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DISPENSING CUP ASSEMBLY WITH A MATERIAL-RECEIVING CAVITY

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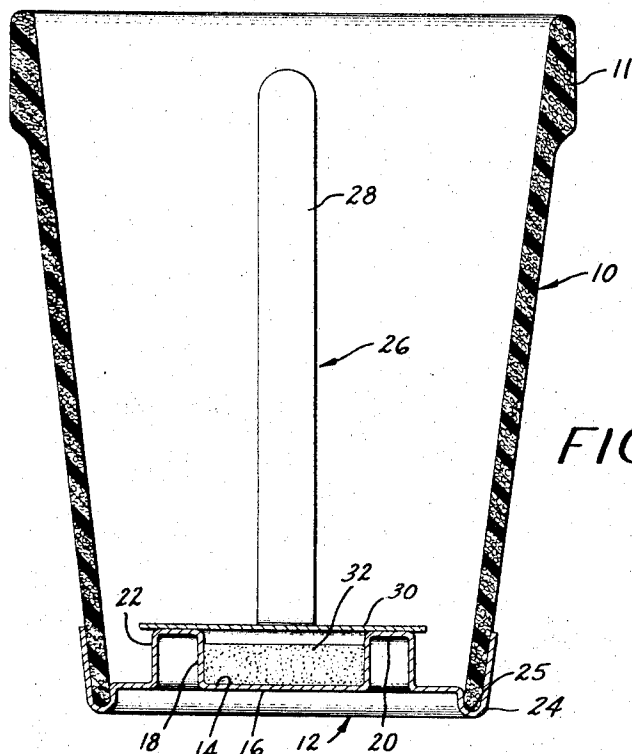


FIG. 1

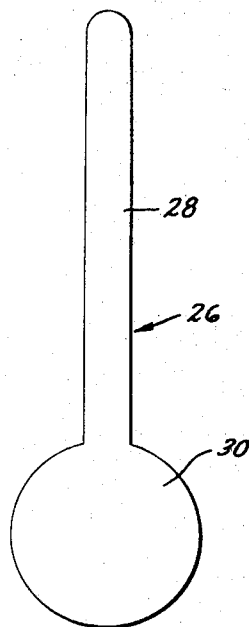


FIG. 2

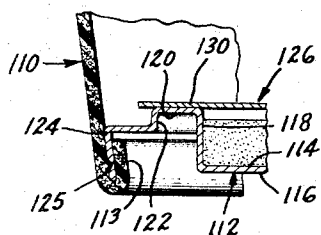


FIG. 3

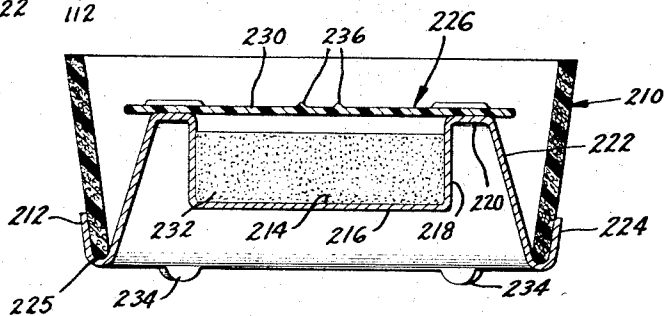


FIG. 4

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DISPENSING CUP ASSEMBLY WITH A MATERIAL-RECEIVING CAVITY

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ABSTRACT OF THE DISCLOSURE

There is disclosed a container assembly which comprises a separately-formed and subsequently joined sidewall member and a bottom wall member closing the lower end of the sidewall member and having a peripheral flange portion engaged with the lower end of the sidewall member. The bottom wall member has an upwardly-opening material-receiving cavity in its upper surface inwardly of the sidewall member, and this cavity is sealed with a closure member which is releasable therefrom to expose the contents of the cavity to the main portion of the container. Various embodiments are shown for the cooperative construction of the elements, and the cavity is preferably positioned wholly within the confines of the sidewall member to protect it and insulate it from supporting surfaces.

Background of the invention

Various dispensing containers have been proposed which might be pre-filled with foodstuffs, food concentrates, medicaments and the like, for future consumption with or without dilution. Exemplary of such dispensing containers are the structures illustrated in F. W. Epperson, 1,709,168, W. M. Williams, 1,770,118, W. Serr, 1,889,111, N. F. Abbot, 1,933,468, A. I. Yealdhall, 2,328,872, J. G. O'Neil, 2,915,176, J. G. O'Neil, 2,971,304, B. Mayer, 2,972,406, L. Toms, 3,121,636, R. Anthony, 3,186,850.

Generally, the prior containers of this type have not provided a simple and economical construction which would adapt itself readily to use of different materials for side and bottom walls or which would provide a spacing between the cavity and the sidewall member for insulating purposes or for entry of a mechanical member to remove a closure over the cavity. Some structures have not permitted facile filling on automatic equipment or treatment of the contents.

It is an object of the present invention to provide a container assembly having a releasably closed cavity which is relatively inexpensive to manufacture and which is loaded and utilized with relative facility.

It is also an object to provide such a container assembly which provides a high degree of environmental protection for the preloaded contents thereof.

Another object is to provide such a container assembly in which different materials may be used for various of its parts, and in which the filled compartment may be subject to treatment without treatment of the remaining portion of the container.

A specific object is to provide such a container assembly which can be used to store powdered or liquid materials for subsequent dilution with a fluid added thereto.

Summary of the invention

It has now been found that the foregoing and related objects and advantages can be attained in accordance with the present invention by a container assembly which has a sidewall member and a bottom wall member closing the lower end of the sidewall member by means of a peripheral flange portion engaged with the lower end of the sidewall member. The bottom wall member is form-

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ed with an upwardly-opening material-receiving cavity in its upper surface positioned inwardly of the sidewall member, and a closure member is releasably engaged with the bottom wall member to close the cavity to the atmosphere and protect the contents thereof.

More particularly, the bottom wall member has a center portion and a sidewall portion extending upwardly from the periphery of the center portion to define the cavity. A shoulder portion extends outwardly from the upper periphery of the sidewall portion, and a connecting, or web, portion extends between the shoulder portion and the peripheral flange portion previously mentioned so as to space the cavity inwardly from the sidewall member.

Preferably, the center portion of the bottom wall is spaced above the peripheral portion thereof so that the cavity is positioned wholly within the confines of the sidewall and away from a supporting surface. The cavity may comprise a relatively small proportion of the total volume of the entire container assembly, as in the case where a relatively large quantity of diluent is to be added to the container prior to consumption of the contents, or it may comprise a relatively large proportion of the total volume of the assembly, as when the contents of the cavity are to be used directly or without appreciable dilution.

The sidewall member of the containers of the present invention may have any suitable configuration, including polygonal, circular and other curvilinear form. A frusto-conical configuration is most advantageous since it is not only attractive and conveniently handled by the consumer, but it also allows the assembled containers to be telescoped, one within the other, for convenient and economical shipping and storage in quantity. Desirably, the sidewall member has a peripheral bead or thickened portion about the exterior of its upper portion to increase the structural strength thereof. While it is not necessary to configure the bottom portion of the sidewall member, a bead or similar configuration at that location may be provided to facilitate engagement with the bottom wall member or to provide a better seal therebetween. Alternatively, the lower edge of the sidewall member may be so configured as to provide the principal means of engagement with the bottom wall member.

The sidewall may be fabricated as a seamless member by use of tubular extrusions, injection molding, and the like, or it may be made by rolling sheet stock and sealing the overlapping edges thereof. As was indicated previously, the sidewall member may be of much greater length than the depth of the cavity in the bottom wall member, or it may be of only slightly greater height, depending upon the intended use of the container.

The peripheral flange of the bottom wall member must, of course, conform to the opening defined by the lower edge of the sidewall member so that the bottom wall member can function as a closure therefor. Although the cavity in the bottom wall member may have any suitable shape, one of circular cross-section will generally be most convenient from the standpoint of fabrication and ease of utilization of all the contents. The dimensions of the cavity will be controlled primarily by the quantity of material which is to be contained therein. As previously indicated, the cavity is spaced inwardly from the sidewall member, and the center portion thereof is preferably spaced above the peripheral flange portion so that the entire cavity is positioned within the confines of the sidewall member and above any supporting surface, so as to provide a high degree of protection against possible injury during handling and against environmental influence, and to facilitate stacking, treating, etc.

As will be appreciated from the foregoing description, the preferred configuration for the bottom wall member provides an annular space surrounding the cavity therein

serving to insulate the cavity and its contents from external influences. By so configuring the bottom wall, the cavity portion thereof tends to be flexibly suspended away from the sidewall member of the container. Therefore, physical impacts received by the container will be transferred to the cavity portion in a diminished degree. The described configuration also provides a degree of thermal insulation for the sidewall member when it is desired to subject only the contents of the cavity to thermal treatment. It will be appreciated that while in the preferred embodiments the space surrounding the cavity is an inverted U- or inverted V-shaped annular recess, the space can have any shape which will serve the same purpose.

As was mentioned previously, the cavity in the upper surface of the bottom wall member is provided with a releasable cover which abuts against and releasably engages the shoulder portion about the cavity. This cover will generally be of a shape similar to the cross-section of the cavity and of somewhat greater dimension so as to adequately seal the cavity when in place. Although the cover may be configured with ribs or other surfaces so as to facilitate gripping, or may be punctured or otherwise opened, it preferably is dimensioned and configured so as to provide a circumferential portion protruding beyond the shoulder portion of the bottom wall member so that it can be readily grasped either manually or by means of some automatic device. This protrusion may take the form of a tabular extension which projects upwardly or horizontally depending upon the container design, the relative dimensions, and the method by which gripping and removal is effected. Such an extension can have any shape and can be of any sort which will serve the desired purpose, e.g., a strip, string, wire or the like attached to the body portion. Since the cover is located at the bottom of the container assembly it will be appreciated that when a tabular extension is used, it may desirably be of sufficient length to extend to a point adjacent the top opening of the container, or at least to within a short distance thereof.

Although the extension can be made in any way and of any suitable material, it is preferred to form the tabular extension integrally with the body of the cover member. When the body portion of the cover member and the elongated integral handle portion are formed from a flat flexible sheet material, it will be appreciated that, upon assembly of the bottom wall member and cover member with the sidewall member, the resiliency of the cover member will force the handle portion to a position adjacent the side wall where it will be readily accessible to the user and yet out of the way so as not to interfere with the telescopic stacking of a number of container assemblies. When the contents of the cavity are to be treated after loading, the material of the cover member must be such as will withstand the conditions of treatment, so that the material may be synthetic plastic, treated paper stock, metal foil and the like, depending upon the intended exposure.

The cover member and the bottom wall member can be assembled by any suitable means. Of course, it is to be borne in mind that while the cover member is to be releasable from the bottom wall member, it must be secured thereto with sufficient tenacity so that an adequate seal for the contents of the cavity is provided. Thus, the most suitable methods of engaging the cover member and the bottom wall member include solvent or adhesive bonding, heat sealing, etc., although mechanical interlocks may be utilized by suitably configuring the parts.

The material or materials out of which the container assembly and its constituent parts will be fabricated will depend, at least in part, upon the nature of the contents to be contained therein and the treatment intended. The material for the container must be one which is substantially inert to the cavity contents so that neither the container nor the contents thereof has an adverse effect on the other. One of the most significant advantages which is realized in accordance with the present invention is that

by forming the bottom wall member and the sidewall member in separate operations, there is provided an opportunity for utilizing one material for the sidewall member and a different material for the bottom wall member. The sidewall member may be fabricated from any suitable material such as fibrous materials including paper and cardboard which are generally impregnated or coated papers, plastic sheet stock, foamed plastic, resins, metal sheet or foil, extruded tubing, etc. Most advantageously, the sidewall member is formed from a closed cell foamed thermoplastic because of its excellent thermal properties and relatively low cost. Exemplary materials are the foamed polystyrenes and polyethylenes.

Although the bottom wall member may be formed of expanded foams, the more complex configuration involved generally dictates the use of a relatively thin material to avoid problems in fabricating and to avoid excessive cost. Exemplary materials are thermoplastic or thermosetting synthetic plastics, metal foils, and fibrous sheet materials. Sterilization after loading or preheating of the contents of the cavity will dictate the selection of a material which will withstand the thermal treatment, such as aluminum foil and synthetic plastics which are thermosetting or which have a high softening point.

In such a case the bottom wall member may be filled with the desired contents, sealed, heat treated, and then assembled with a thermoplastic side wall member. Upon use, suitable apparatus may be employed to concentrate heat at the cavity portion, to heat the contents thereof, while minimizing heat applied to the sidewall member. It will be appreciated that many variations are possible in accordance with this aspect of the present invention, such as utilization of low temperature treatment methods, which might embrittle the materials conventionally used for containers.

The bottom wall member is assembled with, and secured to, the sidewall member by any suitable method, which will depend largely upon the materials employed to fabricate the constituent parts. Thus, when, for example, the sidewall member is a thermoplastic and the bottom wall member is a metal foil, crimping may advantageously be employed to join the two portions. An alternative method involves the use of a suitable non-contaminating adhesive to secure and seal the two members. When both members are of a thermoplastic material, heat-sealing or solvent-sealing methods may be employed to bond them together.

Similar methods can be used to secure the cover member to the bottom wall member to close the cavity. It should be noted, however, that in this case the bond must not be so tenacious as to make removal of the cover unduly difficult. In this regard it should be further noted that one method which may be employed to seal the cover member and the bottom wall member involves the utilization of members carrying opposite electrical charges to provide continuing static attraction therebetween.

The container assemblies of the present invention are readily adapted to individual use by manually removing or puncturing the cover. However, they are also highly adapted for use in vending machines which incorporate a suitable gripping attachment which will extend into the container and automatically remove the cover.

It will be appreciated that the container assemblies of the present invention may serve as drinking cups either for hot or cold beverages, the cavity in the bottom wall member suitably containing a syrup, food concentrate, pharmaceutical, etc. which may be diluted with water, soda, milk or other liquid for ultimate consumption. In such a case, the sidewall member will be relatively high and extend a substantial distance above the top of the cavity in the bottom wall member so that a relatively large volume of diluent may be added, and the bottom wall member may be heated if so desired.

Alternatively, the container assemblies may comprise so-called "frozen" or "hot entree" packs, wherein the cav-

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ity contents are respectively initially frozen or are to be subsequently heated for consumption. In this embodiment, the volume of the cavity will comprise a major portion of the total volume of the container assembly, the sidewall member being provided primarily for protection of the cavity and its contents from external influences. Heat may be applied to the bottom wall member cavity portion to heat the contents, with the sidewall member serving as insulating means to permit manual handling. Alternatively, the sidewall member may be disengaged prior to heating and thus function to protect the cavity portion during shipping and handling and also to provide a surface for advertising, etc. If separation is desired, the means of joining the two members should be selected so as to facilitate such separation. When the container assembly of this embodiment is a "frozen pack," it is desirable to provide supporting legs depending from the peripheral portion of the sidewall, or bottom wall members and/or raised surfaces on the upper surface of the closure member to facilitate separation of stacked assemblies, which may otherwise tend to become tightly joined at points of contact due to condensation and freezing of water at low temperatures.

By using containers of the type herein disclosed, the manufacturer or processor of the material to be loaded can load the material directly into the cavity of the bottom wall member, without handling or otherwise concerning himself with the remainder of the container assembly, and without regard to final assembly or ultimate shipment of the product. He is thereby saved the inconvenience and expense of an intermediate packaging and storage step.

Brief description of the drawing

FIGURE 1 is a sectional view in elevation of a container assembly embodying the present invention;

FIGURE 2 is a plan view of the closure member of FIGURE 1;

FIGURE 3 is a fragmentary sectional view showing another embodiment of the container assembly utilizing a different structure for the engagement between the sidewall and bottom wall members thereof; and

FIGURE 4 is a sectional view in elevation of still another embodiment of container assembly.

Description of the preferred embodiments

Referring now in detail to the attached drawing, FIGURE 1 illustrates a container assembly in accordance with the present invention having a sidewall member generally designated by the numeral 10 which is engaged with the bottom wall member, generally designated by the numeral 12, which has secured thereto the closure member generally designated by the numeral 26. In this embodiment, the sidewall member 10 is composed of an expanded synthetic plastic foam and has a generally frustoconical configuration with a thickened portion 11 adjacent its upper end for additional structural strength at the open end of the container assembly and to facilitate gripping and handling.

The lower end of the sidewall member 10 is seated in an annular recess 25 provided in the peripheral flange portion 24 of the bottom wall member 12 and may be secured thereto by any suitable means such as adhesives, heat sealing, crimping, etc. Spaced inwardly from the flange portion 24, a cavity 14 is defined in the bottom wall member 12 by the center portion 16 and the upstanding sidewall portion 18. A shoulder portion 20 about the sidewall portion 18 and a connecting or web portion 22 extending downwardly and outwardly therefrom to the flange portion 24 complete the configuration of the bottom wall member 12.

After the desired contents designated by the numeral 32 have been placed in the cavity 14, the closure member 26, which is best seen in FIGURE 2, is assembled with the bottom wall member 12 with its cover portion 30 overlying the cavity 14 and secured to the shoulder portion 20 by suitable means, such as adhesives or heat sealing.

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The handle portion 28 extends upwardly from the bottom wall member 12 along the sidewall member 10 for gripping by the user to break the engagement between the closure member 26 and bottom wall member 12 for exposure of the contents 32.

In FIGURE 3 there is shown an alternative construction for engagement between the bottom wall member generally designated by the numeral 112 and the sidewall member generally designated by the numeral 110. In this embodiment, the lower end of the sidewall member 110 has an inwardly and upwardly extending flange portion 113 providing an annular recess 125 which seats the depending peripheral flange portion 124 of the bottom wall member 112. The remaining structure is substantially the same as in the embodiment of FIGURE 1 except for a minor change in connecting or web portion 122.

Referring now to FIGURE 4, another embodiment of the invention which is generally similar to that of FIGURE 1 is depicted wherein the cavity 214 comprises a major proportion of the total volume of the container assembly. In this embodiment, the sidewall member 210 is only somewhat greater in length than the depth of the cavity 214 as defined by its sidewall portion 218, and the bottom wall member 212 has a multiplicity of supporting legs 234 depending from the peripheral flange portion 224. The closure member 226 has on the upper surface of the cover portion 230 a plurality of upstanding bosses 236. The bosses 236 and supporting legs 234 minimize the areas of contact between the container assembly and other assemblies which would be adjacent thereto when stacked therewith. The raised bosses and depending legs may either be utilized in combination, as depicted in FIGURE 4, or they may be used alternatively.

Accordingly, it will be seen that container assemblies are provided which are relatively inexpensive to manufacture, which may be loaded and utilized with relative facility, and which may be fabricated of different materials. The container assemblies allow treatment of the contents of the cavities thereof without subjecting the remaining portions to the conditions of treatment, and they provide a high level of environmental protection for the preloaded contents so that they may be used to store materials for subsequent dilution therein, if desired.

Having thus described the invention, I claim:

1. A container assembly comprising a sidewall member; a bottom wall member closing the lower end of said sidewall member, said bottom wall member having a peripheral flange portion engaged with said lower end and having an upwardly opening material-receiving cavity in the upper surface thereof inwardly of said sidewall member; and a closure member releasably engaged with said bottom wall member and closing said cavity.

2. The container assembly of claim 1 wherein said bottom wall member has a center portion and a sidewall portion extending upwardly from the periphery of said center portion to define said cavity, a shoulder portion extending outwardly from the upper periphery of said sidewall portion, and a connecting portion extending between said shoulder portion and said peripheral flange portion, whereby said cavity is spaced inwardly from said sidewall member.

3. The container assembly of claim 2 wherein said center portion is spaced above said peripheral flange portion to position said cavity wholly within the confines of said sidewall member and away from a supporting surface.

4. The container assembly of claim 3 wherein said sidewall member is of generally frustoconical configuration with said cavity comprising a relatively small portion of the total volume of said assembly, and wherein said closure member has an extension adapted to be gripped by the fingers of a user to facilitate release and removal thereof.

5. The container assembly of claim 3 wherein said cavity comprises a relatively large proportion of the total

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volume of said assembly, and wherein said bottom wall member has a multiplicity of supporting legs depending from said peripheral flange portion to provide spacing from a supporting planar surface.

6. The container assembly of claim 3 wherein said cavity comprises a relatively large proportion of the total volume of said assembly and wherein said closure member has a cover portion over the cavity with a plurality of upwardly projecting bosses on the upper surface thereof.

7. The container assembly of claim 1 wherein said sidewall member is fabricated of a material selected from the group consisting of fibrous materials and thermoplastic materials, and wherein said bottom wall member is fabricated of a second material different in composition from that of said sidewall member.

8. The container assembly of claim 7 wherein said second material is a metal foil.

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9. The container assembly of claim 7 wherein said thermoplastic material is a closed-cell synthetic thermoplastic foam.

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