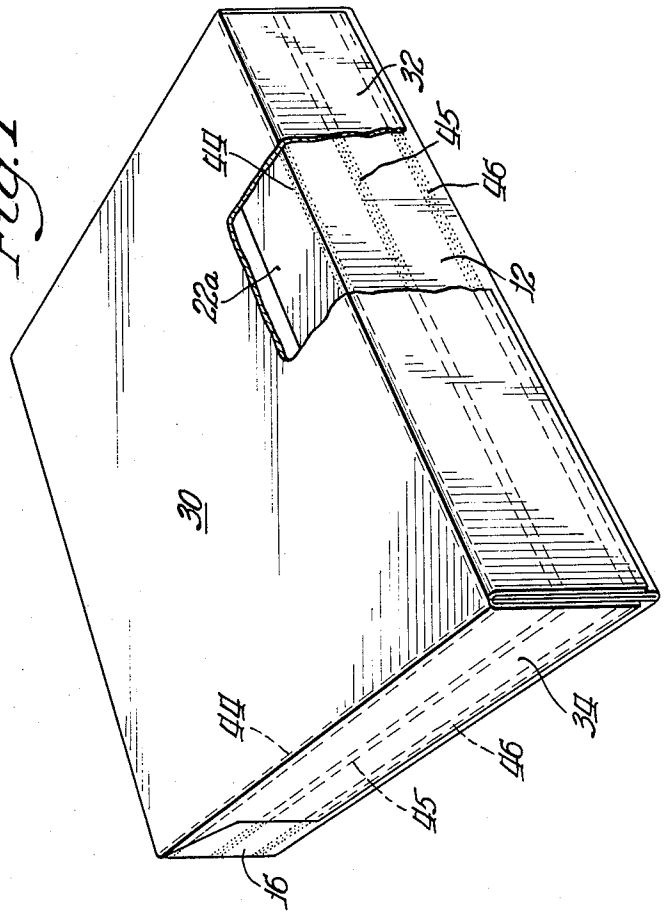
May 3, 1966 W. G. KUEHN, JR 3,249,282

CLOSING MEANS FOR PAPERBOARD CARTON

Filed Dec. 6, 1963 2 Sheets-Sheet 1

Fig. 1



Inventor:
William G. Kuehn, Jr.
By: Richard W. Carpenter
Atty.

May 3, 1966 W. G. KUEHN, JR 3,249,282

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Filed Dec. 6, 1963 2 Sheets-Sheet 2

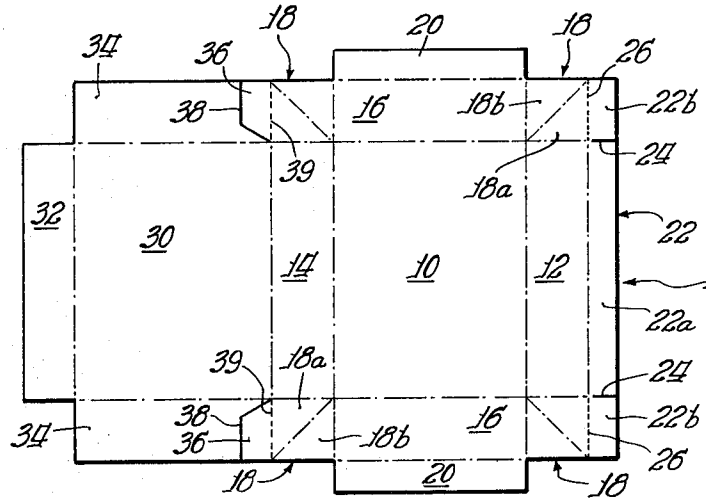


Fig. 2

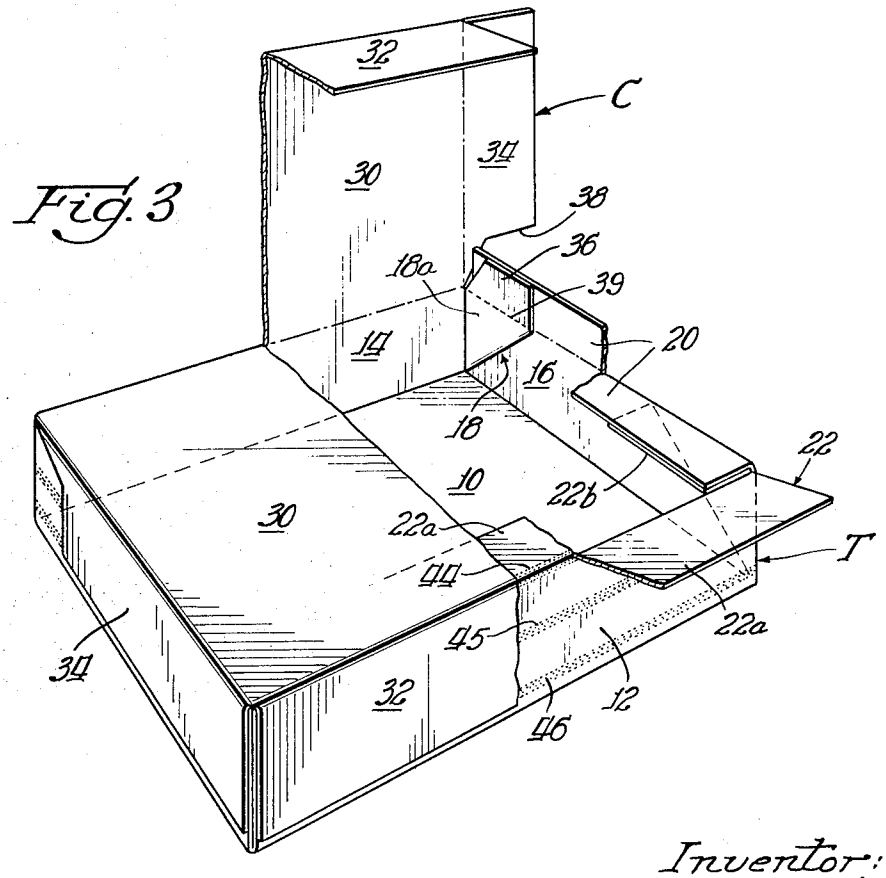


Fig. 3

Inventor:
William G. Kuehn, Jr.
By: Richard W. Carpenter Atty

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CLOSING MEANS FOR PAPERBOARD CARTON

William G. Kuehn, Jr., Malvern, Pa., assignor to Container Corporation of America, Chicago, Ill., a corporation of Delaware

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1 Claim. (Cl. 229—3.1)

The present invention relates to carton closing and sealing and more particularly to the construction by which a closure panel on a carton may be sealed to the body of the carton to provide an effective, liquid-tight construction.

An important object of the invention is to provide an efficient and economic sealing construction for securing a carton closure of the type comprising a main closure panel having flap portions that are foldable to overlie the carton side walls.

Additional and more specific objects and advantages of the present invention will become apparent as the description proceeds.

In the drawings:

FIGURE 1 is a perspective view of a form of carton, in sealed condition, which is particularly suitable for use in connection with the present invention;

FIGURE 2 is a plan view of a blank from which the carton shown in FIGURE 1 may be produced; and

FIGURE 3 is a perspective view of the carton with a portion of the cover shown broken away and in open position.

The form of carton disclosed herein forms the subject matter of the copending application of Mark Goldstein, Serial No. 250,862, now Patent No. 3,156,403 issued November 10, 1964.

The present invention is especially applicable to the sealing of cartons such as usually employed for retention of quick frozen foods which should be retained in packages having a high degree of resistance to moisture-vapor transmission. This requires that not only the quality of the paperboard have high resistance to moisture-vapor transmission but that the sealing of the carton be equally effective, for the best preservation of the contents of the carton.

Accordingly the carton for use with the present invention is preferably formed with side or edge walls connected at the corners by gusset folds and such side or edge walls preferably have inwardly foldable flaps partially underlying the main closure panel. This panel has flaps extending from its edges that are foldable to overlie the side or edge walls. The closure panel is preferably hinged to one of the edge walls.

Referring first to the construction of carton, such carton includes a body or tray portion indicated generally at T, having hinged thereto a lid or cover portion, indicated generally at C.

The entire tray may be formed from a single blank of foldable paperboard, indicated generally at B, as shown in FIGURE 2 of the drawing. As the carton, herein shown, is primarily to be used for packaging such commodities as frozen foods it is desirable that the inner surface of the blank be coated with a moisture-vapor resistant material such as wax, polyethylene, or other appropriate material.

The tray portion of the carton includes a central, generally rectangular, bottom wall panel **10** having hingedly attached to and upstanding from its front and rear side edges a pair of opposed front and rear side wall panels **12** and **14**, respectively, and having attached to its end edges a pair of opposed end wall panels **16**.

At the corners of the tray the end and side walls are connected to each other by a square bellows or web fold member **18** which includes a pair of generally triangular

web sections or gussets **18***a* and **18***b*, hingedly attached to each other and a side wall panel and end wall panel respectively. When the tray is set up, as shown in FIGURE 3, the respective sections of each web **18** are folded back so as to overlie each other as well as an end portion of a related end wall panel.

At its upper edge each end wall **16** has hingedly attached thereto and extending inwardly therefrom a relatively narrow elongated closure flap **20**. Likewise, front wall panel **12** has hingedly attached to its upper edge an inwardly extending closure flap **22**. As best seen in FIGURE 3, flap **22** has a central portion **22***a*, hinged directly to and co-extensive with the upper edge of front side wall panel **12**, and a pair of end sections **22***b*, cut from the main flap **22** along cut lines **24** and hingedly attached to the related front wall panel web sections **18***a* along score lines **26**. When the carton is in erected condition the end sections **22***b* of flap **22** serve as connecting tabs and are disposed to overlie an end portion of flap **20** and may be adhesively secured thereto to effect a permanent connection between the end and side walls of the tray.

Again referring to FIGURE 3 of the drawing it will be seen that the cover portion of the tray includes a generally rectangular top wall panel **30** hingedly attached at its rear edge to the upper edge of the tray rear side wall panel **14**.

The cover top wall panel **30** has hingedly attached to its forward edge and to its end edges a cover front flap **32** and a pair of cover end flaps **34** which extend downwardly from the forward and end edges of the cover top wall in overlying relation with the tray front wall and end walls, respectively.

It will be seen that the cover end flaps **34** have cut therefrom, along cut lines **38**, a pair of rear connecting tabs **36** hingedly attached to the rear side wall web sections **18***a* and which, like tabs **22***b*, are secured to end wall flaps **20** to effect a permanent connection between the tray rear side wall and the end walls of the tray.

In this construction the corners of the tray are the same height as the side and end walls of the tray, because the connecting tabs **22***b* and **36** are cut from flaps **22** and **34**, respectively rather than from the web sections **18***a*, as has been done in prior art cartons. Thus, the liquid tight corner construction extends for the full depth of the tray and at the same time the blank is used in the most efficient manner with no paperboard being wasted. This provides a liquid tight web-corner tray with hinge cover which is efficient and economical to produce.

To close the filled carton, flaps **20** and **22** on the upright edge walls are folded down over the contents. The cover panel is folded downward flatwise against the upper edges of the front and side edge walls and held in such position.

After the cover panel has been swung down, the opposite cover flaps **34**, **34** are preferably swung upward to clear the side walls for reception of adhesive. The flaps are then supported in raised position until the adhesive has been applied to the carton.

With the flaps **34** in raised position, quick setting adhesive is then applied to the side edge walls **16**, **16**. It is preferred to apply the adhesive in a plurality of narrow strips in the interests of economical operation.

While various specific forms of adhesive may be employed, it is preferred to apply to the carton edge walls narrow strips or beads of thermoplastic adhesive material in hot condition. This material is well known and is produced in various compositions, broadly referred to as hot melt adhesives. In practice, the action of hot melt adhesive is such that setting or hardening may take place within a few seconds and after a relatively short travel of the carton.

The hot melt adhesive may be applied in any desired conventional manner, whereby such adhesive may be

spread in narrow lines or strips along the vertical edge walls of the carton.

Mechanism employed for heating a supply of solid hot melt material and delivering same to the rotatable rolls **42, 42** may be similar in principle to the mechanism disclosed in the copending application of Francis A. Chidsey, Jr., Serial No. 125,920, showing the heating and delivery of a supply of hot melt to a rotary member and the delivery of a narrow strip or bead of adhesive by such rotary member to a carton joint.

As shown in FIGURE 1 the uppermost bead or strip of hot melt is applied to the extreme upper edge of the vertical walls to provide an adhesive strip **44** of a width so as to extend appreciably on both sides of the center of the fold lines between wall **16** and attached flap **20** at the sides of the carton; and likewise on both sides of the center of the fold line between wall **12** and attached flap section **22***a*. The other adhesive strips **45** and **46** may be applied centrally of the walls **12** and **16, 16** and near their lower edges respectively.

As soon as the hot melt strips have been applied to the walls **16, 16**, the flaps **34, 34** will be folded down by suitable means.

After the flaps **34** have been secured in place, the package is ready to have flap **32** folded down and secured against the front wall **12**.

Generally the flap **32** is raised initially, and while flap **32** is in raised position adhesive is applied as a strip or bead of hot melt along the mid portion of the wall **12**, along another line near the lower edge of the wall, and along the fold line between the wall **12** and its attached flap section **22***a* which results in some of the adhesive being spread on both sides of the center line of the fold, as shown in FIGURE 1. The flap **32** is thereafter folded down and held firmly against the wall **12** until the adhesive sets.

As the top line or bead of adhesive laid along the fold lines between the top wall panel **30** and its attached flaps is spread approximately symmetrically along the center line of the fold, it is clear that, when the flaps **32** and **34, 34** are folded down, the freshly applied adhesive will tend to spread slightly and cause adherence, not only along the exact line of fold, but also it will spread along the edges of the top wall panel **30** and along the adjacent edges of inturned flaps **20, 20** and **22***a* to cause adherence between these parts. The carton is thus substantially hermetically sealed.

It is to be understood that the paperboard material employed may be quite thin, having a caliper of the order of approximately .012 to .016 inch, and that the places of overlap of flaps **22***a* and **20, 20** near the front corners of the carton are negligible, and those places do not prevent or interfere with the complete closing of the carton at these points. The thickness of the bead of hot melt adhesive as freshly applied to the carton walls is in practice somewhat in excess of the thickness of the paperboard employed.

While the hot melt adhesive has been shown herein as being applied directly to the carton walls, it is also within the contemplation of my invention to apply the adhesive to the flaps **32, 34, 34** on the carton cover panel.

It is to be understood that references made herein to the folding or swinging of the cover panel and cover panel flaps downwardly or upwardly, and other references related to the vertical or horizontal, are made in a relative sense for convenience of description and definition, and not in a limiting sense.

While the present description sets forth a preferred embodiment of the invention, various changes may be made in the construction as disclosed 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 claim rather than to the foregoing description to indicate the scope of the invention.

I claim:

Closing and sealing means for a paperboard carton of the type having overlapping inner and outer sections of paperboard, the inner section having two panels hinged together along a first hinge line to define at the first hinge line an exterior corner and the outer section having two panels hinged together along a second hinge line to define at the second hinge line an interior corner, said exterior and interior corners being in juxtapositioned and parallel arrangement, the closing and sealing means comprising a narrow strip of adhesive applied directly to the paperboard along the exterior corner of the inner section and along the interior corner of the outer section to straddle the corners operable to secure the sections together securely at the corners, and additional continuous narrow strips of like adhesive applied directly to the paperboard on the outer side of one inner section panel at widely spaced locations from the first mentioned strip of adhesive operable to hold the overlying panel of the outer section securely against the inner section.

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FRANKLIN T. GARRETT, *Primary Examiner.*

J. L. KRUTER, *Assistant Examiner.*