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3,404,988

LIQUID FILLED PACKAGE WITH DISPENSING OPENING MEANS

Filed Oct. 22, 1965

2 Sheets-Sheet 1

FIG. 1

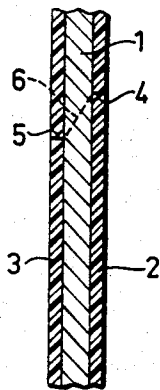


FIG. 2

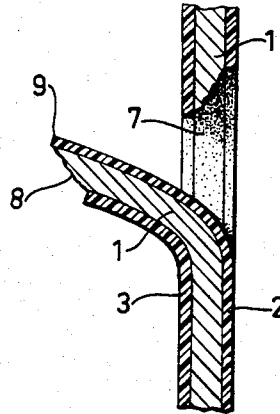
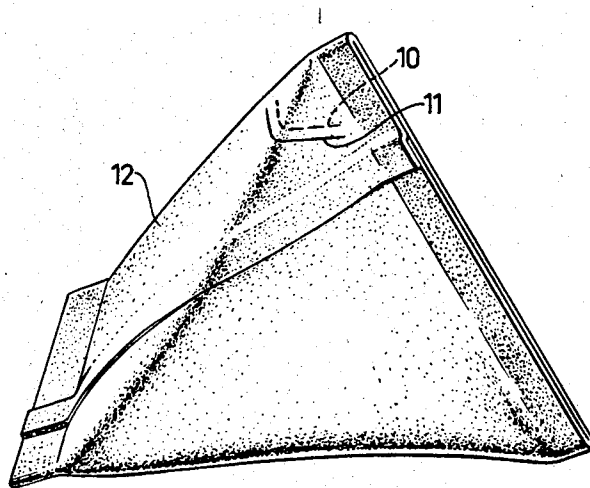


FIG. 3



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FIG. 4

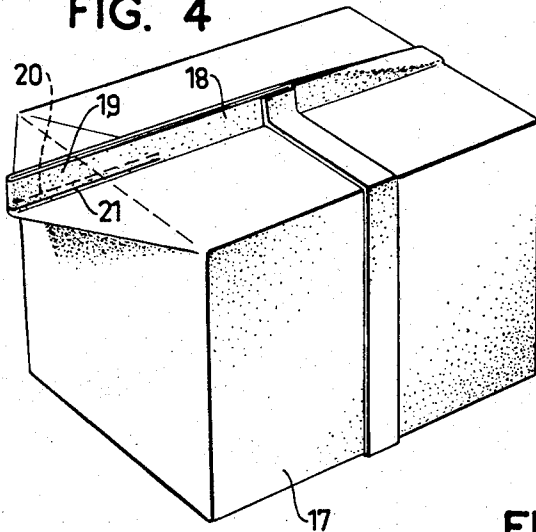


FIG. 5

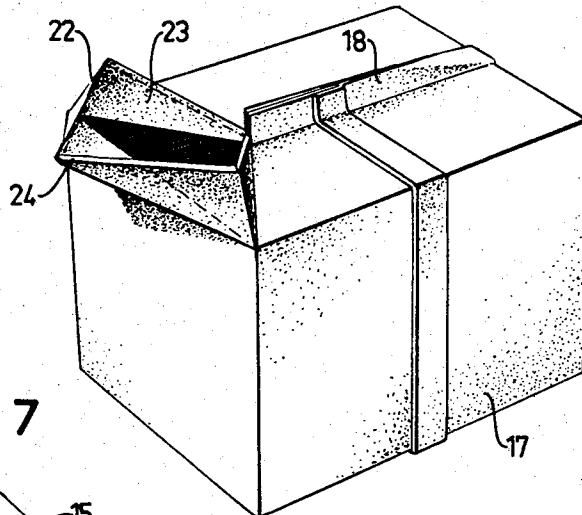


FIG. 6

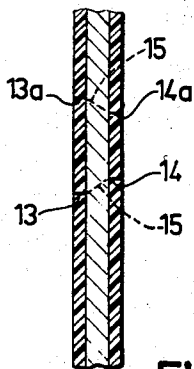
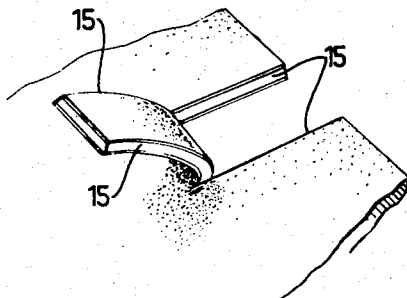


FIG. 7



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**LIQUID FILLED PACKAGE WITH DISPENSING OPENING MEANS**

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14,274/64

3 Claims. (Cl. 99—171)

**ABSTRACT OF THE DISCLOSURE**

A liquid filled container with an opening notch formed in the side walls by cutting a notch on the plastic coated inside layer of the container and another spaced notch on the outside of the container so that the liquid in the container will contact only the plastic coated side of the container when opened for pouring.

The present invention relates to a liquid filled package with an opening notch, which is easy to break open, for any emptying opening having a protected pouring lip in a liquid-filled package of the kind having a wall containing at least one layer of paper, cardboard or a similar relatively rigid material, said layer being coated on at least that side which faces the interior of the package with a plastic layer impermeable to the packed liquid.

Modern liquid packages, in particular those intended to be used once only, are often manufactured from a packaging material containing a relatively rigid layer of paper or cardboard and a liquid-tight plastic layer of preferably heat-sealable plastic. The advantage of this packaging material is of course that the plastic layer, which is relatively more expensive, can be made very thin and that the mechanical stability of the package is produced by the paper or cardboard layer.

Packages of this kind and of different forms, e.g., tetrahedral packages and parallelepipedic packages, are well-known, and it is also known to provide such packages with an opening notch which is easy to break open along a weakened portion provided in the packaging material or with a prepared emptying opening covered with a strip which can be torn off, or with a covering wafer.

The disadvantages of the known packages with opening notches and the methods for providing them reside in the fact that a punching operation partly penetrating the package wall has to be carried out with a considerable precision because the weakening of the package wall must not, on one hand, be such that the mechanical strength of the package is jeopardized, while on the other hand it must be such that the package wall can easily be perforated along the opening notch when the package is to be opened. This punching operation, which calls for considerable precision, and the method of providing a removable covering wafer over an emptying opening prepared in advance is relatively expensive. It is further a problem that the liquid at the emptying of the package will flow over the cut edge of the paper layer, whereby absorption into the fibrous substrate entails that the pouring lip becomes soft and loses its ability of effectively guiding the liquid jet in the desired manner. If the filling material is for instance sterilized milk, the sterile liquid may easily become infected by bacteria existing in the cut edge of the substrate portion, said bacteria being transferred to the filling material poured out from the container. It is a hygienic requirement that the filling material, if consisting of a foodstuff, will not come into contact with the unprotected outer face of the package and will not come into contact with the cut edge of the fibrous substrate layer.

The present invention, which relates to a package with

a simple opening notch forming a protected pouring lip when the opening notch is torn open, is characterized in that the package wall is provided in a suitable place with two parallel grooves partly perforating the package material, disposed on both sides of the package wall and spaced from each other, said grooves being disposed in such a way that the pouring lip created when the opening notch is broken open will essentially present an oblique sectional profile where the said inner plastic layer projects beyond the paper layer of the package material, thus preventing the filling material at the pouring from coming into contact with the portions of the package material which are located outside the inner plastic layer.

Further particulars and advantages of the invention will be apparent from the accompanying drawings showing an embodiment of the invention chosen by way of example, and where

FIG. 1 shows a cross-section of a package wall provided with a tearing notch;

FIG. 2 shows a cross-section of a tearing notch broken open;

FIG. 3 shows a tetrahedral package provided with an opening notch in accordance with the invention;

FIG. 4 shows a package of parallelepipedic form, the upper sealing fin of which is provided with an opening device in accordance with the invention;

FIG. 5 shows the same package as in FIG. 4 after the opening notch has been broken open;

FIG. 6 shows a cross-section of a package wall having a double tearing notch;

FIG. 7 shows the double tearing notch torn open.

The package material wall shown in FIG. 1 consists in the embodiment shown of an inner paper layer 1, an outer plastic or wax layer 3 and a plastic layer 2 facing the interior of the package. In addition, there are provided in the packaging material two perforating grooves 4 and 5 spaced from each other and located on both sides of the package wall, said grooves penetrating the layers 2 and 3, respectively, completely or at least to the greater portion. As the plastic layers 2 and 3 are largely perforated, the tearing notch is relatively easy to break open, since the paper layer 1 is relatively brittle. Because the grooves 4 and 5 are spaced from each other, the paper layer 1 will break along the dotted line designated 6, the torn edge becoming consequently oblique.

The grooves 4 and 5 may of course be created in many different ways. Thus, for instance, the web of packaging material may be advanced between a pair of cutting wheels fixed in a suitable manner in relation to each other, or else the web of packaging material may be punched in a known manner.

From FIG. 2, which shows a cross-section through the package wall after the tearing notch has been broken open, it is evident that the plastic layer 2 projects beyond the paper layer 1 at the pouring lip 9. Since the paper layer 1 contains an oblique edge 8 on account of the design of the tearing notch at the breaking open of the said notch, the filling material is prevented from coming into contact with the paper material, and the filling material will leave the opening at the edge 9 of the plastic layer 2 when it is poured from the package.

The invention may, of course, be applied to packages of varying form, and FIG. 3 shows a tetrahedral package manufactured from a laminated material of the kind described above and having an opening notch created in accordance with the invention. The tetrahedron 12 has consequently been provided with an opening notch which is easy to break open and which is located at one corner of the tetrahedron and above one of its edges. The opening notch consists of two parallel cuts 10 and 11 which have been cut or punched to the desired depth from different sides of the package wall. Since the wall material, and in

particular the inner plastic layer, is not perforated, the package is sealed and mechanically weakened to a small extent only, at the same time as the opening notch is relatively easy to break open. The edge formed at the breaking open of the opening notch presents a cut edge of the paper layer, in which the liquid filling material could easily be absorbed if it were permitted to come into contact with the paper margin. This absorption, which constitutes an important drawback because the paper layer becomes soft on account hereof and loses its shape in the area around the opening, at the same time as the filling material can be contaminated by bacteria occurring in the paper layer, is avoided by giving the pouring lip an obliquely cut section where the plastic layer facing the interior of the package projects beyond the paper layer, the paper layer of the cut edge being prevented from coming into contact with the filling material.

FIGS. 4 and 5 show a parallelepipedic package 17 of the type converted from a tube into a parallelepipedic container. The manufacture of this package may be carried out in such a way that a tube prepared from a plastic coated paper web is sealed in sealing zones transversal to the tube axis, the liquid filling material introduced into the tube being enclosed in that portion of the hose which is located between the said sealing zones. The cushion-shaped package thus formed, whose inside has a liquid-tight plastic coating, is thereafter exposed to a shaping process, during which the package obtains the desired shape.

In order to facilitate the opening of the package, the package wall is provided in the area immediately below one sealing fin 18 with an opening notch, by means of which a part 19 of the sealing fin 18 may be torn open along the tearing notches 20 and 21. The said notches, which have been created in accordance with the invention, consist of two parallel cuts or weakening lines spaced from each other and penetrating from different sides into the package wall. The cut 20 opening towards the inner side of the package should not perforate the plastic layer of the package wall completely but should merely weaken it to the extent of permitting it to be broken open.

The cuts 20 and 21 are preferably applied to the web of package material prior to shaping the said web of material into a tube and in such a place on the web as will be corresponded to, in the finished package, by the area immediately inside one of the sealing fins of the package and on both sides of the edge of the sealing fin. When the package according to FIG. 4 is to be opened, the portion 19 of the fin 18 is torn open along the tearing notch formed by the cuts 20 and 21, it being possible to move the fin portion 19 aside and widen the opening 23 into rhomboidal shape.

Due to the fact that the opening notch of the package has been created according to the method of the invention, the plastic layer facing the interior of the package will project beyond those portions of the package wall which are located outside the said interior plastic layer so that the pouring lip 24 of the package will be protected from coming into contact with the filling material when the package is being emptied.

FIG. 6 shows a package wall having two tearing notches spaced somewhat from each other, each containing two parallel cuts or grooves 13 and 14 (13a and 14a, respectively) which have been disposed in the manner described

above in the package wall penetrating from opposite sides thereof. The tearing open of the opening notch shown in FIG. 6 is shown in FIG. 7, where the package wall between the two tearing notches has been removed along a stripshaped portion, thus exposing an opening through which the filling material can be poured out. If the cuts 13 and 14 (13a and 14a, respectively) have been disposed in such a way that the cuts 14 (14a) are provided on the inside of the package wall, the obliquely torn-off pouring lip will be protected from contact with the filling material by the inner plastic layer projecting beyond the paper layer.

The embodiments of packages and emptying openings shown here and having a protected pouring lip merely serve to illustrate the invention, which may of course be applied to packages of all shapes and to openings of all configurations. The inventive idea is not, of course, restricted to packages of a given geometric shape but may be applied to all kinds of liquid packages containing an inner plastic layer and at least one paper layer or a layer of some other fibrous, relatively rigid material.

That which is claimed is:

1. A liquid filled package comprising: a plurality of walls forming a closed container, one of said walls having a layer of relatively rigid paper like material, said one wall being coated with a plastic layer impermeable to liquid and being on the innermost side of said one wall facing the interior of said package, a first notch cut in said plastic layer of said one wall and a second notch substantially parallel to said first notch cut into the other side of said one wall, said layer of relatively rigid paper like material having an imperforate surface on the side of said layer which faces said plastic layer to prevent the wicking of liquid into said paper like layer, said first notch being longitudinally spaced from said second notch whereby said one wall will present an oblique sectional profile when said wall is opened at said cuts to provide a pouring lip so that said plastic layer will project beyond said layer of paper like material to prevent the contents of said container from contacting said paper like layer.

2. The structure of claim 1 wherein said one wall has a second layer of plastic like material on the outside thereof.

3. The structure of claim 2 wherein said first notch is in said plastic layer and said second notch is in said second layer of plastic like material, said other surface of said paper like material facing said second layer of plastic being imperforate.

#### References Cited

##### UNITED STATES PATENTS

2,401,417	6/1946	Engle	-----	229—51	XR
2,608,341	8/1952	Eckman	-----	229—51	
3,038,649	6/1962	Rausing	-----	229—22	XR
3,083,876	4/1963	Schneider et al.	----	229—22	XR
3,158,491	11/1964	Farrell et al.	-----	229—51	XR
3,266,713	8/1966	Martensson et al.	..	229—51	XR
3,185,578	5/1965	Scharre	-----	229—51	XR

##### FOREIGN PATENTS

606,816 10/1960 Canada.

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