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CARTON FOR SEALING BY IMMERSION

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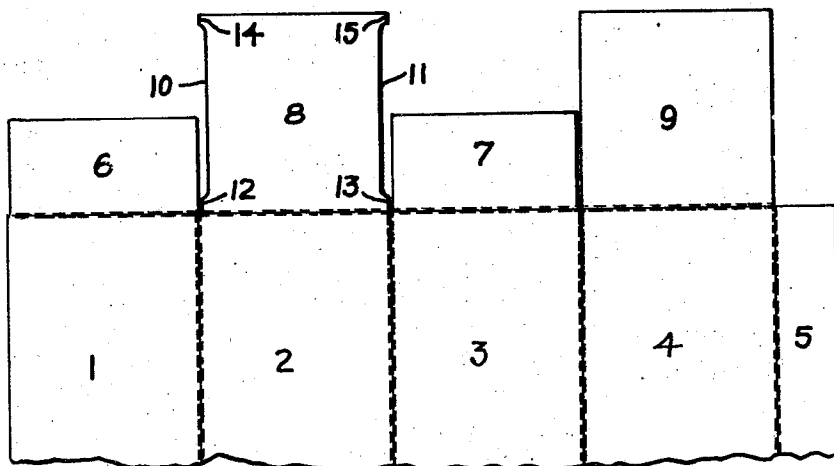


FIG. 1.

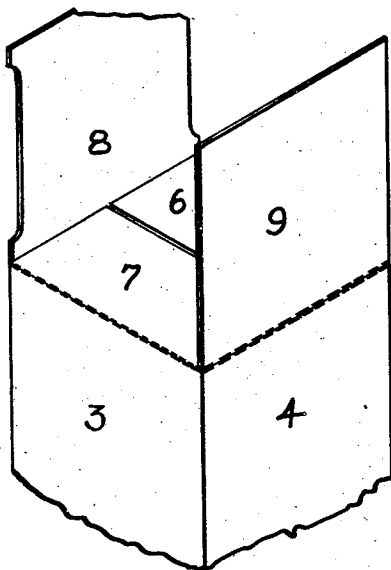


FIG. 2.

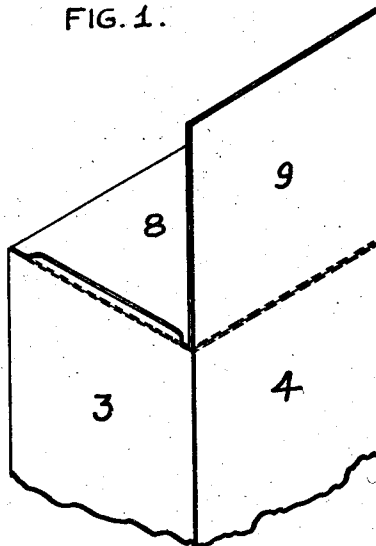


FIG. 3.

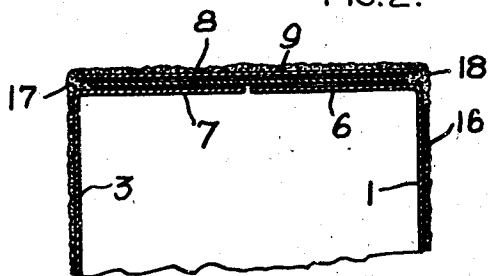


FIG. 4.

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CARTON FOR SEALING BY IMMERSION

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7 Claims. (Cl. 229—37)

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My invention relates to cartons designed to be proofed or sealed by immersing them in proofing agents. Such cartons are used for the packaging of milk, dairy products, frozen foods, and the like. There has been a marked commercial growth in recent years in the use of dipping processes for paperboard containers in the packaging industry, employing a variety of fluid sealing mediums including molten paraffin wax, wax and rubber mixtures, and other sealing and proofing substances, to all of which my present invention pertains. The cartons are provided on one end at least with closure flaps, which are folded over and adhesively secured. In some instances, the carton is provided with similar flaps at both ends and is filled and closed, after which the entire carton is dipped in a bath of the proofing and sealing substance. In other instances, as in milk bottles, the carton is erected, closed at one end as described, and then passed through a bath of the proofing and sealing substance. Afterward, it is filled, and then closed at the top by suitable closure means.

Both types of procedure and both types of carton present essentially the same problem. In each, at one or both ends, there is a closure formed by adhesively secured flaps lying in face-to-face relationship, with certain of the flaps presenting free or cut surfaces along opposite side edges of the closure. It is at these places that the greatest weakness in such packages is encountered. A slight imperfection in the coating elsewhere, as on a wall surface, or rupture or abrasion of the sealing medium on a wall surface due to handling and shipping, does not necessarily weaken or rapidly destroy the effectiveness of the package itself. But the slightest imperfection or rupture of the coating along the free edges of the flaps at the end of a container starts leakage and loss of effectiveness almost immediately.

The principal object of my invention is the provision of means for overcoming this weakness and providing along the edges of the closure not only a tight and dependable seal, but a seal of such strength and resistance as to minimize damage in handling and shipping. It is my object to accomplish this in a simple and inexpensive manner.

These and other objects of my invention, which will be set forth hereinafter or will be apparent to one skilled in the art upon reading these specifications, I accomplish by that certain construction and arrangement of parts, of which I shall now describe an exemplary embodiment. Ref-

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erence is made to the accompanying drawing wherein:

Figure 1 is a partial plan view of a paperboard blank for a carton embodying my invention.

Figure 2 is a partial perspective view showing a stage in the formation of an end closure.

Figure 3 is a partial perspective view showing a later stage thereof.

Figure 4 is a partial sectional view taken across the carton end closure after immersion in the sealing substance.

I have discovered that by providing a seal-end carton blank wherein the edges of an underlying sealing flap are recessed, I provide a structure which, when sealed, is characterized by a crevice along opposite edges of the closure, whereby when such a carton is dipped or immersed in the sealing medium, an excess or surplus of the medium is retained in the crevice.

When a so-called "seal-end" carton is closed and adhesively secured, an intermediate flap lies above a pair of shorter flaps and is covered by an outer flap. The intermediate and outer flaps present cut edges at opposite sides of the closure, which are coterminous. The adhesive used in retaining the flaps in their closed positions is not relied upon to effect a seal. When the carton is dipped, there may be formed a very thin skin or coating, overlying the cut edges of the board and the bent edges of the underlying flaps, which will make the structure initially liquid tight. The slightest rupture of this thin skin, however, destroys the sealed character of the container. There is little or no penetration of the sealing medium between the layers of board at the side edges of the closure, and such penetration as there is cannot usually be relied upon.

However, if the edges of the intermediate flap are cut away or recessed, there is presented, between the outer flap and the inner flaps, a recess having a width at least as great as the thickness of a layer of board. The sealing medium collects in this recess directly bridging the gap between the outer flap and the inner flap, uniting them together in sealed relationship. The thickness of the sealing medium in this recess is sufficient to give the seal strength and resistance to handling and scuffing so that the abrasions normally expected during use cannot destroy the seal. The seal has none of the characteristics of a thin skin, but rather possesses the characteristics of a solid plug.

It is not, however, preferred to recess or cut back the edges of the intermediate flap throughout the entire length of these edges. This would

be likely to leave minute openings at the corners of the closure where the first folded flaps might not accurately contact adjoining walls. A very fluid sealing medium might run through these cracks, entering the interior of the container in undesired amounts. As a consequence, I prefer to relieve the opposite edges of the intermediate flap between the extreme ends thereof, leaving these extreme ends of full width.

Referring to Figure 1, I have shown a flat, cut and creased paperboard carton blank comprising main body panels 1, 2, 3 and 4 and a glue flap 5 articulated together by longitudinal score lines in the usual fashion. Closure flaps are articulated by a common score line to the ends of the body walls. A pair of closure flaps, 6 and 7, are short flaps, articulated to opposite walls 1 and 3. An intermediate flap 8 is articulated to the body wall 2, while an outer flap 9 is articulated to the body wall 4. The flap 9 is of full dimensions to extend entirely across the end of the carton. The flap 8 is similarly dimensioned in general; but its side edges are recessed, as shown at 10 and 11, not, however, for the full length of these side edges. Adjacent the articulation of flap 8 to wall 2, there are full width portions 12 and 13 of minor extent, and similar full width portions 14 and 15 occur adjacent the outer end of the flap.

The blank shown in Figure 1 is not complete and has been shown with one closure only. The other end of the body may be provided with an exactly similar closure, where the carton is to be filled and closed and then dipped bodily in the sealing bath. Where the carton is to be closed on one end only and then dipped, the other end may be provided with any desired type of closure appropriate to the uses to which the carton is to be put. The size and cross-sectional shape of the carton form no limitation upon my invention nor does the number of enclosing body walls possessed by the carton, since it will be clear to one skilled in the art upon reading these specifications how the teachings hereof may be applied to cartons of other polygonal cross-section.

The paperboard blank of Figure 1 is tubed in the ordinary way on the ordinary carton tubing devices by being bent on a pair of intermediate score lines, glue or other suitable adhesive being applied to the meeting surfaces of wall 1 and glue flap 5, and these being adhered together, as will be readily understood. The glue flap 5 may be adhered either inside or outside the wall 1. The blank may initially be made of proofed board if desired; but this is not necessary for most purposes in view of the immersion treatment to which it will be subjected. The tubed blank is shipped in the flap or collapsed form to the purchaser.

The user squares up the tubular body of the blank and effects a closure. The first stage of this closure is illustrated in Figure 2 where the short flaps 6 and 7 have first been folded in. Glue or other adhesive may be applied to flaps 6 and 7 if desired, and preferably will be so applied.

A next stage is shown in Figure 3 where the intermediate flap 8 has been folded over upon and preferably adhered to the short flaps 6 and 7. Finally, the outer flap 9 will be folded over upon the intermediate flap 8 with the interposition of adhesive between their meeting surfaces. The closure may be effected in any way desired; and there are machines available for the purpose which requires no description here. The closure may, if desired, be accomplished over a mandrel, and preferably there will be means for exerting

pressure on both sides of the closure to insure proper setting of the adhesive, and a conformity of the flaps which is as complete as possible.

The carton, having been closed on one end as described, may then be bodily immersed in a bath of proofing and sealing substance. Or, if the carton is of a type having the illustrated closure at each end, it may then be inverted, filled with the desired contents, and similarly closed and adhesively secured on the opposite end, after which it will be dipped in a bath of proofing substance. While I have mentioned dipping, it will be understood that this is the normal procedure; but that other modes of applying the proofing and sealing substance may be employed without departing from the spirit of my invention, such for example, as painting, spraying, or otherwise applying the coating agent or, in the instance of cartons made of proofed boards, immersion of the ends thereof as distinguished from complete submergence in a bath.

Figure 4 is a semi-diagrammatic cross-sectional view of the carton showing the closure and the effect of dipping it into a bath of proofing substance, or otherwise applying the substance as described. The flaps 6 and 7 lie in a single plane surmounted by the intermediate flap 8 and the outer flap 9, all of these flaps lying parallel and in face-to-face relationship; but it will be seen that the edges of the intermediate flap 8 are spaced inwardly of the corresponding edges of the overlying flap 9 and the upper ends of the body walls of the carton, leaving recesses. The formation of the external coating 16 of proofing substance results in the introduction of the substance into the recesses, as shown in Figure 4 at 17 and 18. It will be noted that the recesses are large enough so that capillarity or the lack of it is not controlling as to whether or not they are filled. Hence, as distinguished from the formation of a comparatively thin skin of sealing substance over superposed and coterminous cut edges of the board at the opposite sides of the closure, with uncertain penetration of the sealing substance between the board layers, in my carton a heavy deposit of sealing substance at 17 and 18 fills a definite recess in the structure and directly joins the outer flap 9 with the ends of the body walls and immediately adjacent portions of the short flaps 6 and 7. These masses of sealing substance are quite strong; and the bond, and consequently the seal, is not liable to destruction under ordinary handling strains.

Yet, the formation of my seal is a matter of negligible expense. It requires only a slight modification of the ordinary die by which the carton blanks are cut and scored and a very slight additional quantity of sealing substance in the recesses, as at 17 and 18. The physical operations of closure and immersion are not altered as such, and may be performed either by hand or on standard and available equipment.

Modifications may be made in my invention without departing from the spirit of it. Having thus described my invention in an exemplary embodiment, what I claim as new and desire to secure by Letters Patent is:

1. A carton blank having enclosing body walls in articulation and end closure flaps articulated to said body walls, said end closure flaps adapted to be folded in sequence to form a plural layered closure in which the flaps lie in face-to-face engagement and adhesive union, one of said flaps being an outer flap dimensioned to cover the entire end cross-section of said body, another of

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said closure flaps being an intermediate flap similarly dimensioned to cover the entire end cross-section of said carton body, excepting that edge portions thereof where exposed in the closure are slightly recessed so as to extend inwardly of the corresponding edges of the outer flap to form recesses in said closure adapted to be filled with sealing substance.

2. The structure claimed in claim 1, wherein the recessed edges of said intermediate flap have at the ends one or more of said edge portions of substantially full dimension so as to be coterminous with adjacent portions of the outer flap at corners of the closed carton body.

3. A blank for a paperboard carton sealable by immersion or the like, said blank comprising a body portion having four walls and a glue flap in articulation and an end closure comprising closing flaps, an opposite pair of said flaps being short enough in length to lie in the same plane across an end of the carton formed from said blank, another flap, adapted to overlie said first mentioned flaps, being dimensioned to cover the entire cross section of the end of said carton excepting that its side edges are slightly recessed, and a fourth flap adapted to overlie the last mentioned flap and dimensioned to cover the entire cross section of the end of said carton.

4. The structure claimed in claim 3, wherein the recessing of the edges of the third mentioned flap is confined to intermediate portions thereof, end portions of said edges being of full width.

5. The structure claimed in claim 3, wherein the recessing of the edges of the third mentioned

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flap is confined to intermediate portions thereof, end portions of said edges being of full width, said carton body having at its opposite end a similar series of closure flaps.

6. A sealed carton comprising enclosing body walls in articulation and an end closure comprising flaps articulated to said body walls and adhered in face-to-face engagement, intermediate and outer ones of said flaps dimensioned to cover the end of said carton, said intermediate flap having edge portions thereof recessed inwardly of corresponding edges of the outer flap, and a coating of sealing substance on said carton covering at least opposite edge portions of said closure and entering said recesses whereby to seal edge portions of said outer flap directly to inner flaps past the recessed edges of said intermediate flap.

7. A sealed carton comprising enclosing body walls in articulation and an end closure comprising flaps articulated to said body walls and adhered in face-to-face engagement, intermediate and outer ones of said flaps dimensioned to cover the end of said carton, said intermediate flap having edge portions thereof recessed inwardly of corresponding edges of the outer flap, and a coating of sealing substance on said carton covering at least opposite edge portions of said closure and entering said recesses whereby to seal edge portions of said outer flap directly to inner flaps past the recessed edges of said intermediate flap, the said recessed edges of said intermediate flap having portions at their corners of full width.

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