of the back wall **18** of the container and it should be noted that an open space **39** is provided on the upper side of the slot **35** and the container chamber **25** is below the slot **35**, such that the walls **40** and **41**, forming the sides of the slot, are not too rigid and thus have resiliency and give so that the pintle portion of the closure, to be described hereinafter, can be readily snapped into the circular opening **36** by entry through the slot **37** by spreading the slot defining walls **40** and **41** outwardly. The walls **40** and **41** will return to their original positions due to the "memory" of the plastic.

Referring to the closure: a substantially planar portion **43** is surrounded by front and back walls **44** and **45** and side walls **46** and **47**. The walls **44–47** extend upwardly above the planar portion to provide a depressed area **48** which receives the lower end of the container and specifically the legs **23** as hereinbefore described to lock a vertical stack of the containers. When stacked, the flange **24** of the top container is slightly above the top edge of closure walls **44–47** and leg **23** is entirely within area **48**.

The walls **44–47** of the closure extend downwardly so that when the closure is in the closed position on the container, the lower edges of the walls are substantially seated within the depressed portion **26** of the container, with the exception of the recessed portion **27** of the back wall of the container, to provide aesthetic continuity between the container and closure.

The back wall **45** of the closure has an extension hinge bar **41** (see FIGURE 10) having a pintle **50** affixed to its lower end with pivot bars **51** and **52** extending transversely outwardly from and coplanar with the hinge bar **49**. The pivot bars **51** and **52** are snapped into portion **35** by spreading walls **40** and **41** apart as previously described, and are free to rotate within the circular portion **36** thereby permitting the closure to pivot relative to the container in the manner shown in FIGURE 1. The inner surfaces of portion **35** provide bearing surfaces for the pivot bars and have sufficient surface engagement between portion **35** and bars **51** and **52** to hold the closure in an open upright position, as shown in FIGURE 1, and the closure is substantially immovable after opening.

The underside of planar portion **43** of the closure has a circular downwardly directed continuous rib **60** affixed to its underside, which has a peripheral dimension substantially corresponding to the inside peripheral dimension of the top of the neck **28**. The outer face of rib **60** is beveled at **61** at about 40°–60°, preferably 50°, from the horizontal so that the rib may readily be cammed inwardly into the dispensing opening **29** of the neck **28** during closing of the container. The rib **60** is continuous except for a front portion wherein a downwardly directed, coextensive, integral attaching member **62** is affixed to the underside of the planar portion **43** for about 25°–40°, preferably 30°, on each side of the center line and provides a front face **63** which engages the inside surface of the neck **28**, as shown in FIGURE 9, and has an outwardly extending rib **64** having a top surface **65** sloped outwardly and downwardly to approximately match surface **32** and a bottom surface **66** sloped upwardly about 50° from the horizontal. The lower sloped surface **66** effectively cams the connecting unit **62** into the dispensing opening **29** of the neck during closing of the container and the upper surface **65** of the connector unit engages within the groove **30** in the manner shown in FIGURE 9 to effectively hold the closure in tightly closed position on the container; however, surfaces **65** and **30** are sloped to readily slide apart during opening the container thereby permitting a simple and easy opening of the container. It should be noted that the underside of the planar portion **43** of the closure tightly engages the upper end **31** of the neck thereby providing an effective seal to minimize contamination of the container contents.

An additional important aspect of this invention is that the pivot bars **51** and **52** are captively held in openings **35** against axial movement of the bars in the openings. This insures a positive, repeative opening and closing of the container with no likelihood of closure misalignment.

In the ideal package according to this invention, the dimensions between the surface engagement of the pivot bars and opening **35**, and the engagement of the top of neck **28** with the underside of portion **43** (particularly adjacent rib **60** on the side toward the hinge connector **49**) are such that the pivot bars are slightly stressed in a downward U-shape so that the bars are resiliently pulling the closure toward the container to provide an effective seal at the top of the neck. The upper rear portion **31** of neck **29** functions as a fulcrum in this structure; however, the front portion **31** of the neck is held in sealing contact by rib **64**; therefore the seal on the front of the closure is not affected.

FIGURES 14–16 illustrate a modified form of the present invention. The container has side, bottom and top walls **17–22** with a peripheral depressed area **26** which receives the lower edge of a modified cap **70** pivotally mounted to the container, all basically constructed and arranged in the manner previously described.

The depressed area **26** has an inwardly cut groove **71** formed in the vertical face thereof. This groove can extend across the entire length of the face, but the preferred embodiment, shown in the figures, has a limited length and is centrally located.

The upstanding neck **28**, which provides a dispensing passage **29** through the top wall **22**, has an upper face **72** with a continuous, upstanding rib **73** concentric with the passage **29**.

The cap **70** is constructed and arranged like the cap previously described, including side and end walls **44–47** closed by a top planar portion **43** providing a recessed top area **48**. A downwardly extending, continuous ridge **74** is affixed to the underside of planar portion **43** and is concentrically located slightly outside the periphery of the upper end of neck **28**. The lower end of ridge **74** is beveled inwardly. A compressible liner **75**, such as foamed rubber or polyurethane, or paper or the like, is

affixed (preferably by gluing) to the planar portion **43** within the ridge **74**.

A lock ridge **76** is integral with the inside of the central portion of the lower edge of front wall **44** of the cap. The lock ridge is dimensioned to snap into the groove **71** to maintain the cap is closed position on the container as shown in FIGURE 15. When the cap is in closed position, the liner **75** is compressed between the upper face **72** of neck **28** and the lower face of planar portion **43** with rib **73** effectively compressing the liner in a circular ring around the neck, thereby sealing the container contents from outside contaminants and moisture. Since the ridge **74** is outside the neck **28**, the liner is effectively compressed between face **72** (and rib **73**) and the inside face of the ridge to provide a secondary seal.

While I have described the present preferred embodiment of my invention, it may be otherwise embodied within the scope of the following claims:

I claim:

1. A plastic container and cap, comprising:

(a) said container having a hollow body formed by side and bottom walls, a top wall enclosing the upper end of the hollow body and having a central dispensing opening with an integral upstanding neck forming a continuation of the opening,

(b) said cap including a horizontal planar portion having a bottom face engaged with the top end of the upstanding neck,

(c) a rib extending downward from said bottom face of the cap and positionable within the dispensing opening in engagement with the inside surface of the dispensing opening in said neck,

(d) another rib extending downward from said bottom face of the cap and disposed within said dispensing opening,

(e) a depression in the inside surface of the dispensing opening in said neck, said another rib being engageable in the depression to releasably retain the cap in closed position on the container,

(f) a downwardly depending flange on the periphery of the cap planar portion, the flange extending into engagement with the upper extremity of the container,

(g) an extension plate depending downwardly from and coplanar with the flange,

(h) a pintle coplanar and integral with the lower end of said extension plate, portions of the pintle extending transversely beyond each side of the extension plate,

(i) an upper portion of the container side wall having a recessed area sufficiently large to receive the lower end of said extension plate,

(j) a second elongated recess communicating with and extending transversely from each side of said recessed area, each second recess receiving one of said pintle portions by snapping the portion therein, said pintle portions pivoting within said second recesses to swingably mount the cap to the container.

2. A plastic container and cap, comprising:

(a) said container having a hollow body formed by side and bottom walls, a top wall enclosing the upper end of the hollow body and having a central dispensing opening with an integral upstanding neck forming a continuation of the opening,

(b) said cap including a planar portion having a bottom face positionable over said dispensing opening,

(c) a ridge extending downwardly from said bottom face and positionable slightly outside said upstanding neck,

(d) a compressible liner positioned within the confines of said ridge and having a lower face engageable with the upper end of said neck,

(e) a downwardly depending flange on the periphery of the cap planar portion, the flange extending into engagement with the upper extremity of the container,

(f) an extension plate depending downwardly from and coplanar with the flange,

(g) a pintle coplanar and integral with the lower end of said extension plate, portions of the pintle extending transversely beyond each side of the extension plate,

(h) an upper portion of the container side wall having a recessed area sufficiently large to receive the lower end of said extension plate,

(i) a second elongated recess communicating with and extending transversely from each side of said recessed area, each second recess receiving one of said pintle portions by snapping the portion therein, said pintle portions pivoting within said second recesses to swingably mount the cap to the container,

(j) snap-together means joining the cap to the container to maintain the cap in closed position thereon.

3. A plastic container and cap according to claim **2**, including:

(a) an inwardly directed rib on the inner face of the cap flange, said rib being on the opposite side of the cap from the pintle,

(b) a groove in the container adapted to receive said rib when the cap is in closed position to maintain the cap in said position.

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