July 1, 1969 D. W. DONOVAN 3,452,921

SEALED CONTAINER

Filed Sept. 13, 1967

FIG. I

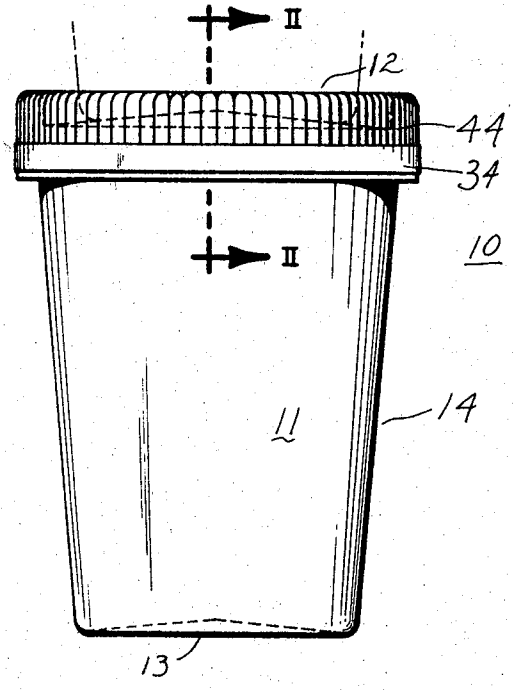


FIG. II

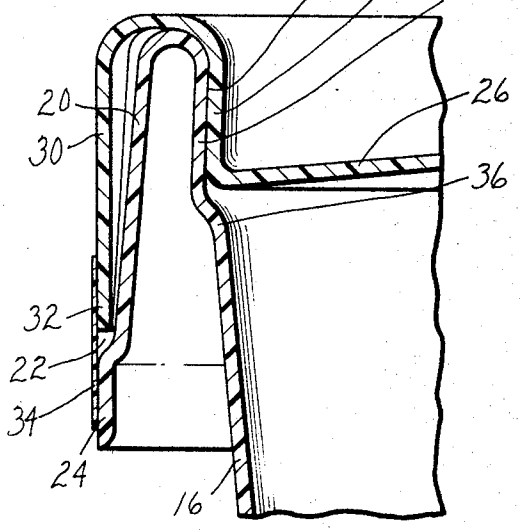
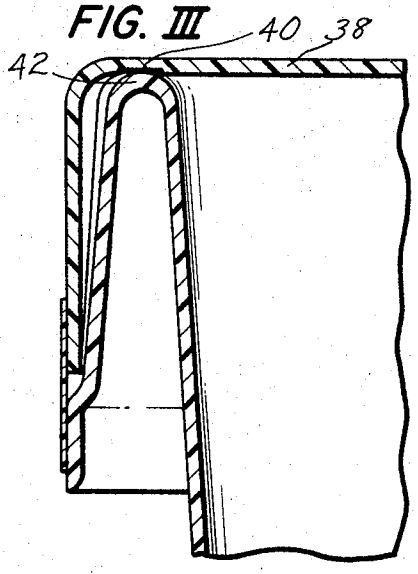


FIG. III



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AGENT:

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SEALED CONTAINER

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9 Claims

ABSTRACT OF THE DISCLOSURE

A beverage container comprising a cup with a sanitary lip, and a closure tape sealed to the cup which protects the lip.

This invention is concerned with containers, and more particularly with sealed beverage containers of the throw-away type.

As is well known, there are in existence sealed expendable containers made of wax board, impregnated paper and the like which are used on picnics, in school and factory lunches, and in the home for holding pre-packed beverages such as milk, soda, juices, etc. To consume the contents, the user either requires a straw for use with the purchased container, or another receptacle such as a separate sanitary glass or cup into which the contents of the expendable package are emptied prior to consumption. Direct consumption from the expendable container is generally either unsanitary because of the unprotected container outlet, or awkward either because the outlet is off-center or has discontinuities in its rim. Spillage often occurs during opening because of the tightness of the seal of the relatively small package. Once the seal is broken, the container generally cannot be resealed, though it may be desirable to do so when all the contents are not consumed at one time.

Accordingly, it is an object of the present invention, to provide an improved beverage container for milk, juices and other products which avoid the prior art difficulties discussed above.

It is an additional object of the present invention to provide a beverage container for milk, juices and the like having a tight fitting cover which may be readily removed when desired.

It is a further object of the present invention to provide a beverage container having a tight fitting, easy opening cover which may be readily removed and reinstalled to reseal the container.

A still further object of the present invention is to provide a wide mouth beverage container having a sanitary drinking lip for cooperation with a cover which shields the lip from exposure.

Another object of this invention is to provide a plastic container and lid for milk, juices and the like wherein the lid is firmly retained in tamper-proof sealing engagement, and is readily removable by means of a tear strip.

A further object of this invention is to provide a plastic container for milk, juices and the like having a plastic lid sealed in place thereon, and removable by means of a tear strip, wherein the lid subsequently is capable of resealing for continued storage of material which is not dispensed from the container upon initial opening thereof.

Other objects of this invention will in part be obvious and will in part appear hereinafter.

These and other objects are accomplished by providing a thin wall drinking container comprising a cup portion, a closure member for the cup portion, and a band seal for the cup portion and the closure member, the cup portion comprising a bottom, a sidewall extending upwardly and outwardly from the axis of the cup portion to form an open upper end, and a down-turned, sanitary lip at the top of, and outwardly disposed relative to the sidewall, the closure member in mounted position on the cup portion providing a top lying across, and in sealing engagement with the upper margin of the down-turned lip, the closure member having a depending shielding flange covering a major portion of the outer surface of the down-turned sanitary lip, with the band seal being associated with the outer surfaces of both the sanitary lip and the shielding flange.

In describing the overall invention, reference will be made to preferred embodiments illustrated in the accompanying drawings in which:

FIG. I is an elevational view of a container constructed in accordance with the present invention.

FIG. II is an enlarged longitudinal section through the container of FIG. I, substantially along line II—II of FIG. I.

FIG. III is a view similar to FIG. II of an alternate embodiment of the present invention.

With reference to the drawings, wherein identical numerals refer to identical parts, there is shown in FIG. I a thin wall plastic drinking container, broadly identified as **10**, constructed in accordance with the present invention. Container **10** comprises cylindrical one-piece cup portion **11**, one-piece closure member **12** and band seal **34**. Cup portion **11** has a cylindrical bottom **13** which may peripherally taper conically upwardly toward the cup axis, as in FIG. I, and a circumferential sidewall **14** having a lower portion **16** extending upwardly and tapering or diverging outwardly along the cup axis from the confluence of the sidewall and the bottom wall. Sidewall **14** further has an upper margin **18** which is back tapered or reversely angled slightly inwardly from lower portion **16** to form an open, wide mouth upper end. Sidewall **14** is of sufficient total length to permit gripping thereof by the user of the container. Down-turned elongated drinking or sanitary lip **20** is provided at the top of, and flaring outwardly from the inwardly extending portion **18** of sidewall **14**. Drinking lip **20** is curled outwardly and extends substantially downwardly from the upper end of the top portion, a sufficient distance to permit placement of the user's lip thereon, and has a smooth and continuous outer surface as shown in FIG. II. Shallow outward step **22** is located at the lower end of lip **20** formed by outward extension **24** of lip **20**.

One-piece closure member **12** for cup portion **11** in the embodiment of FIG. II is of the plug type design for telescoping insertion into the mouth or upper end of cup portion **11**. Closure member **12** in FIG. II has a generally planar depressed top wall **26** for closing the open end of cup **11**, which may be slightly arched so as to fit within the gradually upwardly tapered bottom wall **12** of the cup portion **11**, when one cup portion is placed on a closure member as shown schematically in FIG. I. This construction provides some lateral stacking stability for the filled container during bulk shipment in that the lower end of the cup portion is confined protectively on the arch of the closure top wall, and within the confining sidewall of the closure member, and thereby not as prone to slide off. Closure member **12** further comprises short cylindrical sidewall **28** reversely angled from lower portion **16** of cup **11** and matching the reversely angled upper margin **18** of cup sidewall **14**. Sidewall **28** extends upwardly from the periphery of top wall **26**. Closure member **12** also has protective skirt or shielding flange **30** projecting downwardly from the upper end of closure sidewall **28**.

When the closure member **12** as depicted in FIGS. I and II is mounted on cup portion **11**, top wall **26** thereof lies across and covers the open end of the cup. Reversely angled sidewall **28** of closure member **12** snugly and resiliently snaps into the open end of cup **11**, and seals against the outside surface **31** of the mating back tapered

portion **18** of sidewall **14** of cup portion **11**, along its full length. Protective skirt **30** of closure member **12** surrounds and covers at least the user's lip area of drinking lip **20** of cup portion **11**, with the lower portion **32** thereof snugly and flushly fitting within outward step **22** in the lower end of lip **20** so as to provide a generally neat appearing and cylindrically contiuous container outer upper end, without any outward projections. The outer surface or protective skirt **30** may be either completely or partially circumferentially serrated above its lower end as typically shown at **44** in FIG. I, to facilitate gripping for opening the container as hereafter described.

Circumferential band seal **34** of container **10** is provided at the lower ends of the mating drinking lip **20** and protective skirt **30**, as depicted in FIG. II, to insure against contamination of any type entering between the outer surface of the sanitary drinking lip and the inner surface of the shielding flange, prior to removal by the consumer. This band seal **34** compressively overlies at least a portion of the outer surface of the lower end **32** of protective skirt **30**, and the outer surface of step defining projection **24** in the lower end of drinking lip **20**, so as to flushly seal the lower end of the protective skirt within step **22** of drinking lip **20**. Band seal **34** may be either peripherally continuous, or comprise a number of short sections at spaced intervals around the container circumference.

At the junction of the lower portion **16** and the upper portion **18** of cup portion **11**, there may be provided an outward, fairly sharply rounded nesting shoulder **36**, the outer surface of which may rest upon the inner edge of the rounded top of an adjacently nested cup portion, to maintain the cups in spaced relationship when one is nested within another for storage purposes prior to filling. This shoulder would provide for reliable individual dispensing of cup portions from automatic feeding equipment during filling of the containers in the plant of the packager.

In FIG. III is shown an alternate embodiment of the present invention, in that top wall **38** of the closure member is not depressed, but is rather generally flat as shown. In place of the interference or friction fit provided by the back tapered sidewall of the telescoping plug type closure member of FIG. II, there is provided a separate auxiliary seal **40** adhesively joining the underside of flush type lid **38** to the rounded upper end **42** of cup portion **11**. Obviously sealant **40** must be of a non-toxic nature, and preferably is applied to, and remains adhered to the closure member when the container is opened, so as to minimize the existence of sealant on the rounded top of the peripheral lip of the container cup during use by the consumer.

To remove closure member **12** of FIGS. I and II from cup portion **11**, the consumer grips serrated outer surface **44** of shielding lip **30** with one hand and twists while retaining cup portion **11** stationary with the other hand, thereby gently rupturing tape or band seal **34** which binds skirt **30** to lip **20**. The thumb or fingers of the user may be then placed within step **22**, and closure member **12** gently pried locally upward to interrupt the interference fit between the outer surface of sidewall **28** of closure **12** and the inner surface of the upper margin **18** of sidewall **14** of cup portion **11**. As will be appreciated, the continued upward pressure on the closure in a localized region which may be accompanied by twisting, causes the back tapered sidewall of the closure to cam all of the way over the similarly configured upper margin of the cup sidewall, thereby allowing the lid progressively to be removed from the cup with ease. Alternatively, band seal **34** could have a pull tab extension for first peeling off seal **34** from the container. In such cases the serrated surface may not be necessary. With the closure removed, the contents are then accessible to the consumer, who may drink from the wide mouth cup by placement of his lip against drinking lip **20** of cup portion **11**. If all of the contents are not consumed at one time, the container may be resealed by gently and resiliently snapping the closure back into place on the cup, to reestablish the frictional sealing fit between the upper end of the cup and the closure sidewall.

The above description and particularly the drawings are set forth for purposes of illustration only and are not to be taken in a limited sense.

The material from which the cup and closure members are formed may be of any material of sufficient strength to be fabricated relatively thinly for economy purposes, and sufficiently flexible to permit the parts to be fitted together. Typical materials are paper, cardboard, plastics, etc. including any combination of two or more of such materials. Any common method of manufacture may be employed which is most suitable to the particular material being processed. It is preferred, in the present invention that the container be made of thermoplastic, which has the additional advantage of being tough and unbreakable under ordinary use conditions. The preferred forming method is from web stock by any of the well known sheet thermoforming processes such as, for example, pressure differential forming, using vacuum or positive pressure, and with or without a plug assist. The resulting cap or closure when formed in this manner is unitary in construction, has no seams and is of the thin wall variety having a wall thickness between about 2 to 80 mils. This thickness is substantially uniform throughout the entire extent of the formed parts. Styrene-based thermoplastics are preferred for manufacturing the containers of the present invention, since even when thin, this material is tough and resent, even at low temperatures. This latter point is important in considering the plastc material for the container, since it must be kept in mind that the contents at times may be refrigerated below about 0° F. for extended periods. Some plastics are more brittle and susceptible to fracture under these conditions.

The band seal of the container of the present invention may take a variety of forms, as long as it functions to hold the shielding flange of the closure protectively over the sanitary drinking lip of the cup portion, and seals off the outer edges of these two parts. For example, the band may be either circumferentially continuous around the full container body, or may comprise short spaced sections adhered to the lip and shielding flange. It may take the form of a rubber band, wire, adhesive tape, etc. A heat shrinkable sleeve is preferred because of the unusually tight and relatively inexpensive seal obtained.

The cup portion of the container of the present invention may be of any geometrical configuration as long as there is a smooth sanitary drinking lip at its upper end. Otherwise the cup may be round, square, hexagonal, etc. and may have any number of sides.

The preferred embodiment of the present invention contemplates the use of a tear strip to break an initial seal, but wherein the cup and closure are so configured to allow resealing. In some instances such resealing may not be at all necessary such as in the case of very small containers in which it is intended that the entire contents be consumed promptly on opening the container. In such instances it is unnecessary to have the cooperating back tapered portions, and accordingly the embodiment of FIG. III is provided. In general, however, a separate seal of some type is necessary at the rim of the cup, to prevent the contents from working in between the sanitary lip and closure sealing flange.

The present invention provides a unique beverage container suitable for containing various liquids in an air tight and sanitary manner. The closure in each instance is initially firmly held in place, but is readily removable without spilling the contents. The lid, however, cannot be removed without the tearing off of a band seal therefrom, thereby insuring purity and freshness of the contents, and sanitary protection of a smooth drinking lip on the container cup portion. The container cup portion when uncovered presents a wide mouth sanitary opening for direct drinking of the container contents by the consumer.

It will be understood that numerous changes may be made in the design and construction hereof without departing from the spirit and scope of the invention.

What is claimed is:

1. A thin wall plastic drinking container comprising a resilient cup portion, a plug type closure member for the cup portion and a band seal for the cup portion and closure member,

(a) said cup portion comprising a circular bottom, a circumferential sidewall initially extending upwardly and diverging outwardly from the bottom, the upper margin of said sidewall tapering slightly inwardly to the uppermost end of said sidewall to form an open upper end having a diameter less than that of the lower end of said upper margin, an outwardly directed stacking shoulder in said sidewall at the lower end of said upper margin for supporting said cup portion on the upper end of the upper margin of a similarly constructed cup portion, a downturned drinking lip at the top of, and flaring outwardly of the upper end of said sidewall, said lip extending downwardly below said shoulder to facilitate placement of a lip of a user thereon;

(b) said plug type closure member having a top, a short reversely angled sidewall extending upwardly therefrom, and a protective skirt extending downwardly from the upper end of said closure sidewall, said closure sidewall and said upper margin of the cup portion being in sealing engagement, with said closure top lying across the open end of the cup portion and said protective skirt covering the user's lip area of the cup portion when the closure is mounted on the cup portion; and

(c) said band seal binding the outer surface of the lower end of said protective skirt to the drinking lip of the cup portion.

2. The container of claim 1 wherein the plug type closure has a reversely angled sidewall, and the upper area of the sidewall of the cup portion is similarly reversely angled, to provide a friction sealing fit between the closure and cup portion when the closure is mounted on said cup portion.

3. The container of claim 1 wherein the outer surface of the drinking lip of the cup portion is continuous.

4. The container of claim 1 wherein the bottom wall of the cup portion peripherally conically tapers gradually upwardly toward the cup axis, and the top wall of the plug type closure member is arched so as to fit within the gradually upwardly tapered bottom wall of the cup portion when a cup portion is placed on a closure member.

5. The container of claim 1 wherein the protective skirt of the closure member is serrated to facilitate turning the closure to rupture the seal between the cup portion and the closure member.

6. A thin wall plastic drinking container comprising a one-piece cup portion, a one-piece telescoping closure member for the cup portion, and a band seal for the closure member and cup portion,

(a) said cup portion comprising a circular bottom, a circumferential sidewall having a lower portion extending upwardly and expanding outwardly from the bottom, said lower portion being of substantial height to permit gripping thereof by the user, an upper margin tapering slightly inwardly to form an open upper end, and a downturned, elongated drinking lip at the top of and extending outwardly of said sidewall, said lip having a smooth outer surface, and a shallow outward step at its lower end;

(b) said closure member having a top wall for closing the open end of the cup portion, a short reversely angled sidewall for telescoping engagement with the upper margin of the cup portion, and a protective skirt extending downwardly from the upper end of the closure sidewall for covering said drinking lip of the cup portion, the lower end of said skirt fitting flushly within said step in the drinking lip; and

(c) said band seal compressively overlying at least a portion of the outer surface of the lower end of said protective skirt, and the outer surface of the step defining surface of the drinking lip, thereby flushly sealing the lower end of the protective skirt within the step of the drinking lip.

7. The container of claim 6 wherein the band seal is circumferentially continuous.

8. The container of claim 6 wherein the outer surface of the protective skirt of the closure member is serrated above the lower end.

9. The container of claim 6 wherein the cup portion is formed from thermoplastic sheet to provide a seamless unitary construction having a sidewall thickness between about 2 to 80 mils.

References Cited

UNITED STATES PATENTS

79,843	7/1868	Loder	215—95
2,626,703	1/1953	Watson.	
2,829,790	4/1958	Isele-Aregger.	
3,055,540	9/1962	Ringlen	150—.5 XR
3,150,811	9/1964	Amberg.	
3,237,803	3/1966	Edwards.	
3,315,872	4/1967	Carbone.	
3,331,105	7/1967	Gordon.	
3,351,227	11/1967	Collie	150—.5
3,355,056	11/1967	Fisch	150—.5 XR
3,358,879	12/1967	Mueller.	
3,362,575	1/1968	Fotos.	
3,321,124	5/1967	Bank	229—43
3,392,871	7/1968	Donovan	220—60 XR

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U.S. Cl. X.R.

150—.5; 215—95; 220—60; 229—1.5