Dec. 11, 1951 J. K. M. HARRISON 2,578,244

PAPER CONTAINER

Filed June 24, 1947

Fig. 1.

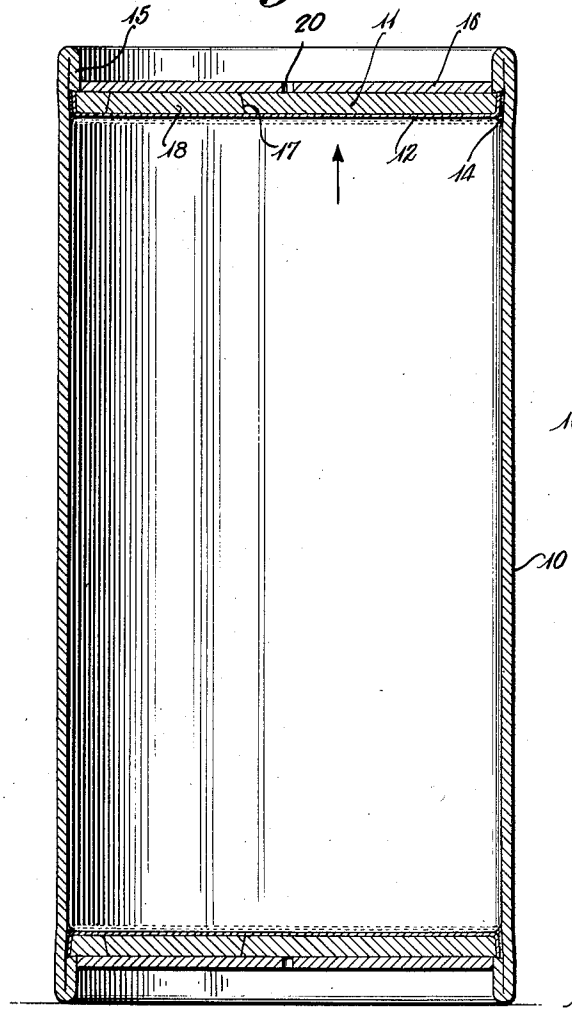


Fig. 2.

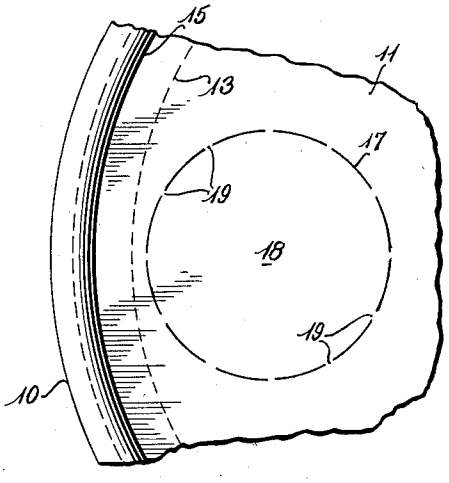


Fig. 3.

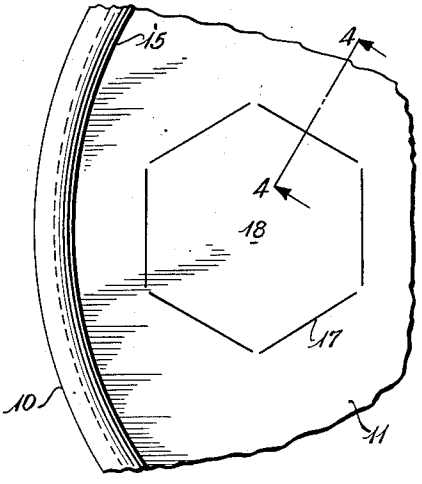


Fig. 4.

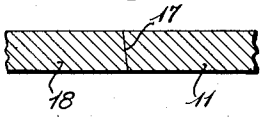
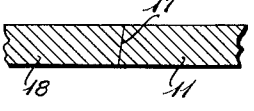


Fig. 5.



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PAPER CONTAINER

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Application June 24, 1947, Serial No. 756,663

1 Claim. (Cl. 229—5.5)

1

This invention relates to containers and particularly to nonmetallic containers of the type used for the packaging of liquids such as oils or foodstuff.

In the design of containers made of plastic, paper or other nonmetallic material, one of the problems encountered is the provision of adequate means for gaining access to the contents of the container without spilling of the contents or contamination thereof with displaced or torn portions of the container body. If openers are used of the type which cut through an end wall of the container in the manner of can openers, it frequently happens that shredding of the end wall material occurs which results in serious contamination of the container contents. On the other hand, if the container end wall is rendered removable either in whole or in part in some convenient way, it has been found that the strength of the container during ordinary handling, which it must encounter between the time of filling and the time of use, is so reduced as to impair seriously its adaptability to widespread packaging applications.

It is an object of this invention to overcome the foregoing difficulties and to provide a nonmetallic container which is characterized by adequate mechanical strength to withstand the ordinary handling encountered between the filling of the container and the ultimate use of its contents, and yet which may be conveniently and quickly opened without causing contamination of the container contents.

It is contemplated, according to this invention, to provide an end closure for a nonmetallic container with a removable plug which is very resistant to displacement by the forces engendered in the ordinary handling of a container, but which is susceptible of easy, deliberate removal when the access to the container contents is desired.

Other objects and advantages of this invention will be apparent upon consideration of the following detailed description thereof in conjunction with the annexed drawings wherein:

Figure 1 is a view partially in side elevation and partially in section of a chip-board container for oil or the like embodying the improved end closure and plug of the present invention;

Figure 2 is a top plan view of the container of Figure 1 with the cover disc removed to better illustrate the plug of the end closure of the present invention;

Figure 3 is a view similar to Figure 2 but showing a modified type of end closure and plug;

2

Figure 4 is a view in section taken along the line 4—4 of Figure 3; and

Figure 5 is a view similar to Figure 4 but illustrating a modified plug edge contour.

Referring now in greater detail to Figures 1 and 2 of the drawings, the container there illustrated is comprised of a cylindrical body portion 10 of laminated paper, plastic or the like having closure discs at its opposite ends, one of which is designated by the reference numeral 11.

The end closure disc 11 is of a diameter very slightly in excess of the internal diameter of the body portion 10 and is located adjacent the end of the body portion. A disc 12 of parchment, cellulose acetate film or the like underlies the disc 11. The disc 12 is of a greater diameter than the disc 11 and the skirt or margin of the disc 12 is bent upwardly to lie between the edge of the disc 11 and the interior wall of the body portion 10. The disc 11 is attached by a suitable adhesive to the disc 12 in an annular path indicated in broken lines at 13 in Figure 2, and the margins of the disc 12 are attached by an adhesive to the inner wall of the container. Since the manufacture of the assembly just described is effected by applying a coating of adhesive to the inner wall of the body portion in an annular zone adjacent its end and then inserting the discs 11 and 12 as a prefabricated sub-assembly, some of the adhesive is forced axially toward the center of the body portion 10 and builds up a rigid, annular, sealing fillet indicated at 14 in the drawings. The end of the body portion is spun down at 15 to hold the end closure in position and a cover disc 16 is then applied by wedging it in the space defined by the spun down portion 15.

In order that access to the contents of the container may be gained, and yet to prevent the introduction of contaminants from the material of the container during the opening operation, a frusto conical aperture 17 is provided in the end closure disc 11 and this aperture is filled by a frusto conical plug 18 of complementary configuration.

Upon reference to Figure 1 it will be noted that the defining wall of the frusto conical aperture 17 is of minimum diameter at the outer face of the disc 11 and is of maximum diameter at the inner face thereof. Since the edge of the plug 18 is of complementary configuration, it is apparent that movement of the plug outwardly from the container in the direction of the arrow in Figure 1 is resisted so that pressure on the inner face of the disc 11 exerted through disc

12 will not cause plug 18 to be displaced from its aperture filling position. It is, of course, apparent that movement in this direction is likewise resisted by the cover disc 16 which is wedged against and held by the spun down portions 15 of the tubular container. The plug 18 is restrained against inward movement in the direction opposite to the direction of the arrow in Figure 1 by the disc 12.

It is contemplated that in many instances the plug 18 will be cut directly from the disc 11 and, in such cases, a series of slits are cut through the disc 11, said slits being arranged in an annular path and together defining the generally frusto conical contour of the plug. The slits may be somewhat circumferentially spaced and separated by uncut portions indicated in the drawing at 19, see Figure 2. These uncut portions, of course, tend to hold the plug 18 in the plane of the disc 11 until they are ruptured by removal of the plug.

While reference has been made in Figures 1 and 2 to a generally frusto conical plug of circular cross section, it is apparent that the plug may conform in cross section to almost any polygon, either regular or irregular, so long as the side walls or edges of the plug slope in convergent relationship toward one end surface of the plug. As an example of such a modification, a pentagonal plug is shown in Figure 3 and the slope of its edge is shown in Figure 4.

In some instances it may be that the container will be subjected to greater external pressures than internal pressures, in which case it is desirable to reverse the direction of the slope so that the defining edges of the plug are divergent rather than convergent in the direction of the outer surface of the disc in which the plug is formed and seated. This modification of the invention is illustrated in Figure 5. It is also contemplated that some of the edge surfaces of the edge surfaces of the plug may be beveled in one direction and others in another direction so as to render the plug resistant to displacement in either direction.

It can now be seen that the provision of a plugged aperture in the end disc of the container does not materially weaken the container. It is apparent, however, that this construction considerably facilitates the opening of the container which is effected by prying the plug out of place by any pointed instrument and breaking the seal provided by the disc 12. In the event that the plug is formed in situ and is connected initially to the disc 11 by the uncut portions 19, it is apparent that these portions will be broken or severed as incident to the opening of the container. Since the plug is pried loose and removed from the end wall of the container, it is apparent that it does not fall into the contents of the container to constitute a contaminant. Should the contents of the container be only partially used, the plug may be restored to aperture closing position for temporary action by merely inserting it in the aperture at 17 with the narrow end of the plug facing downwardly or opposite to the direction of the arrow of Figure 1.

Upon reference to Figure 1 it is noted that the cover disc 16 is provided with a central aperture at 20. Since the plug 18 is conveniently formed integral with the disc 11 and since in the assembly of the article the disc 11 is placed in position before the edges of the container side wall are spun down, it is apparent that insertion of the cover disc 16 might cause sufficient displacement of the plug 18 to rupture the disc 12 were it not for the air vent at 20 which relieves any air pressure which might exist in the zone between discs 11 and 16 during the installation of the latter. The aperture at 20 also constitutes a convenient way of removing the cover disc 16 so that the plug 18 may be pried out of position as indicated above.

The invention has been described with respect to but several embodiments thereof and it is to be understood that these embodiments are not regarded as exhaustive of the invention but merely as illustrative of several embodiments of practicing the same.

What is claimed is:

In a container having a body portion and an end closure having an aperture therethrough extending from one surface to the other thereof, the defining walls of said aperture converging from the inner surface of the closure to the outer surface thereof, a cover member overlying the outer surface of said closure, said cover member having a small air vent aperture therein, a unitary plug in said end closure occupying said aperture and lying flush with both of the closure surfaces, said plug having marginal portions complementary to the defining walls of the aperture in said end closure and a sheet of frangible material attached to the inner surface of said closure member and extending across the defining edges of said aperture whereby the slope of the plug edges inhibits its movement outwardly from the plane of the closure member and the sheet inhibits its movement inwardly from the plane of the closure member.

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