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CONTAINERS AND CLOSURES THEREFOR

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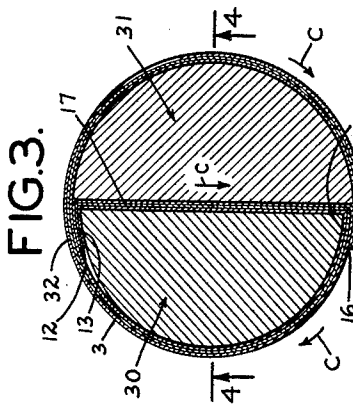


FIG. 3.

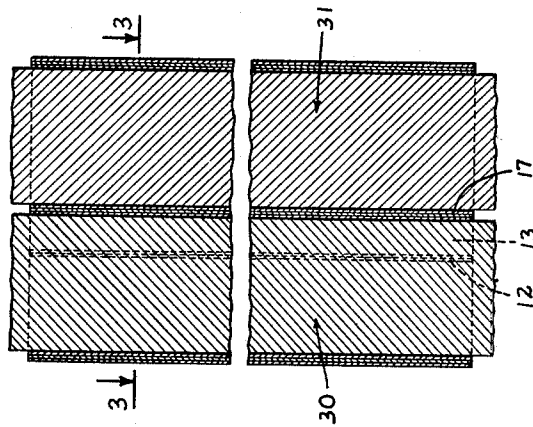


FIG. 4.

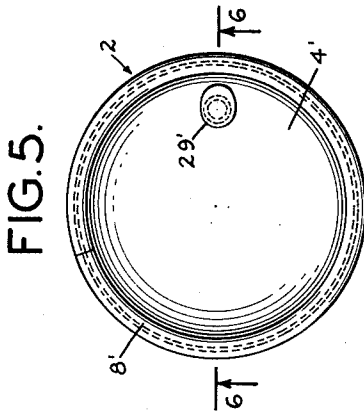


FIG. 5.

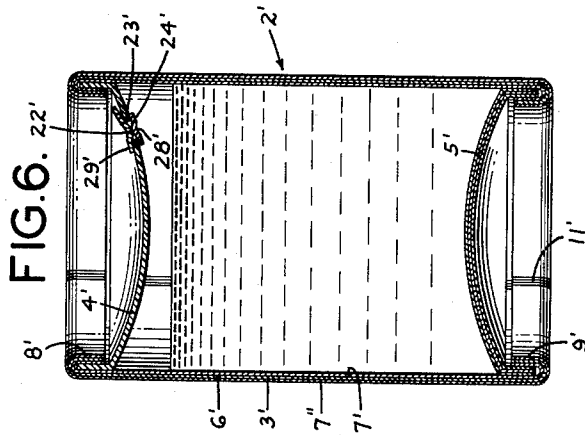


FIG. 6.

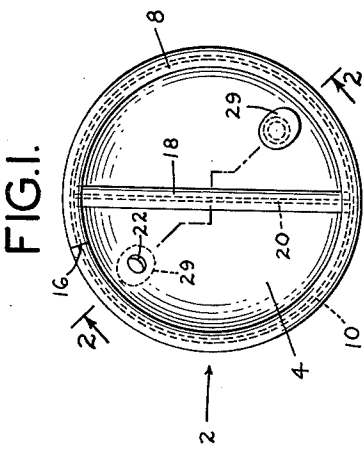


FIG. 1.

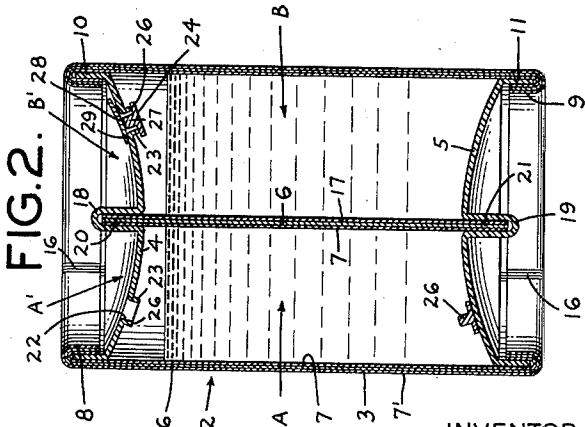


FIG. 2.

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9 Claims. (Cl. 229—5.6)

The invention relates generally to containers, closures therefor, and a method of making said containers. More particularly, the invention relates to sealed containers for pourable materials, particularly those required to be stored under pressure, closures for said containers that specifically adapt said containers for storing those of said materials that are under pressure prior to use, and a method of producing said containers that lends itself to present-day mass production operations.

At the present time, it is customary in the distribution of beverages, such as beer and carbonated non-alcoholic soft drinks in smaller quantities that are intended for individual or group consumption, to package, ship and store them in glass bottles or metal containers referred to in the art and colloquially as "cans." Since said beverages are charged and accordingly must be kept under pressure within sealed containers prior to consumption, the glass bottles when used for such purpose are equipped with sealing closures that are conventionally of the long-known "crown" cap variety. Said caps comprise a metal disc with down-turned flanges that retain a gasket or seal of cork or other suitable material. After the bottle has been filled with the beverage under pressure, the cap is seated on the pouring end of the bottle and said flanges of the cap are crimped over the lip of the pouring end of the glass bottle that is provided for such purpose so that the gasket is retained in sealing relationship with said pouring end of the bottle. On the other hand, "cans" are for the most part completely sealed and devoid of any closure means, except in the case of beer cans in certain instances that are provided with metal pouring spouts and crown cap closures of the above type conventionally used for glass bottles. As is well-known, a tool of some kind, such as a portable or a mounted crown cap remover or "bottle opener" is necessary to open the capped glass bottles and cans. In the case of the more conventional cans that are fully sealed and not provided with a spout, so-called "beer can openers" or other puncturing means are necessary to force an opening in the top of said cans to permit pouring of the contents thereof. To facilitate pouring, a second opening is almost invariably necessary to permit entrance of air as the contents are being poured whereby build-up of a partial vacuum is avoided. Hence, the necessity for a tool to open conventional bottles and cans and the need for the application of such tools with considerable force and some skill, that many persons for reasons of age, debility, or handicap, may not muster, are serious disadvantages inherent in the use of the prior art containers for beverages that are packaged under pressure.

Other disadvantages of said prior art containers stem from the obvious facts that production costs with respect to manufacture of the glass bottles and cans due in part to the cost of the materials per se, that must be capable of withstanding the internal pressure caused by the charged beverage contained therein as well as external impacts normally sustained in shipping and handling, are comparatively high. In addition, glass bottles are bulky

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and metal containers are comparatively weighty so that use of either results in greater shipping costs. Moreover, glass bottles always present the inherent danger of being broken, whereas metal containers, while not bulky and not normally breakable, have not found acceptance in the carbonated soft drink field, doubtless because the greater pressures evolved by the highly carbonated beverages, than by beer, for example, require even heavier construction of the containers with resultant additional shipping and handling weight and cost of materials, and more durable lacquers for resisting the higher acidity of such beverages resulting from the solution of carbon dioxide under pressure in the aqueous medium of the beverage.

Furthermore, containers made of glass or metal have certain serious limitations that mitigate against their use for providing more than one fully sealed and separately openable compartment in a single container. Such containers, if fabricated in either glass or metal, would be far too costly to produce as disposable containers that could be discarded after their contents had been consumed. Another drawback in the use of metal containers, particularly if soft drinks were to be packaged therein, resides in the fact that the colors of such beverages that are visible when packed in glass bottles and have accepted sales appeal, would not, of course, be visible in said containers.

With the foregoing and other disadvantages of the prior art in mind, it is a primary object of the present invention to provide a container for beverages that need be neither of glass nor metal.

It is yet another object of the present invention to provide such a container that is inherently strong and sturdy enough to withstand internal pressures such as those generated by carbonated soft drinks and beer and external forces to which such containers are normally exposed during shipping and handling.

It is another object of the invention to provide a container that is of compartmented structure which, by arrangement of its parts, reinforces the strength characteristics thereof, both as to internal pressures and external forces.

It is yet a further object to provide a container having a plurality of compartments therein, wherein each compartment is fully sealed against contamination or intermingling of its liquid contents with the contents of adjacent compartments.

Another object is to provide a container of the character described, wherein means are employed for reinforcing the top wall thereof and also serve to subdivide the outer area of said top wall into open cup-like receptacles into which at least some of the contents of the respective, or the plurality of, sealed compartments may be introduced or admixed after withdrawal from the compartment(s).

A further object is to provide a container of the character described, wherein the circumferential wall thereof may be of paper, fiberboard, or the like, rather than glass or metal, and the said wall may be coated with a material on its interior face at least to render it impervious to the wetting and/or chemical action of the contents of the container.

It is yet another object to provide a method for fabricating a container of the character described.

Another object is to provide a method for forming both

the circumferential and the compartment-dividing walls of a compartmented container of the character described, from a continuous sheet of stock.

A further and additionally primary object of this invention is to provide a container for beverages that may achieve the objects set forth hereinabove and has an access and/or pouring aperture in the top wall thereof with closure means therefor that are easily removable from the exterior side of said container without the necessity for tools, but are not easily removed by inadvertence, gas pressure within the container, or weight of the liquid contained therein if inverted, nor by unintentional exterior forces, whereby, as an important feature of the invention, a closure effective in both the inward and the outward directions with respect to container, is provided.

Another object of the invention is to provide a container with closure means of the type described, wherein the gas or liquid pressure of the contents of the container, prior to manual opening of the closure means, tends to urge the closure means in the direction of further sealing relationship with the access and/or pouring aperture in the top wall of the container.

With the foregoing objects in view, in conjunction with other objects that will appear from reading of the following detailed descriptions of various embodiments thereof, my invention resides in the novel arrangement and combination of parts, in the details of construction, and in the method of manufacture, hereinafter described and claimed. It will be understood that my invention is susceptible of embodiment in many and various forms, several of which are illustrated in the accompanying drawings, and that the structural details and mode of assembly herein set forth may be varied to suit particular purposes and still remain within my inventive concept.

The invention will be more clearly understood from a consideration of the following description taken in connection with the accompanying drawings, that form a part of this specification. In such drawings, wherein like numerals identify like parts in the several views thereof:

FIGURE 1 is a plan view of one of the preferred embodiments of the container of the present invention, comprising one embodiment of my novel closure means;

FIGURE 2 is a vertical section of the container of FIGURE 1, taken along section line 2—2 of the latter figure to show the interior details of the novel compartmented structure and easily removable closure means therefor of this embodiment of the invention;

FIGURE 3 is a sectional view taken along section line 3—3 of FIGURE 4 showing the circumferential and compartment dividing wall of the compartmented container of FIGURES 1 and 2, prior to application of the top and wall sections of said container, and while still on the forming mandrels;

FIGURE 4 is a sectional view of the assembly of FIGURE 3 along section line 4—4 of the latter FIGURE and further illustrating the relationship of the mandrels to the sheet stock of which the circumferential and dividing wall of the container is fabricated;

FIGURE 5 is a plan view of another container of uncompartmented structure and illustrating another embodiment of the closure means of the present invention;

FIGURE 6 is a vertical section of the container of FIGURE 5 taken along section line 6—6 of the latter.

Referring now to the embodiment of the invention disclosed in FIG. 1 and FIG. 2, the container 2 comprises a circumferential wall 3, a top wall 4 of generally concave configuration as viewed from the exterior, and a bottom wall 5 that has a contour similar to that of top wall 4. Preferably, wall 3 is of paper or fiberboard 6 that is covered interiorly with a plastic coating 7 that may optionally be of other material such as wax, a coating of lacquer, or other substance used in this art for the purposes of resisting the wetting, and attack by chemical action, if any, by the liquid contents of the container. The exterior side of circumferential wall 3 may also be protected by a coat-

ing 7' that may be of the same or a different material than is coating 77. However, the same material for both coatings 7 and 7' is preferred for purposes of fabrication as will appear hereinafter.

Top and bottom walls 4 and 5, respectively, are retained in gas and liquid sealing engagement with circumferential wall 3 by the folding over of respective top and bottom edges 8 and 9 of circumferential wall 3 to envelope the edge flanges 10 and 11 of top and bottom walls 4 and 5, respectively, and retaining the juxtaposed parts in sealing relationship by adhesives, crimping, and/or other means conventional in the art. Top and bottom walls 4 and 5 are preferably of plastic material that may be of the same type for both said walls. However, it is preferred that top wall 4, at least, is transparent, whereby the contents of container 3 may be visible from the exterior.

Circumferential wall 3 is fashioned from a single continuous sheet that, as best seen in FIG. 3, begins at edge 12 of underlap 13 and ends at edge 14 of overlap 15 to provide a single external seam 16 in the finished container 2, while a median section of said sheet provides dividing wall 17 for compartments A and B of said container 2, whereby fabrication thereof by the novel method described in detail hereinafter is feasible. Said underlap 12 and overlap 13 are respectively attached to the juxtaposed portions 32 and 33 of circumferential wall 3 in sealing relationship therewith by heat-sealing, adhesives or other means known to the art.

Top and bottom walls 4 and 5 are respectively provided with ridges 18 and 19 that extend substantially diametrically thereof and are positioned in alignment to receive the upper and lower ends 20 and 21, respectively, of wall 17. Wall 17 is of reduced vertical dimension as viewed in FIG. 2 to avoid the necessity for ridges 18 and 19 to extend beyond the extreme top and bottom contours respectively of container 2 for the purpose of accommodating said ends 20 and 21. Ridges 18 and 19 of top and bottom walls 4 and 5, respectively, are sealed as by heat-sealing, an adhesive or other means, to said upper and lower ends 20 and 21 of wall 17. Said ridges 18 and 19 also function to divide the concave contours of top and bottom walls 4 and 5, respectively, into two equally dimensioned cup-shaped areas, of which areas A' and B' defined in top wall 4 particularly may serve an additional purpose as will be referred to hereinafter.

In accordance with the present invention, top wall 4 is provided with an aperture 22 for each of the cup-shaped areas A' and B'. The circumferences of apertures 22 are respectively defined by down-turned lip members 23 in the preferably plastic transparent top wall 4. As best seen in FIG. 2, a plug 24 is positioned in the aperture 22 of cup area B' so that the head 25 of said plug 24 abuts the edge 26 of down-turned lip 23 with the short shank 27 of said plug 24 extending upwardly (as viewed in FIG. 2) and having its terminal edge 28 substantially in the plane of the web of top wall 4. An external seal 29 is secured over aperture 22 to the area peripheral thereto as by an adhesive or other suitable means, in obturating relationship with aperture 22. The central area of seal 29 is adhered to the terminal edge 28 of shank 27 of plug 24.

In fabricating the container described above, the circumferential wall 3 is preferably fashioned into an externally cylindrical shape from a continuous strip of stock that, as illustrated in FIG. 3 and FIG. 4, permits it first to be wound, preferably starting at edge 12 and proceeding in the direction of the arrows C, around mandrel 30 that is in the shape of substantially a half-cylinder. After the stock is wound substantially completely around mandrel 30, a second half-cylinder mandrel 31 is brought into position in abutment with wall 17 so that the axes of mandrels 30 and 31 substantially coincide. The stock is then wound around mandrel 31 in the direction of arrow C so that the outer edge 14 extends to overlap wall 3 at 15. Preferably, underlap 13 and over-

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lap 15 are adhered to, or otherwise sealingly engaged with the respectively juxtaposed inner and outer regions of wall 3. Thereafter, the formed wall 3 is removed from mandrels 30 and 31 by moving said wall and mandrels axially in relation to each other. The upper and lower edges 20 and 21 of section 17 of wall 3 are then shortened by trimming to the lengths shown in FIG. 2 for the purpose referred to hereinbefore. Bottom wall member 5 which has ridge 19 preformed therein, and preferably a coating of some adhesive material on the inner surface of ridge 19, is inserted within the cylinder presented by wall 3 with said ridge 19 receiving end 21 of wall 17. Ridge 19 may be heat-sealed where necessary for setting the adhesive. Thereafter, or simultaneously, edge 9 of wall 3 is folded and crimped over cylindrical lip 11 of bottom wall 5, which may similarly have a thermosettable adhesive on both surfaces thereof, and the parts heat-set in such relationship as shown in FIG. 2.

The beverages are introduced into compartments A and B of container 2 under pressure and top wall 4 is secured to said container 2 without loss of pressure, as is well-known in the filling art. More specifically, top wall 4, preferably furnished with the apertures 22, 23 in which one of the plugs 24, is inserted and sealed at edge 25, and external sealer 29 is adhered to the concave surface of top wall 4, and preferably also to the edge 28 of shank 27 of plug 24. Thereafter, top wall 4 is inserted as was bottom wall 5 so that upper portion 20 of wall 17 is received within ridge 18 and cylindrical web 10 abuts interior surface of wall 3, and the lip of wall 3 is folded over and crimped and heat-set or otherwise sealed to produce the finished container shown in FIG. 2.

The hermetically-sealed containers containing beverage under pressure may be shipped and stored indefinitely until their intended use. At such time the user merely rips off the sealing tab 29 (as by starting an edge thereof with a fingernail) and presses down on the then exposed end 28 of shank 27 of plug 24 with his fingernail, a straw, or any of a variety of instruments that may be found to be handy. Such force will be sufficient to break the bond between the periphery 25 of plug 24 and the edge 26 of lip 23 of aperture 22. The bond will be chosen not to be too firm just for such purpose, or in some instances, may be omitted entirely. The plug 24 is chosen to be of a material that is relatively unaffected by the beverage in the container and will either sink or float depending upon the relative densities of the material used for the plug and the beverage in the container. In either case, a sucking straw or other means for withdrawing the contents may be inserted in the aperture 22 or the contents may be poured out therethrough. Obviously, the aperture 22 of just one of chambers A and B at a time may be opened by removal of the respective sealing tab and plug therefor and the contents consumed. It will be recognized that another advantage of the compartmented structure of the invention is that periods of time up to long intervals may intervene between openings of the two chambers as desired.

In the embodiment of the invention disclosed in FIGS. 5 and 6, the container 2' comprises structure quite similar to that disclosed in FIGS. 1 to 4, except that the container is not compartmentalized and hence need have but a single aperture 22' in the top wall 4' thereof. Container 2' comprises a cylindrical wall 3', a top wall 4' and a bottom wall 5', both of concave configuration as viewed from the exterior. Top and bottom walls 4' and 5' are in hermetically sealing engagement with the ends 8' and 9' of circular wall 3' by means that may be similar to those illustrated in the container of FIGS. 1 to 4. As in the latter case, the wall 3' may be of a continuous sheet, but may not necessarily be so.

In this case, the closure means for aperture 22' comprises an exterior sealer 29' of comparatively stiff material, resting freely on the top surface of top wall 4' and having the central portion thereof dipping into aperture 22'. On the interior surface of top wall 4', there is a

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plug member also of comparatively stiff material that has a central portion 28' thereof adhered to the central portion of exterior sealer 29' with the structure being such that the portion of top wall 4' comprising the periphery 23' of aperture 22' is clampingly retained between the peripheries of exterior sealer 29' and interior plug 24', respectively.

The ultimate use of container 2' just described is similar to that of the embodiment disclosed in FIGS. 1 to 4 with the exception, of course, that the beverage is contained in a single compartment. Specifically, the edge of sealer 29' may be raised with the fingernail and then ripped from its adherence to plug 24' within the container. As a result, plug 24' may drop away from aperture 22' whereby access may be had to the contents of container 2' as by means of a sipping straw, or the contents may be poured out through aperture 22'.

While preferred embodiments of the invention have been disclosed and described herein, it will be understood as referred to hereinbefore, that many modifications of the present invention and variations in the structure of devices for exercising the same within the scope of the appended claims are possible and contemplated. For example, the materials may be other than paper, fiberboard, and/or plastic; the material utilized may be coated or lacquered or may be inherently resistant to the beverages that it is to confine; and the parts may be hermetically sealed in other than the manners described. Similarly, the external sealer may be supplied with protruding means to facilitate manipulation for removal from the area of the aperture with which it is associated, or from engagement with the inner seal or plug; the external sealer may have perforations or a stripping to facilitate the tearing thereof from its attachment to the container wall; the internal seal may be hinged at one end or otherwise secured to the inner surface of the top wall so as not to fall into the beverage when the container is opened; etc.

I claim:

1. A closed container for fluids comprising a circumferential wall, a top wall and a bottom wall each having the edges thereof in sealing engagement, respectively, with the opposite edges of said circumferential wall to form an enclosed space, a wall extending interiorly from said top wall to said bottom wall and diametrically of said circumferential wall to separate the enclosed space of said container into two substantially equal compartments, said top wall and said bottom wall each having an exterior ridge therein that defines interiorly a U-shaped retaining slot in which the respectively adjacent edge of said interior wall is retained.

2. A closed container for fluids as claimed in claim 1, wherein said top wall and said bottom wall are of generally concave configuration exteriorly.

3. A closed container for fluids comprising a circumferential wall, a top wall and a bottom wall each having the edges thereof in sealing engagement, respectively, with the opposite edges of said circumferential wall to form an enclosed space, a wall extending interiorly from said top wall to said bottom wall and chord-wise of said circumferential wall to separate the enclosed space of said container into at least two separate compartments, at least one of said top wall and said bottom wall having an exterior ridge thereon that defines interiorly a U-shaped retaining slot in which the adjacent edge of said interior wall is retained.

4. A closed container for fluids as claimed in claim 3, wherein at least one of said top wall and said bottom wall is of generally concave configuration exteriorly.

5. A closed container for fluids as claimed in claim 3, wherein at least said top wall is of a transparent plastic material.

6. A closed container for fluids as claimed in claim 3, wherein said circumferential wall is of paper coated with a liquid repellent material.

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7. A sealed container for fluids comprising a horizontally disposed circumferential wall, a top wall and a bottom wall each having the edges thereof in sealing engagement, respectively, with the top and bottom edges of said circumferential wall to form a sealed space, a wall extending interiorly vertically from said top wall to said bottom wall diametrically of said circumferential wall to separate the sealed space of said container into two substantially equal sealed compartments, said top wall and said bottom wall each being of generally concave configuration exteriorly and each having an exterior ridge therein that defines interiorly a U-shaped retaining slot in which the respectively adjacent edge of said interior wall is sealingly retained, said circumferential wall and said interior wall comprising a continuous web that presents only one exterior seam and one interior seam.

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8. A closed container for fluids as claimed in claim 7, wherein at least said top wall is of a transparent plastic material.

9. A closed container for fluids as claimed in claim 7, wherein said continuous web is of paper coated on both sides with a liquid repellent material.

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