United States Patent [19]

Kuhn et al.

[11] **3,744,705**

[45] **July 10, 1973**

[54] **CARTON CLOSURE RIGIDIFYING CONSTRUCTION**

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[73] Assignee: **Stone Container Corporation**, Chicago, Ill.

[22] Filed: **Oct. 30, 1970**

[21] Appl. No.: **85,622**

[52] U.S. Cl. ..... **229/33**, 229/45, 229/51 WB

[51] **Int. Cl.** **A45c 13/26**

[58] **Field of Search** ..... 229/33, 36, 45, 51 TC, 229/51 SC, 37 R, 51 WB, 44 R

[56] **References Cited**

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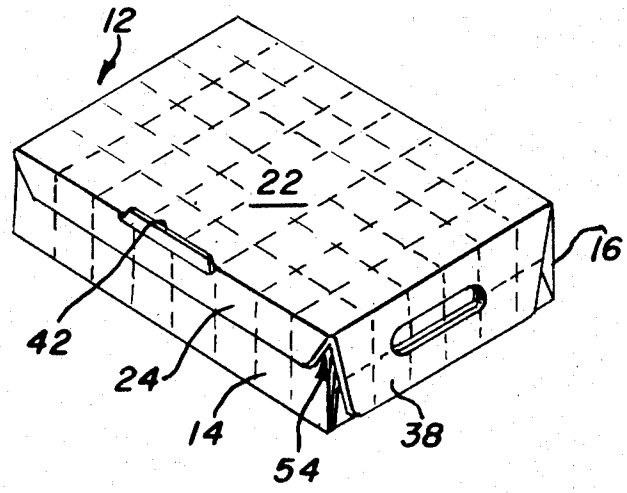
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Assistant Examiner—Stephen P. Garbe
Attorney—Silverman and Cass

[57] **ABSTRACT**

A carton formed from foldable paperboard, cardboard or the like to include a first or top panel with a hingedly connected end closure or manufacturer's flap, a second or front panel juxtaposed the top panel for adhesive attachment thereto by means of the flap, a pair of parallel side panels, and a rear panel disposed parallel to but spaced from the front panel. The flap forms a joint completing assembly of the carton. In one embodiment, slot and tab means are provided between the juxtaposed top and front panels which enable the tab means to maintain the joint rigid and intact while the adhesive sets. In another embodiment, in addition to the slot and tab means, a pair of flaps are hingedly connected to the side panels, respectively, to abut the rear panel and provide support to prevent bending thereof as the carton is being formed.

6 Claims, 8 Drawing Figures



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SHEET 1 OF 2

Fig. 1

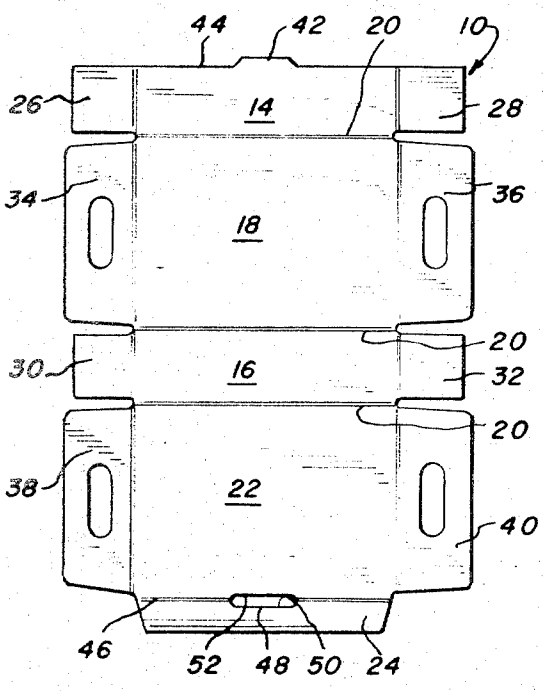


Fig. 3

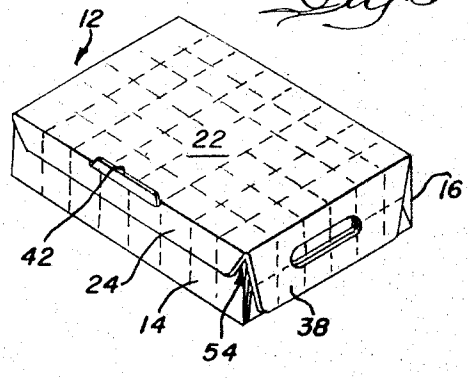


Fig. 4

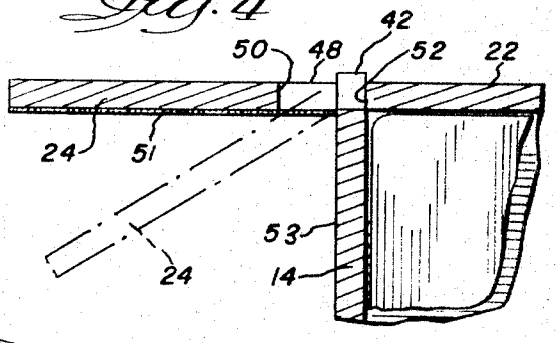


Fig. 2

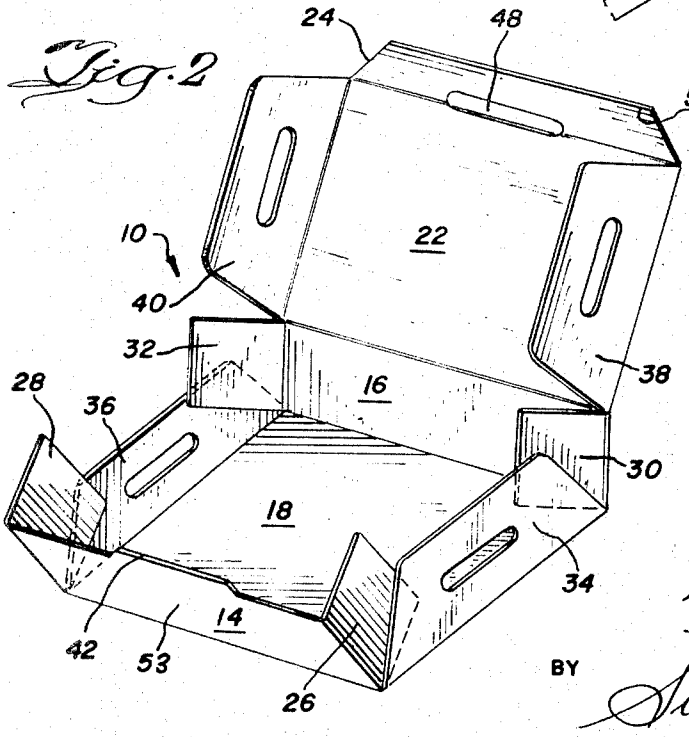
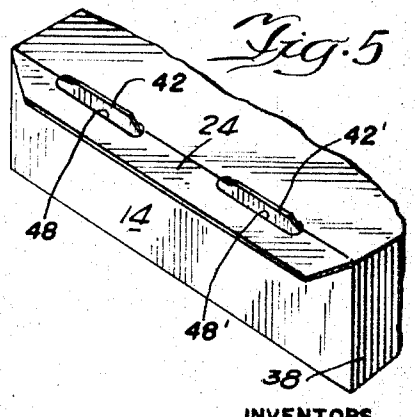


Fig. 5



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Fig. 6

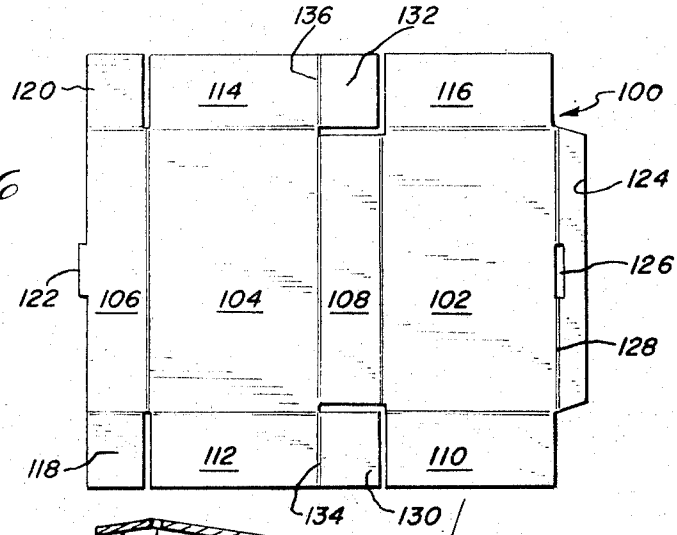


Fig. 8

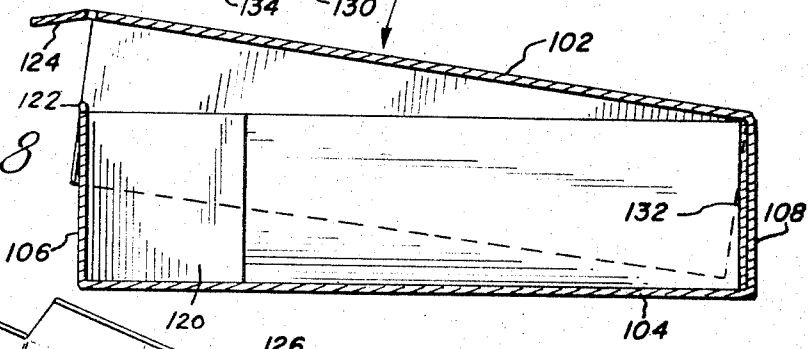
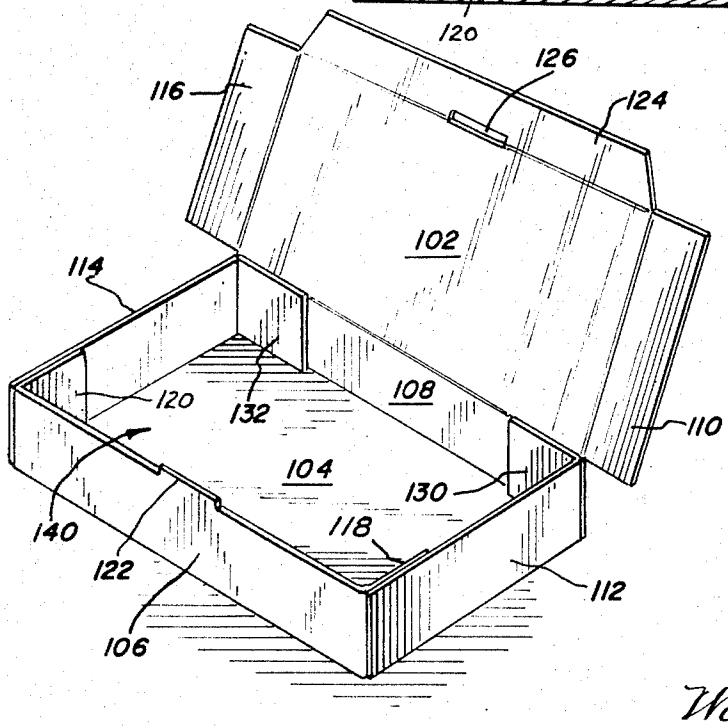


Fig. 7



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CARTON CLOSURE RIGIDIFYING CONSTRUCTION

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to paperboard containers, and more particularly, to a novel front and rear end closure ragidifying construction to facilitate assembly of such cartons.

2. Description of the Prior Art

In the paperboard carton art, there are machines for folding carton blanks with the contents enclosed upon completon of the folding operation. One such carton blank folding machine is disclosed in co-pending application Ser. No. 10,584, filed Feb. 11, 1970 assigned to the assignee herein, and entitled "Packaging Machine". The folding operation described in said co-pending application refers to a manufacturer's lap or flap of the carton blank being required to be secured to form the manufacturer's joint of the assembled container. Also, certain flaps disposed opposite to and spaced from the manufacturer's joint must be secured. This folding or wrap-around operation requires mating panels or flaps of the carton blank to be pressed against one another and held in face-to-face juxtaposition by a suitable pressure until adhesive applied therebetween sets or dries.

A problem which occurs during set-up of such a carton blank in a carton folding machine arises in connection with completing said joint satisfactorily because the adhesive must set to maintain the joint. The same problem is encountered in connection with the aforementioned flaps which are spaced from the joint. Carton blanks heretofore used did not provide specific means for maintaining the pertinent flaps and panels in proper face-to-face juxtaposition relative to each other during setting of the adhesive. Pressure applied against the outside of the flap was transmitted to the nether and/or adjacent positioned panels tending to push the panels apart and prevent suitable face-to-face juxtaposition until an adhesive bond therebetween is established. This is especially pertinent and relevant in high speed carton folding machines.

SUMMARY OF THE INVENTION

A wrap-around carton formed from a pre-scored foldable blank which includes a top panel having a hingedly connected end closure flap, a front panel positioned for cooperation with the flap to form the manufacturer's joint of the erected carton, a pair of side panels, and a rear panel disposed parallel to but spaced from the front panel. A tab or tongue is formed on the front panel and a slot is provided along the fold line between the top panel and the end closure flap. A pair of rear support flaps hingedly are connected, respectively, to the side panels. Upon erecting the carton blank, in the final folding operation, the tab is extended through the slot to hold the front panel in face-to-face abutting relationship with the end closure flap whereby to reinforce and rigidify the manufacturer's joint so that the flap can be pressed against the front panel and maintained in this condition until the adhesive sets along the manufacurer's joint. The rear support flaps abut the rear panel and prevent bending or bowing of the rear panel during the folding operation.

Accordingly, a primary object of the invention is to provide a foldable carton having panel rigidifying means integral therewith so that in completing folding assembly of the carton, first and second panels are retained in face-to-face juxtaposition, and an intermediate panel is retained in vertical position parallel to but spaced from the first panel, with the said rigidifying means arranged to maintain the assembly arrangement until an adhesive joint between respective panels is completed.

A further object of the invention is to provide such a carton in which the panel rigidifying means include slot and tab means on the first and second panels, and rear support flaps adapted for cooperation with the intermediate panel.

Other objects and advantages of the invention will become apparent to the skilled artisan from the ensuing disclosure.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a plan view of a carton blank embodying one form of the carton closure rigidifying means of the invention.

FIG. 2 is a perspective view of the blank illustrated in FIG. 1 partially erected with the top still open.

FIG. 3 is a perspective view of the carton completely assembled from the blank illustrated in FIG. 1.

FIG. 4 is a fragmentary sectional view of the carton of FIG. 3 with the manufacturer's flap shown in solid line prior to being folded down, and in dotted line in partially folded down condition.

FIG. 5 is a fragmentary perspective view of a carton similar to that illustrated in FIG. 3, but illustrating the use of plural rigidifying means of the invention of FIGS. 1–4.

FIG. 6 is a plan view of a carton blank embodying an alternate form of the carton closure rigidifying means of the invention.

FIG. 7 is a perspective view of the blank illustrated in FIG. 6 partially erected with the top still open.

FIG. 8 is a sectional view taken through a carton formed from the blank of FIG. 6, showing the top panel thereof in partially closed condition.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In FIG. 1 there is illustrated a carton blank 10 which may be die cut from sheeting of paperboard, either corrugated or otherwise, by conventional automatic machinery. The blank 10 is pre-scored for folding into a carton 12 and includes a front panel 14, and a rear panel 16 with a bottom panel 18 joined between the said front and rear panels. Lines of fold 20 are provided to facilitate erection of the carton 12 in a well known manner. The blank 10 includes a top panel 22 joined to rear panel 16 along a fold line 20, and terminates in a front flap 24, more commonly known as a manufacturer's flap. Side flaps 26, 28 are joined along lines of fold to front panel 14 and side flaps 30, 32 are joined along lines of fold to rear panel 16. Bottom and top panels 18, 22, respectively, are provided with side panels 34–40 as illustrated.

The above features of the carton blank are conventional and comprise the usual panels and flaps of a standard carton blank. Such blanks can assume a wide variety of configurations and dimensions, the specifics of which generally are dictated by the size and characteristics of the item or items intended to be packaged. However, all such cartons include at least top and bot-

tom, and front and rear panels, at least one of such panels being provided with a manufacturer's flap, such as hinged flap **24.** As seen in FIG. **3,** flap **24** is located and sized to abut front panel **14** in a face-to-face relation with adhesive, preferably, means applied to these abutting surfaces so that the carton will remain assembled, as desired.

In addition to the above standard features, the carton blank **10** includes an extension tab or tongue **42** provided on the free edge **44** of front panel **14.** Also provided in the blank **10** along the line of fold **46** between top panel **22** and flap **24** is a cut-out slot **48.** The specific elongate dimensions of the tab **42** and slot **48** are not of critical importance; however, the dimensions are such that tab **42** conveniently can be inserted or received within slot **48** when blank **10** is assembled.

As seen most clearly in FIG. **4,** slot **48** has a lead edge **50** and an abutment edge **52.** The transverse dimension of slot **48** is greater than the thickness of tab **42** such that the tab may be positioned within the slot conveniently.

The carton blank **10** may be assembled manually, or as generally will be the case, by packaging machine such as that described in the aforementioned copending application. It is to be understood that blank **10** is capable of being assembled by any conventional packaging machine. In FIG. **2,** a partially assembled blank **10** is shown just prior to completion of the assembling operation. The blank **10** is designed and adapted most effectively for assembly about the items intended to be packaged. That is, the items are positioned on bottom panel **18** of the blank **10** and the blank thereafter is assembled. Thus, although not illustrated, the partially assembled blank of FIG. **2** normally has items covering panel **18.**

In the said final assembly operation the front panel **14** is folded upwardly and the side panels **34, 36** hingedly connected with the bottom panel **18** are folded into their vertical position. Top panel **22** next is moved into overlying position with bottom panel **18** such that manufactuer's flap **24** extends beyond front panel **14** to subsequently be bent over into abutment with front panel **14.** Rear panel **16** is maintained in its vertical position by abutment against the items in position on bottom panel **18.** Prior to the folding operation, adhesive **51** is applied to the lower surface of flap **24** or to surface **53** of front panel **14.** Next, flap **24** is folded over so that surface **51** is juxtaposed surface **53.**

During this latter operation of folding flap **24** over surface **53** of front panel **14,** a short period of time is required for maintaining the two surfaces in face-to-face juxtaposition until the adhesive bond has become firm. During this period of time it is necessary to maintain front panel **14** in fixed relationship relative to top panel **22** and to prevent movement of these latter panels until the adhesive has set. In the blank shown, tab **42** is positioned within slot **48** during the final assembly operation such that the tab abuts edge or surface **52** of the slot. Upon folding over of flap **24** to abut surface **53,** as shown in progress in FIG. **4,** tab **42** maintains front panel **14** in fixed relationship with top panel **22.** Thus, flap **24** may be pressed against front panel **14** to which it is being secured, and the pressure can be maintained until the adhesive has set. Tab **42** will prevent collapse or withdrawal of panel **14** into carton **12** while the adhesive sets and pressure is maintained against flap **24.**

Once a sufficient period of time has elapsed to allow the adhesive to set, the manufacturer's joint **54** will be secured. There is no necessity for applying a force from the inside of the carton or for relying upon the items to be packaged to maintain the rigidity of front flap **14** while this assembly operation is taking place so as to prevent collapsing of front panel **14.**

In instances where heavier and/or larger items are required to be packaged so that a larger carton is required, or where the elongate dimension of the front panel **14** is great, it may be desirable to utilize an additional set of tab and slots **42', 48',** as seen in FIG. **5.** The arrangement of FIG. **5** provides additional rigidity to the container blank as the same is being assembled and formed into the container as shown. In all other respects, the structure of FIG. **5** is identical to that previously described.

The carton and blank illustrated in FIGS. **6–8** is intended for use in instances where assembly thereof is effected without items to be packaged suitable for preventing bending or bowing of the rear panel of the carton during folding. The blank **100** is similar to blank **10** in that it includes top and bottom panels **102, 104,** front and rear panels **106, 108,** and side panels **110-116,** respectively, as illustrated. Likewise, side flaps **118, 120** are hingedly connected to front panel **106,** and an extension tab **122** is provided on the front panel **106.** Top panel **102** includes a manufacturer's lap **124** and a cut-out slot **126** is provided along line of fold **128,** the tab **122** being adapted for mating engagement within slot **126** upon assembly of blank **100** as previously described.

Blank **100** differs from blank **10** in the construction of rear support or side flaps **130, 132.** Whereas side flaps **30, 32** of blank **10** are formed integral with rear panel **16** along lines of fold respectively therebetween, rear support flaps **130, 132** are hingedly connected to side panels **112, 114,** respectively, along lines of fold **134, 136.** The said rear support flaps **130, 132** are not joined in any fashion to rear panel **108** or side panels **110, 116,** but are free thereof.

As indicated, blank **100** is adapted most effectively for assembly in instances where items to be packaged do not bear against the rear panel **108** to prevent bowing or bending thereof during the assembly operation. In such instances, while tab **122** and slot **126** cooperate effectively to maintain front panel **106** in rigid condition, provision also is necessary for maintaining rear panel **108** in substantially vertical, rigid condition. Without the benefit of support from the inside of the carton confines which is rendered by the packaged items, rear panel **108** tends to bend or bow thereby deterring efficient assembly of the tab **122** in the slot **126** and establishment of the adhesive bond between the rear and side panels. This especially is pertinent during high speed assembly in carton folding machines.

Rear support flaps **130, 132** are provided for rigidly maintaining rear panel **108** in substantially vertical position during assembly of carton blank **100.** Upon assembly of side panels **112, 114** and front panel **106** into upright position, rear support flaps **130, 132** are folded inwardly as seen in FIG. **7** to be disposed substantially parallel to front panel **106.** Next, rear panel **108** is folded into upright position to abut the said rear support flaps **130, 132.** In this juxtaposed condition, rear panel **108** is supported and prevented from bending outwardly or collapsing into the tray portion **140**

formed by the bottom, side, front and rear panels of blank **100**. The rigid condition is maintained until adhesive applied between the abutting surfaces of rear panel **108** and rear support flaps **130, 132** has become firm.

The rmaining operation of folding over top panel **102** is the same as that described in connection with blank **10**.

It is to be understood that the invention contemplates implementation thereof in connection with other than end closures or top walls of foldable cartons. The reinforcing or rigidifying means represented by a tab **42** and a cooperating slot **48** in the fold line can be applied also to side wall or bottom wall joints.

What it is desired to be secured by Letters Patent of the United States is:

1. A foldable carton formed from a one-piece paperboard blank comprising, at least a first top panel having a closure flap connected thereto along a hinge line, a second front panel positioned for cooperation along a free edge thereof with said closure flap and normal to the first panel, said panels being secured by an adhesive bond between said flap and said second panel, a pair of side panels, and a rear panel disposed parallel to but spaced from the second panel, slot and tab means positioned between said first and second panels for mating engagement one within the other rigidly supporting and maintaining said second panel normal to said first panel and inwardly of said closure flap while said adhesive bond is secured, said slot positioned along said hinge line, the transverse dimension of said slot being greater than the thickness of said tab such that the slot has a lead edge and an oppositely facing abutment edge when said first panel and said closure flap are lying in the same plane, said edges lying on opposite sides of said hinge line, said tab being integral with the second panel and juxtaposed said abutment edge while said bond is being secured, and rear panel support means associated with said side panels ro rigidly support said rear panel during forming of said carton.

2. A carton as claimed in claim **1** in which said rear panel support means comprise a pair of rear panel support flaps on said side panels.

3. A carton as claimed in claim **2** in which said rear panel support flaps are hingedly connected to said side panels to abut said rear panel.

4. In a foldable carton formed from a one-piece paperboard blank comprising at least one panel having a closure flap connected thereto along a hinge line, a second panel positioned for cooperation along a free edge thereof with said flap, an adhesive joint between said second panel and said flap with the first and second panels maintained one normal to the other; slot and tab means positioned between said panels for mating engagement one within the other rigidly supporting and maintaining said second panel normal to said one panel and inwardly of said closure flap while said adhesive joint is secured, said slot positioned along said hinge line and the transverse dimension of said slot being greater than the thickness of said tab such that the slot has a lead edge and an oppositely facing abutment edge when said first panel and said closure flap are lying in the same plane, said edges lying on opposite sides of said hinge line, said tab being integral with said second panel and juxtaposed said abutment edge while said joint is being secured.

5. A carton as claimed in claim **4** in which said slot and tab means comprise a pair of slots and tabs for cooperation respectively one with another.

6. A carton blank comprising at least a first panel having a hingedly connected flap along one edge thereof, an intermediate panel formed along an edge opposite said one edge, a second panel formed adjacent said intermediate panel, and a terminating panel formed adjacent said second panel, said terminating panel having a free end opposite said second panel, said terminating panel having an extension formed along the free edge thereof, the extension being of longitudinal dimension less than that of said terminating panel and coplanar therewith at all times, a fold line provided between said first panel and said flap, said first panel having a slot formed therein along said fold line, said extension having a length less than the length of said slot, the transverse dimension of said slot being greater than that of said extension, said second panel including a pair of side panels hingedly connected along opposite free edges thereof, a pair of intermediate panel support flaps formed respectively along one edge of each said side panels, said intermediate panel support flaps being hingedly connected to said side panels and being adapted to be assembled normal to said second panel in abutting relationship with said intermediate panel.

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