United States Patent

Scully

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[45] **Apr. 4, 1972**

[54] CARTON HAVING A HINGED END CLOSURE

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[21] Appl. No.: **68,864**

[52] **U.S. Cl.** ..... **229/51 TC**

[51] **Int. Cl.** **B65d 5/54**

[58] **Field of Search** ..... 229/51 TC, 51 TS

[56] **References Cited**

UNITED STATES PATENTS

3,282,492 11/1966 Vergobbi ..... 229/51 TC

3,523,636 8/1970 Phillips ..... 229/51 TC

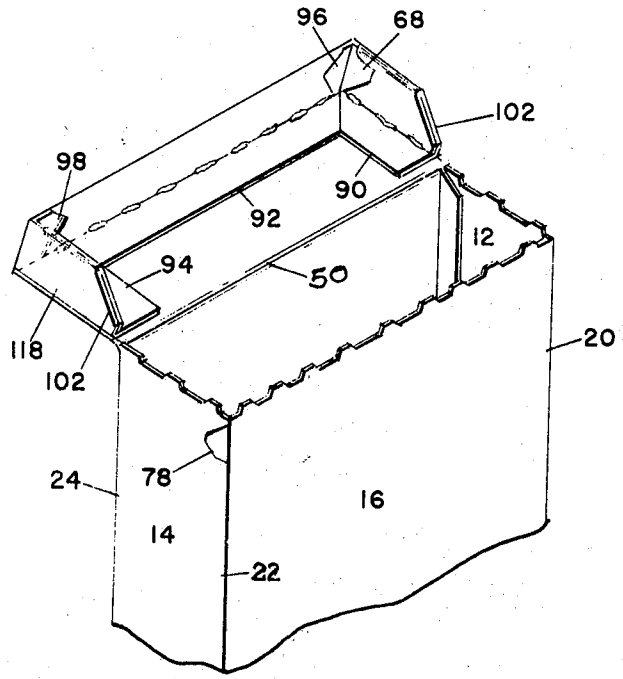
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[57] **ABSTRACT**

A rectangular carton having a hinged top closure connected to the body portion by weakened lines along the upper edges of the front and end wall panels and adapted to be opened by tearing along the weakened lines, the carton having provision for automatically locking the hinged top closure to the body portion upon reclosing the same whereby to prevent inadvertent opening thereof.

5 Claims, 9 Drawing Figures



Patented April 4, 1972 3,653,582

4 Sheets-Sheet 1

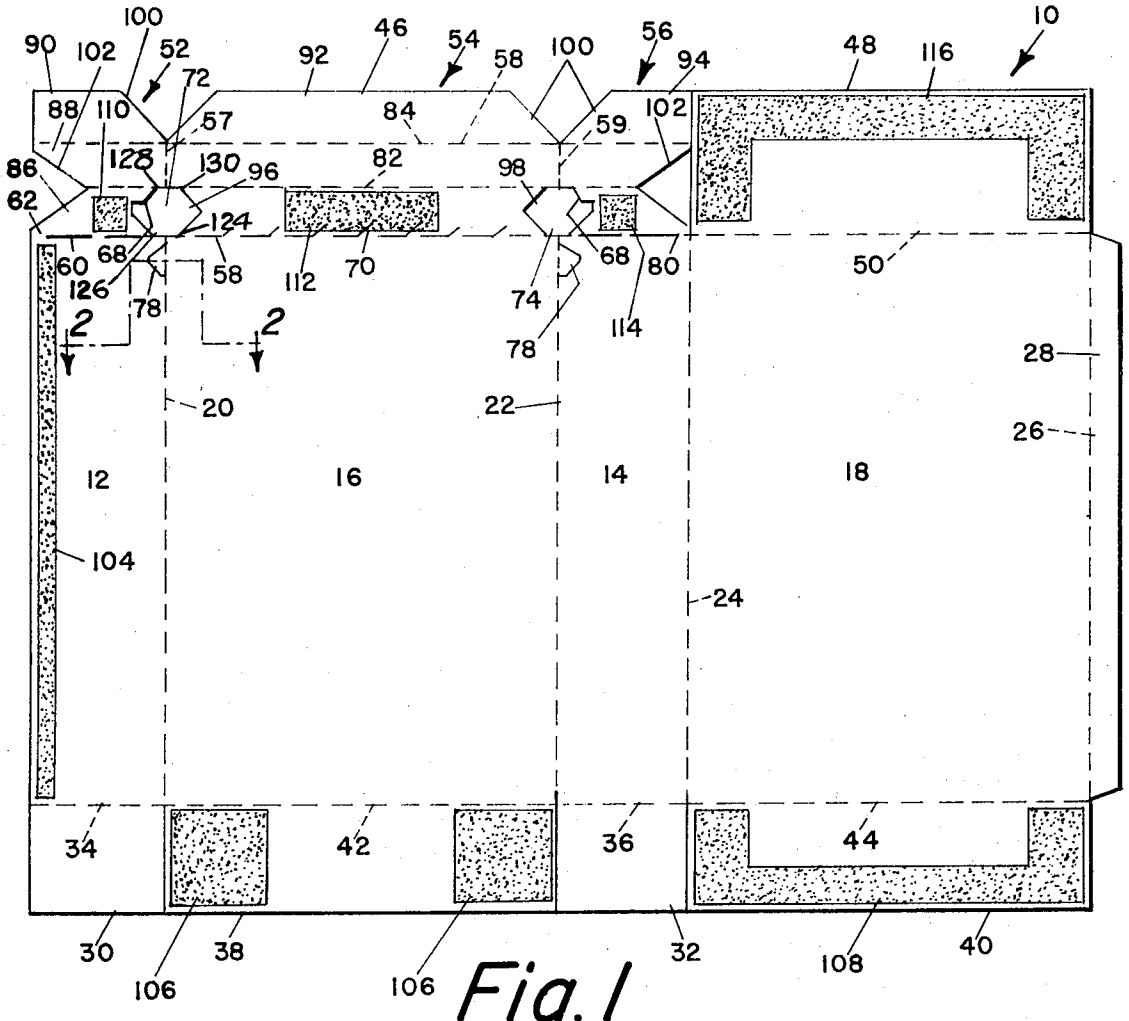


Fig. 1



Fig. 2

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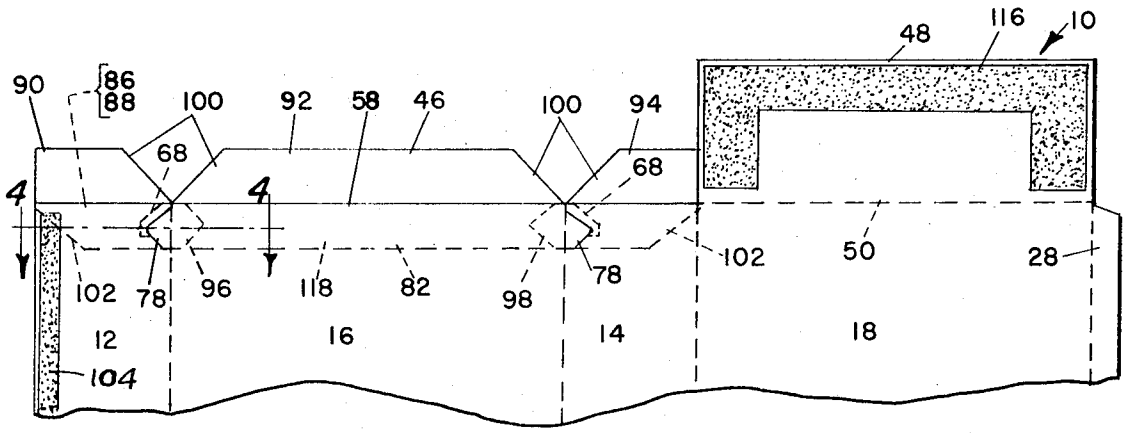


Fig. 3

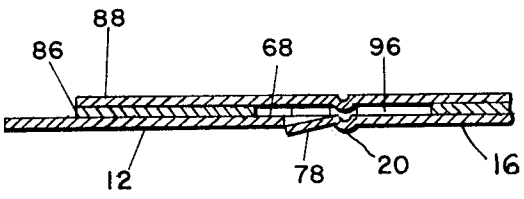


Fig. 4

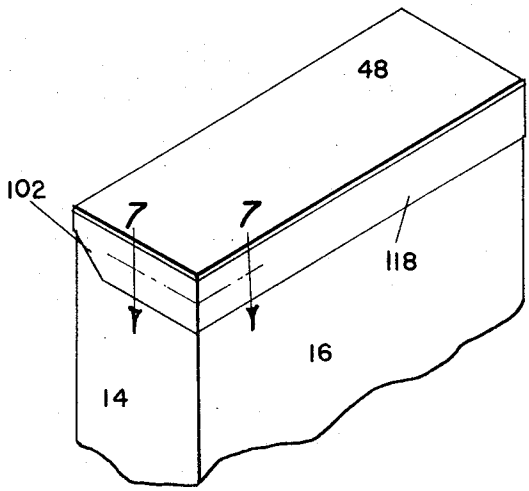


Fig. 6

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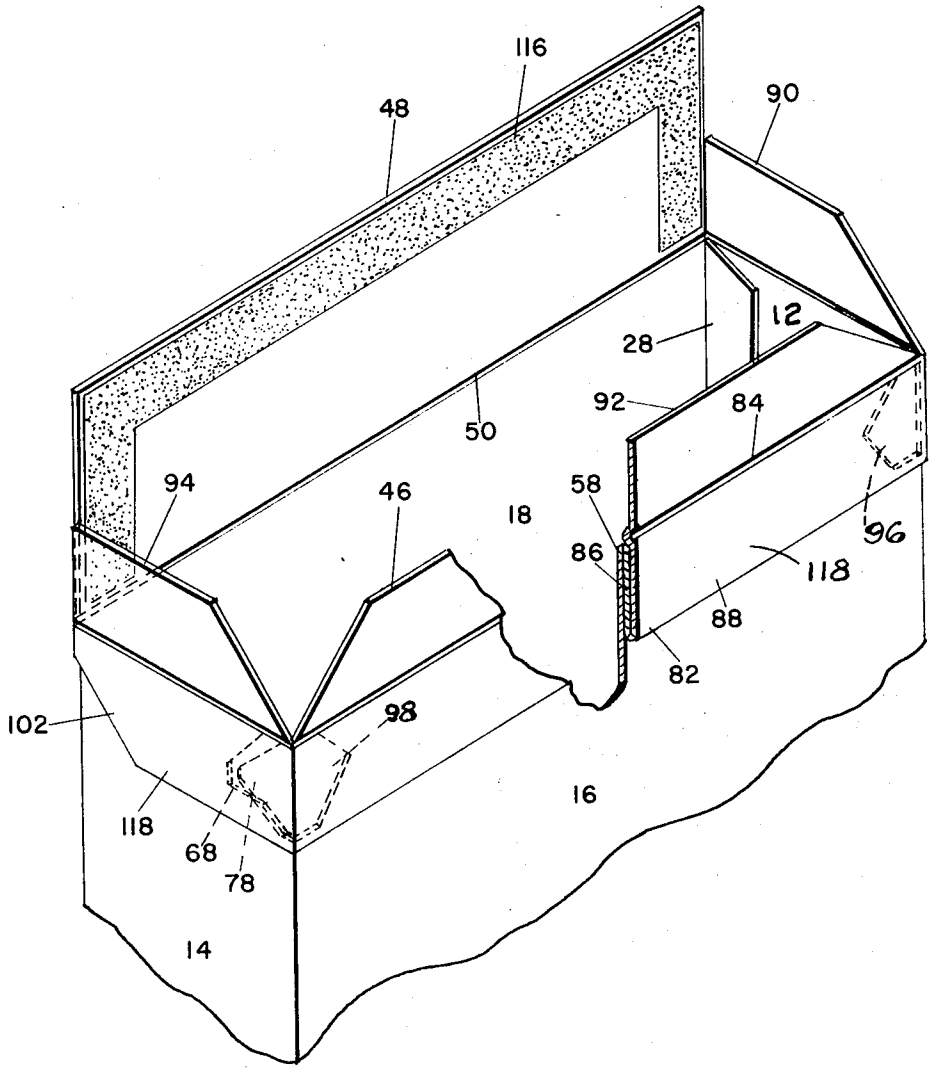


Fig. 5

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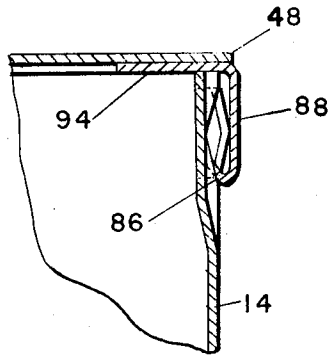


Fig. 9

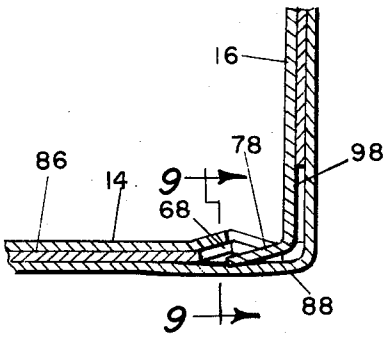


Fig. 7

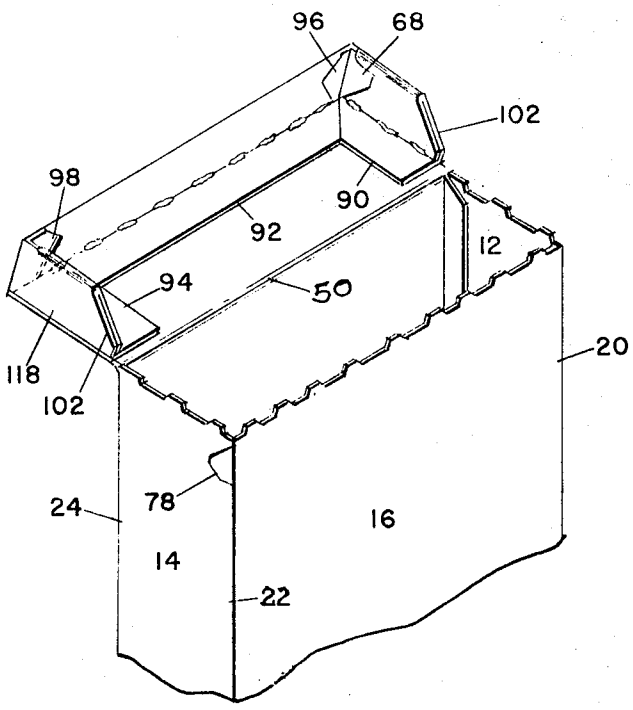


Fig. 8

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CARTON HAVING A HINGED END CLOSURE

The invention relates to a carton and particularly to a carton having a hinged and reclosable top closure.

The invention has for an object to provide a novel and improved carton having a novel top closure providing a hinged cover which may be easily opened and reclosed and which is characterized by novel means for automatically locking the hinged closure to the body portion of the carton upon reclosing the same.

The invention has for a further object to provide a novel and improved carton of the character specified whose structure is such as to enable it to be efficiently and economically produced on a standard high speed packaging machine, and which uses a minimum of carton material whereby the carton may be economically manufactured.

With these general objects in view and such others as may hereinafter appear, the invention consists in the carton having a hinged end closure as hereinafter described and particularly defined in the claims at the end of this specification.

In the drawings illustrating the preferred embodiment of the invention:

FIG. 1 is a plan view of a carton blank embodying the present invention;

FIG. 2 is an enlarged cross-sectional view taken on the line 2—2 of FIG. 1;

FIG. 3 is a view of the upper portion of the blank showing the initial folding operation to provide a two-ply band;

FIG. 4 is an enlarged cross sectional view taken on the line 4—4 of FIG. 3;

FIG. 5 is a perspective view of the upper portion of the carton folded into rectangular form and showing the top flaps extended;

FIG. 6 is a perspective view similar to FIG. 5 showing the top closure completed;

FIG. 7 is a cross-sectional view taken on the line 7—7 of FIG. 6;

FIG. 8 is a perspective view of the hinged top closure shown in its opened position; and

FIG. 9 is a cross-sectional view of the carton showing the same reclosed;

In general, the present invention contemplates a novel and improved carton having a hinged top closure commonly known as a "flip top" closure and which is characterized by novel means for positively locking the closure to the body portion automatically upon reclosing the carton. The present carton is an improvement over the carton having a hinged top closure as illustrated and described in the U.S. Pat. No. 3,282,492, issued to John G. Verbobbi, Nov. 1, 1966, and assigned to the present assignee. In the illustrated embodiment of the invention, the top closure is formed by integral end closing portions which are folded and sealed to provide a hinged closure in the completed carton wherein the sides of the closure extend over and around three sides of the top of the body portion of the completed carton, the fourth side being hingedly connected thereto. The closure is secured in its initially closed position by partially slit or weakened lines along three of the top closure score lines of the body of the carton and which may be easily broken by the user to open the carton, the closure being joined to the fourth score line to provide the hinge.

The construction of the present carton is such that it may be economically produced in a standard high speed carton forming machine. It will also be noted that the present hinged closure may be produced from integral end closure portions using no more material than would be used in producing a normal full flap conventional end closure whereby to enable low cost production of the carton.

Referring now to the drawings, the carton blank indicated generally at **10** in FIG. 1 is provided with end wall panels **12, 14** and side wall panels, **16, 18** forming the body portion of the carton and which are defined by prescored lines **20, 22, 24, 26**, a side seam flap **28** being connected to the side wall panel **18** as shown. The side wall panel **16** is also referred to herein as the front panel.

The illustrated carton blank is provided with bottom closing flaps comprising end flaps **30, 32** connected to end wall panels **12, 14**, respectively, by prescored lines **34, 36** and side flaps **38, 40** connected to the side wall panels **16, 18**, respectively, by prescored lines **42, 44**.

The top closing portions of the illustrated carton blank include an integral three-section portion, indicated generally at **46**, connected to the body panels **12, 16** and **14**, which portion is adapted to be folded to form the three sides of the hinged closure or cover fitted about the upper end of the body portion. The top closure further includes a side flap **48** hingedly connected to the side wall panel **18** by a prescored line **50** and which comprises the last folded flap to form the top of the hinged cover in the completed carton.

As herein shown, the three-section cover-forming portion **46** comprises integral sections **52, 54** and **56** extending from the body panels **12, 16** and **14**, respectively, and connected together by prescored lines **57, 59**. The cover-forming portion **46** is connected to the body panels along the top score line **58** which is provided with weakened portions, herein shown as comprising elongated spaced slits cut through the material, leaving relatively small frangible connecting portions between the body panels and the integral cover-forming portion **46**. As illustrated herein, the weakened line between the end wall panel **12** and the section **52** comprises spaced slits **60**, leaving relatively small unslit connecting portions **62**. The weakened line between the panel **16** and the section **54** also comprises spaced slits, leaving relatively small unslit portions **70**. Likewise, the weakened line between the end wall panel **14** and the section **56** is also provided with spaced slit portions, leaving small unslit portions **80** as shown.

The integral closure forming portion **46** is also provided with two spaced transverse score lines **82, 84** providing elongated transverse sections indicated at **86, 88** of substantially equal width adapted to be folded one upon the other to form two-ply side walls which extend about three sides of the top of the body portion in the assembled carton, leaving relatively short flaps **90, 92, 94** extending from the side walls. As shown in FIG. 1, the transverse section **86** is provided with cutout areas **72, 74** formed in the sections **52, 56** which define tab-engaging portions **68** designed for cooperation with tab portions **78** formed in the end wall panels **12** and **14** as will be hereinafter more fully described. The section **86** is also provided with V-shaped cutouts **96, 98** formed in the front panel **16** and which form a continuation of the cutout areas **72, 74**, the cutout portions **96, 98** serving to relieve the tension at the corners of the assembled carton. As herein shown, the adjacent corners of the short flaps **90, 92, 94** are cut off at 45°, as indicated at **100**, and the ends of the transverse sections **86, 88** are also provided with V-shaped cutouts as indicated at **102**.

While the carton blank is still in its developed form, as shown in FIG. 1, selected areas of the inner face of the blank are provided with a coating of adhesive. Thus, a narrow strip of adhesive **104** is applied to the marginal areas of the end wall panel **12** for sealing the same to the side seam flap **28** in the formation of the carton. The bottom closure flap **38** is provided with rectangular areas **106** of adhesive, and the bottom closure flap **40** is also provided with an adhesively coated U-shaped area **108** as shown. The transverse section **86** of the cover-forming portion **46** is provided with adhesively coated areas **110, 112, 114** for sealing the same to the transverse section **88** to form the two-ply band or side wall about three sides of the closures in the assembled carton. The side flap **48** is also provided with an adhesively coated area **116** along the marginal portions thereof as illustrated.

In accordance with one feature of the present invention, the cutout areas **72, 74** define engaging portions **68** which are adapted to cooperate with triangular tab portions **78** formed by slitting the end wall panels **12, 14** and which are arranged to effect automatic locking of the closure to the body of the carton after the closure has been initially opened and reclosed. The triangular tabs **78** are rounded at their outer ends and are hinged along the score lines **20, 22**, respectively.

The cutout areas **72, 74** defining the engaging portions **68** and the triangular tab portions **78** are formed in the blank prior to assembly. More specifically, one cutout area **72** is defined by a cut line extending from a point **124** along weakened line **58** on one side of score line **20** to a point **126** on the other side of score line **20**. The cut line then extends angularly upwardly at about 45° to a medial point in the transverse section **86**; then upwardly and inwardly to form a right angle defining the tab-engaging portion **68**; and then angularly inwardly to a point **128** on score line **82**. The cut line then extends along the score line **82** inwardly to a point **130**. From the point **130**, the cut line extends angularly downwardly and inwardly and then downwardly and outwardly to the starting point **124**. It will be apparent that the cutout area **74** is similarly defined. Thus, the transverse section **86** has two spaced tab-engaging portions **68** disposed in sections **52** and **56** adjacent the score lines **20, 22**, and the end wall panels are slit to provide triangular tab portions immediately below the engaging portions **68** so that in the assembled carton, the engaging portions **68** coincide substantially with the tabs **78** in a manner such that the portions **68** hook under the triangular tabs **78**. Each tab **78** is defined by a cut line, one end of the line extending from its adjacent score line **20, 22** downwardly and outwardly at 45°; over the rounded end portion; and then downwardly and inwardly at 45° back to its score line. In practice, the hinged tab portions **78** tend to rock outwardly in their folded and assembled condition to permit the portions **68** to engage thereunder whereby to effect locking of the cover to the body of the carton.

In the assembly of the carton, the closure forming portion **46** is first folded to provide the two-ply side wall portion or band **118**. As shown in FIG. **3**, the three-section portion **46** is folded downwardly along the weakened score line **58** to present the same against the outer face of the front panel **16** with the section **86** in non-adhesive engagement with the upper end of the panel **16**. The portion **46** is then folded upwardly along the score line **82** to present the section **88** against the adhesively coated areas **110, 112, 114** of the section **86**. Application of pressure will seal the sections together to provide the two-ply portion **118**.

The carton blank as thus folded is then assembled into tubular form, as shown in FIG. **5**, preferably by folding the same about a forming block to present the adhesively coated area **104** in overlapping engagement with the side seam flap **28** and applying pressure to seal the seam. This folding operation also folds the two-ply portion **118** to form in effect an unsealed band about three sides of the upper end of the body portion. The inner face of the two-ply band is free of adhesive, and the engaging portions **68** extending from the inner ply engage with the tabs **78** in the end wall panels **12, 14**. The open portions **96, 98** occurring at the corners relieve any undue strain or tension when folding the two-ply section about the corners.

In practice, the bottom closing flaps are then folded in overlapping relation and pressed against the end of the forming block in the usual manner. The end flaps **30, 32** are first folded inwardly, and the side flap **38** is then folded over the end flaps to present the rectangular adhesive coated areas **106** against portions of the end flaps. The last folded flap **40** is then folded to present the adhesively coated portion **108** against the remaining portions of the end flaps and also in overlapping relation to the side flap **38** as shown. Pressure may then be applied to set the adhesive and complete the bottom closure. It will be understood that the bottom closure herein shown comprises what is known in the trade as an "economy" bottom closure wherein the closing flaps are shorter than the thickness of the carton and wherein the side flaps overlap along the center of the carton, as distinguished from a conventional bottom closure wherein both side flaps are of a full length equal to the thickness or narrower width of the carton. The carton with its adhesively secured bottom closure is then removed from the forming block and filled with the material being packaged.

After the filling operation, the top closure is completed in the manner shown in FIGS. **5** and **6**, wherein the short flaps **90, 92, 94** are first folded inwardly and thereafter the hinged and adhesively coated side flap **48** is folded down on top of the short flaps and adhesively secured thereto to produce the flip-top carton shown in FIG. **6**. It will be seen that the expedient of cutting off the adjacent corners of the flaps **90, 92, 94** presents the latter in a single plane free of any overlapping portions, thus providing less bulk and forming a more efficient seal.

From the description above, it will be seen that in the completed carton the top closure is hingedly secured along the score line **50**, and the two-ply band **118** of the closure extending around three sides of the top of the body portion is connected to the body portion by the relatively small unslit portions **62, 70** and **80** of the score line **58** which comprise the frangible portions between the spaced slits. In practice, the tab portions **78** formed in the end wall panels **12, 14** have a tendency to unfold along their score lines **20, 22**, thus urging the tab portions into a position to be engaged by their respective cutout portions **68**. In operation, when initially opening the carton, it is merely necessary to pull the end wall portions of the band **18** outwardly slightly to disengage the locking elements and then lift upwardly with sufficient force to break the frangible connections whereupon the closure may be rocked back on its hinge score line **50** as shown in FIG. **8** wherein the broken away portions are indicated along the upper edges of the end wall panels **12, 14** and the front wall panel **16**. The hinged top closure may now be conveniently closed to its initial position whereupon the tab portions **78** will automatically flex into engagement with the cutout portions **68** whereby to lock the cover in its closed position. In order to again open the carton, the locking elements are first disengaged by pulling outwardly the end wall panels and then lifting upwardly.

As illustrated in FIG. **6**, the V-shaped cutouts **102** in transverse sections **86, 88** when folded to form a two-ply band provides a 45° cutoff at the ends of the band to facilitate closing of the carton. The weakened portions, herein shown as spaced slits providing frangible portions therebetween, may take other forms capable of being separated upon application of a lifting force as described. In the illustrated structure of hinged end closure, the weakened portions along the score line **58** are entirely concealed in the assembled carton and are protected from inadvertent damage by the overfolded portions of the closures as shown.

As above described, the present hinged end closure carton may be economically produced in a standard automatic packaging machine wherein the prescored carton blank is folded about a forming block. While a preferred manner of assembling the carton, as herein described, contemplates folding of the bottom closure flaps against the end of the forming block and then removing the carton to be filled through the top, it will be understood that the present invention also contemplates forming the top closure against the end of the forming block. When thus formed, the carton is removed from the block and filled through the bottom, whereupon the bottom closure is folded and sealed, and the carton turned upright.

From the above description it will be seen that the present carton is provided with a hinged end closure of novel structure which may be economically produced with a minimum of carton material and which may be manufactured in a standard automatic packaging machine to produce an efficient self-locking and easily opened hinged closure.

It will be observed that the present closure locking structure leaves the front panel **16** free of any slits or cutout portions, thus having the advantage of providing a continuous and uninterrupted printing surface.

Having thus described the invention, what is claimed is:

1. A hinged reclosable top closure for a rectangular carton having a body portion closed at its lower end and comprising front and rear side wall panels connected along their side edges to a pair of end wall panels, said hinged top closure being formed by integral extensions from the upper edges of said wall panels and including an integral three-section portion extending from said front and said end wall panels and

connected to the upper edge thereof by weakened lines providing frangible connecting portions, said upper edges lying in a common plane and said three-section portion being folded downwardly and upwardly to provide a two-ply band about the upper portion of said front and end wall panels, the inner ply portions confronting the upper portions of the end wall panels of said two-ply band being partially cut out to provide engaging portions, the upper portions of said end wall panels being provided with slit openings defining tabs for cooperation with said engaging portions, there being relatively short separate front and end wall flaps projecting upwardly from said two-ply band which are folded inwardly, and an inwardly folded flap hingedly connected to the upper edge of said rear wall panel and adhesively secured to said relatively short inwardly folded front and end flaps to provide a hinged cover connected to the upper edges of said front and end wall panels by said frangible connecting portions, said closure being initially opened by pulling the band outwardly and upwardly with sufficient force to rupture said frangible connecting portions, said engaging portions and said tabs arranged to cooperate to effect automatic locking of the hinged cover upon closing and reclosing the carton.

2. A carton having a hinged top closure as defined in claim 1, wherein the cutout areas defining the engaging portions are disposed adjacent the forward ends of said two-ply portions confronting the upper portions of said end wall panels, and the slit openings defining the cooperating tabs are likewise disposed adjacent the forward ends of the upper portions of said end wall panels.

3. A carton having a hinged top closure as defined in claim 1, wherein the tabs are hinged and are adapted to flex into engagement with said engaging portions upon closing the cover.

4. A carton having a hinged top closure as defined in claim 1, wherein the inner faces of said two-ply band are adhesively secured together except that the areas defining the engaging portions are free of adhesive.

5. A carton having a hinged top closure as defined in claim 1, wherein the cutout portions of the inner ply adjacent the end wall panels further include integral cutouts in the inner ply adjacent the edges of the front wall panel.

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