

[54] COLLAPSIBLE CONTAINER AND PACKAGE

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[51] Int. Cl.² **B65D 5/36**; B65D 5/60

[58] Field of Search 206/218-19, 206/525; 220/1 R, 8; 229/1.5 B, 41 R, 41 B, 41 C, 41 D, 43, 93, 14 B, 14 BA; 150/48, 50

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Primary Examiner—William Price

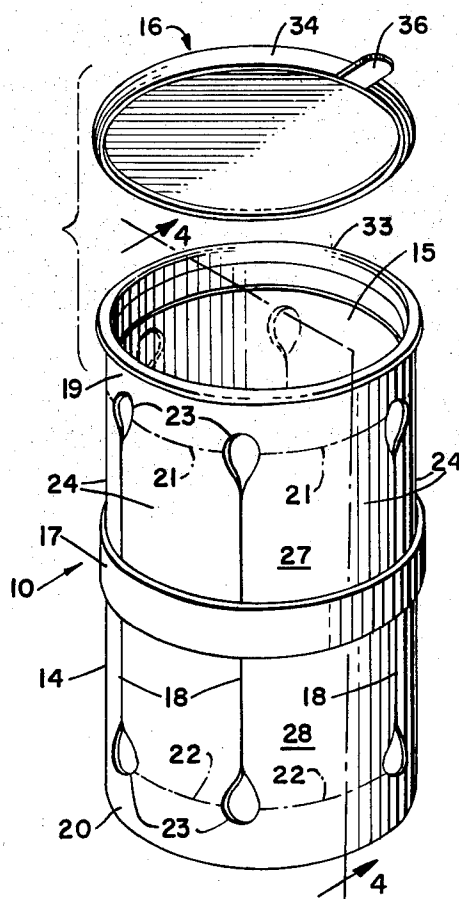
Assistant Examiner—Steven E. Lipman

[57]

ABSTRACT

A collapsible container comprising a collapsible outer tube, a liquid proof bag liner, and a removable closure is disclosed which is especially adapted for use in packaging and shipping in the collapsed condition a small quantity of a powdered material. The package may be expanded at the point of use and liquid may be added to and mixed with the powdered material within the bag lined container. The powder may be any material which is normally mixed with a liquid at the point of use to provide a usable product. Examples of such powders are beverage concentrates, glues, etc., which are normally mixed with water at the point of use. The collapsed packages are adapted for vertical stacking and banding with a handled carrier to provide a six pack, twelve pack, and package of other determined multiples. The outer tube is made collapsible by providing spaced longitudinal slits through the tube to form a plurality of panels which are connected to top and bottom end portions of the tube along top and bottom hinge lines. The panels each have intermediate hinge lines which permit the panels to collapse outwardly when axial force is applied to the ends of the tube. A slidable ring encompassing the tube is provided to overlie the intermediate hinges to prevent outward collapse of the panels when the package is expanded.

21 Claims, 13 Drawing Figures



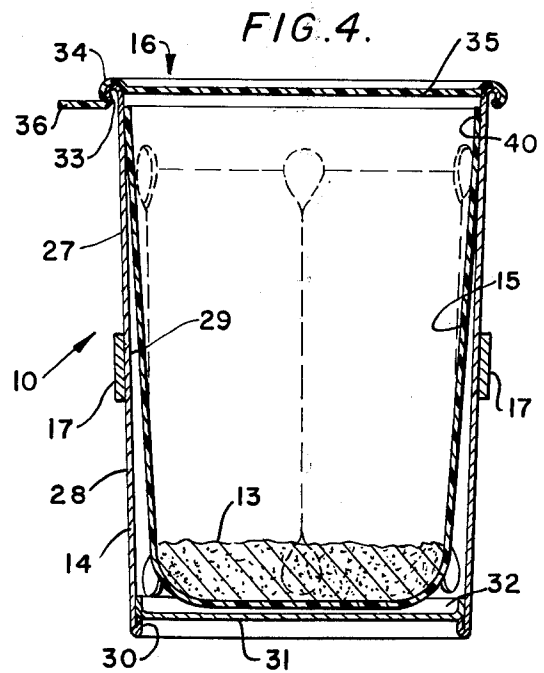
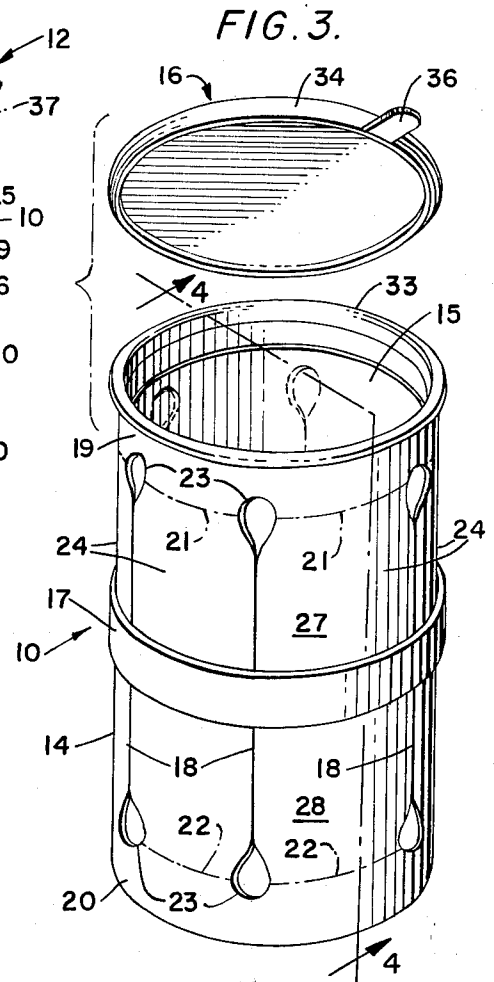
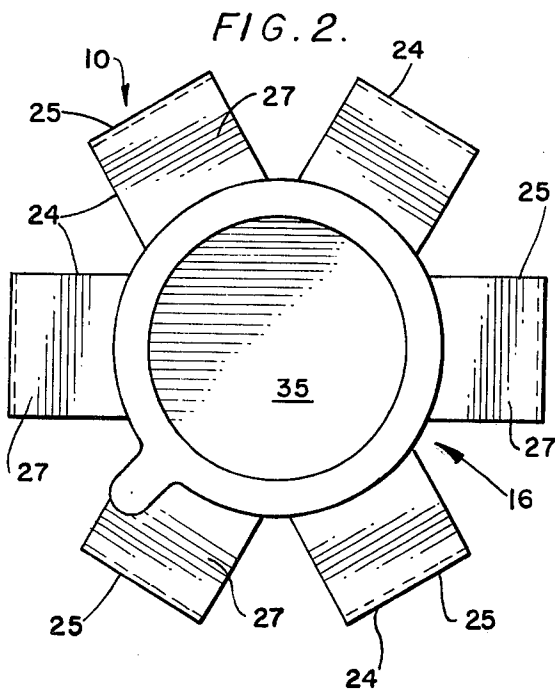
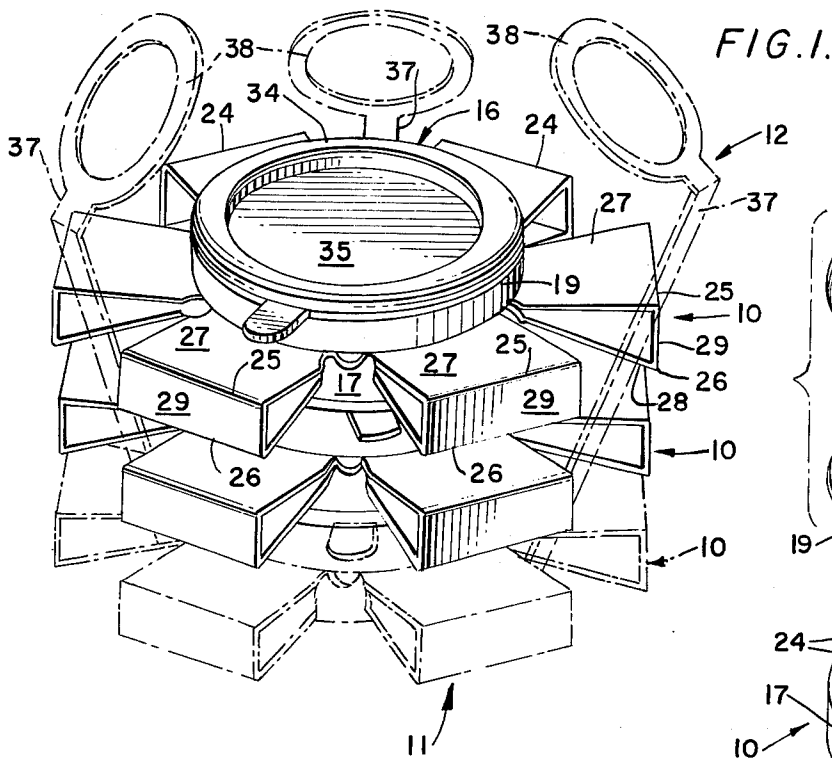


FIG. 5.

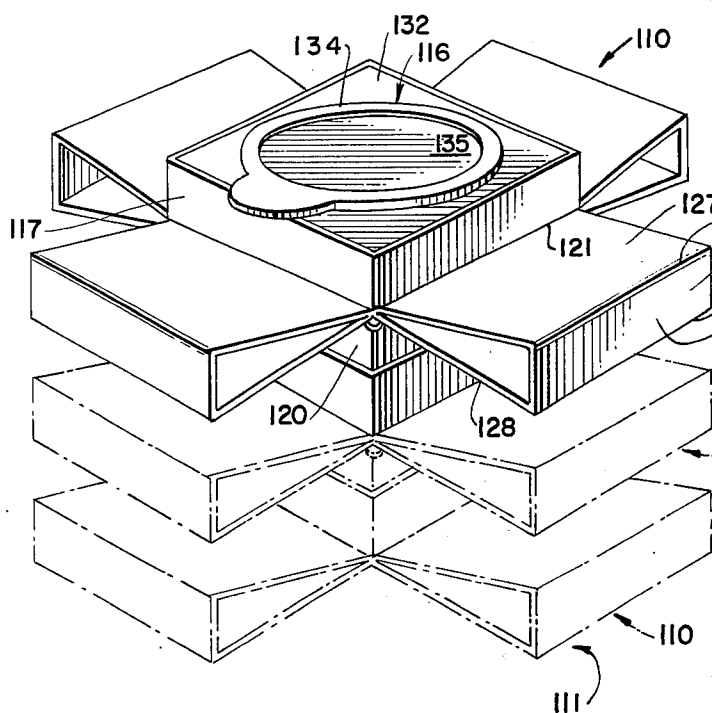


FIG. 7.

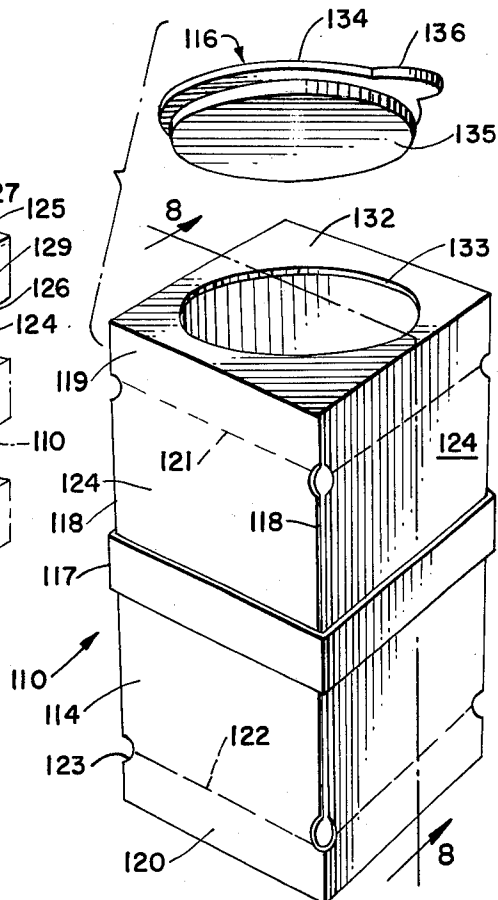


FIG. 6.

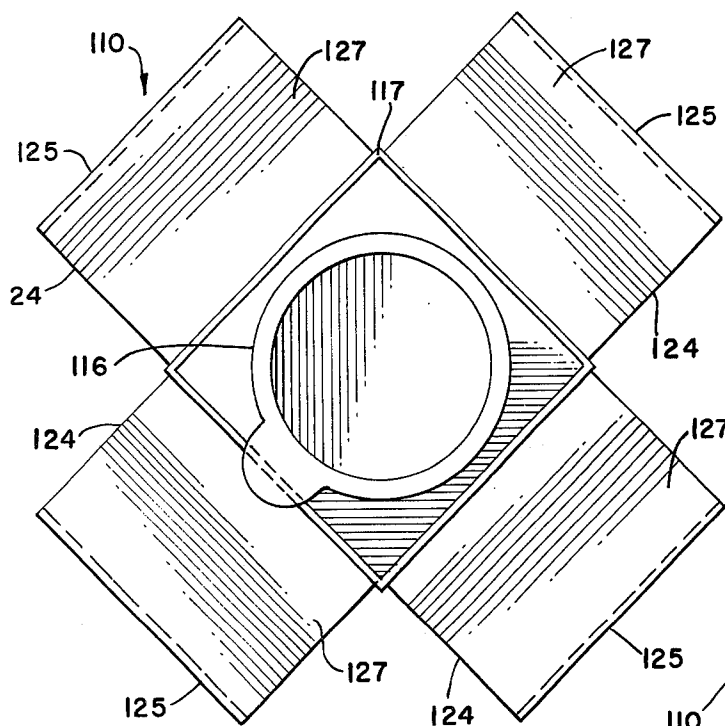
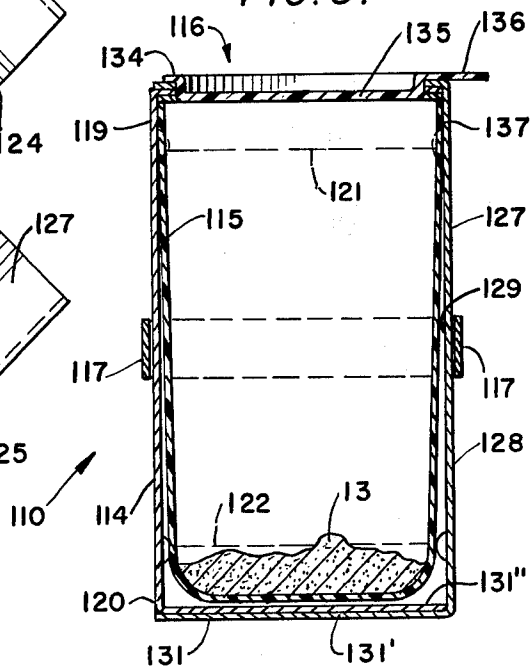
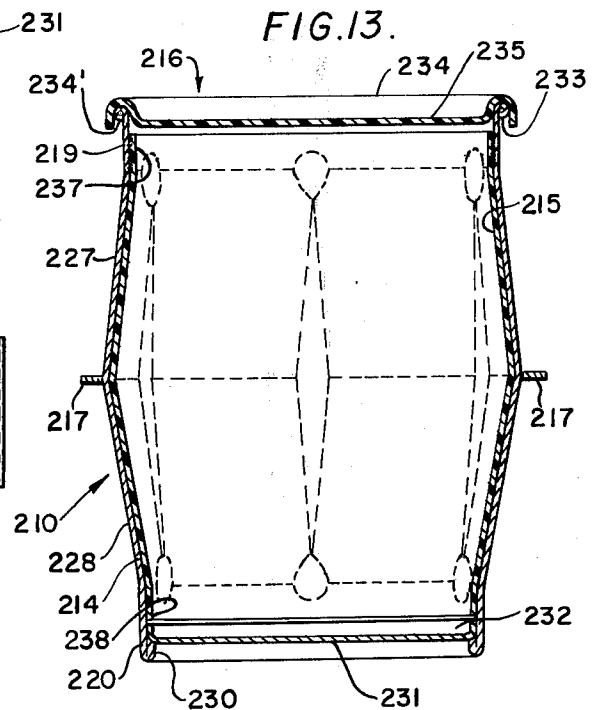
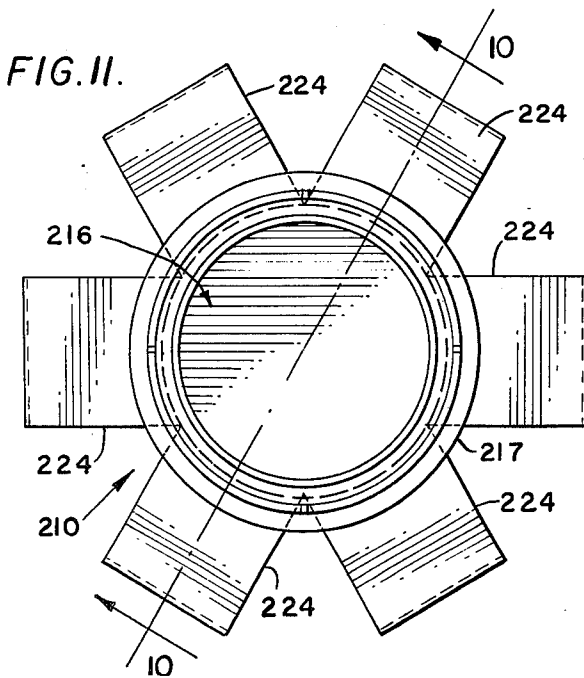
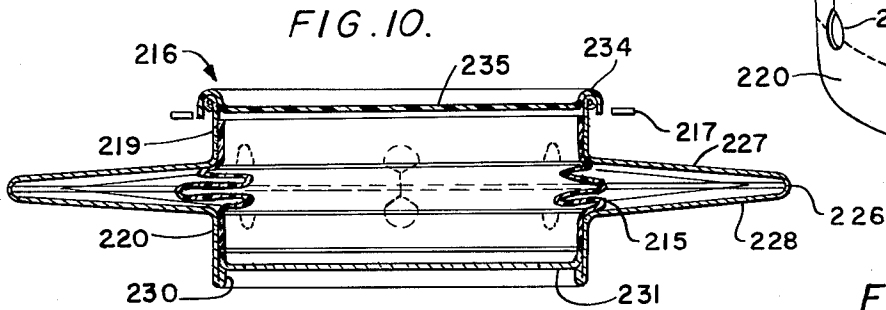
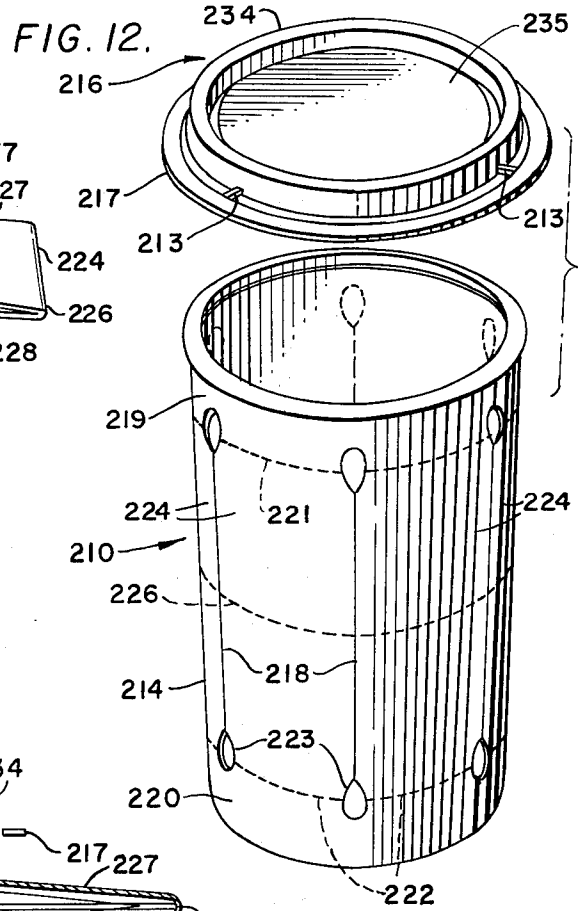
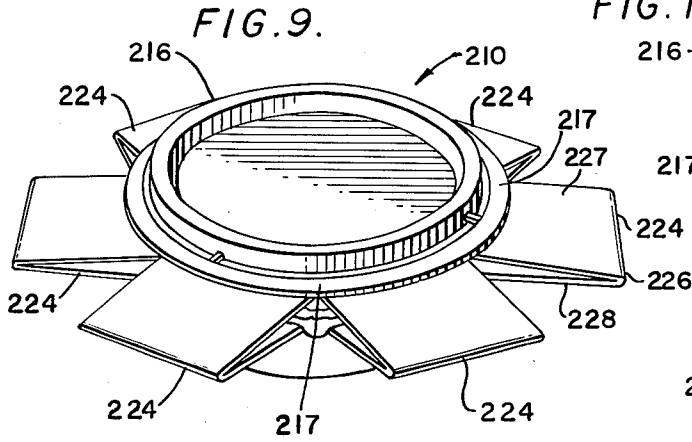


FIG. 8.





COLLAPSIBLE CONTAINER AND PACKAGE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to a collapsible container and to a package including the collapsible container and a small quantity of material occupying a minor portion of the volume of the container. The package when sealed and collapsed is especially adapted for vertical stacking in multiples with other like packages. The invention further relates to a stack of the collapsed packages banded with a handled carrier.

2. Description of the Prior Art

The broad concept of a reusable collapsible cardboard container with a bag liner is disclosed by U.S. Pat. No. 2,412,544. The use of bands to prevent collapse of the erected container is also suggested by U.S. Pat. No. 2,412,544, however the structure of the container disclosed in U.S. Pat. No. 2,412,544 is substantially different from the present invention. U.S. Pat. Nos. 1,720,889 and 1,808,833 broadly teach the concept of providing slits at the corners of a container or liner for a container to permit outward or inward bulging of the container walls. The containers disclosed in U.S. Pat. Nos. 1,720,889 and 1,808,833 are especially suitable for packaging fragile articles such as light bulbs and the purpose of the bulging walls is to permit the container to adjust itself to fit the article. U.S. Pat. Nos. 2,353,178, 3,179,323 and 3,662,944 are illustrative of containers having liquid proof liners for packaging liquids.

The present invention distinguishes from each of the patents listed above.

SUMMARY OF THE INVENTION

A principle object of the invention is to provide a collapsible, expandable container having a liquid proof liner which with the introduction of fluids, expands to an erected form. The container in the erected form can be locked against collapse by a sliding ring encompassing the container which may be slid into position to prevent outward collapse of the container walls. The expanded and filled container is such that a person can drink from it and set it down without fear of its tipping, spilling, or leaking.

It is another object of the invention to provide a container which may be collapsed for shipment and which may be erected at a point of use and locked into erected condition. The erected container is adapted for use as a mixing, storage, and dispensing container for various quantities of materials. It lends itself especially to use as a mixing and dispensing container for beverages, such as fruit juices. The container may be sold and shipped empty, or it may be used as a primary package for the merchandising of concentrated beverage powders, such as a reconstitutable soft drink, while in its collapsed condition. Its use is of course not limited to beverages and food stuffs since many other materials which require mixing with a liquid at the point of use may be shipped in concentrated, or powdered, form in the collapsed container.

The basic structure of the invention comprises a die-cut, collapsible outer tubular member, or sleeve, a collapsible liquid proof liner, or bag, contained within the outer tubular member, a removable closure for the container, and a slidable ring for locking the container in erected condition. The collapsible outer tubular

member may be made of various normally rigid, shape sustaining materials such as cardboard, plastics, and even thin metals which are capable of bending repeatedly about defined hinge lines. A paper product such as cardboard is preferred for the outer sleeve because of its relative lightweight, cheapness, and ease of manufacture into the finished product. The cardboard may be coated, or not, as desired depending upon its intended use. The collapsible liner or bag is preferably a liquid proof plastic bag, such as polyethylene, polypropylene, and other polymers commonly used in making liquid proof bags and liners. Other liquid proofed materials such as plastic coated papers and metal foils may be used for making the liner or bag.

With the foregoing more important objects and features in view and such other objects and features which may become apparent as this specification proceeds, the invention will be understood from the following description taken in conjunction with the accompanying drawing, in which like characters of reference are used to designate like parts and in which:

FIG. 1 is a perspective view of a vertical stack of multiples of the collapsible containers of the invention in their collapsed condition;

FIG. 2 is a top plan view of one of the collapsible containers of the invention;

FIG. 3 is an exploded perspective view of the invention with its closure removed;

FIG. 4 is a vertical sectional view of the invention with the lid on taken along line 4-4 of FIG. 3;

FIG. 5 is a perspective view of another embodiment of the invention showing in phantom lines several containers stacked;

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

FIG. 7 is an exploded perspective view of the embodiment shown in FIG. 5 in its erected condition and with its closure removed;

FIG. 8 is a vertical sectional view taken along line 8-8 of FIG. 7 with the closure in place.

FIG. 9 is a perspective view of a still another embodiment of the invention in its collapsed condition;

FIG. 10 is a vertical cross sectional view taken on line 10 of FIG. 11;

FIG. 11 is a top plan view of the embodiment shown in FIG. 9;

FIG. 12 is an exploded view of the embodiment shown in FIG. 9 in its erected state and with its closure and integral locking ring separated from the container;

FIG. 13 is a vertical cross sectional view of the embodiment shown in FIG. 12 with its closure in place and locking ring detached from the closure and encompassing the container.

DETAILED DESCRIPTION OF INVENTION

Referring now to FIGS. 1-4 of the drawings a preferred embodiment 10 of the collapsible container of this invention is shown in its collapsed condition in FIGS. 1 and 2, and in its erected condition in FIGS. 3 and 4. A stack 11 of several of the collapsed containers 10 is shown in FIG. 1 and a handled carrier band 12 is shown positioned to bind the stack together.

Looking particularly at FIGS. 3 and 4 the collapsible container 10 comprises a tubular outer body member 14, of cardboard, an open top bag liner 15 within the body member, a top closure 16 and a slidable locking ring 17 encompassing the tubular body member 14. The tubular body member 14 is generally of circular

cross section which may be of uniform diameter through out its length, or which may be tapered in the manner of a cup as seen in FIG. 4. A plurality of peripherally spaced, longitudinal slits 18 cut through the tubular body member 14 divide the member 14 into a plurality of separated longitudinal panels 24. The slits 18 terminate short of the top and bottom ends of the member 14 leaving peripherally continuous top and bottom end portions 19 and 20 at opposite ends of the body member 14. Upper and lower transverse hinge means 21 and 22 are provided at the top and bottom respectively of the panels 24 for hingedly connecting the panels to the top and bottom end portions respectively. The hinge means 21 and 22 are preferably score lines made by scoring the inside surface of the body member 14. Intermediate hinge means are provided intermediate the upper and lower transverse hinge means to permit the panels 24 to collapse outwardly. The intermediate hinge means in each panel 24 comprises a pair of parallel longitudinally spaced, intermediate score lines 25 and 26 (see FIG. 1) which divide each panel 24 into top and bottom panel portions 27 and 28 of equal length and an intermediate panel portion 29 between the intermediate score lines 25 and 26. The bottom end of the tubular body member 14 has an inturned inner edge 30 which seats a bottom wall 31. The bottom wall 31 has an upturned flange 32 which is sealed to the inside wall of the body member 14. The top end of the body member 14 is rolled outwardly to provide a sealing lip 33 which is sealingly engaged by a corresponding rolled edge 34 provided on the closure 16.

The closure 16 is preferably made of a plastic material which is sufficiently resilient to snap over the rolled lip 33 of the tubular body 14 and is at the same time sufficiently rigid to be shape retaining. The center portion of the lid is depressed to provide a stopper portion 35 which fits inside the top end of the container body 14. A finger piece 36 extends outwardly from the bottom edge of the rolled lip 34 of the closure 16 so that the closure may be readily grasped between a person's thumb and forefinger for removal.

The container 10 is adapted to be locked in erect condition by sliding the locking ring 17 along the tubular body 14 until it overlies the intermediate panel portion 29 as seen in FIGS. 3 and 4. When it is desired to use the container 10 for merchandizing a beverage concentrate, a quantity of the beverage extract 13 is placed in the bottom of the liquid proof bag 15 and the closure 16 is snapped into place over the top end of the body member 14. The package may then be collapsed for shipping by sliding the locking ring 17 to one end of the container 10 so that it overlies one of the end portions 19 and 20. When the container 14 is cup shaped as in FIG. 4, the locking ring must be slid downwardly over the bottom end portion 20 of the container to permit collapse of the container.

When the container 10 is collapsed the intermediate portion of the body member 14 spreads outwardly as the upper and lower panel portions fold outwardly about the hinge lines 21 and 22 respectively. The folded panels 24 thus form radially extending wings connecting the end portions 19 and 20 which are axially moved into close proximity to each other. The bag 15 with its contents 13 contained therein collapses within the top and bottom portions 19 and 20. Portions of the collapsed bag 15 may even bulge radially outwardly between the top and bottom portions into the

radial wings formed by the folded panels 24 and the space therebetween.

When a plurality of the collapsed containers 10 are stacked, as shown in FIG. 1, they may be readily banded by a handled carrier 12. The carrier 12 has a plurality of narrow band portions 37 connected together under the stack 11 and spaced about the stack 11 so that the bands engage the top and bottom portions of the stacked containers between the folded panels 24. At the top of the bands are enlarged annular handle portions 38 which fold together to provide a handle by which the bound stack may be carried. A specific number of the collapsed containers may be stacked, bound and sold much in the manner of a six pack, or 12 pack of bottled drink containers now common in merchandizing.

It is preferred that the top 40 of the bag 15 be adhered to the inside of the tubular body member 14 near the top end. If the bag is a thermoplastic material it may be heat sealed to the tubular body member 14. Various modifications of the top of the container and of its closure 16 may be employed within the scope of this invention. The top of the bag 40 may be extended upwardly and turned out over the lip 33 and sealed thereto so that the closure 16 sealingly engages the top of the bag between the closure lip 34 and the container lip 33. Also a supplemental rigid plastic collar may be affixed to the top of the bag 15 to which the closure 35 may be applied for closing the bag rather than directly to the top of the tubular member 14.

The curved tear-drop shaped apertures 23 are provided at the ends of the slits 18 in order to reduce the tendency for the tubular body member 14 to tear along the line of the slits into the top and bottom end portions 19 and 20.

At the point of use of one of the collapsed packages 10 which has, for example, a powdered beverage concentrate therein, the consumer would grasp the container in the area of the end portion 19, remove the closure 16 and add water. As the package expands under the weight of the water entering the bag 15, the locking ring 17 would be slipped half-way down the container 10 to lock the container in its erect condition. When sufficient water has been added to reconstitute the beverage, the closure 16 may be replaced and the container 10 and contents shaken to promote mixing of the water and powdered concentrate. If desired, ice may be added to the container, and the cooled beverage may be drunk directly from the container 10.

FIGS. 5-8 illustrate a second embodiment 110 of the collapsible container of this invention which is of polygonal form. FIGS. 5 and 6 show the container 110 in its collapsed condition and FIGS. 7 and 8 show the erected container.

Looking particularly at FIGS. 7 and 8, the collapsible container 110 comprises a tubular outer body member 114 of cardboard, or similar stiff paper material, an open top, liquid proof bag liner 115 within the outer body member, a plastic top closure 116, and a slidable locking ring 117, encompassing the tubular body member 114. The tubular body member 114 is a square cross-sectioned tube having four side wall panels 124, a bottom wall 131, and a top wall 132. The side wall panels 124 are separated by slits 118 cut through the tubular body member at the four vertical corner edges thereof. The slits 118 terminate short of the top and bottom ends of the tubular body member 114 leaving peripherally continuous top and bottom end portions

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119 and 120. Upper and lower transverse hinge means 121 and 122 are provided at the top and bottom respectively of each of the panels 124 for hingedly connecting the panels to the top and bottom end portions respectively. The hinge means 121 and 122 are preferably score lines made in the body member 114. Intermediate hinge means 125 and 126, (preferably score lines) are provided intermediate the upper and lower transverse score lines 121 and 122 to permit the panels 124 to collapse outwardly. The intermediate hinge means 125 and 126 (see FIG. 5) divides each panel 124 into top and bottom panel portions 127 and 128 of equal length and as intermediate panel 129 between the score lines 125 and 126.

The bottom wall 131 is shown as comprising several overlapping flaps 131' and 131'' which are hingedly connected to the bottom edges of the side walls in the usual manner of forming a tube type container. The top of the container 132 has a circular aperture 133 formed centrally therein. A removable closure 116, preferably of plastic material, has a stopper portion 135 adapted to fit inside the aperture 133, and a radially outwardly extending annular flange 134 adapted to overlie the top wall 132 in the area surrounding the aperture 133 when the stopper portion 135 is pressed into the aperture. The open top bag 115 is heat sealed, or otherwise suitably adhered about its top edge to the inside surface of the top portion 119. The top 132 of the container 110 may be liquid proofed on its inner surface with a liquid proof coating of wax, or plastic, or if desired the top edge of the bag 115 may be turned in and sealed to the under surface of the top wall 132. In any event when the closure 116 is in place sealing the opening 133, a sealed liquid proof container is provided. The container 110 is adapted to be locked in erect condition by sliding the locking ring 117 along the tubular body member 114 until it encompasses the intermediate panel portion 129 in the same manner as has been described with respect to the embodiment shown in FIGS. 1-4. To collapse the container 110 the locking ring is slid to one end of the container and the ends 131 and 132 are pushed toward each other. In so doing the panels 124 collapse outwardly until the container 110 assumes the condition illustrated in FIGS. 5 and 6. A plurality of the collapsed container 110 may be stacked vertically to form a stack 111 as indicated in FIG. 5. The stack 111 may be bound in the same manner as has been described for the embodiment shown in FIGS. 1-4.

The apertures 123 at the ends of the slits 118 reduce the tendency of the tubular body member 114 to tear along the lines of the slits into the end portions 119 and 120.

FIGS. 9-13 illustrate a third embodiment 210 of the invention. Looking at FIGS. 9-11 the container 210 is seen collapsed, while looking at FIGS. 12-13 the container is seen erected. The container 210 comprises a tubular body 214, a water proof liner 215 affixed inside the tubular body member, a top closure 216, and a locking ring 217 which is initially connected integrally to the top closure 216 by multiple easily severable membranes 213 (see FIG. 12). The locking ring 217 may be separated from the closure 216 by breaking the membranes 213 and slid downwardly about the tubular body member 214 until it encompasses the body member 214 intermediate its ends, as seen in FIG. 13, to lock the container 210 in its erected condition. The tubular body member 214, which is of circular cross sec-

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tion, has six, equally spaced, longitudinal slits 218 cut through the thickness thereof so as to divide the member 214 into six, peripherally separated, longitudinal panels 224. The slits 218 terminate short of the top and bottom ends of the body member 214 at the apex of tear drop-shaped apertures 223 leaving peripherally continuous top and bottom end portions 219 and 220. Score lines 221 and 222 connect the top and bottom of panels 224 to the top and bottom end portions 219, 220 respectively and serve as hinge means for the panels. An intermediate score line 226 located equally distant between the score lines 221 and 222 divides each panel 224 into top and bottom panel portions 227 and 228 which are of equal length. The bottom end of the tubular body member 224 has an inturned edge 230 which seats a bottom wall 231. The bottom wall has an upturned flange 232 which is sealed to the inside wall of the body member 214. The top end of the body member 214 is rolled outwardly to provide a sealing lip 233 which is sealingly engaged in the annular groove 234' of the channel-shaped rim 234 provided on closure 216.

The closure 216 is preferably made of a thermoplastic material which is sufficiently resilient so that the rim 234 will snap over the rolled lip 233 of the body member 214. The center portion of the closure 216 is depressed to provide a stopper portion 235 which fits inside of the top end of the container body 214. As previously mentioned the locking ring 217 is preferably formed integral with the closure 216 during molding of the closure. It is connected to the outside edge of the closure rim by four thin membranes 213 which are easily broken to permit the locking rim 217 to be separated from the closure 216 by the consumer at the time the container 210 is erected and put into use. This can be a cost saving device in production, eliminating another mechanical operation for making and placing a separate locking ring over the container 210.

It is within the scope of this invention that the closure 216 with attached locking ring 217 may be substituted for the closure 16 and detached locking ring 17 for use in conjunction with the container 10 shown in FIGS. 1-4. Likewise the closure 16 and separate ring 17 may be substituted for the closure 216 and attached locking ring 217 for use in conjunction with the container 210 shown in FIGS. 9-13.

The liner 215 is adhered at its top and bottom margins 237 and 238 to the inside surfaces of the top and bottom end portions 219 and 220 respectively of the body member 214. The liner intermediate its top and bottom margins 237 and 238 is left unadhered to the inside of the body member 214 so that the panels 224 of the body member may collapse outwardly as shown in FIGS. 9-11 without tearing the liner. In the collapsed condition of container 210 the liner 215 folds between the folded panels, or wings, 224 (see FIG. 10). When the container is erected and filled with a liquid, or other material, the panels 224 will tend to bulge outwardly as seen in FIG. 13 but they will be prevented from further collapsing by the locking ring 217. The liner 215 is preferably of a waterproof thermoplastic material commonly used as a liner material for food storage containers in the food industry, although waterproofed paper and metal foil can be used.

It is entirely within the scope of this invention that liners may be substituted for bags, and bags substituted for liners in any of the embodiments of this invention. In manufacture of a lined container, such as the con-

tainer 210, a blank for forming the tubular body member 214 would be die cut from a cardboard sheet and scored to form the hinge lines 221, 222 and 226. A flat plastic liner would also be cut and placed over the blank, and its edges would be adhered adjacent the top and bottom edges of the cardboard blank. The cardboard blank with attached liner would then be rolled into a cylindrical form with the liner inside, and the meeting edges would be heat sealed. The bottom edge 230 would be rolled in, and the bottom wall 231 inserted and sealed about its periphery 232 to the inside of the container 210.

While in the foregoing there have been described and shown preferred embodiments of the invention, various modifications and equivalents may be resorted to within the spirit of the invention as claimed.

It is within the scope of this invention that the bottom walls 31 and 131 of the embodiments 10, 110 respectively may be omitted if desired, provided the bag liners 15 and 115 respectively have sufficient strength to avoid rupture in normal use.

What is claimed is:

1. A collapsible container comprising a tubular body member having top and bottom ends, a bottom wall closing said bottom end, a plurality of equally spaced longitudinal slits provided in said tubular body and dividing said tubular body member into a plurality of peripherally separated longitudinal panels, said slits terminating short of the ends of said tubular body member leaving peripherally continuous top and bottom end portions at the opposite ends of said body member, upper and lower transverse hinge means provided at the top and bottom of said panels for hingedly connecting said panels to said top and bottom end portions respectively intermediate hinge means provided intermediate said upper and lower transverse hinge means permitting said panels to collapse outwardly, a peripheral band encompassing said tubular body member and slidable longitudinally thereon, said band being slidable over said intermediate hinge means to prevent the outward collapse of said panels, and slidable from over said intermediate hinge means to a position over one of said end portions to permit collapse of said panels outwardly.

2. The container according to claim 1 wherein said tubular body member is circular in cross-section throughout its length.

3. The container according to claim 1 wherein said tubular body member is polygonal in cross-section throughout its length.

4. The container according to claim 1 wherein curved apertures are provided at the opposite ends of said slits to prevent tearing of said body along the lines of said slits into said end portions.

5. The container according to claim 1 wherein said tubular body member is made of normally shape sustaining, bendable material, said upper and lower transverse hinge means being transverse score lines provided inside of said panels to permit said panels to bend outwardly relative to said top and bottom portions respectively.

6. The container according to claim 5 wherein said intermediate hinge means in each panel comprises a pair of parallel, longitudinally spaced, intermediate score lines which divide each panel into top and bottom panel portions of equal length and an intermediate panel portion between said pair of intermediate score lines.

7. The container according to claim 6 wherein said tubular body member is made of paper.

8. The container according to claim 6 wherein said tubular body member is made of a synthetic resinous plastic.

9. The container according to claim 1 together with a waterproof liner within said tubular body member.

10. The container according to claim 9 wherein said liner is adhered to the inside of the tubular body member in the areas of said top and bottom end portions only.

11. The container according to claim 1 together with a bag lining said collapsible container, the bag having an open end, and being affixed adjacent its open end to the inside of said upper portion of said tubular body member.

12. The container according to claim 11 together with an apertured end wall affixed to the top end of said tubular body member, and a removable closure for closing said apertured end wall.

13. The container according to claim 12 wherein said closure includes a stopper portion fitting inside of the aperture of said end wall and tightly sealing same.

14. The container according to claim 13 wherein said bag is made of a heat sealable thermoplastic material and is heat sealed to the top portion of said tubular body member, and said end wall comprises a relatively rigid thermoplastic collar affixed inside of the tubular body at said top end and heat sealed to said bag, said collar having an intumed lip defining an aperture in said end wall.

15. The container according to claim 11 together with removable closure means for closing the top end of said tubular body member.

16. A package comprising the container of claim 15 and a quantity of powdered material in the bottom bag, said closure means being positioned to close the top of said tubular body member.

17. A vertical stack of the packages according to claim 16 each of said containers being collapsed, in superimposed relationship said ring of each container being slid over one end portion of said tubular body member and said panels being collapsed outwardly with the end portion pushed axially together.

18. The stack according to claim 17 together with banding means for holding said collapsed containers in vertically stacked relationship.

19. A collapsible container comprising a tubular body member having top and bottom ends, a plurality of equally spaced longitudinal slits provided in said tubular body and dividing said tubular body member into a plurality of peripherally separated longitudinal panels, said slits terminating short of the ends of said tubular body member leaving peripherally continuous top and bottom end portions at the opposite ends of said body member, upper and lower transverse hinge means provided at the top and bottom of said panels for hingedly connecting said panels to said top and bottom end portions respectively, intermediate hinge means provided intermediate said upper and lower transverse hinge means permitting said panels to collapse outwardly, a peripheral band encompassing said tubular body member and slidable longitudinally thereon, said band being slidable over said intermediate hinge means to prevent the outward collapse of said panels, and slidable from over said intermediate hinge means to a position over one of said end portions to permit collapse of said panels outwardly, an open top bag positioned

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within said tubular body member and adhesively secured adjacent its open top inside said tubular body member near the top end thereof, and a removable closure means for closing the top end of said tubular body member.

20. The container according to claim 19 wherein said removable closure means has a stopper portion fitted tightly within said top end, and a rim portion surround-

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ing said stopper portion engaged over the top end of said tubular body member.

21. The container according to claim 20 wherein said peripheral band is integrally joined to said closure rim portion by thin, easily broken connecting means for permitting said locking ring to be separated from said rim portion so that the locking ring may be slid along said tubular body member.

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