

May 2, 1939.

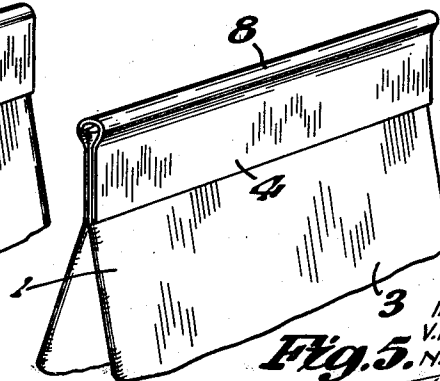
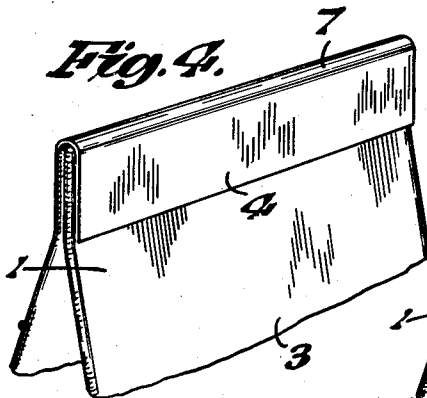
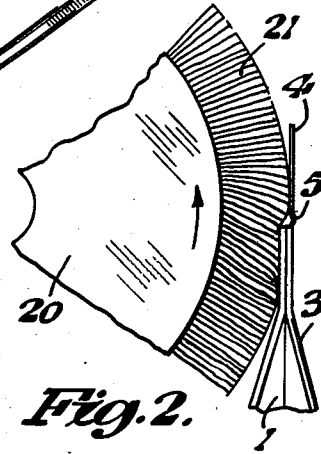
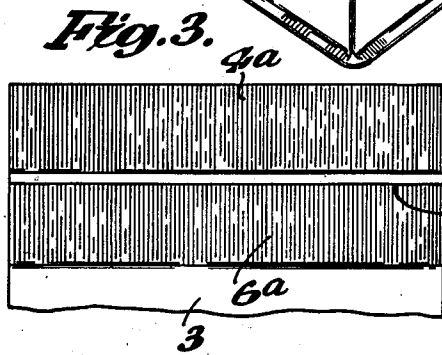
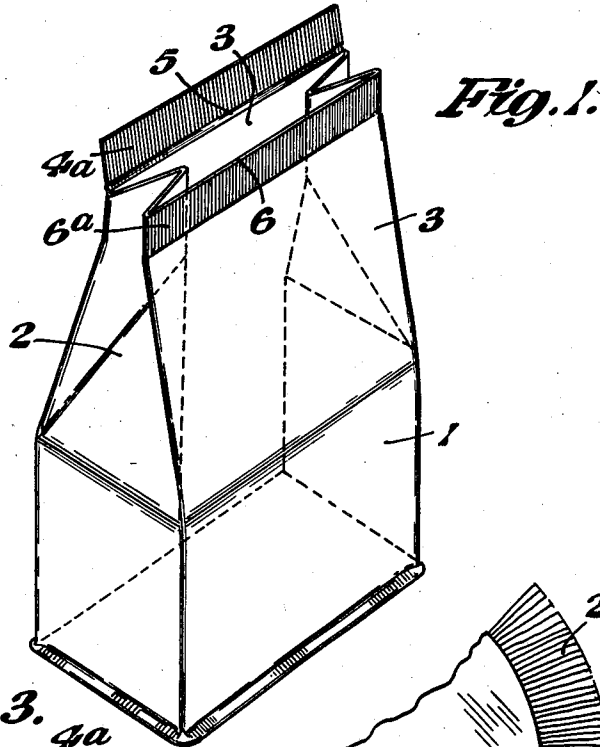
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2,156,441

CARTON AND THE SEALING THEREOF

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2 Sheets-Sheet 1



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Fig. 6.

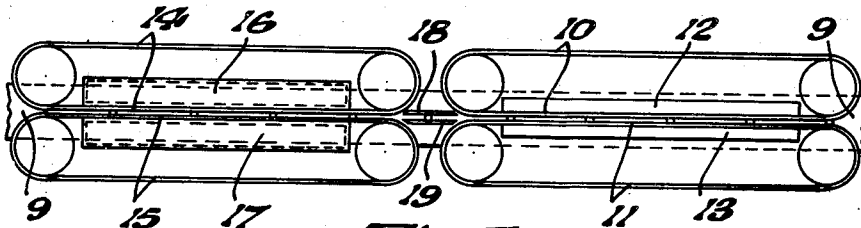
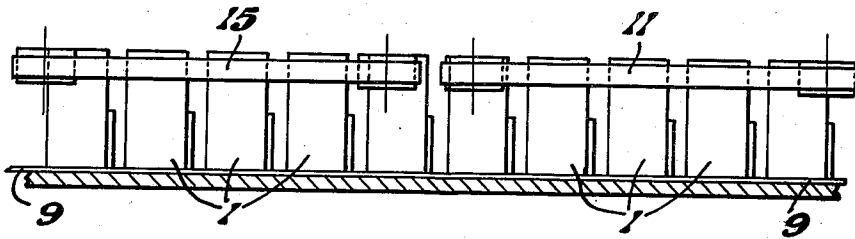


Fig. 7.

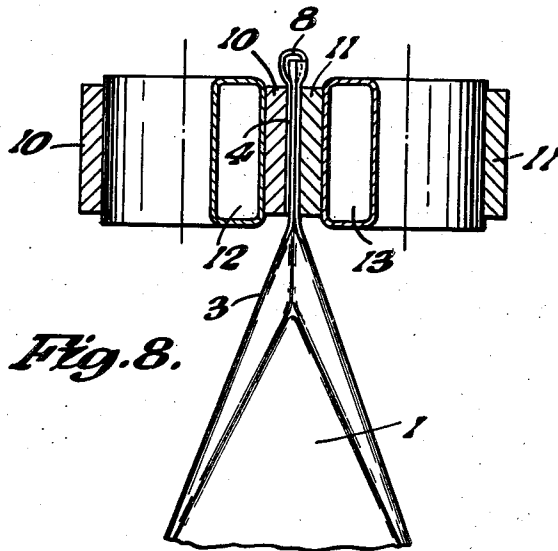


Fig. 8.

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CARTON AND THE SEALING THEREOF

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Leeds, EnglandApplication January 3, 1938, Serial No. 183,099
In Great Britain December 14, 1937

3 Claims. (Cl. 93—6)

The present invention relates to cartons and is particularly useful in connection with water-proof cardboard or like cartons adapted to contain milk and other liquids, although the invention is applicable to cartons for containing powdery or granular substances which it is desired to seal in an airtight manner. The usual practice with cartons used for retailing milk is to provide a wax-proofed rectangular body with a pleated top which brings together parallel edges at the mouth of the carton, and a metal clip, generally corrugated longitudinally is pressed over the said edges, or sometimes staples or wires are passed through the upper part of the pleated carton. The use of metal fasteners is not desirable in many cases. For instance, the now popular practice of serving infants in schools with regular rations of milk renders it undesirable and dangerous to have thin metal strips, or wire accessible to the fingers of the infants, particularly if the infants have to open the cartons. Also on hygienic grounds the use, affixing and removal of the metal clips is not desirable. The object of the present invention is to provide a method of sealing cartons which is hygienic and obviates the necessity of fasteners such as channelled metal strips, or clips.

According to this invention a method of sealing a carton of the type having a pleated or tapered upper part by means of which the edges of the mouth of the carton are brought close together for sealing purposes, consists in the pressing or pinching together of the opposed parts of the mouth of the carton, and also, the provision of a paper strip for such mouth end, which strip is folded over the mouth and lapped against the sides of the carton at such end, an adhesive agent such as for example the wax with which the carton is impregnated being distributed intimately between the pressed together parts of the mouth by heat applied during the pressing operation.

In carrying the invention into practice it is preferred to extend one side of the mouth of a pleated rectangular carton slightly beyond the other side so as to form a narrow flap extending the full length of the straight edged mouth part, said flap being adapted to be folded over the upper edges of the pleated parts and the exterior of the said other side, the width of the flap being slightly greater than the depth of the area of surface of the mouth end of the carton which is pinched together by pressing means during sealing of the carton, so that a neat, narrow and stiffened laminated closure part is pro-

vided at the mouth end of the carton. The pinching together of the said flap and mouth end folds of the carton is preferably effected so as to not quite include the fold of said flap where it bridges the mouth of the carton, and this results in a very narrow beading or tube being formed at the fold of said flap, into which will be extruded wax from the pressed mouth parts of the carton. The opposed faces of the flap and wall which it overlaps are roughened or scratched before overlapping to afford fibre-like coarsened surfaces which seize together or have an affinity to one another assisted by the softened wax which intimately binds together the fine integral fibre-like particles of such roughened surfaces.

In order that this invention may be clearly understood and readily carried into effect two sheets of drawings are appended hereto illustrating an embodiment of the improved carton and suitable apparatus for effecting the sealing operation of cartons in large quantities, and wherein:

Fig. 1 is a perspective view of a complete carton with the mouth open, and showing the scratched or roughened surfaces.

Fig. 2 is a detail view showing how the scratched or roughening action can be carried out.

Fig. 3 is a broken front elevation of the mouth end of the carton when open.

Fig. 4 is a broken perspective view showing the flap on one side of the mouth of the carton initially folded over the other side as a prelude to being sealed, Fig. 5 being a broken perspective view showing the sealed mouth.

Figs. 6 and 7 are side elevation and plan views respectively showing diagrammatically suitable apparatus for sealing the cartons, and

Fig. 8 is a detail sectional end elevation view to a larger scale showing how the carton-engaging parts of the apparatus shown in Figs. 6 and 7 pinch together the layers of wax or like impregnated material of the cartons at the mouth end.

Referring to the drawings the carton 1 is as shown in Fig. 1 of known rectangular configuration with pleated end wall upper parts 2 arranged so as to bring together opposed parallel edges of the mouth end of the side walls 3. A distinctive feature of the carton is that one of the side walls 3 has an integral narrow flap-like extension 4 extending the full length of such side, and during manufacture of the carton it is preferred to crease the junction of this flap

and the integral adjacent wall part as at 5 to ensure that the flap will fold readily over the mouth edge 6 of the other wall.

The flap 4 is pressed and sealed against the outer face of the wall containing the edge 6, and heat is applied during such pressure to soften and force the wax, with which the carton is impregnated, at the mouth or top of the carton into the overlapping parts. It is found that by scratching the marginal zone of the upper end of the wall against which the flap is folded and also the face of such flap which bears against such marginal part, that an infinitesimal number of fine fibre-like ribs or strands completely integral with the said face of the flap and said marginal part are produced, e. g., roughened surfaces somewhat like a fine pile, as indicated by the reference numerals 4a and 6a, consequently when these overlapping parts are pinched together by pressure applied over their whole area of contact, the rib-like strands or exceedingly fine fibres or serrations 4a and 6a produced in the flap 4 and the wall it overlaps will intermingle and become intimately combined by the softened wax. Also if the pressure applied to the folded over parts is such as to just miss the fold 7 (see Fig. 4) of the flap 4, a narrow tubular or bead-like part 8 will be produced at the top of the finished carton, and as some of the wax softened during the pinching operation will be extruded into the bead 8 and fill it, a complete seal of the mouth of the carton is effected.

The pinching together of the laminated mouth parts of the cartons can be effected by the apparatus shown in Figs. 6, 7 and 8, in which the bases of the cartons are stood upon an endless conveyor 9 (the upper track only of which is shown), and their upper parts, with the flaps 4 folded over against the roughened parts 6a, carried between the opposed tracks of two endless belts 10 and 11. These opposed tracks are located in vertical planes and bear against flat walls of a pair of heated tubes 12 and 13, heated by any suitable means, e. g., heated fluid circulated through them or enclosed electric heaters. These tubes 12 and 13 are so spaced that considerable pressure is applied to the necks of the cartons for the depth required to cover the flaps 4 (with the exception of the said folds 7 to produce the beads 8), and this pressure combined with the softening of the wax of the upper parts of the carton due to the heat of the tubes 12 and 13 intimately binds together the opposed roughened surfaces 4a and 6a.

The time involved during this heat and pressure treatment need not exceed five seconds for each carton for normal wax impregnated cartons and with a temperature such as to only soften the wax, and actually a considerably lesser period should normally suffice.

When the cartons leave the heating pinching belts 10 and 11 they are preferably fed without interruption between two further pinching belts 14 and 15, which are subjected to a cooling action, for example by carrying their inner tracks along two tubular members 16 and 17 through which a cooling medium is circulated. This has the desired effect of rapidly hardening the wax at the overlapping parts of the carton and on the beads 8, and thereby ensures positive sealing

before the said overlapping parts can separate by their own resiliency. The space between the two pairs of pinching belts can contain two guide bars 18 and 19 for the flattened overlapping mouth parts of the cartons to further minimize risk of such parts separating whilst the wax is soft.

Any suitable means may be provided for roughening the areas 4a and 6a of the carton, one convenient method consisting in feeding the cartons on a suitable conveyor or by other suitable means past a rotating disc 20 (see Fig. 2) having a periphery constituted by stiff wire bristles or needles 21 the diameter of such disc being such that substantially the whole of the areas 4a and 6a can be pressed into contact with the wire bristles or needles. By feeding the cartons in a direction parallel with the axis of the rotating disc 20 the strands or texture of the material forming the cartons are adequately scratched into fine fibre like tentacles or pile like surfaces.

It will be apparent that whilst a highly efficient hygienic closure of the carton is effected it is also possible to readily open the cartons by engaging a blade or finger nail under the flap 4 and forcing it away from the wall of the carton.

We claim:

1. Method of sealing cartons of the type impregnated with wax proofing and having a pleated, tapered or like upper part affording opposed substantially parallel mouth edges pressed towards each other, consisting in forming on one side of the mouth of the carton an integral narrow flap like extension, scratching or roughening the inner surface of said flap and the area of carton to be overlapped by said flap, to form fibrous like tissues along their full length, folding said flap over the edge of the other side of the mouth of the carton, and passing the mouth end of the carton between pressing members to intimately intermingle the fibrous like tissues of the overlapping parts and simultaneously heating the carton at said over-lapping parts to soften the wax of the overlapping parts to fuse it into the intermingled fibrous like tissues.

2. Method of sealing cartons impregnated with a wax-like proofing substance, according to claim 1 in which the pressing together of said overlapped flap like extension and opposed part of the carton is effected by means of two narrow bands between which the cartons are gripped at the mouth end said bands passing between two supporting guides one of which is heated, the folds of the said flaps projecting beyond adjacent edges of said bands so that wax is extended into the impressed folds of the cartons.

3. Method of heat sealing wax-proofed cartons having a flap overlapping a mouth end of the carton consisting in forming fibrous like tissues on opposed faces of the flap and carton mouth end to be sealed by the flap, and binding the said opposed faces together by fusing the wax therein intimately into contact with the fibrous like tissues simultaneously with pressing said opposed faces against each other and immediately subsequently feeding the pressed together mouth parts between pressing and cooling members to form a cold wax layer containing the intermingled fibrous like tissues.

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