Aug. 13, 1957 R. L. BOYD 2,802,613

LIQUID CARTON AND SEAL THEREFOR

Filed June 9, 1952

Fig. 1.

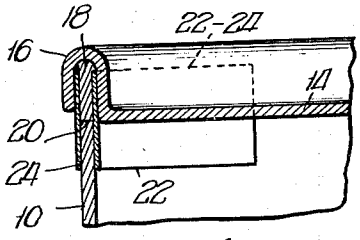


Fig. 2.

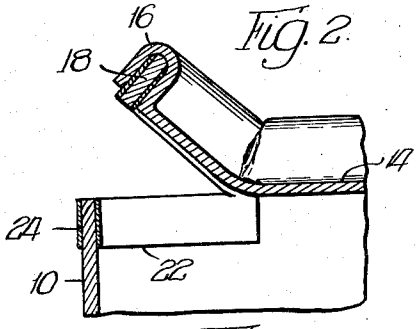


Fig. 3

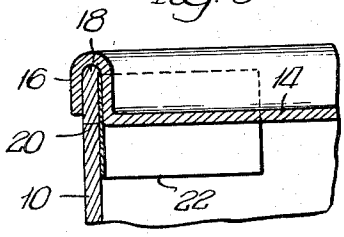


Fig. 4

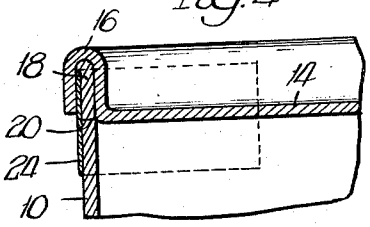


Fig. 5.

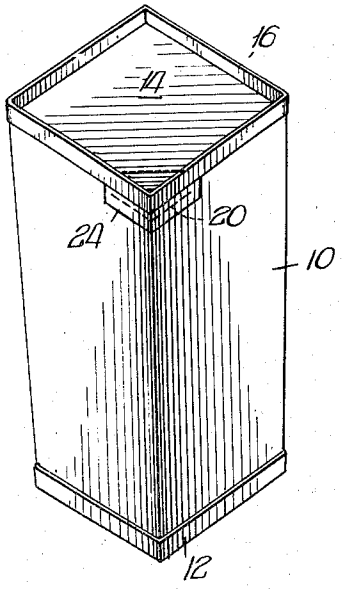
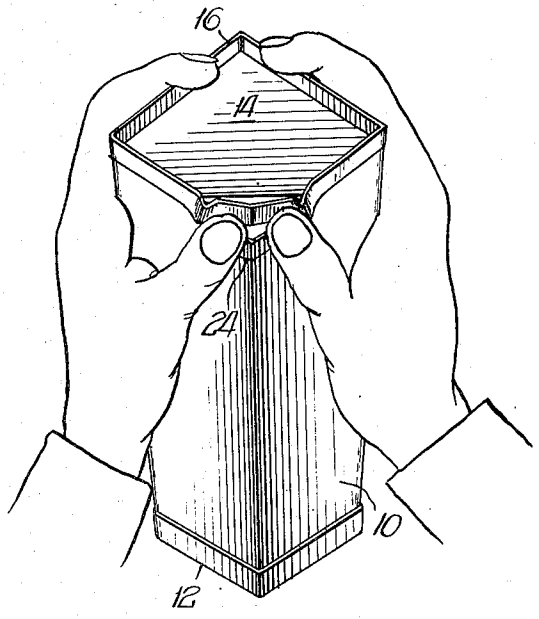


Fig. 6.



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2,802,613

LIQUID CARTON AND SEAL THEREFOR

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Application June 9, 1952, Serial No. 292,538

7 Claims. (Cl. 229—7)

This invention is related to those disclosed in the applications of LeRoy Staunton, Serial Nos. 270,575, now abandoned, and 270,576, and Ervin B. Kodat, Serial No. 270,603, now Patent No. 2,754,045 all of which were filed on February 8, 1952, covering paper liquid containers and seals therefor.

The present invention, as in the case of those disclosed in the applications above identified, relates to cartons such as are commonly used for the distribution of milk, and is characterized by a corner pouring opening disposed adjacent the top in the side walls thereof, which opening is sealed until it is desired to open the carton.

The present invention differs from those disclosed in the aforesaid applications in that a seal is provided which is made of one or more relatively thin membranes of cellulose material impregnated with a thermosetting resin, which is sealed by heat and pressure in overlying relation to the pouring opening in such a way as to become permanently affixed to the contiguous areas of the side walls of the carton.

The present invention shares the idea of having a permanent closure sealed in permanent engagement with the upper edge of the side walls of the carton body, but differs from the latter in that the pouring opening is sealed by an imperforate and relatively unweakened membrane, or membranes, which must be ruptured by a lifting force applied to the corner of the carton at which the pouring incision is provided. The corner of the top, together with the portion of the side walls affixed thereto which lie above the pouring opening, are thus forced upwardly as the seal is destroyed.

It is among the objects of the present invention to provide a seal for cartons of the class described in which the pouring incision and an area surrounding the latter on the outside of the carton are protected by an overlying seal, which prevents the lip of the pouring opening from becoming soiled and prevents the ingress of contaminating foreign matter.

It is another object of the invention to provide a seal interiorly of the carton which surrounds the pouring incision in a way effectively to exclude the liquid contents from gaining access thereto, thus to preclude the liquid from entering the cut edges defining the pouring opening, which, in the case of cardboard, is a wicking material capable of inducing liquid to flow through the walls of the carton in directions parallel to the surfaces thereof by capillary action. This is objectionable, since the liquid thus entrained into the walls softens the latter and causes them to weaken structurally, with the possibility of incurring failure of the carton.

The present invention, like those hereinbefore identified, is characterized by a corner pouring carton, the pouring edge of which is free from obstructing rings or dams such as might prevent the complete discharge of the contents of the carton, to the end that residual amounts of the contents usually wasted are saved and used.

It is a further object of the present invention to provide a carton that is completely sealed by permanent

closures at the top, bottom, and pouring incision, until it is desired to void the contents thereof. An improved method for making such a carton is also contemplated.

Other objects and advantages will become apparent hereinafter when the following description is considered in conjunction with the accompanying drawings, in which—

Figures 1 to 4, inclusive, are fragmentary sectional elevations taken through the side wall and adjacent top of a carton embodying this invention, at the pouring incision therein; and

Figures 5 and 6 are isometric views of a carton embodying the present invention as shown in the preceding figures.

In the drawings, the body portion **10** of the carton is formed of cellulose material, such as cardboard, which is laminated to requisite strength, and impregnated with a thermosetting resin that is non-toxic, and impervious to liquid. A bottom member **12** is suitably formed and sealed to the edges of the body portion **10**. A top member **14** of material similar to that constituting the body portion **10** is formed with an inverted U-shaped channeled marginal portion **16** which is adapted to be inverted upon the upper edges **18** of the carton body and permanently sealed thereto, preferably by thermosetting resinous adhesive. This last operation is usually undertaken by the persons concerned with filling the carton, such as dairymen, who install the top closures and heat seal them in permanent engagement with the upper edges of the carton body after the milk or other liquid contents have been introduced therein.

The side walls **10** of the carton are incised as at **20** completely through the thickness of the material, so as to span a corner of the carton as best appears in Figures 5 and 6. The pouring incision **20** is located adjacent the top, but sufficiently below the flange **16** thereof so as to be unobstructed by the latter prior to being opened.

Seals of tissue-like membrane **22** and **24** are applied, which are of a weight corresponding to second-sheet tissues commonly used in making carbons of typewritten texts. These tissues are impregnated with a thermosetting adhesive, which is preferably the same as that with which the carton side walls **10** and closures **12** and **14** are impregnated. The tissues are of a size to overlie the pouring incision **20** so as to effectively seal the latter while extending in engagement with the adjacent areas of the carton side walls over a substantially greater area than that defining the length of the incision itself.

As shown in Figures 1 and 2, the tissues membranes **22** and **24** are sealed inside and outside of the carton so as to extend from a point below the pouring incision **20** in overlying relation to the latter to a point beneath the closure flanges **16**.

As shown in Figure 3, only the internal membrane **22** need be applied, while in Figure 4 only the external membrane **20** is contemplated. Each is in sealing relation to the pouring incision **20** in a manner corresponding to that disclosed in the preceding figures.

In manufacturing the carton of the present invention, it is desirable to provide a carton wall **10** that is cut so as to provide a smaller cross-sectional area at the bottom of the carton body than at its top when wrapped or folded, so that the latter may be stacked one within another for shipment prior to filling. The pouring incision **20** is cut completely through the wall blank prior to its formation and is located so as to span a corner of the carton body after it is formed on a mandrel. The body blank is impregnated with resin and the internal tissue-like membrane **22**, also impregnated, is applied and sealed in overlying relation to the incision **20**. The carton body is then wrapped on a mandrel in such a way that the already applied seal **22** is disposed against the mandrel so as to be inside the carton. The purpose for this is that

the internal seal, when first applied and later wrapped, is subject only to compression, while if the outer seal 24 were to be applied before wrapping on the mandrel, it would be subjected to such considerable tension upon wrapping as might cause its failure.

Therefore, it is desirable, and in accordance with the practices of the present invention, to apply the internal seal with the carton body in its blank form, and thereafter to wrap the latter and to seal the overlapping edges of the carton body in the usual way by application of heat and pressure thereto, so as to cause the thermosetting resin with which the body is impregnated to adhere at the interface of the overlapped portions and to become cured in this position.

An outer seal 24 of tissue-like material impregnated with a thermosetting plastic as previously described is then applied in overlying relation to the incision 20, and the bottom then preferably is also applied to the carton body, and both of these are sealed into position at the same time. The carton is then ready to be shipped to the dairy or to the ultimate user for filling, after which the top closures 14 are disposed in overlying relation to the upper edges of the carton body, including the portions 18 and those areas of the sealing tissues 22 and 24 which project beneath the flanges 16. All of these parts are then sealed permanently together by heat and pressure.

As appears in Figure 6, to open a carton sealed in this manner, it is preferably disposed on a steady surface, such as a table, and grasped by the hands so that the fingers confine it and steady it against the table. Then, with the thumbs positioned upon a rim of the top adjacent the pouring opening 20, an upward pressure is exerted so as to cause the sealing membranes 22 and 24 to rupture to permit the pouring incision 20 to be opened by a hinge action along the corner of the top, which carries with it the permanently attached rim portion 18 defining the upper edge of the carton body that overlies the pouring incision 20. The carton in open position is shown in Figures 2 and 6.

In the applications identified in the first paragraph of this specification, the seals were either of relatively heavy stock weakened by perforations in one way or another to afford removal, or else were of pressure sensitive adhesive material which could be removed from the pouring incision substantially intact.

In the present case, seals of sufficient thinness to be frangible are permanently sealed into position over the pouring incision and are destroyed along the line of the latter upon application of suitable pressure at the time it is desired to void the contents of the carton. The seal of the present invention is stronger than the seals heretofore contemplated and has the advantage of maintaining the contents of the cartons inviolate until the seals are broken beyond any chance of disguising the fact. The seal being a permanent one, access to the contents is permitted only by its destruction, which differs from all known carton seals on the commercial market today.

In certain of the latter, non-wicking material, such as aluminum foil, is applied to prevent too firm adherence between the portions of the top and the rim of the carton body, so that the top may be separated therefrom without becoming unduly mutilated. These proposals are objectionable, in that the non-wicking material provides an imperfect seal, which, by its very nature, it is intended to do.

The present invention, however, provides a permanent seal, both where the top and bottom closures join the adjacent rim of the carton body and at the pouring incision, so that a completely hermetically sealed container is provided until the seal is broken as above described.

Although it is within the purview of the present invention to provide one sealing membrane either within the carton as shown in Figure 3, or outside thereof as shown

in Figure 4, it is nevertheless the preferred embodiment to have such membranes both inside and outside as appears in Figures 1 and 2, for the reasons already set forth herein first above. As so applied, each seal reinforces the other and tends to maintain the continuity of the wall surfaces inside and outside the carton effectively to resist lateral displacement between the cut edges, such as might accidently shear any one of the seals in two prematurely.

I claim:

1. A method of making cartons for containing and dispensing liquid and the like, which includes impregnating a blank of relatively heavy cellulose material with a liquid proof, thermosetting resin, incising a pouring opening in said blank, impregnating a blank of relatively light cellulose material with a thermosetting adhesive having an affinity for said resin so as to bond therewith when heated, applying a patch of said latter blank to the area immediately surrounding said pouring opening therein by heat and pressure to seal the patch permanently to said heavy blank to close said opening, winding said heavy blank upon a forming mandrel to form a tube with said patch inside said tube, and thereafter heat sealing at least one end closure in said tube.

2. The method of claim 1 further including applying a second patch from said light blank externally of said tube after the latter is wound, and heat sealing said second patch to the walls of said tube surrounding said pouring opening permanently to close the same until ruptured.

3. A liquid dispensing carton having a polyhedral tubular body, flanged countersunk top and bottom closures permanently attached to the ends of said body to close the same, a linear pouring incision spanning a corner of said body and extending for a limited distance along contiguous portions of the included side walls and penetrating the latter, said incision extending substantially parallel to the top edges of said tubular body and approximately in the plane of the lower face of said top closure and below the flange thereof, a frangible membrane of thinner material than said body disposed in closing relation to said incision for being ruptured when pressure is applied to said top closure adjacent said incision, said membrane having been treated with a thermosetting adhesive and being permanently secured to the side walls of said body circumjacent to said incision to seal the same until ruptured.

4. The invention of claim 3, in which the membrane described is applied both internally and externally of the carton body.

5. The invention of claim 3, in which said membrane is disposed internally of the carton body.

6. The invention of claim 3, in which said membrane is disposed externally of said carton body.

7. The invention of claim 3, in which said carton body stock is impregnated with a thermosetting resin to which said adhesive bonds when heated in contact therewith.

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