Feb. 1, 1966 H. G. SWEDE ETAL 3,232,514

FILLED AND SEALED PACKAGE

Filed Jan. 14, 1964 3 Sheets-Sheet 1

Fig.1

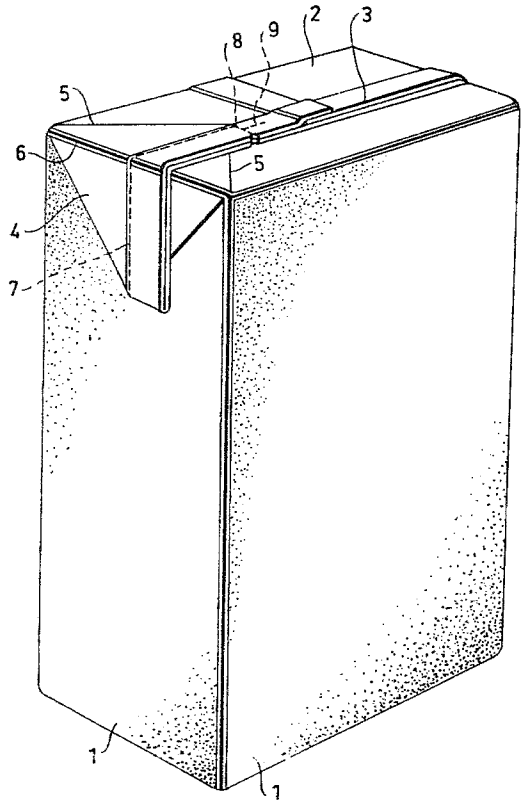

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Fig.2

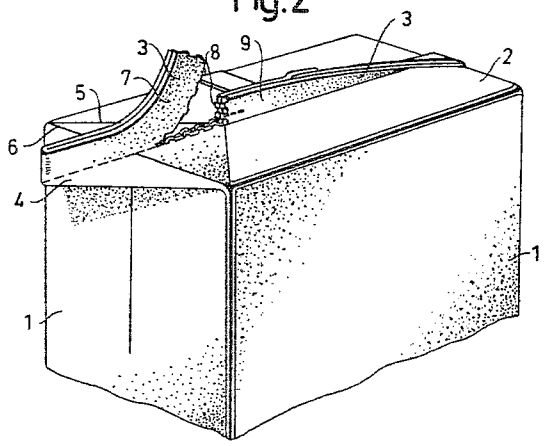

Fig.3

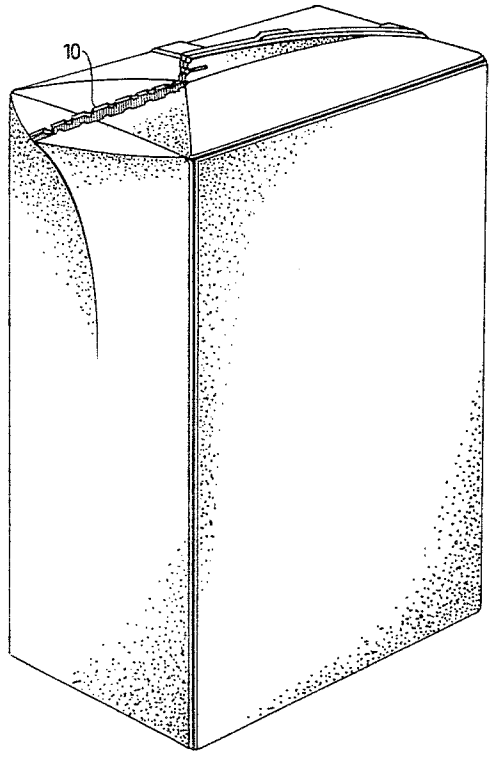

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Fig. 4

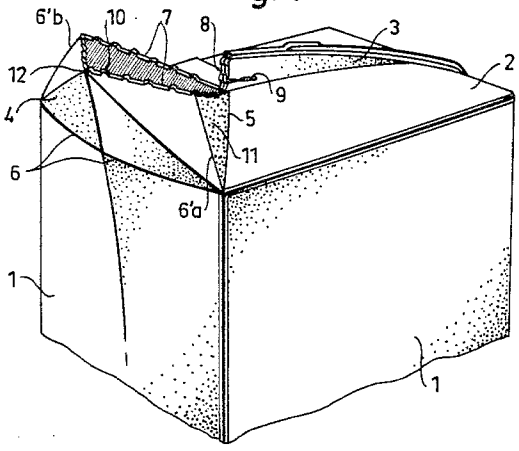


Fig. 5

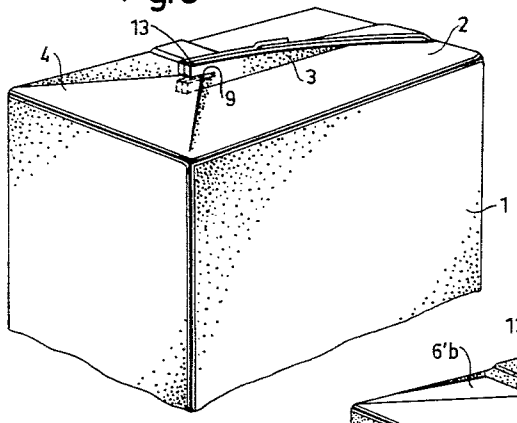
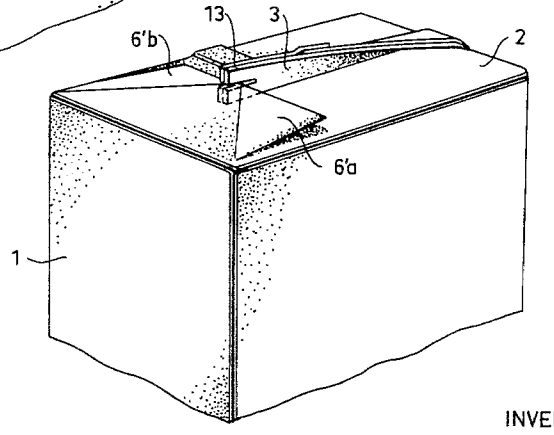


Fig. 6



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FILLED AND SEALED PACKAGE

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Claims priority, application Sweden, Jan. 16, 1963, 443/63
1 Claim. (Cl. 229—17)

The present invention relates to a filled and sealed package of a flexible and relatively rigid package material and more particularly to a package of the kind prepared from a tube and being sealed at least at one of its ends by flattening and sealing a marginal zone of the tube, and being thereafter exposed to such a forming operation that a package having an essentially plane top side and a straight upper side wall edge is obtained.

In the forming operation required in order to convert e.g. a package blank prepared from a tube through successive transverse sealing operations, into a package having e.g. parallelepipedic shape there are formed double-walled, essentially triangular corner flaps of the surplus material which cannot, for reasons of geometry, be fitted into the parallelepipedic shape.

Packages of this kind, which are preferably used for liquid filling material, are preferably made from packaging material coated with a thermoplastic material, e.g. polyethylene, elwax, wax or lacquer. These materials are liquid-proof in themselves and permit liquid-proof seals to be made. Such seals may be produced in a simple and inexpensive manner by pressing two surfaces of material, which are coated with a thermoplastic material, against each other while simultaneously supplying heat, whereby the coatings facing one another will fuse along the zones exposed to pressure and heat. If, for some reason, it should be considered more advantageous to unite the sealing joints by means of glue, this is also possible.

An additional advantage of a package of this kind is that it can be made in a rational manner, starting from a plane web of material which is formed into a tube, said tube being then filled, divided off and sealed by successive transverse sealing operations, whereupon it is separated off and finally converted into individual package units of the intended shape.

Packages of this kind are known per se, and the triangular flap corners formed at the making of the package have generally been folded in towards, and fixed against, the top side of the package in order to reduce the stacking volume required for each package. Furthermore it is known to use one of the flap corners as an emptying orifice. In these known packages the flap corner is used in such a way that the tip of the triangular flap is cut off by means of scissors or a knife, the cut in the package material defining the length of an emptying passage which may be widened and through which filling material may be poured off.

The drawback of an orifice passage of this kind is, however, that the cross-sectional area of the passage will be relatively small, even when the passage is widened to its maximum, and that the shape and size of the emptying passage will not be permanent but will have a natural tendency to become restricted, thus choking the flow of filling material when such material is poured from the package.

This drawback is removed through the present invention, which relates to a filled and sealed package of flexible and relatively rigid package material, comprising on the one hand a closed side wall having an end edge which is essentially contained in one plane and in which at least one section is straight, and on the other a double-walled

triangular flap which has its base along the said straight end edge section and a corner in the centre plane normal to the said section and whose interior communicates along said base with the cavity enclosed by said side wall, and which is characterized in that the end wall is provided with converging pre-crease lines extending from the end points of the said straight end edge beyond the end wall towards the said centre normal plane in order that an essentially slot-shaped emptying orifice formed in the end wall and in the flap wall adjacent said end wall and extending essentially from the said flap corner and at least up to the point of intersection between the converging pre-crease lines tends, when the flap is raised, to widen rhomboidally and symmetrically around the centre normal plane, whereby the flap and the portions of the end wall which are located between the said flap and the said pre-crease lines form a pouring spout.

In a package designed in accordance with the invention the crease lines provided in the top side of the package create an emptying orifice, which is large and relatively permanent with respect to its area, due to the slot formed in the upper end wall of the package being widened so that it occupies a stable position of equilibrium with a rhomboidal orifice having such a size that splashing and spilling will be avoided when filling material is emptied from the container.

An embodiment of the invention will be described in the following with reference to the appended diagrammatic drawings, in which

FIG. 1 shows an unopened package;

FIG. 2 shows the package with its flap torn open and a slot formed by partly removing the sealing fin;

FIG. 3 shows the package after the opening slot has been formed;

FIG. 4 shows the package with its pouring spout raised;

FIGS. 5 and 6 show methods of closing the package again.

The package shown in FIG. 1 consists of the side wall **1**, an upper end wall **2** and a bottom portion (not shown). A corner flap **4** of double-walled package material is folded about the straight side wall edge **6** and is fixed by a tearable sealing means to the side wall which is integral with the edge **6**. The sealing fin **3** formed when the package is shaped extends from the tip of the flap **4** and over the end panel **2** along the centre normal plane and is folded down into contact with the top sides of the end panel **2** and the flap **4**.

In addition, the package is provided with precrease lines **5** extending from the ends of the edge **6** in over the end panel **2** to a point of intersection in the centre plane normal to the edge **6**. In order to facilitate the opening of a slot the sealing fin **3** is preferably provided with a transverse tearing notch **8** and a longitudinal tearing notch **7** disposed at the base line of the fin. A tearing notch **9** is further disposed in the sealing fin proper above the fold line, and therefore no slot opening is formed when the tearing notch **9** is torn open.

When the contents of the package are to be made available the sealing tape holding the flap **4** close to the side wall **1** of the package is torn open and the flap is raised as shown in FIG. 2, whereupon a portion of the sealing fin is removed by tearing open the tearing notches **8** and **7**, or, if there are no tearing notches, by cutting the said portion of the sealing fin by means of a pair of scissors or a knife. Due to a portion of the sealing fin being removed, e.g. by tearing open the tearing notch **7** disposed along the sealing zone, a narrow slot opening **10** is produced, as shown in FIG. 3.

FIG. 4 shows how the opening **10** is widened by pivoting the panels **11** located between the crease lines *6'a* and *6'b* and the crease lines **5** both about said crease

lines 5 and about said crease lines 6'*a* and 6'*b* to a position where the wall portions forming the orifice 10 have no longer any tendency to return to their original positions but will "snap up" into a new position of equilibrium, forming a relatively large spout 12 partly from the flap 4 and partly from the panels 11.

After the intended portion of filling material has been poured out through the spout 12 the package may be partly closed by moving the crease lines 6'*a* and 6'*b* toward one another, whereby the wall portions forming the spout 12 will "snap back" to their original position, whereupon the flap can be pressed flat and the opening 10 be closed so as to form a slot. The triangular flap 4 thus flattened is then folded in over the end wall 2 in accordance with FIG. 5 and is locked in the folded position by means of the free fin portion 13 created by the tearing notch or slot 9.

Another way of closing the package after opening it is shown in FIG. 6, where the spout 12 is folded up by moving the edges 6'*a* and 6'*b* apart while simultaneously folding them against the end wall 2 so as to form an essentially rectangular flap which can be locked against the end wall 2 by means of the fin portion 13.

The prerequisite for the flap 4 being locked beneath the fin portion 13, is, of course, that the distance between the centre of the edge 6 and the tip of the flap 4 is greater than the distance between the centre of the edge 6 and the tearing notch 8 in the sealing fin 3. Of course, the renewed closing described here does not make the package liquid-proof to the extent of preventing liquid filling material from trickling out if the package is tipped over, but it prevents impurities from entering the package.

The embodiment of the invention described here is a considerable improvement of these kinds of packages, as the packages known until now have had a relatively small pouring orifice of such a shape that the opening passage has tended to become restricted unless exterior forces or for instance actuation of the jet of liquid have forced the edges of the orifice passage apart.

When liquid filling material is poured from a container through a relatively small orifice, an air pocket which is not in communication with the surrounding atmosphere is formed above the surface level of the filling material. When filling material is poured from the package, the level of the filling material sinks, whereby the volume of the air pocket increases and a pressure below atmospheric is created in the said pocket. As a result of this the atmosphere penetrates into the air pocket in order to equalize the difference between the pressure of the surrounding atmosphere and the pressure in the air pocket, whereupon the latter sinks again when more material is poured from the package.

The pressure variations in the air pocket above the surface level of the filling material, which are repeated during the pouring of the filling material from the package, and the repeated entry of air through the orifice of the package, have for their result that the filling material when poured from the container is discharged in jets or splashes. Because of the lapping or splashing sound which is produced thereby this phenomenon is called "splashing." In order to avoid splashing, the orifice of the container must be of such a size and shape that the level of filling material is not above the highest point of the orifices, as in such a case there is formed an air pocket which is not in communication with the surrounding atmosphere.

Packages made in accordance with this invention may be given such a form, as in the embodiment described above, that the orifice, in addition to having permanent

shape in the snaped-open position, extends beyond the upper end wall of the package. Hence filling material may easily be poured from the container without any air pocket being formed.

In addition to the possibility of avoiding splashing by means of a package according to this invention, the package has the advantage that the spout in its raised position increases the active volume of the package, whereby the "splashing space" is increased and the risk of spilling on account of splashing is reduced.

The embodiment described and shown in the example above is particularly advantageous, as parallelepipedic packages are practical both with regard to stacking and handling. However, other embodiments may be conceived within the scope of the inventive idea. Thus, the package must not necessarily be of the type which is produced by submitting a tube to transverse sealing operations but it is possible to join separate side walls, end walls and flap portions so as to form a finished package even though such a method seems impractical. Furthermore, the package body does not necessarily have to be of parallelepipedic shape but have any shape, provided that the side wall, whose end edge is to be contained in one plane, have a straight edge section and that at least one double-walled triangular flap having its base along the straight end edge section and a corner in the centre plane normal to this edge and integral with both the end wall and the side wall and is in communication through its interior with the cavity enclosed by the side wall.

We claim:

A filled and sealed package of flexible and relatively rigid package material, said package having a closed bottom wall, a closed substantially plane top wall, side walls and front and rear walls, said top wall comprising side flaps extending inwardly from the upper edges of said side walls, the adjacent free edge portions of said side flaps being joined forming an outwardly extending fin, a triangular end flap comprising a layer the base of which is connected to the upper edge of said front wall and a layer formed by the folded triangular corners of said end flap, said corners being continuous with said side flaps, the adjacent free edge portions of said folded corners being joined to form a continuation of said fin formed by the edge portions of said side flaps, said end flap being folded downwardly against said front wall and said fin being bent over parallel to said top wall and said end flap, a weakened tear line extending longitudinally of said fin from the free end of said end flap to a point on said top wall at a distance from the upper edge of said end wall slightly less than the length of said end flap, a weakened tear line extending transversely of said fin adjacent to the end of said longitudinally extending weakened tear line, a notch in said fin extending rearwardly from said transversely extending weakened tear line and adapted to receive the free end of said end flap after the portion of said fin in front of said transversely extending weakened tear line has been removed.

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