

Oct. 21, 1941.

A. KIENLEN

2,259,822

CARTON

Filed April 21, 1939

2 Sheets-Sheet 1

Fig. 1

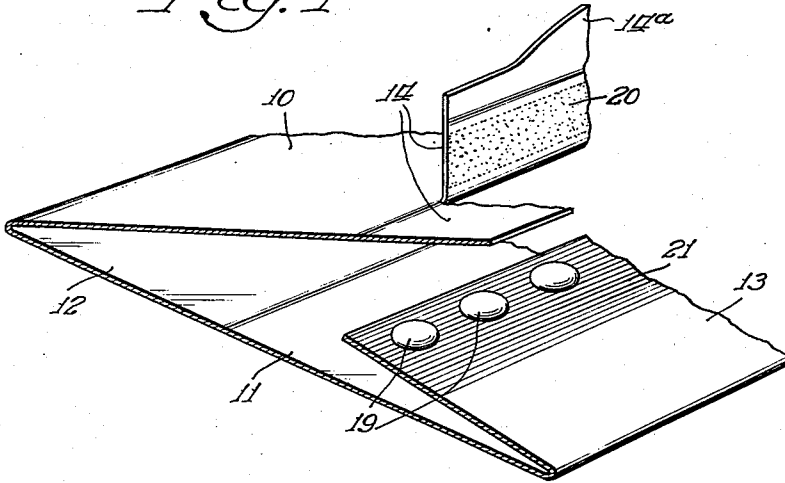


Fig. 2

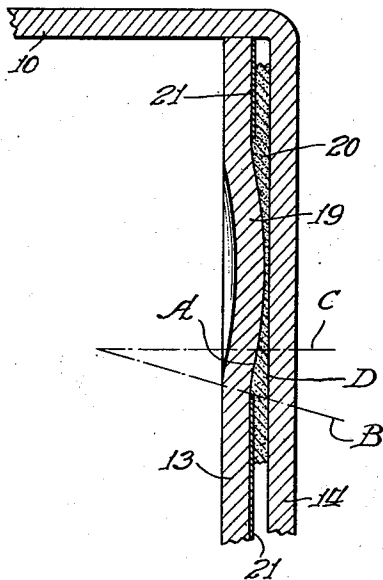
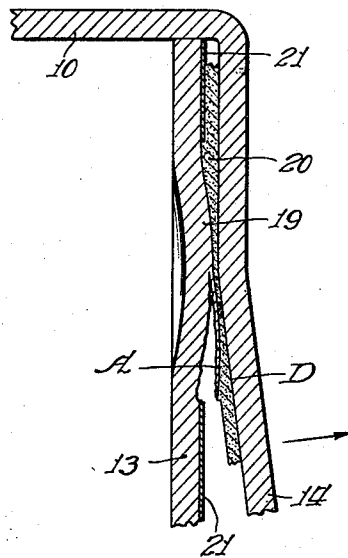


Fig. 3



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Fig. 4

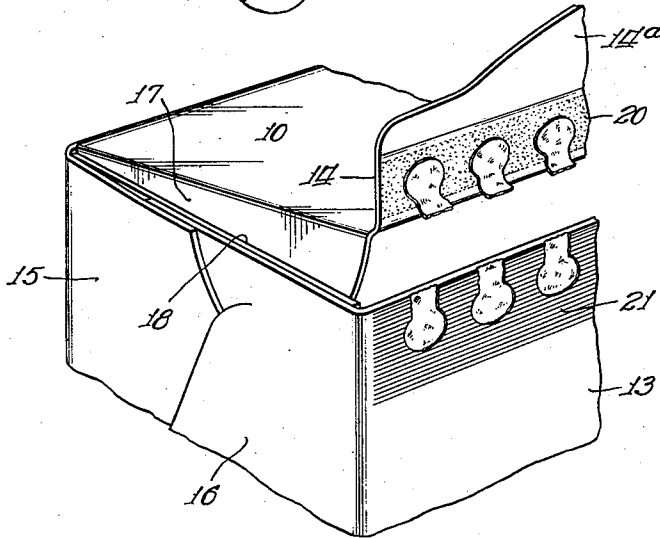
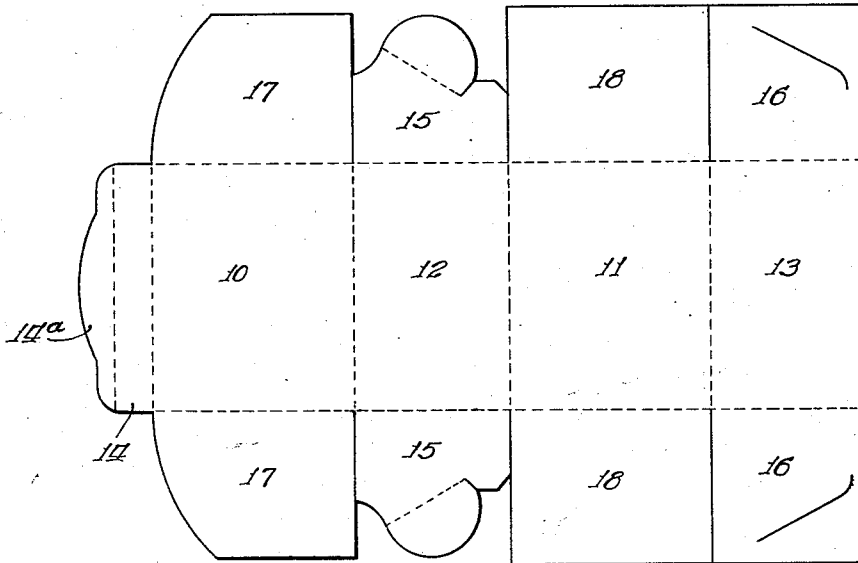


Fig. 5



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UNITED STATES PATENT OFFICE

2,259,822

CARTON

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Application April 21, 1939, Serial No. 269,081

3 Claims. (Cl. 229—48)

The present invention relates to folding cartons and more particularly to the type of folding carton which is adapted to be formed at the box factory in the shape of a tube; and afterward sealed at the ends of the tube upon receiving the contents, and then opened along the joint which secures the carton in tubular form.

Among the objects of the invention are to form a manufacturer's joint between two walls of a carton so as to secure them together in a permanent manner so far as the filling of the carton is concerned, the joint being so constructed as to enable the carton to be opened therealong without undue likelihood of the surface of the board peeling in such a way as to allow or cause the peeled-off material to come into contact with the contents of the carton.

A further object of the invention is to shape the surface of the material comprising the inner one of two overlapping parts of a certain joint so that, when adhesive has been applied to cause adherence between the parts, the effective bond of the adhesive with respect to the inner part will have such relation to the effective bond between the adhesive and the outer overlapping part, that the surface material of the inner part will be more readily pulled away than the surface material of the outer part, whereby peeling will be restricted to the inner part.

Additional objects of the invention will become apparent as the description proceeds.

In the drawings:

Fig. 1 is a fragmentary perspective view of a carton in partially collapsed condition provided with parts adapted to be overlapped and adhered together, such parts being formed in accordance with the present invention;

Fig. 2 is a schematic cross-sectional view showing, in a somewhat exaggerated manner, the relationship between the two wall sections of the carton joint adjacent the raised area and the adhesive material holding the sections together;

Fig. 3 is a view similar to Fig. 2 illustrating the parts after partial separation;

Fig. 4 is a fragmentary perspective view illustrating the overlapping parts of the carton after same have been separated preparatory to opening the carton; and

Fig. 5 is a view of the carton blank.

The present invention, as herein disclosed, provides a carton glue-joint structure formed as a part of the manufacturing operation in the carton plant. The joint is adapted to retain its efficacy during the filling of the carton with the commodity it is to receive, as well as during the

sealing of the carton by the packer. However, when it is desired to remove the contents from the carton the character of the glue joint enables the walls to be readily pulled apart, but the parts are so joined as to tend to restrict the peeling of the surface material of the carton to the inner one of the carton sections. Thus by having the joined wall parts so related that the glue joint is located adjacent the edge of the inner section, and by restricting the peeling of the surface material to the inner or underlying carton section, it is obvious that the length of the peeled fragments will be no greater than the distance from the glued area to the free edge of the underlying carton section.

Referring more particularly to the drawings, the carton is preferably formed from a single blank of folding boxboard suitably cut and scored to provide what may be termed top and bottom panels 10 and 11, an intermediate edge wall panel 12, a front wall section 13, and a flap section 14 formed on the free edge of the top wall 10.

The flap section 14 is preferably provided with an extension flap 14a to serve as a grasping element by means of which the flap section 14 may be more readily pulled away from section 13 after adherence thereto.

The carton is also preferably provided with end closure members, herein illustrated as interlocking flaps 15 and 16 extending respectively from the panels 12 and 13, and additional flaps 17 and 18 extending respectively from the top wall 10 and bottom wall 11. Each end of the carton, in the present instance, is illustrated as being constructed in an identical manner.

As illustrated in Figs. 1 and 4, the flap 14 is arranged to be adhesively secured on the outside surface of section 13. The flap 13, in the present instance, is formed or shaped, as by means of an embossing operation, with a plurality of spaced raised areas 19, 19. These raised areas are preferably of a rounded contour, having a relatively uniform convex curvature with respect to the surface of the section 13 which lies adjacent the outer or overlying flap 14.

The adhesive, indicated at 20, may conveniently be applied in moist condition to the flap section 14 while the carton blank is in flat form. After the application of the adhesive, the sections 13 and 14 are brought into joining relationship and so held until the adhesive has set. The carton is thus brought into the condition of a flat or collapsed tube ready for delivery to the packer.

Means are preferably provided for restricting the action of the adhesive on the section 13 to

an area not substantially greater than the convexly raised areas 18, 19. In the present embodiment this result is accomplished by applying to the surface of section 13 an adhesive resisting coating 21. This may be in the form of printing ink having a small amount of oil mixed therewith and it may be applied as part of the ordinary printing operation to which the carton is subjected.

The adhesive resisting coating 21 is applied in such a way as to leave uncoated areas over the surface of the convexly raised areas 18, and the width of the band of adhesive resistant coating is preferably somewhat greater than the width of the band of adhesive that is applied between the sections forming the joint. In any event the parts of the sections upon which adhesive has been applied should not be of sufficient width to extend beyond the adhesive resistant coating at the edge of such coating which is remote from the free edge of section 13.

As the surface of the flap 14 which is adhered to the surface of section 13 is on the opposite side of the sheet of paperboard, in the case where the carton is formed from a single blank, it is desirable to utilize paperboard material of a type in which no excessive difference exists between the bonding of the surface material to the body of the sheet on the respective sides of the sheet.

Due to the provision of the adhesive resistant coating 21, it is apparent that when a band of adhesive has been applied between the sections and such sections pressed together, the only substantial adherence that will exist between the sections is the adherence between the surface of the section 14 and the uncoated areas of the section 13. Furthermore, due to the provision of the convexly raised areas on the section 13, there will be a tendency, upon pressing the parts together, for the moist adhesive to become appreciably thickened or concentrated in amount upon marginal surface portions somewhat spaced away from the crests of the convexly raised areas. This relationship of parts is illustrated in an enlarged and somewhat exaggerated manner in Figs. 2 and 3. The layer of adhesive material 20 will tend to become uniformly bonded with the surface of section 14, but the bond between the adhesive and section 13 will be restricted substantially to the areas not coated by the adhesive resisting material 21.

The bonding effect that will thus be produced between the sections 13 and 14 is such as to cause, upon pulling the sections apart, the tearing or peeling of portions of the surface material from the section 13 at the convexly raised areas. The peeling is initiated at the side or edge of the section 13 and the directions of the peeling tends to be toward the free edge.

If the initial peeling of the surface material is slight, the peeled fragment will generally not extend substantially beyond the convexly raised area, but if the initial peeling extends deeper into the section 13, the peeling will continue until the edge of the section 13 is reached, whereupon the peeled fragment will be merely carried away upon the section 14 and will thus be kept out of contact with the contents of the carton.

As a result of making numerous tests and observing the results obtained, the principles of operation of the construction of the present invention may be explained as follows:

Referring to Fig. 2, a surface portion A is indicated lying between broken lines B and C, this surface portion being on the section 13 to which

the adhesive layer 20 has become bonded. The extent of the bonded surface A is limited on one side by the adhesive resistant coating 21. At the other side of the surface A, there will be no distinct limiting of the bond, except insofar as the bond may be rendered less strong due to the decrease in thickness of the adhesive as the crest of the convex area is approached. Due to the fact that the extent of the bonded surface A is limited on one side by the adhesive resistant coating 21 and there is no similar limitation of the bond of the adhesive with respect to the opposite surface on section 14, it is obvious that when section 14 is pulled to separate it from section 13 the effective area over which a pulling force is exerted on surface D will extend somewhat beyond the edge of the adhesive resistant coating and this extent of the area D may be approximately represented in Fig. 2 by having the broken line B extend at an angle to broken line C.

The surface portion indicated at D on section 14, lying between the broken lines B and C, approximates the extent of the area of the adhesive coated portion of section 14 which, under ordinary conditions, may be expected to exert reactive force upon the area A when the sections are being pulled apart. Thus, the reactive force exerted upon any given area of small size, due to the bond between the adhesive and section 13 at the convexly raised area, is transmitted through the body of the adhesive 20 in such a way as to cause unit areas over surface area A to be acted upon by pulling forces exerted over somewhat larger unit areas over the surface area D. In other words, the lines of pulling force tend to flare outward beyond the vertical projection of the edges of area A upon the section 14.

Therefore, assuming that the character of the bond over the glue joint area is substantially the same on the surface of the section 14 as it is on the uncoated surfaces of section 13, the primary pulling force exerted over the surface of section 14 is greater than the secondary or reactive force exerted over the adjacent surface area of section 13, this being due to the fact that, as above stated, there is a substantially distinct line of termination of the area A on section 13, whereas the bond between the adhesive and section 14 is unbroken throughout its area and therefore the lines of force, extending through the body of the adhesive between the surface of section 14 and the surface of section 13 will be somewhat fan shape, when viewed as illustrated in Fig. 2.

Accordingly, if the bond between the surface material and the body of the sheet is substantially the same on sections 13 and 14 over their adjacent surfaces, it is clear that when the reactive force exerted on a given increment of area of section 13 is spread over a larger area on section 14, the surface material that must necessarily be peeled away is the surface material on the section 13. This is assuming, of course, that the strength of the adhesive layer and the strength of its bond to the surfaces of the sections is greater than the bond between the surface material and the body of the paperboard.

Due to the fact that the layer of adhesive material is somewhat thicker for areas remote from the crests of the convexly raised areas than it is upon such crests, there will be a tendency for a stronger bond to exist between the sections 13 and 14 over such areas than will be the bond between such sections over the areas at and immediately surrounding the crests of the con-

vexly raised areas. Thus, there will be a tendency for the adhesive to form a stronger bond between the sections adjacent the lower or lesser raised portions of the convexly raised areas. Stated in another way, this stronger bond will extend from the edge portions of the uncoated areas on section 13, and thence up over a marginal portion of the sloping surface of the convexly raised areas. It is to be thus noted that there will exist between the two sections 13 and 14 certain oppositely disposed strongly bonded areas, one of which will lie in the plane of its carton wall section and the other of which will be somewhat inclined or tilted to the general plane of its carton wall section. See particularly parts A and D of Fig. 2.

When the section 14 is pulled away from section 13 (see Fig. 3) certain areas on section 14 will, due to the bonding action of the adhesive, exert a pulling force on certain areas of section 13 which are inclined to the plane of the section. This pull through the adhesive bond of a flat surface upon an inclined or tilted surface tends to initiate peeling of the surface material from the inclined or tilted surface due to the fact that the pull is oblique to the latter surface. Thus, instead of the pulling force being utilized to bodily pull away a portion of the surface, it is utilized to produce a peeling action which action may be initiated with a lesser degree of force than that required to bodily pull a portion of the surface material from the body of the sheet.

By combining the principle of exerting a pull between a flat surface and an inclined surface by a body of adhesive and restricting the bond of the adhesive to a point closely adjacent the edge of the convexly raised areas upon the flap on which the convexly raised areas are formed, the result is that the pulling force exerted by the surface of the section 14 will be exerted over a relatively large area, as indicated at D in Fig. 2, and this force will be exerted over a relatively smaller area on section 13, as indicated at A in Fig. 2. By this arrangement of parts, the tearing away of the surface material of flap 13 will be assured substantially at all times where, as stated above, there is no substantial difference between the bond of the surface material and the body of the sheet on adjacent surfaces of sections 13 and 14.

From the foregoing it is apparent that the present invention provides a carton which can be readily made at the box plant to include a separable manufacturer's joint so that the carton can then be filled and sealed in the usual manner in which tubular cartons with end closure flaps are handled. By providing the carton with a joint construction as herein disclosed, the filled carton may be conveniently opened by breaking the manufacturer's joint, thus disengaging one wall section from the other. Due to the fact that peeling of the surface material will be restricted to the underlying flap 13, the carton of the present invention is well suited for the packaging of ice cream and similar foods, particularly where it is desired to eliminate lining material within the carton to retain such food.

As peeling of the surface material of the carton is restricted to the underlying flap 13 of the container, the peeled fragments will always be limited in length to the distance from the point where the peeling starts to the edge of the underlying flap. Thus, the peeled fragments will

remain adhered to the overlying flap and this flap will be entirely removed from proximity with the contents of the carton when the carton is opened, with the result that no part of the peeled fragments will tend to come into contact with the food contained in the carton.

While the present description sets forth a preferred embodiment of the invention, numerous changes may be made in the construction without departing from the spirit of the invention, and it is therefore desired that the present embodiment be considered in all respects as illustrative and not restrictive, reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

I claim:

1. A folding carton formed of sheet paper-board, comprising two wall sections having co-operating inner and outer overlapping parts, said parts including a surface portion on each capable of being at least partially peeled away from the body of the sheet, the bond of the surface portion to the body of the sheet on the adjacent surfaces of the respective wall sections being substantially the same, the edge portion of the underlying part having a coating of adhesive-resistant material applied thereto, there being spaced areas on said edge portion of restricted size left in an uncoated condition, a band of adhesive applied between the inner and outer overlapping parts to extend entirely over the uncoated areas on the underlying part but having the edge of the adhesive maintained in position so as not to extend beyond the edges of the area coated with adhesive-resistant material, the area on the overlying part to which the adhesive is bonded being appreciably greater in extent than the area on the underlying part to which the adhesive is bonded, whereby pulling away the overlapping section from the underlying section will produce peeling on the underlying section, said peeling being limited to such underlying section.

2. A folding carton formed of sheet paper-board, comprising two wall sections having co-operating inner and outer overlapping parts, said parts including a surface portion on each capable of being at least partially peeled away from the body of the sheet, the strength of the bond of said surface portions to the body of said overlapping parts being substantially the same, the edge portion of said inner part having a coating of adhesive-resistant material applied thereto, there being spaced areas of restricted size on said edge portion left in an uncoated condition, at least a major part of said spaced areas being raised toward said outer part, and a band of adhesive applied between said inner and outer parts extending entirely over said spaced areas but having its boundaries within said edge portion coated with adhesive-resistant material, whereby the area on said outer part to which said adhesive is bonded is appreciably greater in extent than that on said inner part, and separation of said overlapping parts will produce peeling of said surface portion substantially only from said inner part.

3. A folding carton according to claim 2 wherein said raised areas are of a rounded contour presenting relatively uniform convexly curved surfaces to said outer part.

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