March 8, 1966 C. F. SCHILLING ETAL 3,239,129

CARTON

Filed Oct. 16, 1964 3 Sheets-Sheet 1

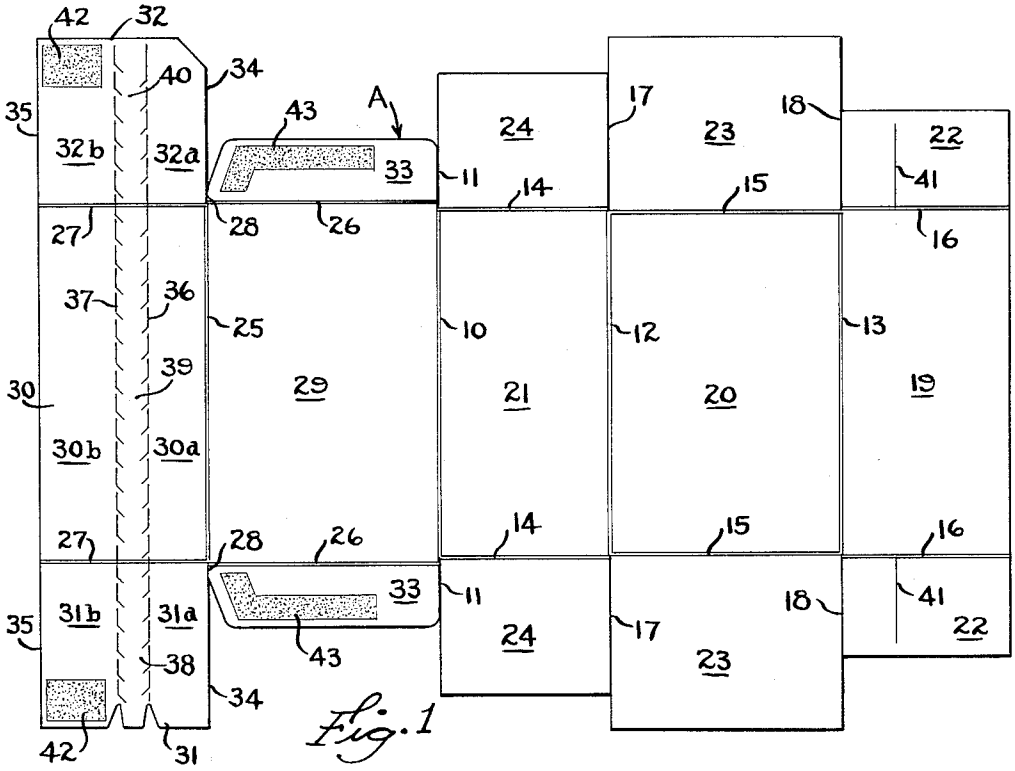


Fig. 1

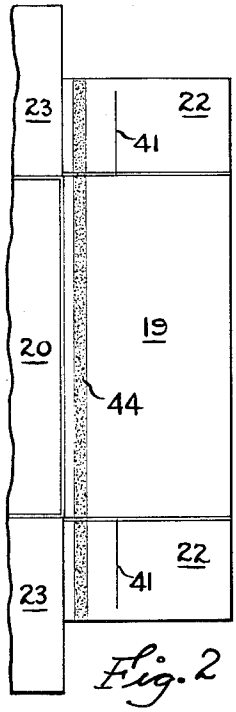


Fig. 2

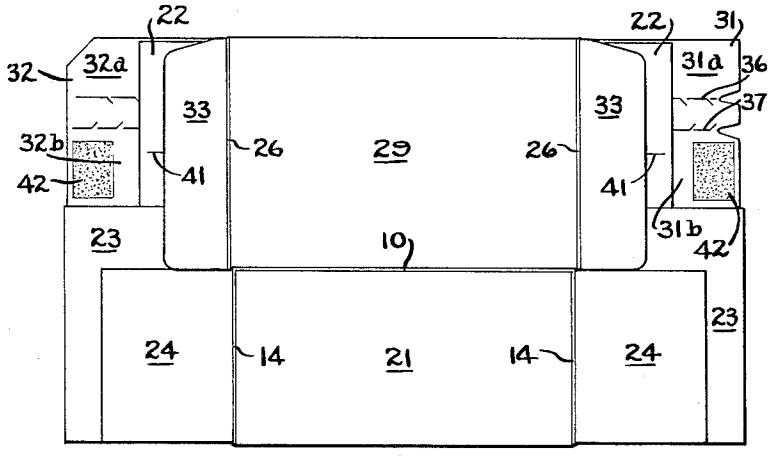


Fig. 3

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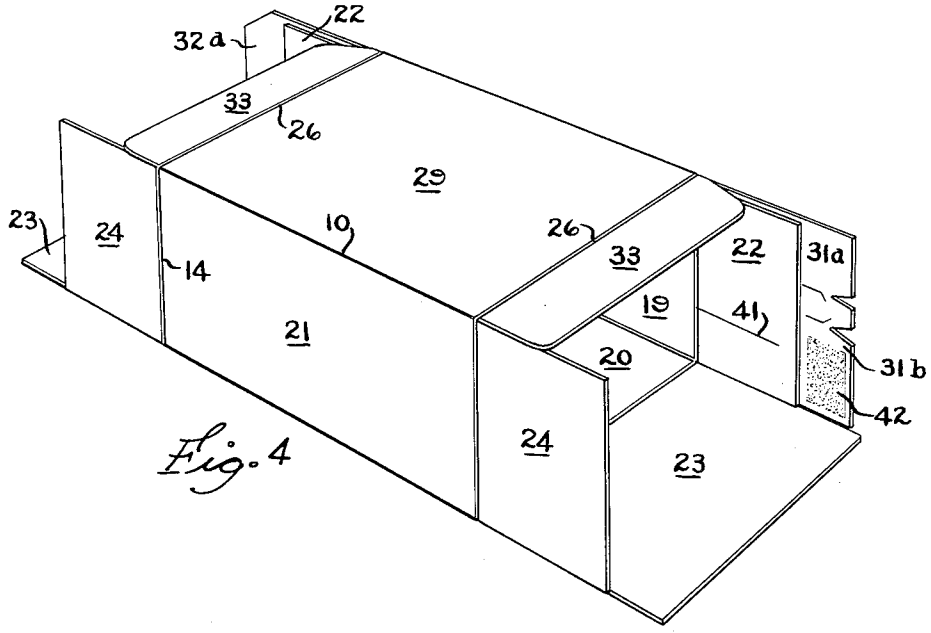


Fig. 4

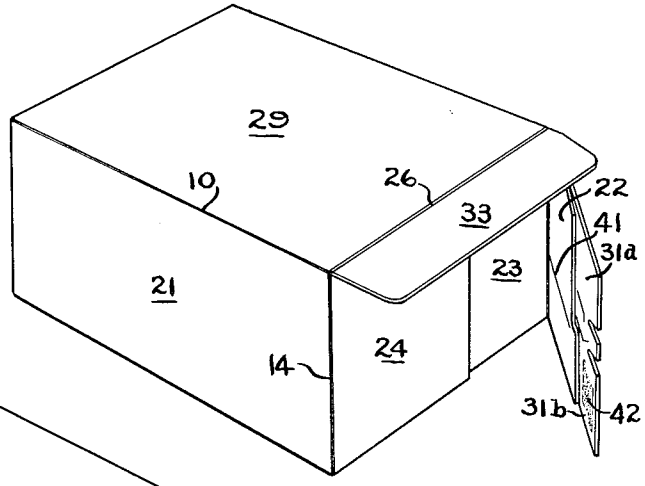


Fig. 5

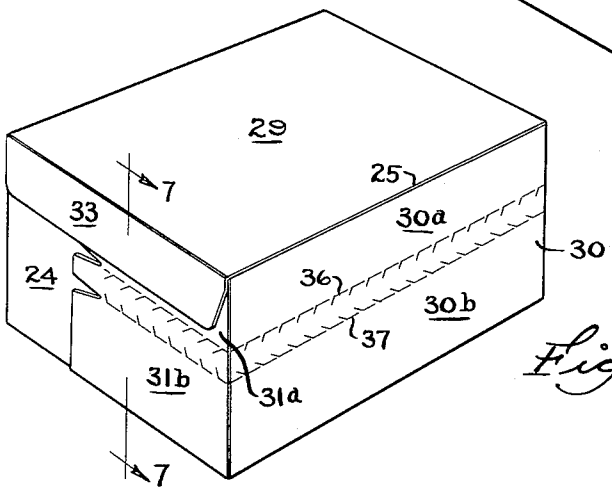


Fig. 6

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CARTON

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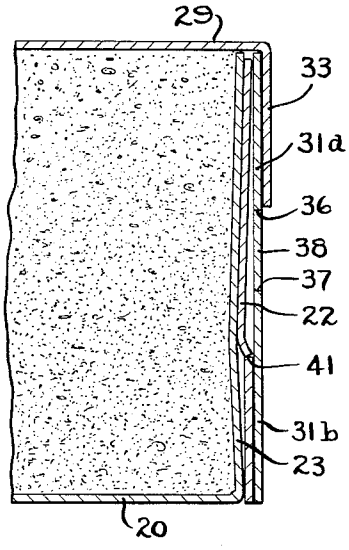


Fig. 7

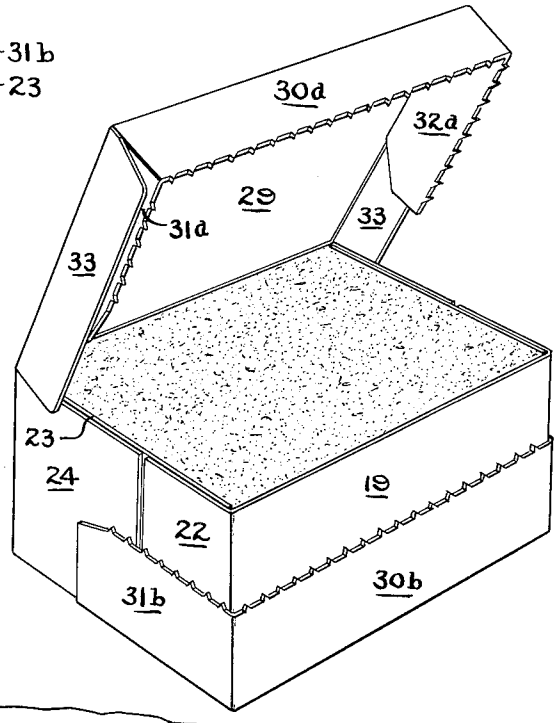


Fig. 8

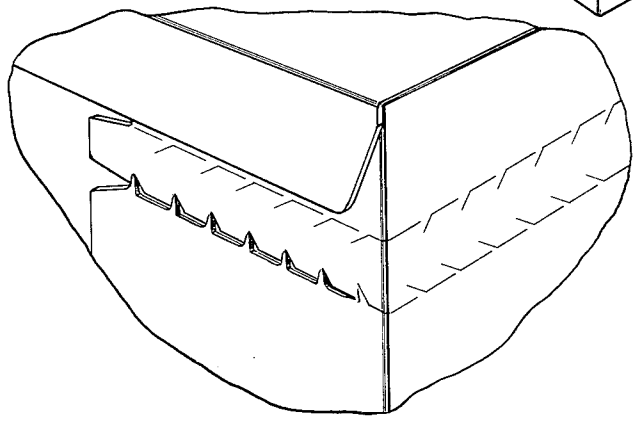


Fig. 9

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3,239,129

CARTON

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Filed Oct. 16, 1964, Ser. No. 404,223
5 Claims. (Cl. 229—51)

This invention relates to carton construction and more particularly to means for facilitating the closing of cartons having an inner and outer panel fixed together in overlapping juxtaposition so that the end edges of the panels are adjacent one another and having overlapping inner and outer flaps which are fixed together in a limited area of their overlap and which are hingedly connected to the adjacent ends of the inner and outer panels, respectively, and which are adapted to be folded perpendicularly to the inner and outer panels.

The improvement provides means which cannot be detected from the outward appearance of the carton for reducing the resistance of the flaps to folding.

The improvement is particularly well suited for use in conjunction with cartons of the above description which have a tear strip in the outer flap. In such known carton constructions, one of which is illustrated in FIGURE 9, there is a buckling or "puckering" of the tear strip along its bottom edge due to the fact that that portion of the outer flap above the line of weakness defining the bottom edge of the tear strip shifts relative to that portion of the outer flap below that line of weakness as the flaps are folded about their hinge connection. This "puckering" of the tear strip is not only unsightly but it also interferes with the closing and sealing of the carton on high-speed packaging machinery.

An object of this invention is to provide a new and improved carton construction having means which do not detract from the outward appearance of the carton which substantially reduce the resistance of the flaps to being folded.

Another object of this invention is to provide a new and improved carton construction which obviates the "puckering" of the tear strip which arises during the closing of known carton constructions.

To facilitate the description of the present invention there is shown in the drawings a carton of the type having a receptacle portion and a cover portion adapted to telescope over the receptacle portion and having a multi-sided, tear-strip opening feature.

Certain details and advantages of the invention will be apparent from the following description made in connection made in connection with the accompanying drawings in which:

FIGURE 1 is a plan view of a paperboard blank embodying the invention,

FIGURE 2 is a fragmentary view of the reverse side of the blank of FIGURE 1,

FIGURE 3 is a plan view of a collapsed carton shell formed from the blank of FIGURE 1,

FIGURE 4 is a perspective view of a squared carton shell formed from the blank of FIGURE 1,

FIGURE 5 is a perspective view of a partially closed carton formed from the blank of FIGURE 1,

FIGURE 6 is a perspective view of a fully closed and sealed carton formed from the blank of FIGURE 1,

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FIGURE 7 is an enlarged cross-sectional view taken along line 7—7 of FIGURE 6,

FIGURE 8 is a perspective view of a carton in opened condition formed from the blank of FIGURE 1 with the tear strip removed, and

FIGURE 9 is an enlarged, fragmentary perspective view of a known carton construction having "puckering" along the bottom edge of its tear strip.

Referring to FIGURE 1, the carton may be made from a single blank "A" of foldable material such as paperboard. The blank "A" is divided by score line **10** and cut lines **11** into a receptacle portion and a cover portion.

The receptacle portion is divided by score lines **12–16** and cut lines **17** and **18** into hingedly connected panels and flaps including receptacle front, bottom and rear panels **19**, **20** and **21**, respectively, and front, bottom and rear end flaps **22**, **23** and **24**, respectively.

Score line **10** defines the upper edge of receptacle rear panel **21** and score lines **16** define the end edges of receptacle front panel **19**.

The cover portion is divided by score lines **25–27** and cut lines **28** into hingedly connected panels and flaps including top panel **29**, opening panel **30**, opening flaps **31** and **32** and top flaps **33**.

Score line **25** defines the front edge of top panel **29** and score lines **26** define its opposed end edges. Score lines **27** define the opposed end edges of opening panel **30**. The openings flaps have upper and lower edges **34** and **35**, respectively.

Lines of weakness in the form of "herring bone" type, perforated score lines **36** and **37** in opening panel **30** and opening flaps **31** and **32** define a tear strip comprising portions **38**, **39** and **40**. Tear strip portion **38** separates first opening flap **31** into upper and lower portions **31*a*** and **31*b***. Likewise, tear strip portions **39** and **40** separate opening panel **30** into upper and lower portions **30*a*** and **30*b*** and second opening flap into upper and lower portions **32*a*** and **32*b***, respectively.

The front end flaps **22** have lines of weakness therein in the form of slits **41**, the function of which will be more fully described hereinafter.

In the preferred form. "preapplied" heat activatable adhesive is applied in patterns **42** and **43** on the opening flaps and top flaps, respectively. "Preapplied" adhesive is adhesive which is applied by the paper converter at the time of manufacture of the blank and is adapted to be activated by heat at the time of erection and closing of the carton.

Blank "A" is formed into a collapsed carton shell, as shown in FIGURE 3, by the paper converter. This is done by first running the blank as shown in FIGURE 1 over a conventional straight line gluer to apply adhesive strip **44** shown on the reverse side of the blank in FIGURE 2. Receptacle front panel **19** is then folded 180° about score line **13** to lie superposed on bottom panel **20** and so that its adhesive bearing surface is facing upwardly. Panels **29** and **30** together with their associated flaps are then folded 180° about score line **10** so that the lower portions **30*b***, **31*b*** and **32*b*** of panel **30** and flaps **31** and **32** are brought in contact with and adhered to receptacle front panel **19** and flaps **22**, respectively, by adhesive strip **44**. The blank is then in the collapsed shell form shown in FIGURE 3. In this form, the carton may be economically shipped to the product packager for setting up, filling and sealing.

To set up the carton, the collapsed carton shell is first squared so that panels **19**, **20**, **21** and **29** are positioned consecutively at right angles to each other as seen in FIGURE 4. Usually, one end of the carton is first closed and sealed and the carton is then filled and the other end is closed and sealed. Since the closing and sealing steps for each end of the carton are the same, reference is had to closing just one end of the carton.

To close one end of the carton, bottom end flap **23** is folded upwardly about score line **15** to a position perpendicular to bottom panel **20**. As seen in FIGURE 5, rear end flap **24** is folded inwardly about score line **14** to overlie the bottom end flap. Front end flap **22** and opening flap **31** which are adhered together below the tear strip portion **38** are folded inwardly and that part of opening flap portion **31*b*** which extends beyond front end flap **22** is adhered to rear end flap **24** by adhesive **42**.

When opening flap **31** and front end flap **22** are folded rearwardly the portions of these flaps which are adhered together below the tear strip rotate as a unit about a single axis which lies between score lines **16** and **27**. In contrast, when the portions of these flaps above the tear strip and which are not adhered together are folded inwardly they rotate about individual axes, namely score lines **16** and **27**.

In the known carton construction when these flaps are folded inwardly that portion of opening flap above the perforated score line defining the bottom edge of the tear strip tends to move or slide relative to that portion of the flap which is below this perforated score line, thus, causing "puckering" along the bottom edge of the tear strip as shown in FIGURE 9.

The present invention obviates this "puckering" along the bottom edge of the tear strip by providing a line of weakness in the form of slit **41** in front end flap **22**. The slit is positioned below perforated score line **37** defining the bottom edge of the tear strip and above the area of adhesion between opening flap portion **31*b*** and the subposed end flap **22**. In a preferred embodiment slit **41** extends substantially across front end flap **22** to provide a line of weakness therein which is substantially weaker than the line of weakness **37** defining the bottom edge of the tear strip. This allows the upper portion **31*a*** of opening flap **31** together with tear strip portion **38** to forcibly slide that portion of front end flap **22** above slit **41** relative to the portion below slit **41**. As shown in FIGURES 5 and 7, this causes a wrinkle in front end flap **22** at the end of slit **41** which cannot be seen when the carton is closed and sealed and which does not interfere with the operation of the closing and sealing machinery.

Thus, by weakening front end flap **22** by slit **41** to a greater degree than opening flap **31** is weakened by perforation line **37**, "puckering" along the lower edge of the tear strip portion **38** is eliminated.

To fully close the end of the carton, top flap **33** is folded downwardly about score line **26** to overlie rear end flap **24** and opening flap portion **31*a*** and it is adhered to portion **31*a*** by adhesive **43**. The folding and sealing of top flap **33** thus completes the end closure of the carton and fully closed carton as it appears to the consumer is shown in FIGURE 6.

Referring to FIGURE 8, to open the carton, the tear strip is gripped at the free end of portion **38** and torn completely from the carton. The removal of the tear strip thus severs the lower portions of **30*b***, **31*b*** and **32*b*** of the cover which are adhered to the receptacle portion from the upper portions of the cover **30*a***, **31*a*** and **32*a***, respectively, which are not so adhered.

While a particular embodiment of the invention is shown in the drawings and described in detail herein, the invention is suitable of embodiment in various different forms and it is understood that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the particular form illustrated. The scope of the invention will be pointed out in the appended claims.

We claim:

1. In a carton having an inner panel, an outer panel in overlapping juxtaposition with and fixed to the inner panel, the outer panel having an end edge adjacent an end edge of the inner panel, an inner flap hingedly connected to said end edge of the inner panel, and outer flap hingedly connected to said end edge of the outer panel and overlapping said inner flap, the said flaps being fixed together in a limited area of their overlap and being adapted to be folded perpendicularly to said panels, the improvement comprising a cut line in said inner flap extending from adjacent the hinge connection of said inner flap and said inner panel to adjacent a free edge of said inner flap, the cut line being adjacent said limited area.

2. In a carton having an inner panel, an outer panel in overlapping juxtaposition with and fixed to the inner panel, the outer panel having an end edge adjacent an end edge of the inner panel, an inner flap hingedly connected to said end edge of the inner panel, an outer flap hingedly connected to said end edge of the outer panel and overlapping said inner flap, the said flaps being fixed together in a limited area of their overlap and being adapted to be folded perpendicularly to said panels, the improvement comprising a cut line in said inner flap extending approximately perpendicularly to the hinge connection of said inner flap to said inner panel, the cut line being adjacent said limited area.

3. In a carton having a receptacle portion and a cover portion adapted to telescope over the receptacle portion; said receptacle portion comprising hingedly connected receptacle front, bottom and back panels and end flaps; said cover portion comprising a top panel having a front edge, an opening panel hingedly connected along the front edge of said top panel and having opposed end edges, opening flaps hingedly connected along the end edges of said opening panel, said opening panels and opening flaps being superposed over said receptacle front panel and end flaps, respectively, at least one of said opening flaps adjacent an edge remote from the top panel being adhered to a subposed end flap, and a tear strip portion defined by a pair of vertically spaced lines of weakness extending from a free edge of one of said opening flaps to its hinge connection, said tear strip being positioned between the plane of the top panel and the area of the opening flap which is adhered to said subposed end flap; the improvement comprising a line of weakness in said subposed end flap positioned below said tear strip and above the area of the subposed end flap which is adhered to the opening flap.

4. A tamperproof carton as described in claim **3** wherein the line of weakness in said subposed end flap comprises a slit extending approximately perpendicularly to the hinge connection of said subposed end flap and substantially across said subposed end flap.

5. In a reclosable carton formed from a paperboard blank suitably cut and scored to provide a carton having a receptacle portion and a hinged cover portion adapted to telescope over the receptacle portion; said receptacle portion having hingedly connected receptacle front, bottom and back panels and end flaps, said receptacle back panel having an upper edge; said cover portion having a top panel hingedly connected to the upper edge of said back panel, said top panel having a front edge and opposed ends, an opening panel hingedly connected along the front edge of said top panel and having a lower edge and opposed end edges, opening flaps hingedly attached along the end edges of said opening panel and having lower and upper edges, said opening panels and opening flaps overlying and being adhered adjacent their lower edges to said receptacle front panel and end flaps, respectively, top flaps hingedly connected to the ends of said top panel and adhered to said opening flaps in the area

of their upper edge; a tear strip being defined by a pair of vertically spaced lines of weakness extending from a free edge of one of said opening flaps throughout the length of said opening panel to a free edge of the other opening flap, said tear strip being positioned between the plane of the top panel and the area of said opening flaps which is adhered to said end flaps; the improvement comprising a slit in one of said end flaps positioned below the tear strip and above the area of the end flap which is adhered to said opening flap.

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