United States Patent [19]

Buttery

[11] **3,708,104**

[45] **Jan. 2, 1973**

[54] TEAR STRIP FOR A CARTON

[75] Inventor: **Kenneth T. Buttery**, Kalamazoo, Mich.

[73] Assignee: **Brown Company**, Kalamazoo, Mich.

[22] Filed: **Sept. 4, 1970**

[21] Appl. No.: **69,748**

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

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

[58] **Field of Search** ..... 229/51 TS, 51 TC; 206/57 D

[56] **References Cited**

UNITED STATES PATENTS

2,680,558	6/1954	Mai	229/51 TS
3,410,476	11/1968	Buttery	229/51 TC
3,524,581	8/1970	Buttery	229/51 TC
2,930,518	3/1960	Cottrill	229/51 TS
3,065,896	11/1962	Grapp	229/51 TS
3,096,918	7/1963	Van Dyke et al.	229/51 TS
3,131,852	5/1964	Forbes, Jr.	229/51 TC
3,315,870	4/1967	Barnes	229/51 TS X

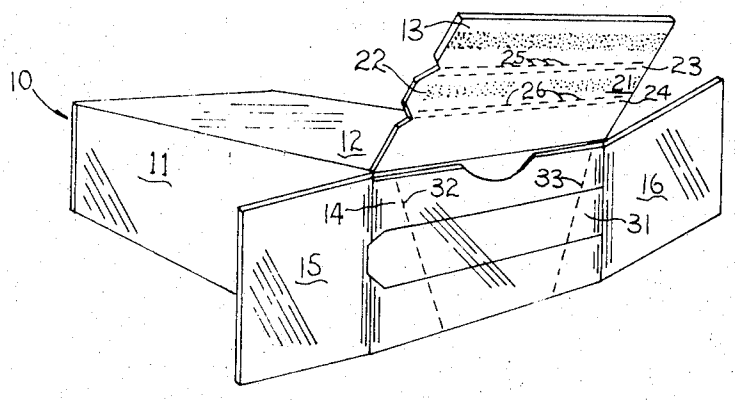
Primary Examiner—Davis T. Moorhead

Attorney—Gordon W. Hueschen and Talivaldis Cepuritis

[57] **ABSTRACT**

A carton including bottom, front, rear and end wall panels, at least one of said panels comprising a pair of overlapping flaps, a detachable tear strip defined by a severance line which comprises at least two rows of linearly positioned, substantially uniformly spaced cuts, cut score line in the outer of said two overlapping flaps coextensive with the severance line, and a cut scored portion provided on the inner of said overlapping flaps having substantially the same configuration as the tear strip. The tear strip is adhesively affixed to the cut scored portion, and the rows of cuts in the severance line are arranged so that the cuts of one row fully overlap the spaces of the adjacent row.

8 Claims, 10 Drawing Figures



PATENTED JAN 2 1973

3,708,104

SHEET 1 OF 3

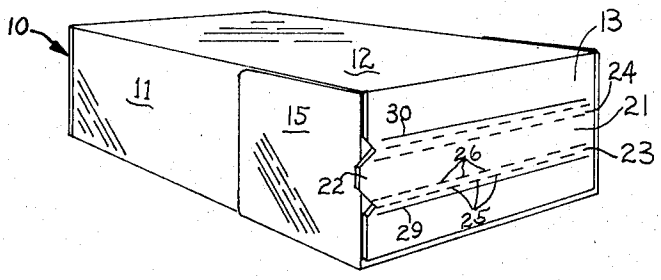


FIG. 1

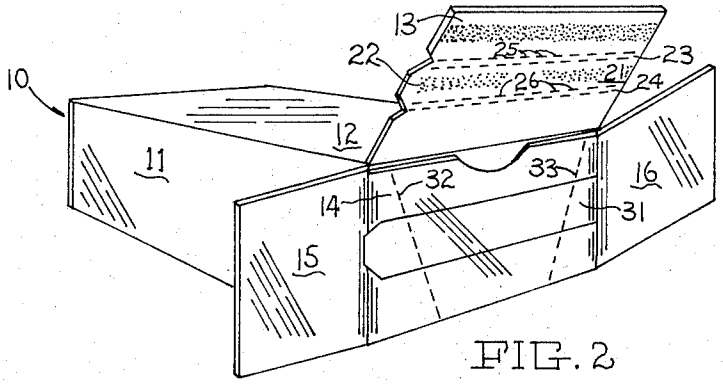


FIG. 2

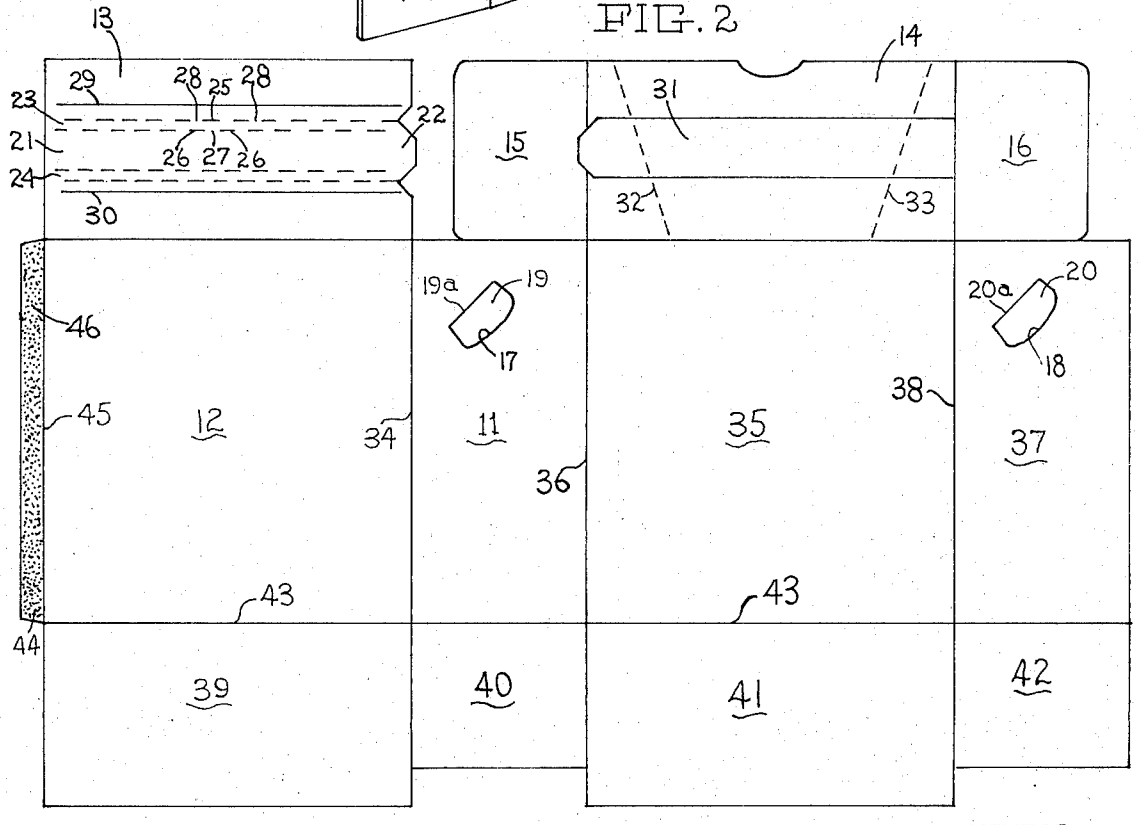


FIG. 3

INVENTOR.
KENNETH T. BUTTERY
BY
Talivaldis Cepuritis
Attorney

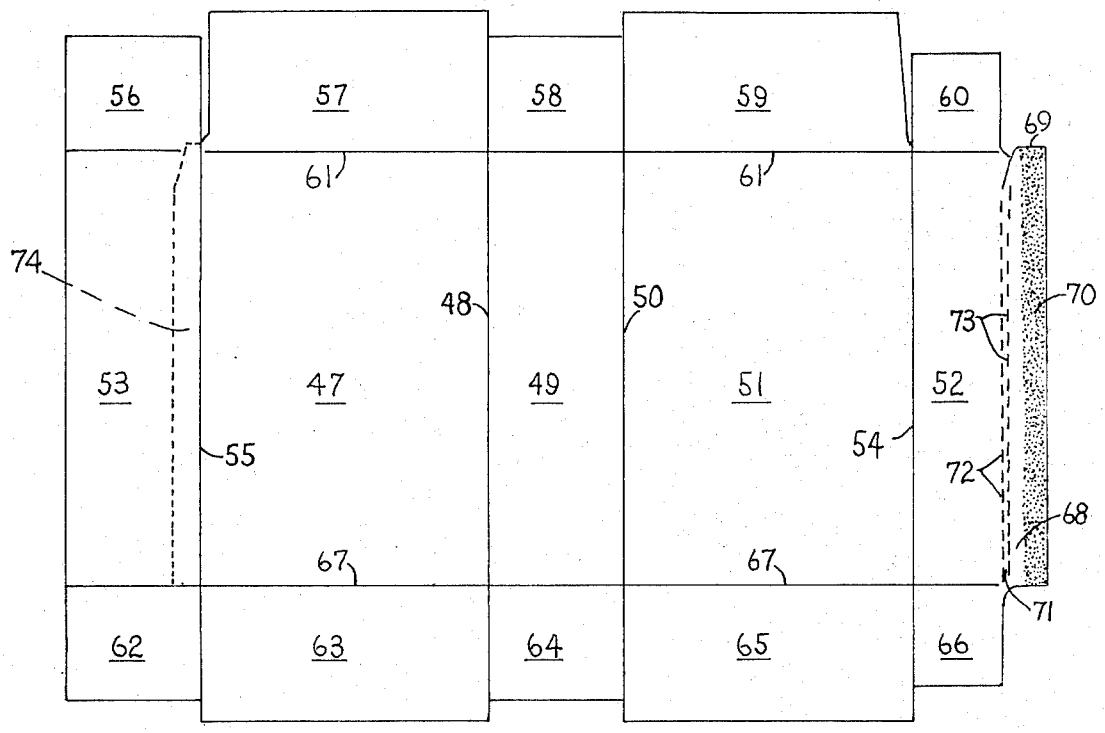


FIG. 4

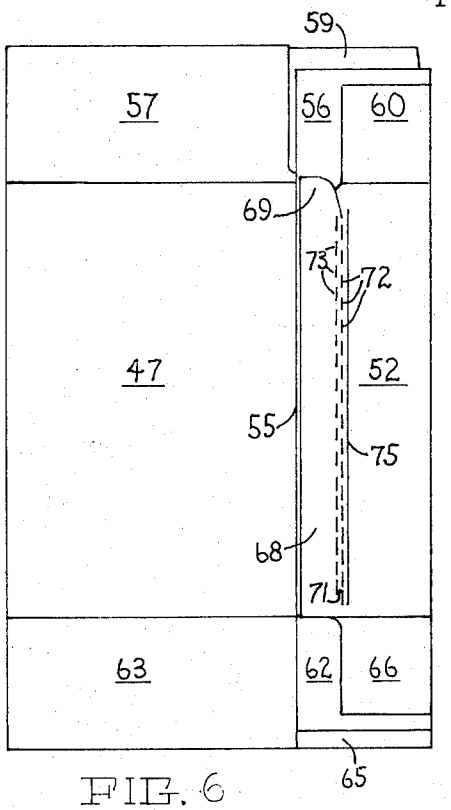


FIG. 6

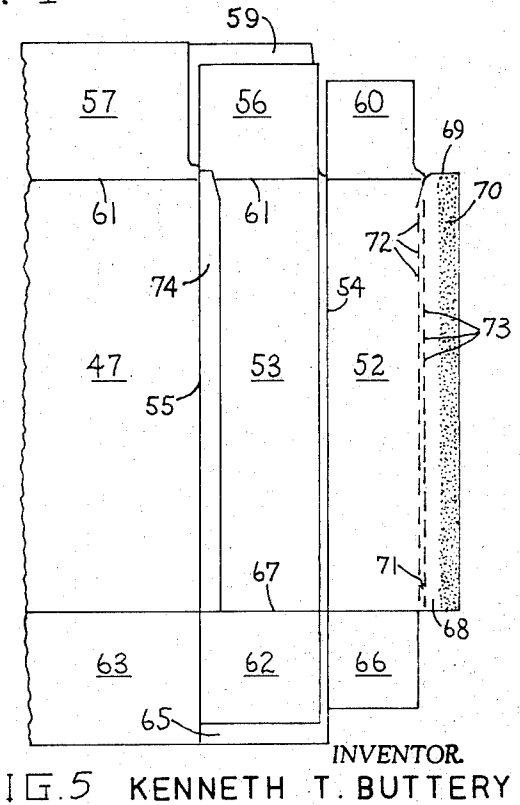


FIG. 5

INVENTOR.
KENNETH T. BUTTERY
BY Talivaldis Cepuritis
attorney

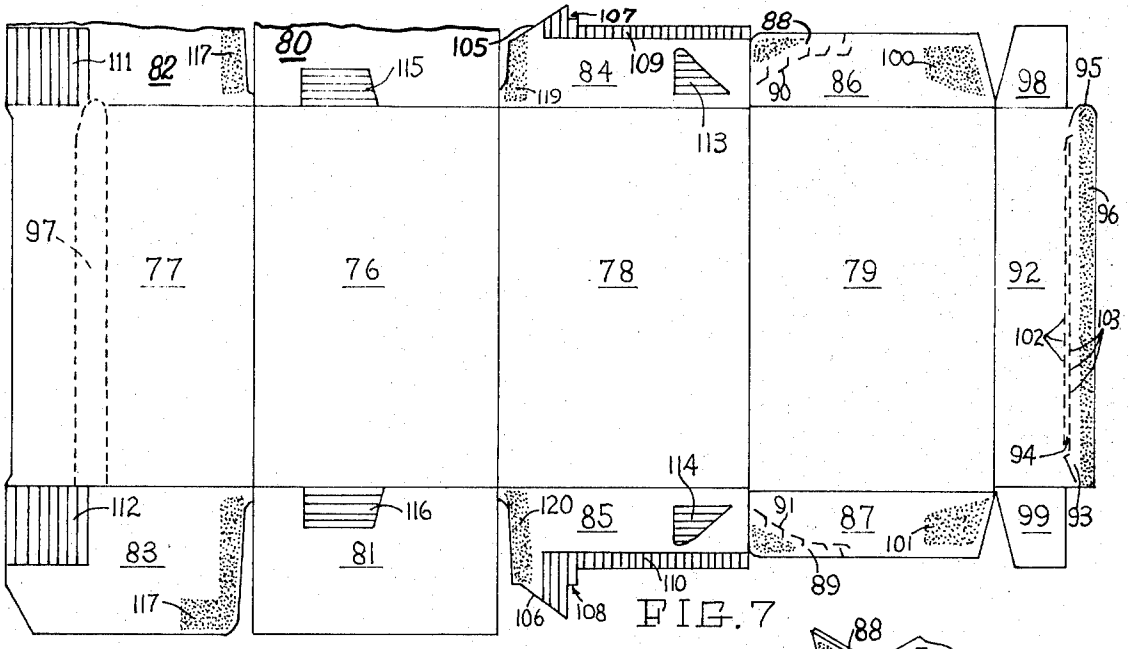


FIG. 7

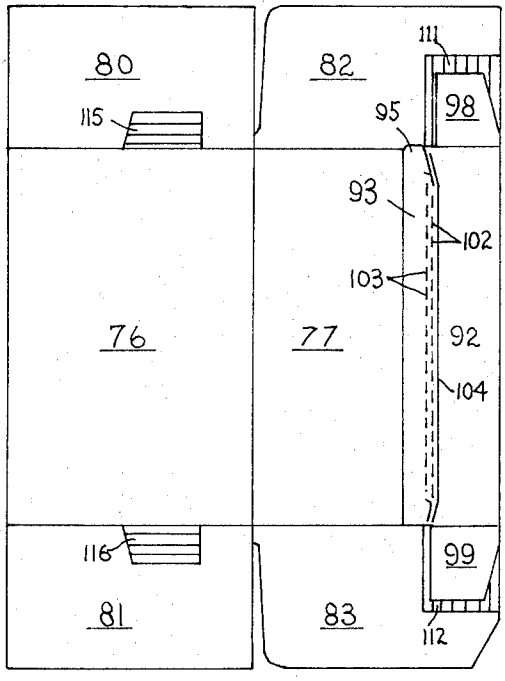


FIG. 9

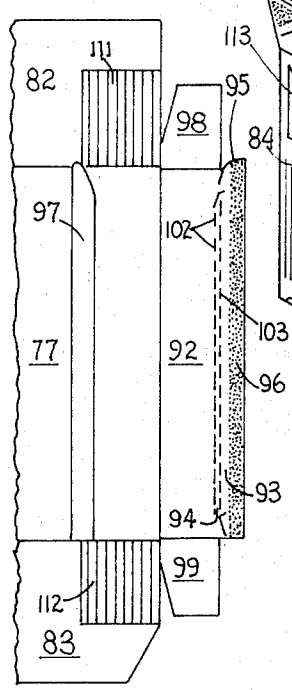


FIG. 8

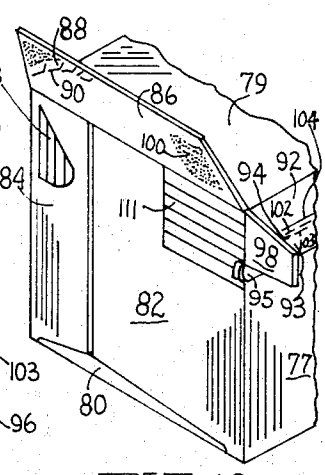


FIG. 10

INVENTOR.
KENNETH T. BUTTERY
BY Gordon W. Hueschen
Talivaldis Cipuritis
attorney

TEAR STRIP FOR A CARTON

BACKGROUND OF THE INVENTION

This invention relates to cartons and, more particularly to means for conveniently opening cartons.

Paperboard cartons are a widely accepted means for packaging various materials, including foodstuffs. Such cartons usually are erected and filled with the normal access opening or cover means in a sealed condition and are subsequently opened by means of a tear strip. Typical such cartons are shown in U. S. Pat. Nos. 3,361,328 and 3,410,476.

A tear strip for a paperboard carton is usually formed by means of two spaced, partially or fully perforated severance lines connected to an adhesive strip which, in turn, is adhesively affixed to the wall of a carton. Alternatively, a combined tear strip and adhesive strip may be used which is detachably connected to a carton cover wall and adhesively affixed to the carton wall, usually at isolated adhesive areas. In either embodiment, the severance lines are intended to provide a means for clean separation and removal of the tear strip as the carton is opened. In practice, however, it has been found that the severance lines seldom provide a clean tear along the intended path, but peel off the outer layer or a portion of the underlying panel attached to the tear strip.

An improvement in the design of tear strips is taught by U.S. Pat. No. 3,410,476 wherein a cut score line is provided alongside a severance line which comprises a plurality of discontinuous slits, each slit having a portion not colinear with the other slits. While generally satisfactory, such tear strips tend to collapse inwardly along the severance line upon handling of the cartons, particularly in automatic carton erecting machines. A partial solution to the problem of tear strip support, but not buckling, is suggested by my U.S. Pat. No. 3,524,581. The total problem of providing a readily removable tear strip having adequate tear strip support, but without a tendency to buckle, has been found to be solved only by a tear strip structure having the combination of structural features provided by the present invention.

It is an object of the invention to provide a further improved tear strip structure which resists inward and outward collapse, reinforces the tear strip, gives more security in tearing off the strip, and which provides a relatively higher tensile strength in the direction normal to the severance line while at the same time assuring quick and clean tear upon opening of the carton. Still other objects will readily present themselves to one skilled in the art upon reference to the specification, drawings, and claims.

SUMMARY OF THE INVENTION

The present invention contemplates a tear strip the severance line or lines of which comprise at least two rows of linearly positioned, substantially uniformly spaced cuts which extend through the thickness of the paperboard. A cut score line positioned apart from the severance line extends substantially the entire length thereof and the tear strip itself is adhesively affixed to a cut scored portion of a carton panel or flap situated below the tear strip. The cut scored portion is cut only partially through the thickness of the panel or flap, i.e., at least through the top liner thereof. When the tear strip is pulled off, the top liner of the cut scored portion separates from the panel or flap and is removed together with the tear strip. Moreover, this added thickness adhered to the tear strip reinforces the same and gives more security during tearing.

In a preferred embodiment of this invention the tear strip is provided at one end thereof with a tab which extends beyond the underlying panel or flap, the cut scored portion is substantially co-extensive with the tear strip, and the cuts of one row fully overlap the uncut spaces of the adjacent row.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings,

FIG. **1** is a perspective view of an end-opening carton incorporating the tear strip of the present invention;

FIG. **2** is a perspective view of the carton shown in FIG. **1** when partially erected;

FIG. **3** is a plan view of a blank cut and scored so as to form the carton of FIG. **1**;

FIG. **4** is a plan view of a blank cut and scored so as to form a side-opening carton incorporating the tear strip of the present invention;

FIG. **5** is a fragmentary plan view of the blank of FIG. **4** folded over prior to adhesively affixing the tear strip to a cut scored portion of a side panel of the carton;

FIG. **6** is a plan view of the blank of FIG. **4** folded over and with the tear strip affixed in place;

FIG. **7** is a plan view of a blank cut and scored so as to form a carton having a recloseable cover and incorporating the tear strip of this invention;

FIG. **8** is a fragmentary plan view of the blank of FIG. **7** folded over prior to adhesively affixing the tear strip to a cut scored portion of the front panel of the carton;

FIG. **9** is a plan view of the blank of FIG. **7** folded over and with the tear strip affixed in place; and

FIG. **10** is a fragmentary perspective view showing a carton partially erected from the blank of FIG. **7**.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the following discussion reference will be made to the accompanying drawings for a better understanding of this invention. In the drawings all the parts are numbered and the same numbers are used for the same parts in the several Figures. Additionally, areas having an adhesive applied thereon are indicated by stippled shading and areas that are embossed or debossed are indicated by a series of horizontal and vertical lines, respectively. The terms "embossed" and "debossed" are used with reference to the outer surface of the carton as constructed.

Referring to FIG. **1**, end-opening carton **10** comprises side panel **11** and back panel **12** provided with flap **13** overlapping flap **14** of front panel **35** (FIG. **3**), which flaps together form an end panel. Auxiliary flaps **15** and **16** are optional and serve to cover openings **17** and **18** when tabs **19** and **20** are pushed inwardly. Tabs such as **19** and **20** can be employed, if desired, to hold canned goods or substances captive within Carton **10**. Score lines **19***a* and **20***a* are provided for tabs **19** and **20**, respectively, to facilitate the bending of tabs **19** and **20** inwardly and back so as to catch into the chimes of the cans containing said goods.

Tear strip 21 provided with tab 22 at one end thereof is formed from the same blank as carton 10 as shown in FIG. 3 and is connected to flap 13 at severance lines 23 and 24. Each severance line comprises at least two rows of linearly positioned cuts such as cuts 25 and 26 which are uniformly spaced and extend through the thickness of the paperboard. Moreover, cuts 25 and 26 are arranged so that cut 25 overlaps uncut portion, space, or land 27 between consecutive cuts 26 and so that cut 26 overlaps uncut portion or space 28 between consecutive cuts 25. Preferably each cut in a given row fully overlaps the uncut space of the adjacent row, substantially as shown in the Figures. Additionally, cut score lines 29 and 30, cut only partially through the thickness of flap 13, i.e., through the top liner of the paperboard, are provided spaced apart from severance lines 23 and 24, respectively, and extending substantially the entire length of severance lines 23 and 24.

Cut scored portion 31, cut scored through the top liner of the paperboard, is provided in flap 14 and is situated so that this portion is in substantial registry with tear strip 21 when flap 13 is folded over flap 14. Preferably cut scored portion 31 is somewhat smaller than tear strip 21. Cut scored portion 31 is cut only partially through the thickness of flap 14 and is of substantially the same configuration as tear strip 21 which is adhesively affixed thereto, preferably by means of a continuous coating of adhesive over at least a substantial part of the area of portion 31, or that area of tear strip 21 corresponding thereto, so that when tear strip 21 is detached upon opening of carton 10, cut scored portion 31 or at least the outer liner thereof is removed at the same time. Flap 13 is also adhesively affixed to flap 14 by means of the adhesive in the stippled region of flap 13 as shown in FIG. 2.

When tear strip 21 is provided with tab 22 in order to facilitate the initiation of the tear, it is desirable that tab 22 extends beyond underlying flap 14. In such cases cut scored portion 31 is so cut that a part thereof is substantially coextensive with tab 22, i.e., into flap 15.

Perforated lines 32 and 33 are provided in flap 14 to facilitate tearing of flap 14 when it is desired to gain access to the contents of carton 10.

In addition to side panel 11 and back panel 12 hingedly affixed thereto along longitudinal score line 34, carton 10 also comprises front panel 35 hingedly affixed to side panel 11 along score line 36 and side panel 37 hingedly affixed to front panel 35 along score line 38. Flaps 39, 40, 41, and 42 hingedly affixed to respective panels 12, 11, 35 and 37 along score line 43 serve to make up a top wall panel opposite that formed by overlapping flaps 13 and 14 when suitably adhesively affixed.

Flap 44, hingedly affixed to back panel 12 along score line 45, is provided with adhesive 46 thereon and is adapted to be affixed to side panel 37 as the blank shown in FIG. 3 is folded over during the manufacture of carton 10.

A blank cut and scored for forming a side-opening carton is shown in FIG. 4 and comprises rear panel 47 hingedly affixed along score line 48 to side panel 49 which, in turn, is hingedly affixed along score line 50 to front panel 51. Overlapping flaps 53 and 52, hingedly affixed to respective panels 47 and 51 along score lines 55 and 54, respectively, make up a side panel. Flaps 56, 57, 58, 59 and 60 when suitably folded along score line 61 and adhesively affixed make up one end wall panel and flaps 62, 63, 64, 65 and 66 when suitably folded along score line 67 make up the other end wall panel. In this instance score line 55 will be a cut score line from the outer surface of the paperboard and score line 67 can be a cut score line in the region adjacent to cut scored portion 74, if desired.

Tear strip 68 provided with tab 69 at one end thereof and with adhesive 70 on the underside thereof is connected to flap 52 along severance line 71 which comprises cuts 72 and 73 arranged in two substantially parallel rows in the same manner as hereinbefore described in connection with the carton shown in FIGS. 1 and 2, with lands of one row coinciding with cuts of the other row.

Cut scored portion 74 (FIGS. 4 and 5) is provided in flap 53 and is in registry with tear strip 68 when flap 52 is folded over flap 53 as shown in FIG. 6 so that tear strip 68 can be adhesively affixed thereto as a carton is constructed from the blank.

Cut score line 75 is provided in flap 52 along severance line 71 and in a spaced relationship therewith so as to assure a clean tear and to avoid defacing any printing that may be present on the outer surface of flap 52. As set forth hereinabove, cut score line 75 is cut only partially through the thickness of flap 52.

A further embodiment of the present invention is shown in FIGS. 7 through 10 which depict a carton having a "flip-top" cover and an integral blank cut and scored for forming such a carton. Referring to FIG. 7, the integral blank comprises bottom panel 76, and front wall panel 77 and rear wall panel 78, both hingedly connected to bottom panel 76. A cover or top panel 79 is hingedly connected to rear wall panel 78. Bottom panel 76 is provided at its end with bottom end wall members 80 and 81 hingedly connected thereto. Similarly, front panel 77 is provided at its ends with front end wall members 82 and 83 hingedly connected thereto and rear panel 78 is provided with rear end wall members 84 and 85 hingedly connected thereto.

Top panel or cover 79 is provided with cover and wall panels 86 and 87 having adhesive panels 88 and 89 connected thereto at fracture lines 90 and 91, respectively.

Fracture lines 90 and 91 can be curved as shown in FIG. 7 or straight if desired, and comprise a plurality of spaced slits extending substantially through the thickness of the paperboard. Preferably each slit has at least one portion which is not colinear with the rest of the slit and the fracture line. Top panel 79 is also provided along its forward edge with cover front wall panel 92 to which is connected tear strip 93 at severance line 94. Tear strip 93 is provided with tap 95 at one end thereof which extends beyond underlying front panel 77 when the carton is assembled and with adhesive portion 96 adapted to be affixed to cut scored portion 97 in front panel 77.

Cover front wall panel 92 is provided at its ends with end flaps 98 and 99 which are adapted for affixation to cover and wall panels 86 and 87, respectively, by means of adhesive areas 100 and 101, respectively. The length of end flaps 98 and 99 is preferably greater than the width of end wall panels 86 and 87, and the width of

end flaps 98 and 99 is preferably less than the width of end wall panels 86 and 87, but this is not essential.

Severance line 94 comprises at least two rows of linearly positioned, substantially uniformly spaced cuts such as 102 and 103 which are so arranged that the cuts of one row overlap the uncut spaces or lands between the cuts of the other adjacent row. A continuous cut score line 104 (FIG. 9) is provided in cover front wall panel 92 apart from severance line 94 and extends for substantially the entire length of severance line 94. Cut score line 104 is cut only partially through the thickness of cover front wall panel 92, i.e., through the top liner of the paperboard. The score line between front end wall member 83 and front panel 77 preferably is a cut score line in the region adjacent to cut scored portion 97.

As shown in FIG. 7, scores at the junctures between all panels and end wall members are aligned, except the scores at the juncture between top panel 79 and cover end wall panels 86 and 87 which are offset outwardly. Also, the scores between cover front wall panel 92 and end flaps 98 and 99 are offset inwardly relative to the scores between top panel 79 and cover end wall panels 86 and 87.

The lower portions of the terminal edges of the rear end wall members 84 and 85 are provided with oblique recesses 105 and 106. Recesses 107 and 108 are provided to facilitate nesting of an adjacent blank closely therewith during cutting and printing.

Debossments 109 and 110 are provided in end wall members 84 and 85 to permit lodging of portions of members 82 and 83, respectively, therein where these members overlap as the carton is formed. Similarly, members 82 and 83 are provided with respective debossments 111 and 112 adapted to receive end flaps 98 and 99, respectively.

Embossments 113 and 114 in end wall members 84 and 85 are adapted to be adhesively affixed to adhesive panels 88 and 89 of cover end wall panels 86 and 87, respectively, and embossments 115 and 116 of bottom end wall members 80 and 81 are adapted to be adhesively affixed to respective front end wall members 82 and 83 by means of adhesive areas 117 and 118, respectively, which adhesive areas also affix members 82 and 83 to debossments 109 and 110, respectively.

Adhesive area 119 secures bottom end wall member 80 to rear panel end wall member 84 and adhesive area 120 secures bottom end wall member 81 to rear panel end wall member 85.

In assembling the carton, the carton blank may be first folded so that the inside surface of front panel 77 is contiguous with the inside surface of top panel 79 as shown in FIG. 8. At this point cut scored portion 97 on the outer surface of the paperboard, which is of about the same configuration as tear strip 93, and adhesive portion 96 of tear strip 93 are brought together (FIG. 9) and tear strip 93 adhesively affixed to cut scored portion 97 thereby forming a folded tube from the carton blank.

To erect this type of carton further for filling, the folded, tube-like blank is squared up, as on a conventional squaring machine. Thereafter one end of the carton is closed by first folding bottom end wall member such as member 80. Rear end wall member 84 and front end wall member 82 are then folded in, the latter overlapping the former. The contour provided by recess 105 permits the terminal edge of member 84 to clear adhesive area 117 on member 82. In addition, debossment 109 of member 84 permits member 82, when lapped thereover, to seat conveniently in the debossed area.

FIG. 10 shows a carton at approximately this stage in its erection. End flap 98 of cover front wall panel 92 is then folded over and seated in debossment 111 whereupon cover end wall panel 86 is folded down so as to engage embossment 113 on rear end wall member 84 and is adhesively affixed to embossment 113 and end flap 98 in any convenient manner such as by heating when a heat sensitive adhesive is utilized for the adhesive areas and/or portions of the carton. At the same time adhesive areas 117 and 119 are also activated and member 80 adhesively affixed to members 82 and 84. If desired, hot melt adhesive may be applied at the aforesaid areas at the machine erecting the cartons so as to accomplish the same result as the pre-applied heat-activated adhesives. When operating in such a manner, additional heat-activating machinery is not required.

The erected carton can now be filled through the remaining open end in the usual manner and the open end subsequently closed in a sequence substantially as hereinbefore described. Alternatively, the first-mentioned carton end may be closed and/or tacked, as with glue, but not sealed, and then both carton ends sealed simultaneously after filling.

The sealed carton may be opened by grasping tab 95 and removing tear strip 93 defined by severance line 94. As cover or top panel 79 is lifted open, cover end wall panels 86 and 87 are parted from adhesive panels 88 and 89, respectively, along the respective fracture lines 90 and 91. The outer liner of cut-scored area 97 adheres to tear strip 93 and, upon opening by removal of the tear strip, this outer liner peels off neatly between the cut scores. The top panel or cover 79, with attached panels 86, 87 and 92, can thereafter be reclosed for storage of any unconsumed contents.

The foregoing embodiments utilizing the improved tear strip of this invention are intended as illustrative but are not to be taken as limiting. Still other variations within the spirit and scope of this invention will readily present themselves to the skilled artisan.

I claim:

1. A paperboard carton including top, bottom, front, rear and end wall panels, at least one of said panels comprising a pair of overlapping flaps,

a detachable tear strip connected to the outer of said overlapping flaps by a severance line comprising at least two rows of linearly positioned, substantially uniformly spaced cuts extending through the thickness of the paperboard,

a cut score line in the outer surface of said outer flap spaced apart from said severance line and extending substantially the entire length of said outer flap, and

a cut scored portion provided on the outer surface of the inner of said overlapping flaps, having substantially the same configuration as the tear strip and in substantial registry therewith;

said tear strip being adhesively affixed to said substantially registering cut scored portion by a con-

tinuous coating of adhesive along substantially the entire length of said tear strip;

said cut score line and said cut scored portion being cut only partially through the thickness of the respective flaps; and

said rows of cuts being so arranged that the cuts of one row fully overlap the uncut spaces of the adjacent row.

2. The carton according to claim 1 wherein the tear strip is defined by a pair of spaced such severance lines and wherein a cut score line is provided on each longitudinal side of the tear strip.

3. An integral paperboard blank for forming a carton cut and scored to provide top, bottom, front, rear and end wall panels, at least one of said panels comprising a pair of overlapping flaps,

a detachable tear strip connected to one of said overlapping flaps by a severance line comprising at least two rows of linearly positioned, substantially uniformly spaced cuts extending through the thickness of the paperboard, said rows of cuts being so arranged that the cuts of one row fully overlap the uncut spaces of the adjacent row,

a cut score line in the outer surface of the flap having the tear strip connected thereto, spaced apart from said severance line, extending substantially the entire length of said flap, and being cut only partially through the thickness of said flap, and

a cut scored portion provided on the other of said overlapping flaps for adhesive affixation to the tear strip by a continuous coating of adhesive along substantially the entire length of said tear strip, having substantially the same configuration as the tear strip, situated so as to be in substantial registry with the tear strip when the flaps are in overlapping position relative to each other, and being cut only partially through the thickness of said flap.

4. The blank in accordance with claim 3 wherein the tear strip is defined by a pair of spaced such severance lines and wherein a cut score line is provided on each longitudinal side of the tear strip.

5. A paperboard carton cut and scored to provide a bottom panel, a front wall panel hingedly connected to one edge of said bottom panel, a rear wall panel hingedly connected to the other edge of said bottom panel, end wall members connected to said panels, and a cover hingedly connected to the upper edge of said rear wall panel and provided with cover flaps which comprise cover end wall panels and a cover front wall panel,

a tear strip detachably connected to said cover front wall panel by a severance line comprising at least two rows of linearly positioned, substantially uniformly spaced cuts extending through the thickness of the paperboard, said rows of cuts being so arranged that the cuts of one row fully overlap the uncut spaces of the adjacent row,

a cut score line in the outer surface of said cover front wall panel spaced apart from said severance line, extending substantially the entire length of said cover front wall panel, and being cut only partially through the thickness of said cover front wall panel, and

a cut scored portion of substantially the same configuration as the tear strip provided on the outer surface of said front wall panel, in substantial registry with said tear strip, and being cut only partially through the thickness of the front wall panel;

said tear strip being adhesively affixed to said substantially registering cut scored portion by a continuous coating of adhesive along substantially the entire length of said tear strip.

6. The carton according to claim 5 wherein the tear strip is defined by a pair of spaced such severance lines and wherein a cut score line is provided on the outside of each of said severance lines and substantially parallel therewith.

7. An integral paperboard blank for forming a carton cut and scored to provide a bottom panel, a front wall panel hingedly connected to one edge of said bottom panel, a rear wall penal hingedly connected to the other edge of said bottom panel, end wall members connected to said panels, and a cover hingedly connected to the upper edge of said rear wall panel and provided with cover flaps which comprise cover end wall panels and a cover front wall panel,

a tear strip detachably connected to said cover front wall panel by a severance line comprising at least two rows of linearly positioned, substantially uniformly spaced cuts extending through the thickness of the paperboard, said rows of cuts being so arranged that the cuts of one row fully overlap the uncut spaces of the adjacent row,

a cut score line in the outer surface of said cover front wall panel spaced apart from said severance line, extending substantially the entire length of said cover front wall panel, and being cut only partially through the thickness of said cover front wall panel, and

a cut scored portion of substantially the same configuration as the tear strip provided on the outer surface of said front wall panel, adapted to be in substantial registry with the tear strip, and being cut only partially through the thickness of the front wall panel;

said tear strip being adapted for adhesive affixation to said substantially registering cut scored portion by a continuous coating of adhesive along substantially the entire length of said tear strip.

8. The blank in accordance with claim 7 wherein the tear strip is defined by a pair of spaced such severance lines and wherein a cut score line is provided on the outside of each of said severance lines and substantially parallel therewith.

* * * * *