Sept. 16, 1958 E. B. WESTLAKE, JR 2,852,326

DESICCANT CONTAINER

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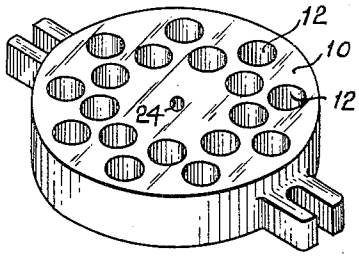


Fig. 1

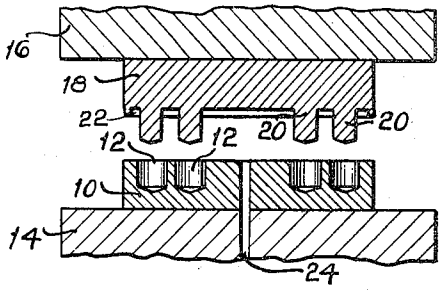


Fig. 2

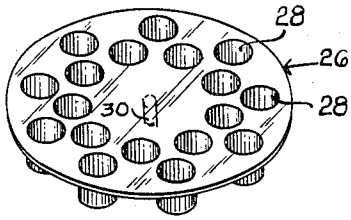


Fig. 3

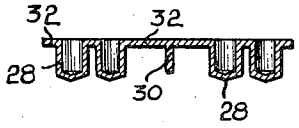


Fig. 4

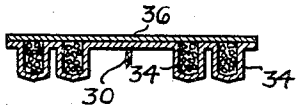


Fig. 5

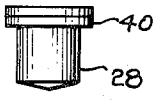


Fig. 6

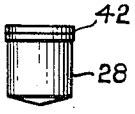


Fig. 7

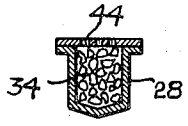


Fig. 8

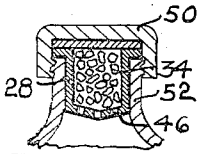


Fig. 9

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DESICCANT CONTAINER

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Application June 23, 1955, Serial No. 517,631

1 Claim. (Cl. 312—31.1)

This invention relates to a desiccant container and more particularly to a desiccant container made from either a transparent or an opaque plastic material for use in housing a desiccant such as a suitable silica gel, although not necessarily so limited.

This is a continuation-in-part application of my co-pending application Serial No. 302,679, filed August 5, 1952, for Desiccant Container and Method of Producing Same.

An object of this invention is to provide a desiccant container provided with a flange or lip that replaces the conventional washer now used in association with container caps, thus providing a moisture-proof seal for the top of a bottle which is used to preserve the contents of the bottle, which contents would be harmed by the presence of moisture.

Another object of this invention is to provide a cup or a container for a desiccant, wherein the cup or container and the cover therefor cooperate to form a radially projecting flange or lip adapted for use in sealing a desiccant cup or container in the top of a bottle for material to be preserved and maintained in a dry state.

Other objects and advantages reside in the construction of parts, the combination thereof and the mode of operation, as will become more apparent from the following description.

Referring to the drawings, Figure 1 is a perspective view of a multi-cavity mold.

Figure 2 is a cross sectional view of a pair of multi-cavity mold members, the lower female mold member being mounted upon a platen and the upper or male mold member being mounted upon a ram, or vice versa.

Figure 3 is a perspective view of a member molded upon a multi-cavity mold, wherein a plurality of cup-shaped members are formed, held together by a sheet of material.

Figure 4 is a cross sectional view, taken substantially on the line 4—4 of Figure 3.

Figure 5 is another cross sectional view showing a top sheet used in forming a cover mounted in position upon a cup filled with a desiccant.

Figure 6 discloses an individual cup-shaped member, together with the cap therefor after being severed or punched from the assembly shown in Figure 5.

Figure 7 is another modification of a cup and the capping member therefor.

Figure 8 is a cross sectional view of a cup or container having holes in the top thereof.

Figure 9 is another cross sectional view of a container having holes in the bottom thereof.

In the drawings, the reference character **10** indicates a multi-cavity mold member provided with a plurality of cavities **12**, the number of cavities being optional. This multi-cavity mold member may be mounted upon a mold support or platen **14**, associated with a ram **16** having attached thereto a male mold member **18** provided with a plurality of projections **20**, there being one projection **20** for each mold cavity **12**. A sealing gasket **22** may

surround one of the mold members, so as to provide a closed cavity when the two mold members are brought together.

The molding may take place by what is generally referred to in the trade as injection molding, the molding material being supplied through a conduit **24** to fill all of the mold cavities in one operation. The molding material may be properly cured.

The cup-shaped cavities **28** are preferably filled with a desiccant chemical **34**, as for example, some metallic oxide combined with a silica gel that has the characteristics of changing color in response to moisture coming in contact with the desiccant. The type of chemical is immaterial as far as this invention is concerned.

After the cavities have been filled with the chemical **34**, irrespective of what this chemical may be, a sheet of material **36** is superimposed upon member **26**. The cover is preferably made from the same material as member **26**. This material may be polyvinyl chloride, sometimes sold under the trade name "Vinylite," or polyethylene, or any other suitable plastic material. This plastic material may be transparent for indicating the condition of the chemical in the container, or it may be opaque, especially if either the cover or the container is provided with apertures through which the chemical may be viewed. Instead of utilizing apertures, a plastic may be used having a suitable rate of moisture transmission. Both "Vinylite" and polyethylene are either transparent or semi-transparent. After the cover has been mounted in position, the cover may be welded or united to member **26** by an electronic heat sealing process, applying heat and pressure. The heat may be applied in any other suitable manner, depending upon the available equipment. The application of the heat and pressure seals the cap member to the assembly **26**, so that the chemical is enclosed in sealed containers, each cup **28**, together with the cover, forming a container. Instead of heat and pressure, a solvent may be used, applied to the surfaces that are to be cemented together immediately prior to the time that the two surfaces are brought into contact, thereby sealing the juncture, or a suitable adhesive or cement may be used, cured in any suitable manner.

The cups **28** may then be punched or severed from the assembly, as shown in Figure 6. This may be accomplished in a punch press having a suitable die. In this particular modification a lip **40** projects radially from the top of the cup-shaped container and may be used as a seal or a gasket member in a cap for a bottle or may be used to secure the cup containing the desiccant in any suitable position. For some purposes it may be desirable to have the cylindrical wall of the cups substantially continuous without a lip, in which event the cover sheet and the cup may be severed, as shown at **42** in Figure 7.

The cover or the closure for the cup-like container may be made from a clear transparent rigid material. The cup-shaped material may be made from flexible plastic material, such as "Vinylite"; but it need not necessarily be clear. When a rigid cap and a flexible cup-shaped member are used, the flange projecting outwardly from the cup-shaped member provides an excellent seal between the cover **50** and the bottle or container **52**. It is then merely necessary to remove the cover from the bottle or container to inspect the condition of the ingredients, without removing the plastic cup and the cap therefor. When so used, the bottom of the cup-shaped member may be perforated, as clearly shown in Figure 9.

The desiccant may be used for various purposes. It may be used as a de-hydrating agent to absorb any residual moisture. When so used, the top may be provided with apertures **44**, as shown in Figure 8, or the bottom may be provided with apertures **46**, as shown in Figure 9, adapted for use in a bottle **52**. The apertures

44 and the apertures 46 may be formed at the time the container is manufactured, providing it is to be put to use immediately. It may be desirable to store the cap and the container together with the desiccant for a period of time before use. In that event, either the cup-shaped member or the cap therefor may be provided with knock-out plugs to be knocked out at the time the desiccant is to be put to use, or holes may be punched or drilled at that time. In the event the crystals of the desiccant may contaminate the materials, such as medicines or other drugs, with which the desiccant is stored, it is preferable to use a thin wall, either in the cup-shaped member or the cap therefor, which wall has the property of transmitting moisture or vapor to the desiccant. This eliminates the use of holes, thereby eliminating any possibility of the desiccant contaminating the surrounding materials.

If a metallic oxide silica gel is used that has the characteristic of changing color upon being exposed to moisture, these containers may be used to ascertain whether or not a product has been preserved without being contaminated by moisture. For example, fuses may be stored in containers, the fuses having the characteristic of deteriorating in the presence of moisture. When the fuses are to be used, one of these containers may be packed with each batch of fuses. The containers may be provided with suitable apertures. In the event moisture has gotten into the package containing the fuses, the color of the desiccant will have changed, indicating that the fuses have been subjected to moisture and therefore cannot be depended upon.

Instead of placing the sheet of plastic material used in forming the containers in a mold so as to mold the individual cups, the cups may be formed by a blowing or drawing operation, or the cups may be formed by the use of a female mold member having a plurality of

cavities, the sheet material overlying the cavities being forced into the cavities by a fluid, either a gaseous fluid or a liquid fluid, to thereby form cup-like cavities in the sheet.

Although the preferred embodiment of the device has been described, it will be understood that within the purview of this invention various changes may be made in the form, details, proportion and arrangement of parts, the combination thereof and mode of operation, which generally stated consist in a device capable of carrying out the objects set forth, as disclosed and defined in the appended claim.

Having thus described my invention, I claim:

The combination including a bottle, a cap therefor and a duo-functional desiccant container and gasket member, said desiccant container consisting of a polyethylene cup-shaped container portion having a radially disposed marginal flange, a polyethylene cover overlying the top of said cup-shaped container, the margins of the cover being fused to the flange of the cup-shaped container, the flange overlying the neck of the bottle and clamped against the neck by the cap, said flange functioning as a gasket member in the bottle cap, said container having moisture openings exposed to the inside of the bottle, and an indicating desiccant such as silica gel in said container adapted to indicate the presence of moisture in said bottle.

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