

Jan. 18, 1966

J. EDELMAN
CARTON CLOSURE

3,229,891

Filed July 5, 1963

2 Sheets-Sheet 1

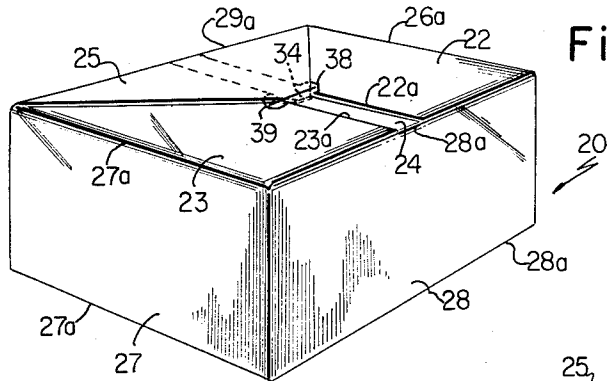


Fig. 1

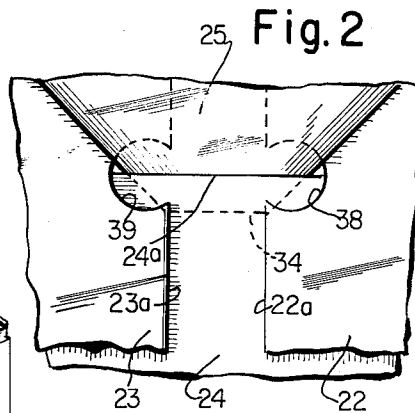


Fig. 2

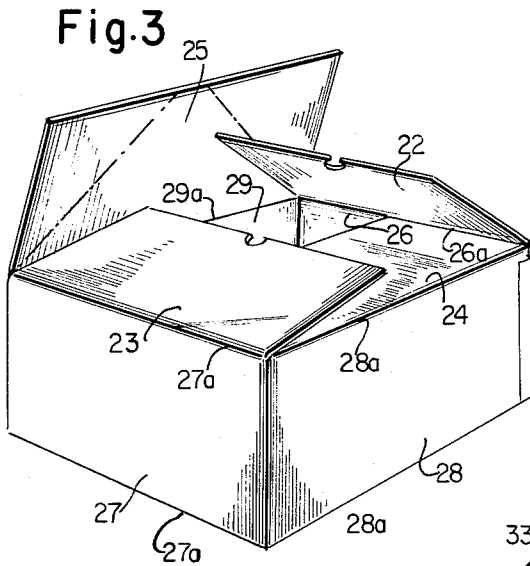


Fig. 3

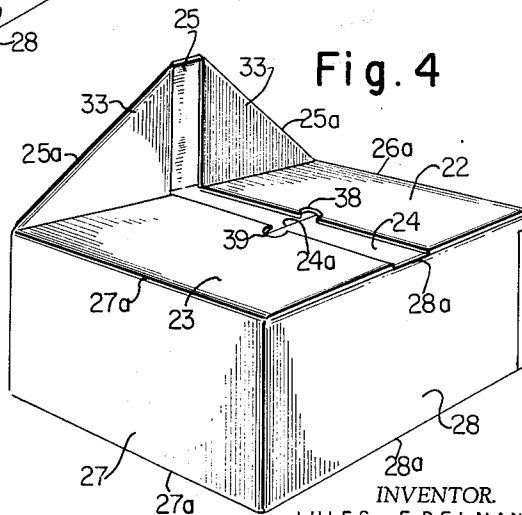


Fig. 4

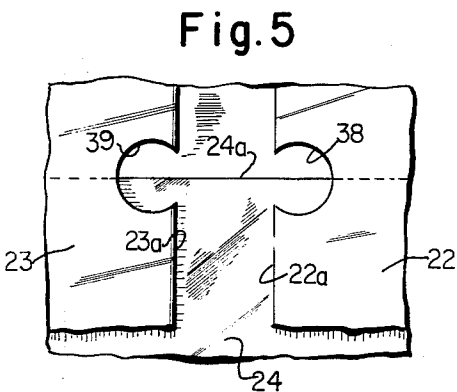


Fig. 5

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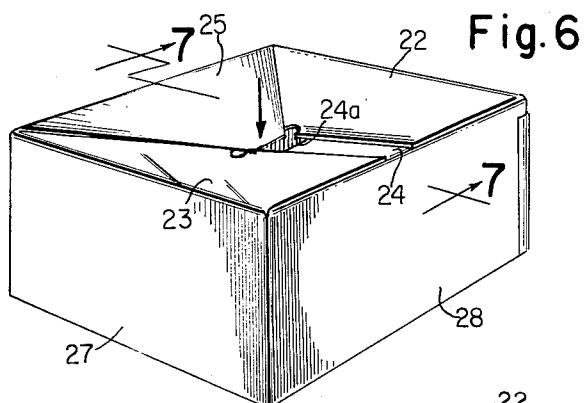


Fig.7

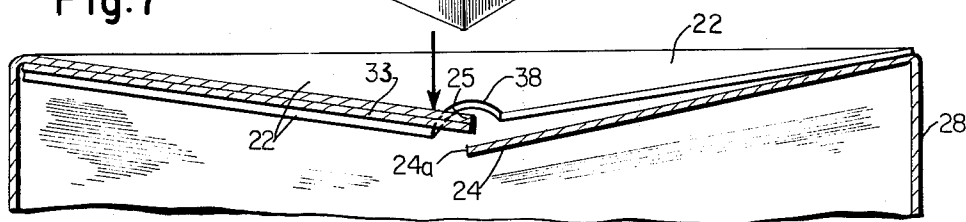
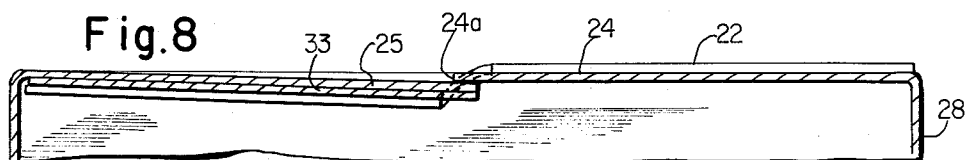
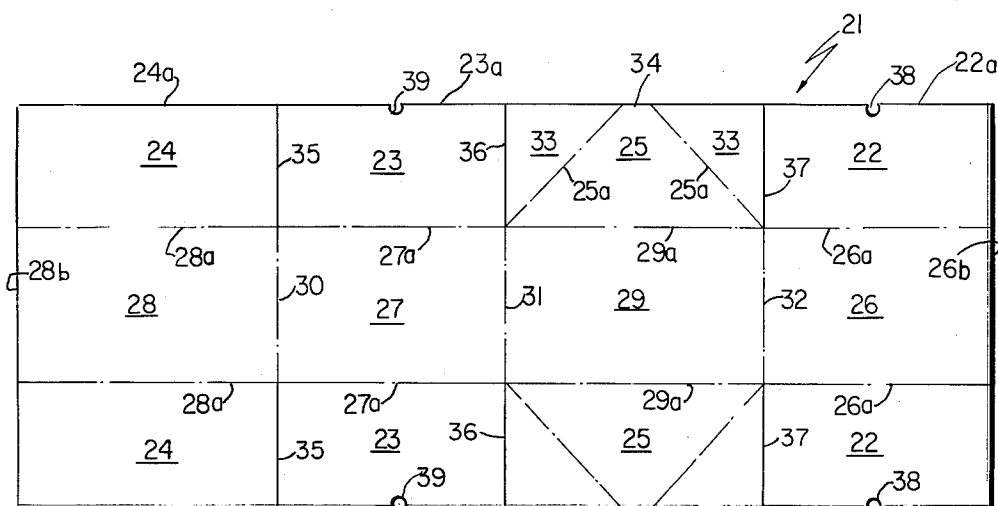


Fig. 9

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CARTON CLOSURE

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5 Claims. (Cl. 229—39)

The invention relates generally to a carton closure and more particularly to a carton closure which is self-locking in the closed position of the carton.

Cartons are normally provided with rectangular closure panels extending from the side wall panels of the carton body. Upon closing the carton, oppositely disposed pairs of the closure panels are folded downwardly and then secured in the closed position by the application of glue, tape, staples, or the like. In order to simplify the closing of a carton, closure panels have been provided which are self-locking. With such an arrangement certain of the closure panels are provided with relieved portions while others are provided with tabs or tongue-like elements. The engagement of the tabs with portions of other closure panels tends to secure the closure panels in the closed position.

Because of the intricate shapes of the relieved portions and the tabs, it is common practice to fabricate the carton blanks on die cutting machines. Consequently the manufacture of a carton blank of this type not only necessitates the use of special machines but also results in a more complicated carton blank which is inherently more costly to produce and which leads to waste of the carton body material due to the portions that are cut away during fabrication. In such a carton blank the nature of the engagement of the tabs or tongues necessarily limits the strength of the closure since the loads applied to the closure must be supported by relatively small and consequently weak portions of the closure panel.

A further disadvantage associated with a carton blank which must be fabricated on a die cutting machine is that the die cutting machine generally is not compatible to the application of printed matter to the blank while it is being fabricated. Consequently it is necessary to print the carton blank after removal from the die cutting machine with the result that the subsequent separate operation increases the cost of the carton blank.

It is one of the objects of the invention to provide a carton having closure panels which are self-locking to form a strong closure for the carton.

It is another object of the invention to provide a carton having closure panels which can be engaged and locked with respect to one another in a simple and convenient manner.

It is still another object of the invention to provide a carton having self-locking closure panels which are provided with increased strength at the point of locking engagement.

It is an additional object of the invention to provide a carton blank having self-locking closure panels which can be produced on a carton blank slotting machine.

It is a further object of the invention to provide a carton blank having self-locking closure panels and side wall panels which utilize substantially all of the carton blank material within the perimeter of the outermost portions of the carton blank.

It is still a further object of the invention to provide a carton blank having self-locking closure panels which can be produced with a reduced number of slots and foldlines.

In one embodiment of the invention the carton has a tubular body portion with a plurality of side wall panels, each having an end portion disposed adjacent to one end of the tubular body portion. The carton has first

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and second closure panels pivotally attached to different side panels of a pair of side panels disposed substantially opposite one another. The edge portion of the first and second closure panels disposed opposite to the pivotal attachment of each is in a facing relationship with one another when the first and second closure panels are folded inwardly to the closed position of the carton. Each of the edge portions contains an opening which is substantially in alignment with the other in the closed position. The carton also includes a third closure panel pivotally attached adjacent to the end portion of one of the side panels of another pair of said panels disposed substantially opposite to one another. The edge portion of the third closure panel disposed opposite to its pivotal attachment extends beneath the first and second closure panels in the closed position. The carton further includes a fourth closure panel pivotally attached adjacent to the end portion of the other side panel of the other pair of side panels. The fourth closure panel includes means for engaging the edge portion of the third closure panel and the opening in the first and second closure panels when the first and second closure panels are folded inwardly to overlie the third closure panel and the fourth closure panel is folded inwardly to overlie the first and second closure panels in the closed position. The advantage of this arrangement is that it enables the closure panels to be locked with respect to one another by the engaging means of the fourth closure panel in a fully overlapping manner which provides a closure of increased strength. Furthermore, this arrangement merely requires a simple and limited number of steps in erecting the carton closure.

In another embodiment of the invention the edge portions of the first and second closure panels which are disposed opposite to the pivotal attachment thereof and provided with openings are spaced apart in the closed position. With this arrangement the movement of the fourth closure panel with its means for engaging both of the openings as well as the edge portion of the third closure panel is facilitated.

In still another embodiment of the invention the fourth closure panel is provided with edge portions extending from adjacent the pivotal attachment thereof and converging to adjacent one another. The converging edge portions are adapted to engage the openings of the first and second closure panels and the edge portion of the third closure panel in the closed position.

In an additional embodiment of the invention the fourth closure panel is provided with oppositely disposed corner portions pivotally attached thereto in a diagonal direction extending in a converging manner from adjacent the end portions of the pivotal attachment of the fourth closure panel. When the corner portions are folded about their pivotal attachment they are adapted to engage the openings of the first and second closure panels and the edge portion of the third closure panel adjacent thereto to secure the closure of the carton. This arrangement has the advantage by virtue of the folded corner portions of providing a double thickness of carton material in the region of locking engagement. The edge portion of the first and second closure panels opposite their foldlines contain openings.

In a further embodiment of the invention the first and second closure panels of the carton blank extend from a foldline disposed along the end portion of a different one of a pair of side wall panels which are spaced apart from one another by at least one side wall panel. The third closure panel extends from a foldline disposed along the end portion of a side wall panel adjacent to at least one of the pairs of side wall panels from which the first and second closure panels extend. The carton blank further includes a fourth closure panel extending from a

foldline disposed along the end portion of another side wall panel adjacent to a portion of the first and second closure panels. The fourth closure panel is provided with means for engaging the third closure panel and the openings of the first and second closure panels when the first and second closure panels are folded over the third closure panel in the erected carton.

In still a further embodiment of the invention the side wall panels of the carton body and the closure panels extend substantially throughout all portions of the carton blank enclosed within its periphery. This arrangement simplifies the fabrication of the carton blank and insures a minimum of waste of the carton blank material.

Various objects and features will become apparent from the following description and claims and in the drawings in which:

FIG. 1 is a perspective view of the carton of the invention;

FIG. 2 is an enlarged fragmentary plan view showing the locking engagement of the closure panels;

FIG. 3 is a perspective view of the carton showing the initial steps of erecting the closure;

FIG. 4 is a perspective view of the carton showing the closure panels prior to the final engagement thereof;

FIG. 5 is an enlarged fragmentary plan view showing the positioning of the edge portion of one closure panel with respect to the openings in a pair of other closure panels;

FIG. 6 is a perspective view of the carton showing the final engagement of the closure panels with one another;

FIG. 7 is an enlarged fragmentary vertical section view showing the step of engaging the closure panels during the closing of the carton;

FIG. 8 is an enlarged fragmentary vertical section view showing the closure panels in their finally engaged position;

FIG. 9 is a plan view of the carton blank of the invention.

Carton 20 (FIG. 1) can be erected from carton blank 21 (FIG. 9). The closure for the top portion of carton 20 includes first closure panel 22, second closure panel 23, third closure panel 24 and fourth closure panel 25 extending from foldlines or scores 26a-29a disposed along an end portion of side wall panels 26-29, respectively. The side wall panels which form the tubular body of the carton are connected to one another along foldlines or scores 30, 31 and 32. Edges 26b and 28b are joined to form the tubular body portion by conventional means such as taping, stitching, etc. Thus it can be seen that the end portion of each of the side wall panels extend along a line disposed at an angle to foldlines 30-32.

Closure panel 25 is provided with corner portions or flaps 33 which extend from foldlines or scores 25a. Foldlines 25a extend in a diagonal manner from the end portions of folding 29a and converge toward one another. In this way the portion of closure flap 25 contained within foldlines 25a and foldline 29a is substantially triangular in form. Foldlines 25a are positioned to intersect the outer edge of closure panel 25 and to form end portion 34 therebetween.

Carton blank 21 further contains cut lines or slots 35-37 which extend between the closure panels. Thus it can be seen that each of the closure panels is pivotally attached to the side wall panel from which it extends and that corner portions 33 are pivotally attached to cover panel 25. Closure panels 22 and 23 have openings or notches 38 and 39 in edge portions 22a and 23a, respectively, thereof.

As shown in FIG. 1 carton 20 includes closure panels 22-25 at the upper portion thereof. A similar arrangement of closure panels can be used to serve as the bottom closure of the carton. In such a case the lower portion of the carton blank, as shown in FIG. 9, is provided

with closure panels, cut lines and scores, similarly as those described with respect to the upper portion of the carton blank. In producing the carton blank, the relative position of the closure panels as shown in FIG. 9 is the factor to be maintained but their actual position with respect to the blank can be varied. Thus, for example, closure panels 24 and side wall panel 28 can be positioned to the right of closure panels 22 and side wall panel 26 as shown in FIG. 9 while the relative position of the remaining panels remains the same. In this way the pair of closure panels comprising the first and second closure panels are spaced apart while the third and fourth closure panels are disposed at opposite sides of one of the first and second closure panels.

It can be seen from FIG. 9 that carton blank 21 extends substantially throughout all the portions contained within its periphery since it is necessary to remove carton blank material only during the forming of openings 38 and 39. Furthermore, it can be seen that only a minimum number of foldlines and cut lines are required in producing carton blank 21.

In erecting carton 20 closure panel 24 is first folded inwardly about foldline 28a to a position overlying the interior of the carton (FIG. 3). Closure panels 22 and 23 are then folded inwardly to a position at which a portion of each overlies and contacts closure panel 24 (FIG. 4). As determined by the length of closure panels 22 and 23 from their respective foldlines to their free edges 22a and 23a, the free edges are spaced apart in the closed position. In the closed position openings 38 and 39 are in a facing relationship and substantially in alignment with one another. The distance from foldline 28a to edge portion 24a of closure panel 24 is conditioned such that edge portion 24a is disposed beneath and intersects openings 38 and 39 when closure panels 22, 23 and 24 are in the closed position (FIG. 5).

Corner portions 33 are folded inwardly with respect to foldlines 25a to a position at which the corner portions are substantially contiguous with closure panel 25 (FIG. 4). Closure panel 25 is then folded inwardly about foldlines 29a to a point at which corner portions 33 engage closure panels 22 and 23 adjacent to openings 38 and 39 (FIG. 6). By applying downwardly directed pressure to closure panel 25 in the direction of the arrow shown in FIGS. 6 and 7, corner portions 33 are urged into engagement with closure panels 22 and 23 and the panels are deflected downwardly. As the corner portions urge closure panels 22 and 23 downwardly, the portions of closure panel 25 adjacent to foldlines 25a pass adjacent to openings 38 and 39. When closure panels 22, 23 and 25 are deflected sufficiently in a downward direction, edge portion 34 of closure panel 25 can pass beneath edge portion 24a of closure panel 24 adjacent thereto. Upon termination of the downward pressure, the resiliency of the closure panels and their related foldlines enables the closure panels to snap upwardly completing the engagement of the closure panel.

Due to the fact that upon engagement end portion 34 underlies edge portion 24a and foldlines 25a overlie the closure panels 22 and 23 as well as engage openings 38 and 39, the closure panels become locked with respect to one another. The width of material at end portion 34 and the double thickness formed by corner portions 33 with closure panel 25 provide a substantially rigid manner for engaging closure panel 24 and thereby results in a strong closure for the carton. Furthermore, the application of force to the interior of the closure tends to tighten the engagement of the closure panels and thereby opposes accidental opening of the closure. Where contents of the carton are of a heavy nature, the locking action of the closing panels can be augmented by conventional taping, stapling, or the like.

After erection of carton 20 the closure can be subsequently reopened by applying pressure to closure panels 24 and 25 in a manner sufficient to disengage end portion

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34 from edge portion 24a. Once this engagement has been effected the closure panels may be folded back to the open position.

While certain embodiments of the invention have been shown and described herein, it is to be understood that certain changes, additions and substitutions may be made without departing from the scope and spirit of the invention.

What is claimed:

1. In a carton having a tubular body portion with a plurality of side wall panels, the side wall panels being spaced apart from one another and each having an end portion disposed adjacent one end of said tubular body portion, the combination comprising first and second closure panels, each of said first and second closure panels being pivotally attached adjacent said end portion of a different side panel of a pair of side panels disposed substantially opposite to one another, the edge portion disposed opposite to the pivotal attachment of each of said first and second closure panels facing one another when said first and second closure panels are folded inwardly to the closed position of the carton, each of said edge portions having a notched opening extending therein, said openings being substantially aligned in said closed position, a third closure panel pivotally attached adjacent said end portion of one of the side panels of another pair of side panels disposed substantially opposite to one another, the edge portion of said third closure panel disposed opposite to the pivotal attachment thereof extending beneath said first and second closure panels and adjacent said openings when in said closed position, a fourth closure panel pivotally attached adjacent said end portion of the other of the side panels of said other pair of side panels, said fourth closure panel having edge portions extending away from the pivotal attachment thereof, said edge portions of said fourth closure panel being adapted to engage said openings and the inner surface of said edge portion of said third closure panel adjacent thereto when said first and second closure panels are folded inwardly to overlie said third closure panel and said fourth closure panel is folded inwardly to overlie said first and second closure panels in said closed position, whereby said fourth closure panel when engaged with said openings and the edge portion of said third closure panel adjacent thereto secures said closure panels in said closed position.

2. In a carton having a tubular body portion with a plurality of side wall panels, the side wall panels being spaced apart from one another and each having an end portion disposed adjacent one end of said tubular body portion, the combination comprising first and second closure panels, each of said first and second closure panels being pivotally attached adjacent said end portion of a different side panel, a pair of side panels disposed substantially opposite to one another, the edge portion disposed opposite to the pivotal attachment of each of said first and second closure panels facing one another when said first and second closure panels are folded inwardly to the closed position of the carton, each of said edge portions having a notched opening extending therein, a third closure panel pivotally attached adjacent said end portion of one of the side panels of another pair of said panels disposed substantially opposite to one another, the edge portion of said third panel disposed opposite to the pivotal attachment thereof extending beneath said first and second closure panels when in said closed position, a fourth closure panel pivotally attached adjacent said end portion of the other of the side panels of said other pair of side panels, said fourth closure panel having edge portions extending from adjacent the pivotal attachment thereof and converging to adjacent one another, said converging edge portions engaging said openings and the inner surface of said edge portion of said third closure panel adjacent thereto when said first and second closure panels are folded inwardly to overlie said third closure panel and said fourth closure panel is folded inwardly to overlie

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said first and second closure panels in said closed position, whereby said fourth closure panel when engaged with said openings and the edge portion of said third closure panel adjacent thereto secures said closure panels in the closed position.

3. In a carton having a tubular body portion with a plurality of side wall panels, the side wall panels being spaced apart from one another and each having an end portion disposed adjacent one end of said tubular body portion, the combination comprising first and second closure panels, each of said first and second closure panels being pivotally attached adjacent said end portion of a different side panel, a pair of side panels disposed substantially opposite to one another, the edge portion disposed opposite to the pivotal attachment of each of said first and second closure panels facing one another when said first and second closure panels are folded inwardly to the closed position of the carton, each of said edge portions having a notched opening extending therein, a third closure panel pivotally attached adjacent said end portion of one of the side panels of another pair of said panels disposed substantially opposite to one another, the edge portion of said third panel disposed opposite to the pivotal attachment thereof extending beneath said first and second closure panels when in said closed position, a fourth closure panel pivotally attached adjacent said end portion of the other of the side panels of said other pair of side panels, said fourth closure panel having corner portions pivotally attached thereto in a diagonal direction extending in a converging manner from adjacent the end portions of the pivotal attachment of said fourth closure panel, said diagonal pivotal attachments engaging said openings and an inner surface on said edge portion of said third closure panel adjacent thereto when said first and second closure panels are folded inwardly to overlie said third closure panel and said corner portions are folded adjacent the surface of said fourth cover panel facing the interior of said body portion, and said fourth closure panel is folded inwardly to overlie said first and second closure panels in said closed position, whereby said fourth closure panel when engaged with said openings and the edge portion of said third closure panel adjacent thereto secures said closure panels in the closed position.

4. In a carton blank having a plurality of side wall panels connected to one another along foldlines extending therebetween, each of said side wall panels having an end portion extending along a line disposed at an angle to said foldlines, the combination comprising first and second closure panels each extending from a foldline disposed along said end portion of a different one of a pair of side wall panels, said pair of side wall panels being spaced apart by at least one side wall panel of said plurality of side wall panels, each of said first and second closure panels having an edge portion disposed opposite to the foldline thereof, said edge portions of said first and second closure panels being adapted to face one another in the closed position of the erected carton and each of said edge portions having a notched opening extending therein, said openings being symmetrically positioned with respect to one another in order to be adapted to be substantially in alignment in the closed position of the erected carton, a third closure panel extending from a foldline disposed along said edge portion of a third side wall panel and adjacent one side of one of said first and second closure panels, and a fourth closure panel extending from a foldline disposed along said edge portion of a fourth side wall panel adjacent the other side of said one closure flap, said fourth closure panel including diagonal foldlines and oppositely disposed corner portions attached therealong, said diagonal foldlines extending in a converging manner from adjacent the end portions of said foldline thereof, a portion of said diagonal foldlines when said corner portions are folded adjacent to said fourth closure panel being adapted to engage said openings and the inner surface

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of said third closure panel when said closure panels are in a closed position in the erected carton.

5. In a carton blank having a plurality of side wall panels connected to one another along foldlines extending therebetween, each of said side wall panels having an end portion extending along a line disposed at an angle to said foldlines, the combination comprising first and second closure panels each extending from a foldline disposed along said end portion of a different one of a pair of side wall panels, said pair of side wall panels being spaced apart by at least one side wall panel of said plurality of side wall panels, each of said first and second closure panels having an edge portion disposed opposite to the fold line thereof, said edge portions of said first and second closure panels being adapted to face one another in the closed position of the erected carton and each of said edge portions having a notched opening extending therein, said openings being symmetrically positioned with respect to one another in order to be adapted to be substantially in alignment in the closed position of the erected carton, a third closure panel extending from a foldline disposed along said edge portion of a third side wall panel and adjacent one side of one of said first and second closure panels, and a fourth closure panel extending from a foldline disposed along said edge portion of a fourth side wall

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panel adjacent the other side of said one closure flap, said fourth closure panel having diagonal foldlines and corner portions attached therealong, said diagonal foldlines extending from adjacent the end portion of said foldline thereof to the central portion of the edge of said fourth closure panel disposed opposite to said foldline thereof, said diagonal foldlines being adapted to engage said openings and the inner surface of said third closure panel when said closure panels are in a closed position in the erected carton.

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