

[54] PACKAGE FOR TABLETS
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Primary Examiner—Leonard Summer

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206/523, 312/31
[51] Int. Cl..... B65d 81/26, B65d 85/56, B01f 3/06
[58] Field of Search 206/42, 46 PV; 312/31

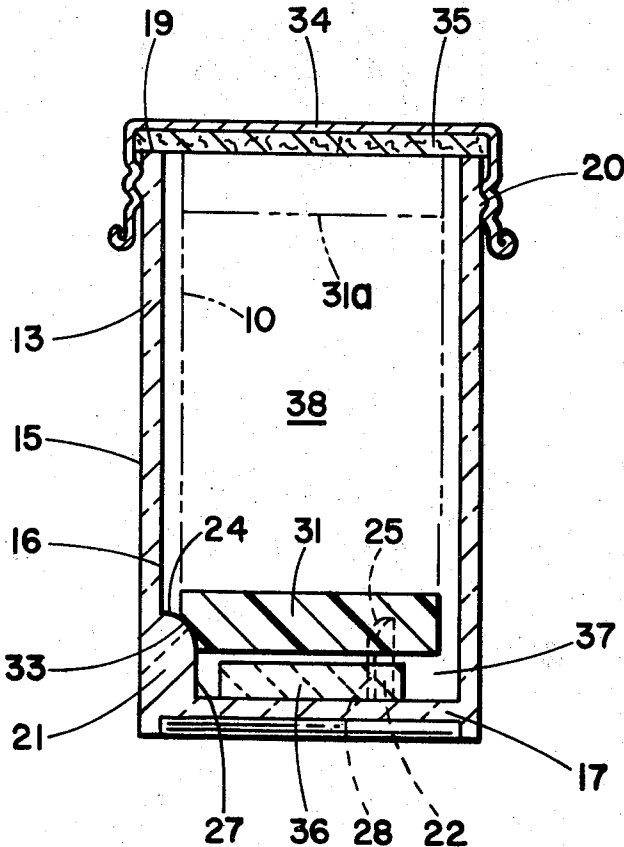
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[57] ABSTRACT

A combination of a tubular container having inwardly projecting holding means and cushion means frictionally engaged therewith adjacent the bottom end wall. An ambient effective element may be retained between the cushion means and the bottom end wall.

4 Claims, 8 Drawing Figures



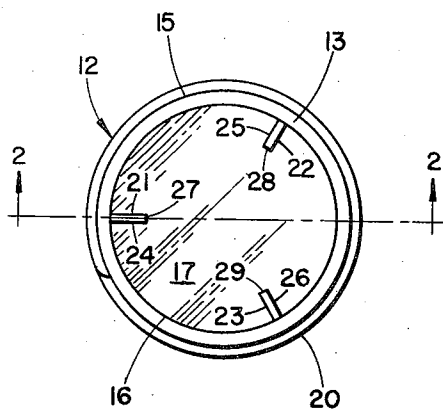


FIG. 1

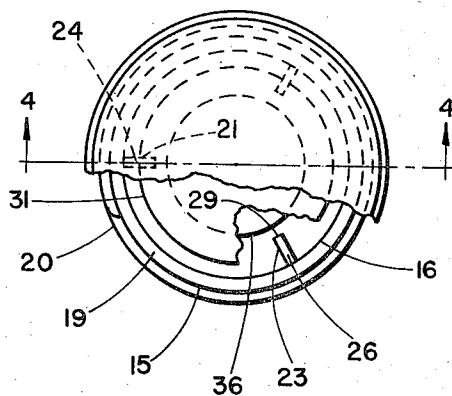


FIG. 3

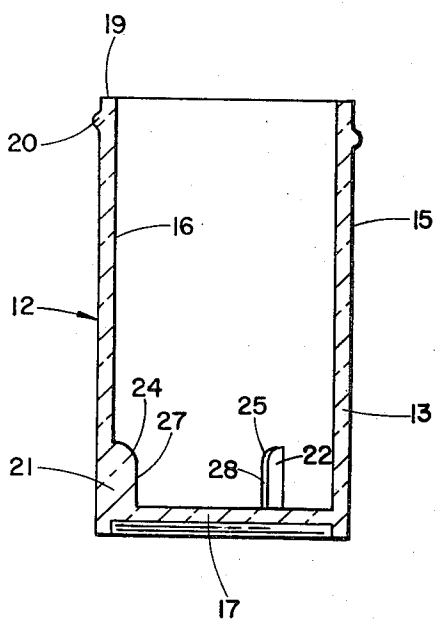


FIG. 2

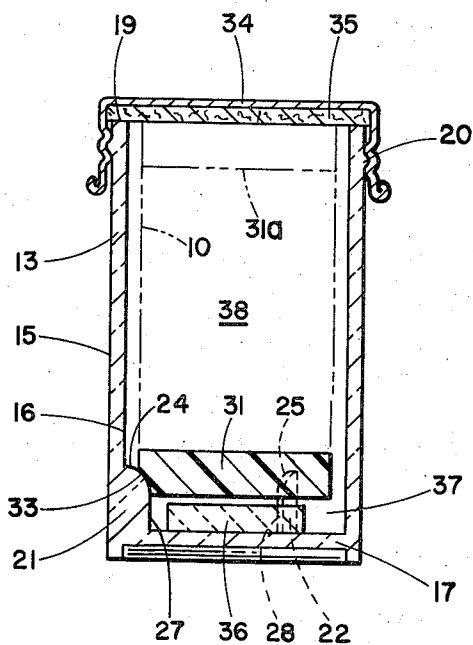


FIG. 4

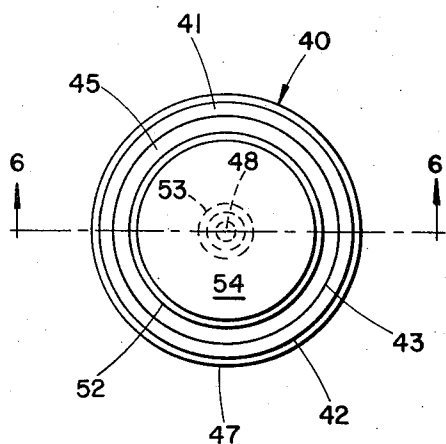


FIG. 5

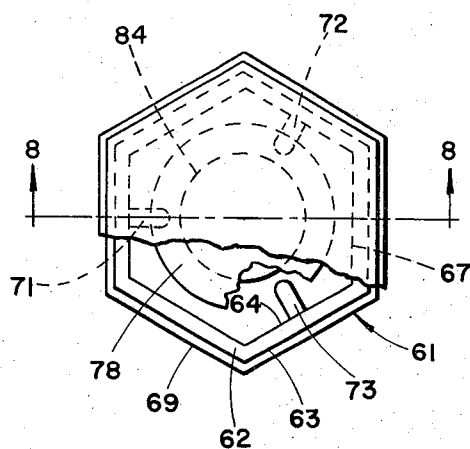


FIG. 7

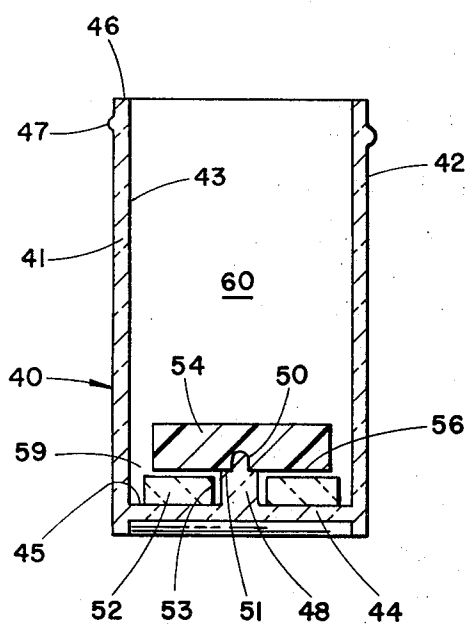


FIG. 6

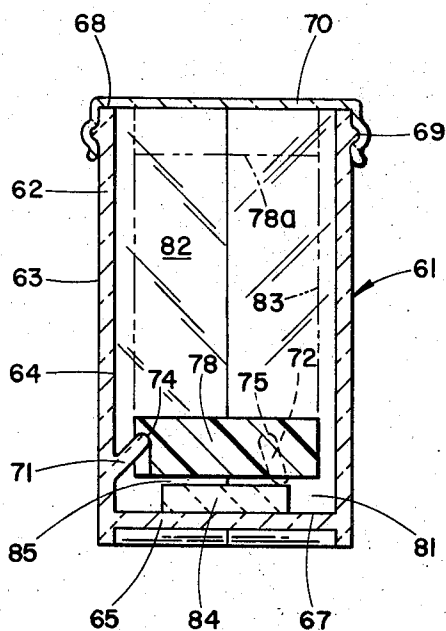


FIG. 8

PACKAGE FOR TABLETS

BACKGROUND OF THE INVENTION

This invention relates to a new package particularly suited for maintaining intact, friable tablets. This invention further relates to a novel package having two communicating chambers such that a physical separation may exist between materials situated in the respective chambers.

In many fields it has been found convenient to prepare single use units in the form of a shaped object, generally referred to as a tablet. Such tablets may be prepared according to known techniques in various sizes, shapes, hardnesses, etc..

One widely used method of forming tablets involves compressing powdered or granular compositions in punch and die sets on tableting equipment. Another known method of preparing tablets involves molding.

It is also known that many tablets are friable, and must be carefully packaged if they are to be received by a consumer in a satisfactory condition.

To protect small tablets, particularly those that are easily broken, it has been a practice to insert in the top of a bottle a cushion of a flexible, soft material, such as cotton, after the bottle has been loaded with tablets. The amount of material inserted is chosen so that it fills the void space remaining after loading the bottle and exerts a light, yieldable, force upon the tablets. In this way, when the bottle is shaken during handling prior to reaching the consumer, the tablets are not permitted to fly about and become fractured.

It has been a practice with larger tablets to use as a cushion a disc of a yieldable material. This cushion is often placed in the space remaining after the filling of the bottle. In some situations, it has been found desirable to insert a cushion in the bottle prior to filling with the product as well as in the space remaining after filling.

In some situations it is desirable to include within the bottle an ambient effective element. Such element may be a humidifying material, a perfume, a color signal device sensitive to heat, moisture, or breakdown of the product, or other element related to the condition of the product. When such element is included in a loose condition with the tablets, it has been the practice to have it in a form which is substantially different therefrom.

One such different form is that used for desiccants. These materials are commonly placed in small packets which should be easily recognizable as not being the product. However, as in the case of a loose cushion, it has unfortunately been found that consumers endeavor, at times, to use these packets as if they were the product.

Attempts have been made to physically separate these elements from the product, such as by incorporation in a cap used with the bottle. Although physical separation does alleviate the problem of the consumer improperly using this element, the cost of such packages has been prohibitively high.

SUMMARY OF THE INVENTION

This invention is embodied in a combination of a container having a tubular sidewall, an end wall and an open end opposite the end wall; and cushion means.

The side wall is provided with shoulder means adjacent to the open end adapted for removable engagement by closure means. Holding means projects from the inner surface of the side and end walls. The cushion means, disposed within the container is retained therein by frictional engagement with the holding means.

Accordingly, it is an object of this invention to provide a package for tablets that includes cushion means frictionally retained therein under normal conditions of removal of a product from the package.

It is another object of this invention to provide, in a container, two communicating, physically separated, chambers separated by cushion means which is retained in the container under normal conditions of removal of a product therefrom.

It is a further object of this invention to provide an inexpensive combination of a container and cushion means having the desirable properties described herein.

An additional object of this invention is to provide a package for tablets that includes an ambient effective element that is physically separated from a product included therein.

It is yet a further object of this invention to provide, in combination, a container and a removable cushion means suitable for use with high speed production equipment.

Other objects of this invention will be readily identifiable by one skilled in the art from the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings:

FIG. 1 is a top plan view of one embodiment of a container having a structure in accordance with this invention;

FIG. 2 is a cross-section view taken along the Line 2—2 of FIG. 1;

FIG. 3 is a top plan view, partly broken away to show detail, of a package in which the container of FIGS. 1 and 2 is shown in combination with a yieldable cushion, an ambient effective element, and a closure member;

FIG. 4 is a cross-section view taken along Line 4—4 of FIG. 3, with tablets and a second cushion shown in phantom;

DETAILED DESCRIPTION

FIGS. 1 and 2 illustrate a container 12 having a tubular side wall 13 with an exterior surface 15 and an interior surface 16. In this embodiment, container 12 has a cylindrical shape and the exterior surface 15 and the interior surface 16 are substantially parallel and concentric. Container 12 may have other shapes, such as, rectangular, triangular, pentagonal, hexagonal, oval, and the like. Preferably, this container will be symmetrical about the longitudinal center axis thereof. The length and width or diameter of container 12 may be varied so that either dimension is the greater according to the end use thereof. Generally, the container 12 will be longer than it is wide, however, it is possible that a reversal of these dimensions may be desirable.

The container of this embodiment is preferably formed by injection molding high density polyethylene. However, it is to be recognized that other materials may be utilized for the construction of container 12 within the scope of this invention. Examples of materi-

als commonly used for this type of container include polyvinylchloride, polystyrene, glass, metal and the like.

Container 12 has an end wall 17 and an open end defined by an annular end surface 19. In this embodiment, end wall 17 is integral with side wall 13. It is contemplated that end wall 17 may be attached to side wall 13 by other means, such as, a friction fit, welding, screwing, adhesive bonding, clips and the like. Preferably, end wall 17 is permanently fixed to side wall 13 if its removal is not required. Of course, if periodic access is desired through this portion of container 12, end wall 17 may detachably cooperate with side wall 13.

Adjacent its open end the container 12 is formed with shoulder means 20 adapted for removable engagement by closure means. In this embodiment, shoulder means 20 is a screw thread. Shoulder means 20 may be spaced from end 19 as shown or contiguous therewith as required. Such shoulder means may be interrupted or extend only partially around side wall 13, as in the case of shoulder means cooperable with a snap lock closure means.

The container 12 is provided with holding means in the form of three axially extending vanes 21, 22 and 23, which are substantially identical and project radially into container 12 from interior surface 16 adjacent the end wall 17. Vanes 21, 22 and 23 are preferably equiangularly spaced and are relatively thin compared to their height and width. The particular shape of vanes 21, 22 and 23 is not considered critical and the selection thereof will vary according to the particular end use of the combination of this invention.

In this embodiment, vanes 21, 22 and 23 each have a rounded inwardly sloping upper end edge surfaces 24, 25 and 26. While a rounded upper end edge surface is preferred, this surface may have other shapes according to the final use of the container. Such surface may be a sloped flat surface instead of rounded. In other embodiments this surface may be rippled so as to impart a lateral movement to an object making contact therewith. Many other shapes may, of course, be selected within the scope of this invention.

Vanes 21, 22 and 23 have an inner surfaces 27, 28 and 29, respectively, which are flat and substantially parallel with interior side wall surface 16. In this embodiment surfaces 27, 28 and 29 blend, respectively, into the radius of each of the surfaces 24, 25 and 26 at the joining point of such surfaces of each vane. Although such a blending is beneficial in this embodiment, it is recognized that a sharp break may be the choice in other structures within the scope of this invention.

It is to be understood that the number of holding means included in container 12 is not critical and that no limitation is imposed on the plurality of holding means therein.

Referring now to FIGS. 3 and 4, yieldable cushion means 31 is shown disposed within the container 12. Cushion means 31 is preferably a cylinder of semi-rigid, cellular material such as foam polystyrene. It is a known characteristic of this material that it will deform when an object applies sufficient pressure thereto and that a portion of such deformation will be permanent. However, this material has adequate resilience to have a small amount of spring back and, accordingly, exerts sufficient continuing pressure against such deforming object, even when the latter is in a fixed relation

thereto, to result in a frictional engagement therewith.

Cushion 31 has a radius greater than the radial spacing between the axis of the tubular wall 13 and the inner vane surfaces 27, 28 and 29 such that deformed portion 33 is formed in cushion 31 at each place of contact between said cushion and vanes 21, 22 and 23 as it is disposed in container 12. Although some permanent deformation exists in cushion 31, its structure is such that there is a continuing exertion of pressure against the vanes and thereby a frictional engagement therewith effective to hold cushion means 31 in the operative position within container 12 shown in FIGS. 3 and 4.

The cushion means 31 may be selected from the numerous semi-rigid materials suitable for this use. Among such materials are cellular polystyrene, cotton wadding, compressed paper, cellulose sponge, polyurethane foam and the like. The size of the cushion is, of course, selected so that it will properly engage the holding means. It is to be understood that the shape of the cushion means is not critical and may be varied according to the container, tablets, or other limitations related to its use.

A closure means 34 is removably engaged with shoulder means 20 and, in conjunction with a sealing liner 35, closes the open end of container 12. Closure means 34, in this embodiment, is a metal cap having a thread that matches shoulder means 20. Liner 35 has been included, as is the practice, to assist in the formation of a substantially airtight seal with annular end surface 19.

In FIGS. 3 and 4 an ambient effective element 36 is shown disposed between end wall 17 and cushion means 31 and is generally centered within the vanes 21, 22 and 23. It will be recognized that element 36 is located within one of two separate and communicating chambers 37 and 38 formed within container 12 by cushion means 31. In the illustrated embodiment the element 36 takes the form of a cylindrical or disc shaped molecular sieve desiccant of a size such that it readily fits within the vanes 21, 22 and 23. Seating of the element 36 is facilitated by the rounded surfaces 24, 25 and 26. It will be observed that, while the element 36 is physically separated from chamber 38 by the cushion 31, the communication between chambers 37 and 38, permits element 36 to beneficially affect the entire ambience within container 12. Element 36 is of such dimensions that when in any position in chamber 37 it is larger than the maximum spacing between cushion 31 and interior surface 16, and is accordingly prevented from passing therebetween into chamber 38.

The element selected may be a desiccant, or it may be selected for other desirable properties related to the ambience within container 12. Such element may have the character of a humidifying material, a perfume, a color signal device sensitive to heat, moisture or breakdown of a product within the container. The shape selected for the element may correspond to the exterior or interior configurations of the container or may be chosen according to other controlling features. Of course it is to be recognized that a plurality of elements may be positioned in chamber 37 if a plurality of effects is desired.

Shown in dot-and-dash lines in FIG. 4 as being disposed coaxially within the chamber 38 and in contact with cushion means 31 is a product 10 which may take

the form of a plurality of stacked cylindrical tablets. Also shown in FIG. 4 in dot-and-dash lines is a cylindrical cushion 31a which may be identical with cushion 31 and is interposed between the top of the product 10 and the closure means 34.

The particular configuration of the external and internal surfaces of this novel container may be other than the preferred arrangements represented by the above described embodiments. Such a variety of configurations is contemplated within the scope of this invention.

The combination of this invention may be readily assembled and filled with product using standard loading equipment. Conventional equipment may be used for placing the cushion means a predetermined distance into the container with adequate force so that it will be properly retained therein by the holding means. Since equipment for these loading operations is currently available, it will not be described herein.

What is claimed is:

1. A package for friable tablets comprising, in combination, a container having a tubular side wall, an end wall and an open end opposite said end wall, said side wall defining an inner chamber of substantially uniform impediment-free cross section and said side wall being provided adjacent said open end with shoulder means adapted for removable engagement by closure means, holding means adjacent said end wall consisting of at least three equally spaced axially extending, radially inwardly projecting vanes of equal size integral with said side and end walls, said vanes each having an inwardly

sloping end edge surface opposite said end wall, said vanes extending longitudinally within said chamber a distance substantially less than the length of said tubular side wall, said vanes reducing the area of said chamber cross section thereat, and semi-rigid cushion means disposed within said container adjacent said end wall, said cushion means having a cross sectional dimension which is less than that of the impediment-free portion of said inner chamber and greater than that of said reduced cross section portion thereof, said cushion means frictionally engaging said vanes and being disposed in spaced relationship to said side and end walls, said cushion means having an inner end surface portion facing away from said end wall and disposed in said impediment-free portion of said inner chamber and spaced longitudinally from said vanes.

2. The combination as set forth in claim 1, wherein said tubular side wall and said cushion means are cylindrical in shape.

3. The combination as set forth in claim 2, wherein there is a cylindrical ambient effective element within said container disposed between said cushion means and said end wall.

4. The combination as set forth in claim 1, including an ambient effective element within said container disposed between said cushion means and said end wall, said ambient effective element being larger than the maximum spacing between said cushion means and said side wall.

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