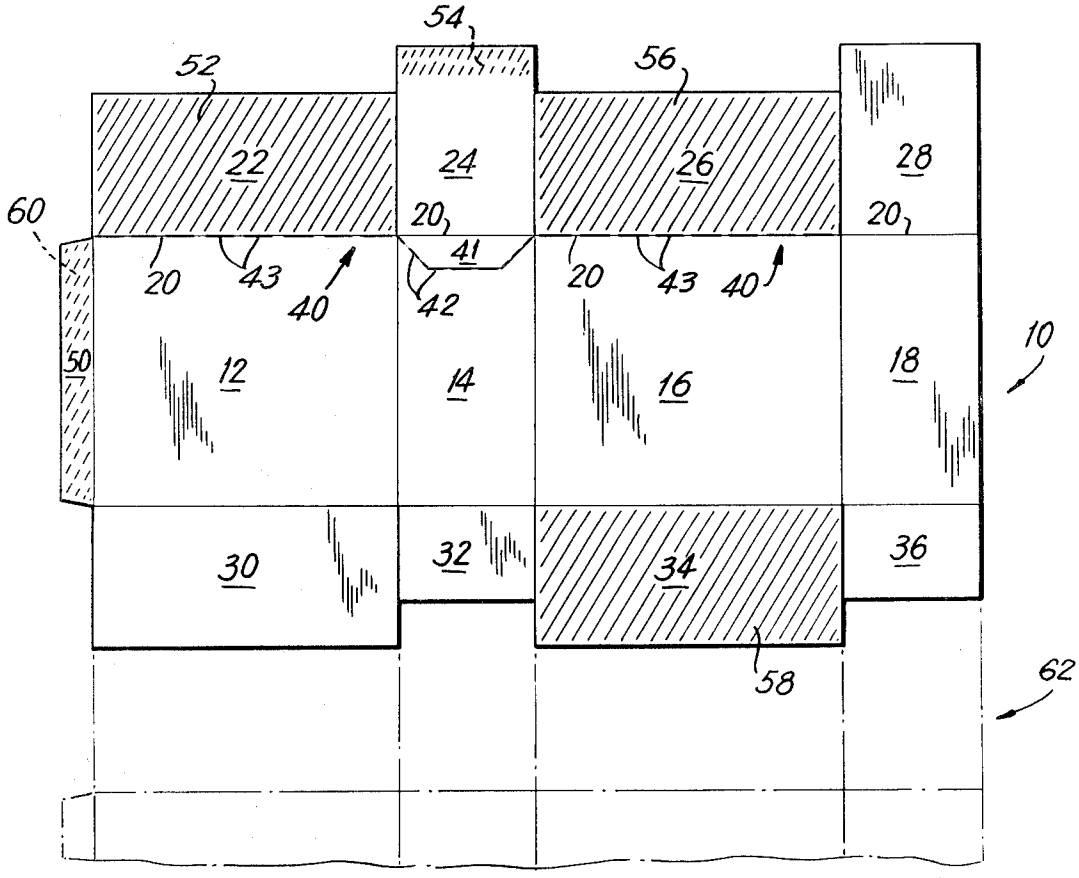
July 14, 1970 R. R. SPIERING ET AL 3,520,465

CARTON CONSTRUCTION HAVING A TEAR-AWAY END WALL AND BLANK THEREFOR

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FIG. 1



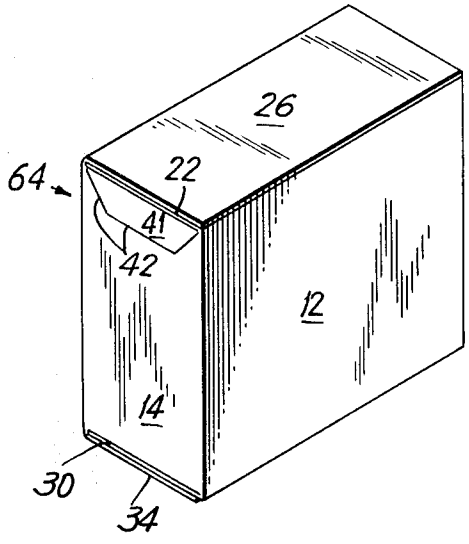


FIG. 2

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FIG. 3

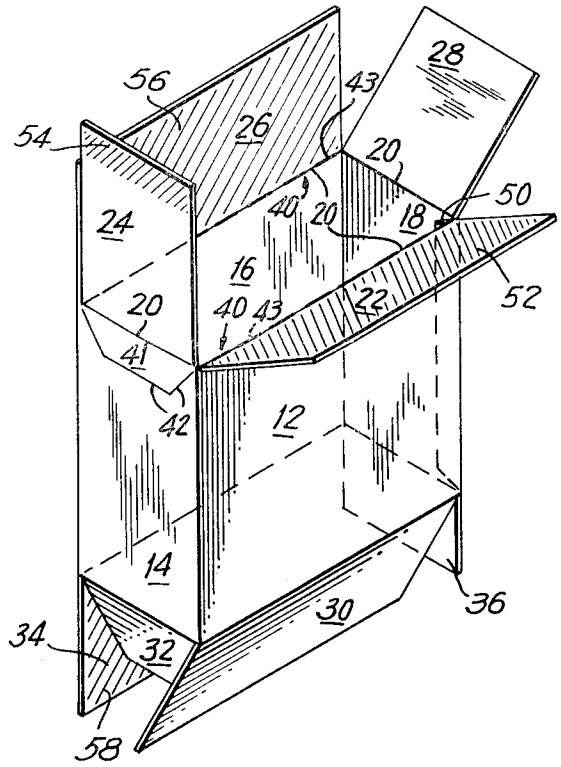
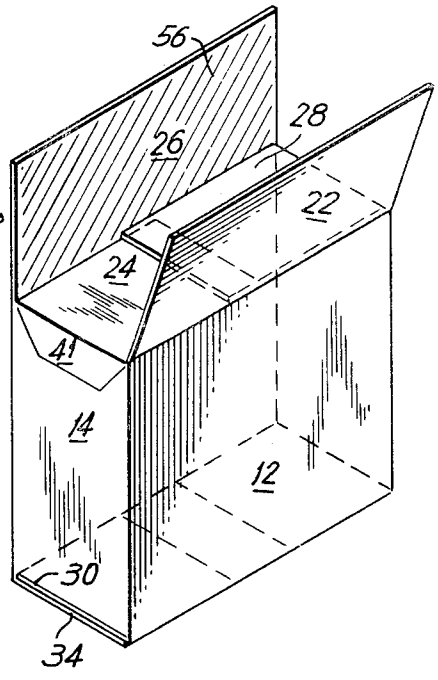


FIG. 4



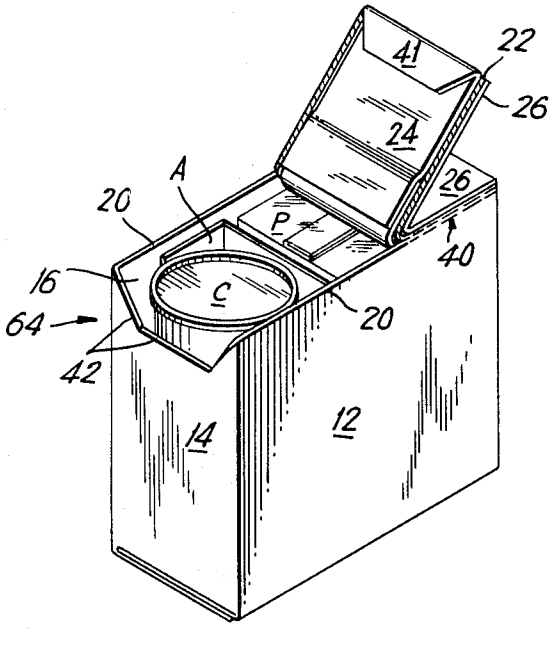


FIG. 5

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3,520,465

CARTON CONSTRUCTION HAVING A TEAR-AWAY END WALL AND BLANK THEREFOR

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Int. Cl. B65d 5/54, 5/72
U.S. Cl. 229—17 7 Claims

ABSTRACT OF THE DISCLOSURE

A carton construction, and blank therefor, having a tear-away end wall. A pair of opposed sidewall end flaps are overlapped and adhesively secured together. A pair of opposed front and rear end flaps are attached to their respective main panels by an internal cut fold line and adhesively secured to each other and the secured side panel end flaps. A score line pattern in one side panel of the carton defines a removable panel with which the tearing action for the removable end wall may be instituted.

BACKGROUND OF THE INVENTION

This invention pertains to foldable flat and tubular carton blanks and to cartons assembled from such blanks. In particular, the invention pertains to a carton having an easily torn away end wall and to a carton blank from which the carton is assembled.

Cartons which have been made heretofore with tear-away end walls have frequently proved to be unsatisfactory from a consumer's standpoint because the tear-away portions are often not cleanly and completely removed. In many instances this is caused by subjecting the adhesively bonded, overlapped carton flaps to a peel force rather than a tension force. Because the peel resistance of adhesives is usually much less than the tensile resistance of adhesives, it is not surprising that the intended tear removal patterns are frequently not followed.

Another factor contributing to the unsuccessful utilization of end wall tear opening devices is the large amount of flexing of the end walls which encourages deviation from an intended tear removal pattern.

BRIEF SUMMARY OF THE INVENTION

The foregoing problems have been effectively overcome in the present invention wherein a carton end wall composed of overlapping end flaps is maintained substantially rigid so that the adhesive bonding therebetween is not subjected to a peel force. In particular, a flat or tubular carton blank is provided having end flaps, capable of being erected into a tear-away end wall, hingedly secured to front, back, and side panels along a common line, namely, the top of the carton. One pair of opposing end flaps is designed to overlap and to be adhesively secured to one another when said blank is erected into a carton. Another pair of opposing end flaps, capable of overlapping and being secured to the first pair, have cut fold lines along the common line at their hinged connection with their respective panels. These cut fold lines do not completely penetrate the entire thickness of the blank and are visible only from the interior of the carton. A weakened area bordered by score lines in one of the side panels adjacent the common line is provided to permit easy grasp of the carton end wall when it is desired to tear it loose.

Thus the aforementioned problems have been solved by producing a novel carton from novel flat and tubular carton blanks having cut lines of weakness only in the interior of the carton and having a pair of opposing end flaps securely adhered to one another, adjacent a side panel weakened area, to act as a lever or wide tear strip to permit complete removal of the carton end wall when desired.

DETAILED DESCRIPTION

Reference is now made to the drawings for a more detailed description of the invention in which:

FIG. 1 is a plan view of a carton blank of this invention, the resultant inside carton face thereof being shown;

FIG. 2 is a view in perspective of a completely erected carton of this invention;

FIG. 3 is a view in perspective of a tubular carton blank of this invention with the carton flaps open and unsealed;

FIG. 4 is a view in perspective of a partially erected carton of this invention with the carton flaps partially folded and sealed; and

FIG. 5 is a view in perspective of a carton of this invention showing its novel tear-away end wall partially torn away to expose the contents of the carton.

Referring now to FIG. 1, there is illustrated a plan view of a carton blank **10** of this invention. The blank comprises a front panel **12**, a back panel **16** and side panels **14** and **18**. These panels are hingedly secured to one another along a plurality of fold lines. A common fold line **20** running across the entire length of blank **10** defines one end of each of these panels. This common line forms the top perimeter of the carton when erected. End flaps are hingedly connected to each of these panels along the fold line **20**. In particular, front panel end flap **22**, side panel end flap **24**, back panel end flap **26**, and side panel end flap **28** are so connected. Additional end flaps **30**, **32**, **34** and **36** may be hingedly connected to the bottom edges of the front, back and side panels.

An important feature of the invention resides in cut score lines **40** which are provided along common line **20** at the hinged connection of front panel **12** with front panel end flap **22**, and also at the hinged connection of back panel **16** with back panel end flap **26**. The inside face of blank **10** is visible in FIG. 1 which will become the carton interior. The cut score pattern **40** is cut into blank **10** only on the inside face thereof, and is not present upon, or penetrate through blank **10** to the exterior face of the blank. The line **20** thereat, then, comprises a ready-fold score fully along both flaps **22**, **26**, and spaced cuts **43** coincident therewith on the blank interior surface to appropriately weaken the same.

A weakened area **41** constituting a removable portion of side panel **14** is provided adjacent said common line **20** bordered by score line pattern **42**. Score line pattern **42**, which can be either cut or scribed, similarly do not penetrate through the blank **10** but can be placed on either or both faces of blank **10**.

It will be observed that the score line pattern **42** terminates adjacent the ends of the cut fold lines **40** whereby the end wall of the carton may be removed as a unit and with a continuous motion beginning with the tear out panel **41** in side panel **14** defined by the score line pattern **42**.

A glue flap **50** is shown hingedly secured to front panel **12** in conventional manner. Various portions of blank **10** are coated with an adhesive material for subsequent use in the erection of a carton. Such adhesive has been applied at **52**, **56** and **58** on the inside faces of end flaps **22**, **26**, and **34**, respectively. Further, the end portion of side panel end flaps **24** is adhesively coated at **54** on the exterior face thereof, as is glue flap **50** at **60**.

A portion **62** of a like blank **10** is illustrated in dotted lines adjacent blank **10** in FIG. 1. The shape of the end flap of both blanks are such as to permit edge-to-edge nesting as illustrated, so as to minimize wastage when a

plurality of such blanks are severed from a web of stock material.

A partially erected tubular carton blank of this invention is shown in FIG. 3. Such a blank is formed from the flat blank **10** by folding it along its hinged connections to permit panel **50** to be secured to the interior face of side panel **18**.

Comparing FIGS. 3 and 4, it will be seen that end flaps **32** and **36** are then folded inwardly and overlapped by end flap **30**. End flap **34** is then folded over flap **30** and secured thereto by any convenient means such as adhesive **58**, thus forming the bottom end wall of the carton.

The top end wall is formed in much the same manner, although embodying certain differences in connection with the invention. Thus, end flap **24** is folded in and overlapped by and bonded to end flap **28** by adhesive **54**. The combined lengths of flaps **24** and **28** measured perpendicular to line **20** are greater than the individual widths of flaps **22** or **26** measured parallel to line **20** in order to permit flaps **24** and **28** to overlap one another at their end portions. The thus formed laminate of flaps **24** and **28** when combined with adjacent weakened area **41** is provided to act as a lever or wide tear strip for use in the tearing away of the carton end wall formed from end flaps **22**, **24**, **26** and **28**.

To complete the erection of the carton, flap **26** is next folded to overlap flaps **24** and **28** and is adhesively secured to those flaps by means of adhesive **56**. Flap **22** is then folded into overlying relationship to flap **26** and adhesively secured thereto by means of its adhesive **52**. In accordance with this invention, either the rear panel end flap **26** or the front panel end flap **22** may be folded down into adhesive securement with side panel end flaps **24** and **28** but it is preferred that rear end flap **26** be folded down first so that the carton has a neater appearance on the shelf.

The important feature, however, is that since the side panel end flaps **24** and **28** are overlapped and secured together and since the front and rear panel end flaps are secured to each other and to the side panel end flaps, the entire top of the carton may be removed as a rigid unit. That is, there is not a substantial amount of deflection of the end wall as it is being removed, so that the adhesive between the various end flaps is subjected principally to tension forces rather than to a peel force which latter tends to delaminate the glued flaps.

The completed, filled and closed carton **64** of this invention is shown in FIG. 2. With cut score lines **40** disposed on the interior face of the carton **64**, the folded corners at the top of the carton are smooth and unbroken to maintain an eye-pleasing external appearance, yet the thus concealed weakness permits easy opening of the carton.

FIG. 5 illustrates the manner of opening the carton in order to gain access to its interior and contents. To open the carton of the present invention, digital pressure is applied to weakened portion **41** in side panel **14**, causing that panel portion to rupture loose along score lines **42**. End flap **24** may then be grasped from the interior of the box and lifted, causing the entire composite end wall of the carton to tear away along the common line **20**. The cut fold lines **40** permit the composite end wall to be easily torn away as illustrated in FIG. 5.

The carton **64** has been shown to contain a can C and a flexible package P separated by means of a carton partition A. These contents have been shown for purposes of illustration only and it is obvious that the carton **64** may be filled with any desirable material and partitioned in any convenient way.

Many modifications of the cartons and blanks of this invention can be made without departing from its basic scope. The carton or blanks may be constructed of any suitable material such as paper, paperboard, cardboard, synthetic plastic material, or corrugated sheet material.

The shapes of the panels and/or flaps need not be rectangular but can be shaped as desired. Score lines **42** surrounding weakened area **41** can appear on one or both faces of a carton or blank. Cut fold lines **40** need not be made to coincide with common line **20** but can be cut into the side, front and back panels to permit a portion of these panels as well as the carton end wall to be torn away upon opening of the carton. The end flaps can be secured together with any desirable adhesive, or without adhesive by using staples, lock tabs, or the like.

It is though that the invention and many of its attendant advantages will be understood from the foregoing description and it will be apparent that various changes may be made in the form, construction and arrangement of parts of the apparatus mentioned herein and in the steps and their order of accomplishment of the method described herein, without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the apparatus and method hereinbefore described being merely a preferred embodiment thereof.

What is claimed is:

1. A rectangular carton having a tear-away end wall comprising:

(a) hingedly connected front, back and side panels forming the body panels of said carton;

(b) a pair of side panel end flaps hingedly attached to a respective side panel, said side panel end flaps being of a length sufficient to at least partially overlap each other;

(c) a front panel end flap hingedly secured to said front panel by a cut fold line;

(d) a rear panel end flap hingedly secured to said rear panel by a cut fold line;

(e) said front and rear panel end flaps being of a length sufficient to at least partially overlap each other;

(f) said side panel end flaps being folded down so as to be secured to each other at their respective areas of overlap;

(g) said front panel end flap and said rear panel end flap being folded down so as to be secured to each other at their respective areas of overlap and to said side panel end flaps to form a substantially rigid end wall of said carton; and

(h) a means for severing one of said side panel end flaps from its respective side panel, said means in cooperation with the respective secured areas of overlap of said side panel end flaps acting as a lever to facilitate severing said front and rear panel end flaps from said front and rear panels respectively along said cut fold lines so that said substantially rigid end wall of said carton may be removed as a unit.

2. A rectangular carton having a tear-away end panel as defined in claim **1** wherein said means for severing one of said side panel end flaps from its respective side panel comprises a score line pattern in said side panel which is hingedly secured to said side panel end flap, said score line pattern defining a removable panel in said side panel with the ends of said score line pattern terminating adjacent opposed ends of said cut fold lines.

3. A rectangular carton having a tear-away end wall as defined in claim **1** wherein said cut fold lines cut through only the inside surface of said carton so as not to be visible when said carton is erected.

4. A rectangular carton having a tear-away end wall as defined in claim **1** wherein said side panel end flaps are adhesively secured together and said front and rear panel end flaps are adhesively secured to each other and one of said front and rear panel end flaps is adhesively secured to said side panel end flaps.

5. A blank capable of being erected into a carton having a tear-away end wall comprising:

(a) hingedly connected front, back and side panels;

(b) a glue flap hingedly connected to one of said panels at the end of said blank;

(c) a pair of side panel end flaps hingedly attached to a respective side panel along a common fold line forming the top of the carton when erected;

(d) said side panel end flaps being of a length sufficient to at least partially overlap each other when said carton is erected;

(e) one of said side panel end flaps being provided with adhesive means with which said end flaps may be secured together at their respective areas of overlap when said carton is erected;

(f) a front panel end flap hingedly secured to said front panel by a cut fold line;

(g) a rear panel end flap hingedly secured to said rear panel by a cut fold line;

(h) said front and rear panel end flaps being of a length sufficient to at least partially overlap each other when said carton is erected;

(i) said front and rear end flaps being provided with adhesive means with which said front and rear end flaps may be secured to each other at their respective areas of overlap and to said side panel end flaps to form a substantially rigid end wall of said carton when said carton is erected; and

(j) a means for severing one of said side panel end flaps from its respective side panel, said means in cooperation with the respective secured areas of overlap of said side panel end flaps acting as a lever to facilitate severing said front and rear panel end flaps from said front and rear panels respectively along said cut fold lines so that said substantially rigid end wall of said carton may be removed as a unit when said carton is erected.

6. A blank capable of being erected into a carton having a tear-away end wall as defined in claim **5** wherein said cut fold lines cut through only the inside surface of said carton so as not to be visible when the carton is erected.

7. A blank capable of being erected into a carton having a tear-away end wall as defined in claim **5** wherein said means for severing one of said side panel end flaps from its respective side panel comprises a score line pattern in said side panel which is hingedly secured to said side panel end flap, said score line pattern defining a removable panel in said side panel with the ends of said score line pattern terminating adjacent opposed ends of said cut fold lines.

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U.S. Cl. X.R.

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