Feb. 17, 1970 A. W. PASCUS ET AL 3,495,757

CARDBOARD CARTON

Filed May 23, 1968 3 Sheets-Sheet 1

FIG. 1

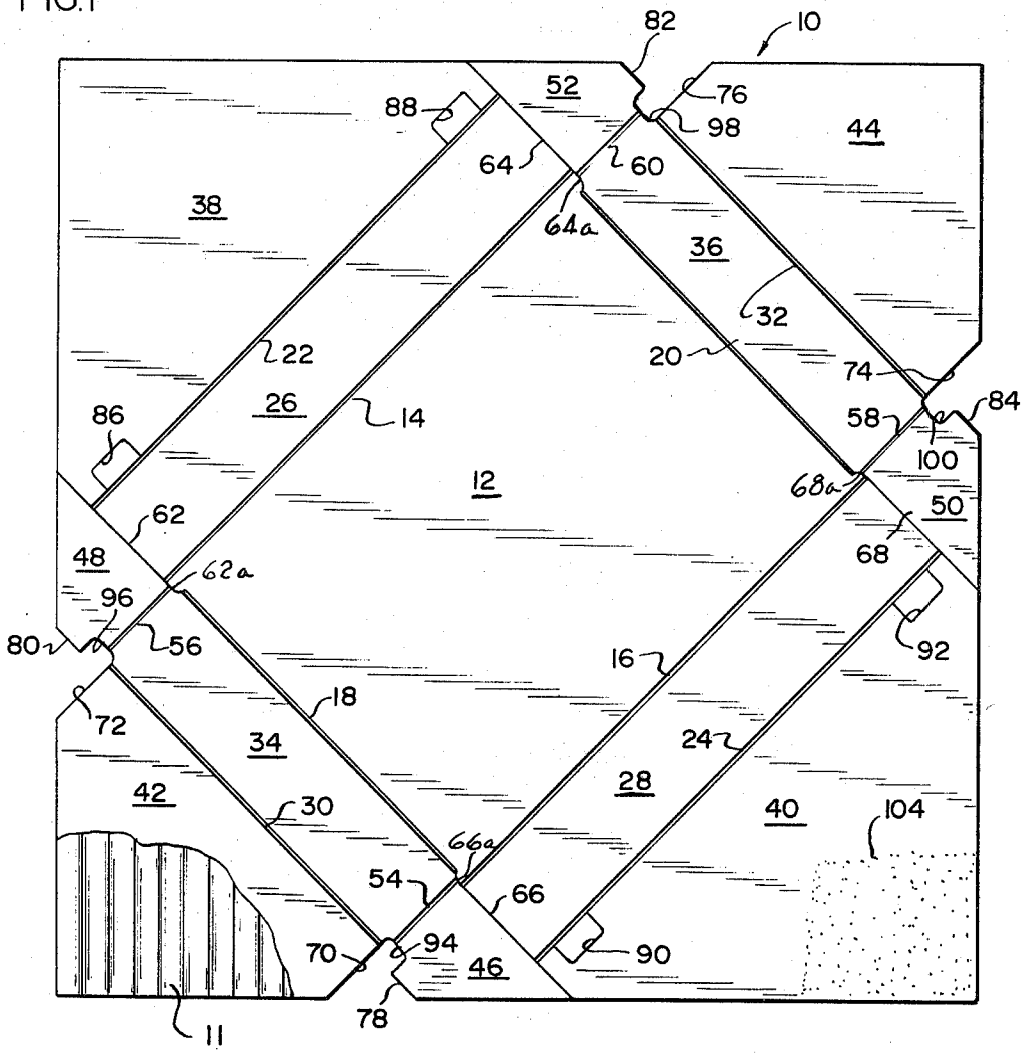
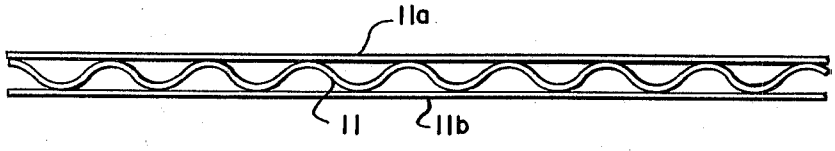


FIG. 1A



INVENTORS.
A. W. PASCUS
EDMUND BOEHM
BY Hofgren, Wegner, Allen, Stellman & McCord.
ATTORNEYS.

FIG.2

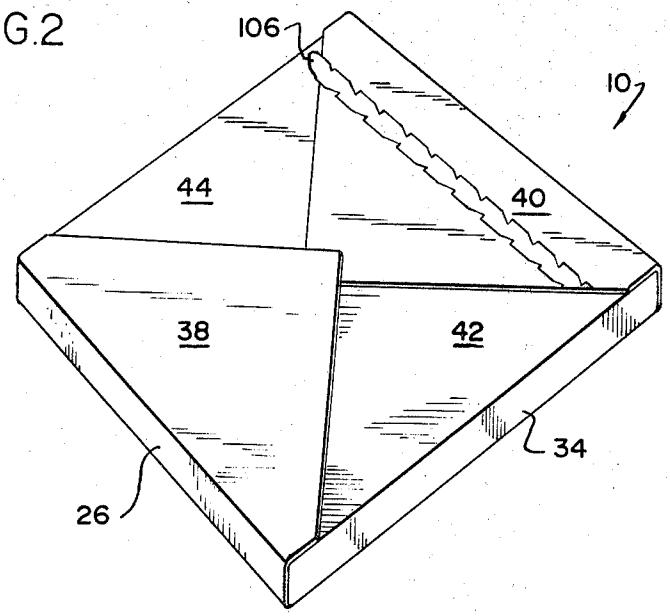
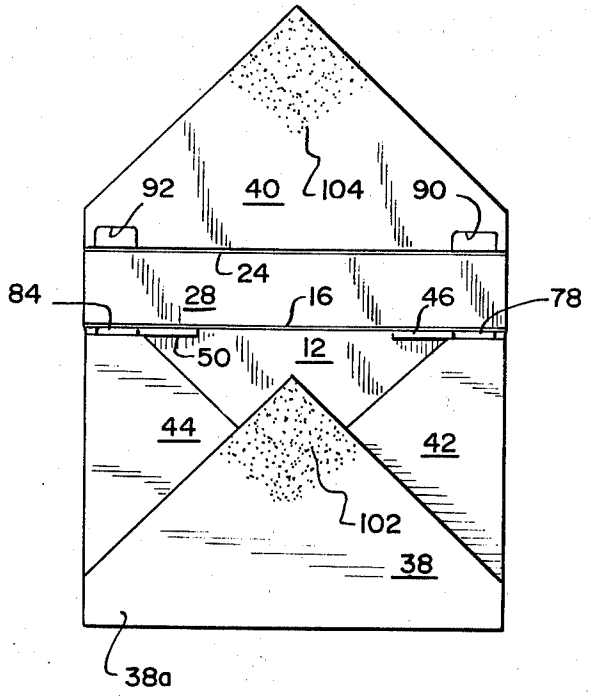

106
10
44
40
38
42
34
26

FIG.6


92
40
104
90
24
84
28
16
46
78
50
12
44
42
102
38
38a

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CARDBOARD CARTON

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FIG.4

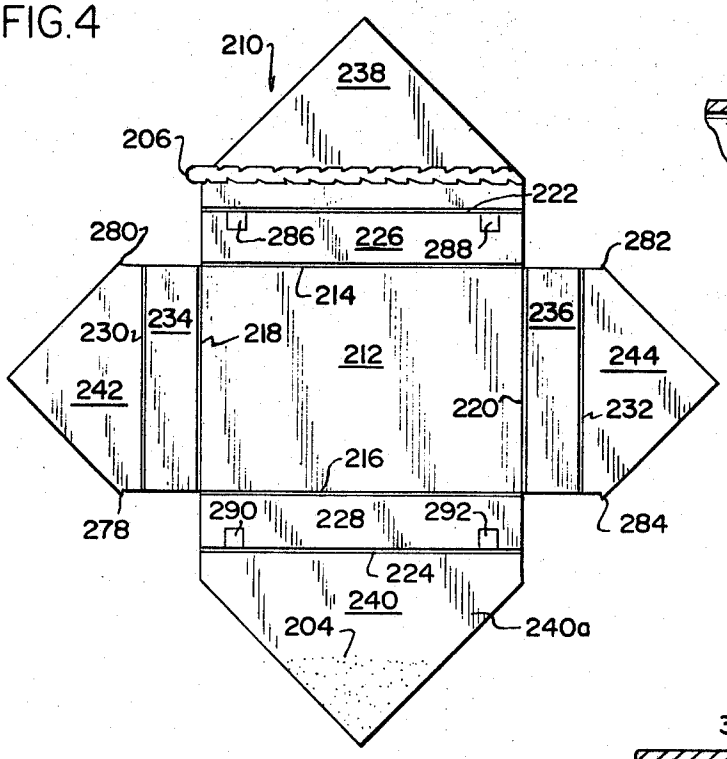


FIG.5

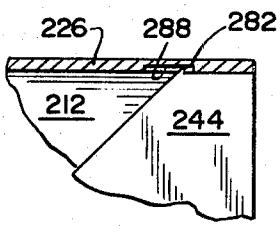


FIG.7

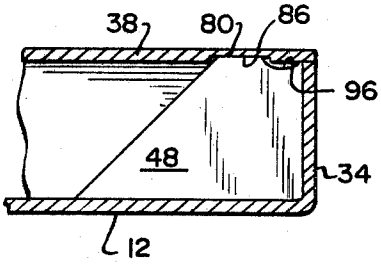
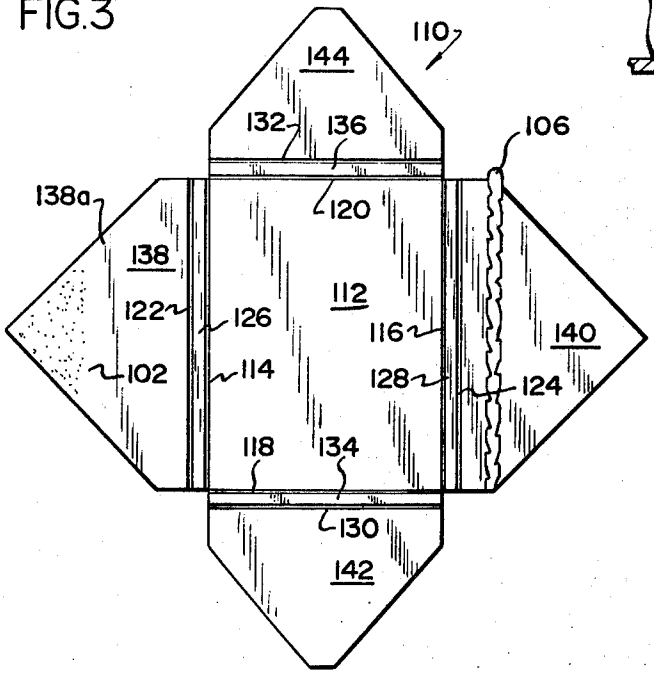


FIG.3



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3,495,757

CARDBOARD CARTON

Arnold W. Pascus, Mount Prospect, and Edmund Boehm, Chicago, Ill., assignors to Elwood Industries, Inc., a corporation of Illinois

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Int. Cl. B65d 5/22, 5/54
U.S. Cl. 229—33 3 Claims

ABSTRACT OF THE DISCLOSURE

A carton formed from a generally rectangular laminated blank including outer plies and a corrugated core with the corrugations extending generally diagonally across the blank. The blank includes a rectangular bottom panel surrounded by pairs of parallel fold lines defining side panels with generally triangularly shaped top panels connected to the outermost fold lines of the side panels. Preferably corner gussets are foldably connected to opposite pairs of side panels with locking tabs on the upper surface of the gussets and locking notches on the underside of the top of the triangular flaps to receive the locking tabs of the gussets. The underside of one triangular top panel and the diametrically opposite surface of an opposite triangular top panel are coated with adhesive means to secure the closure created when the several panels are folded inwardly upon each other. The different fold lines of the carton may be offset relative to each other to properly locate the folded elements with respect to each other to afford a compact rigid, stress-free closure.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates in general to the box or carton art, and more particularly, to a box or carton formed from a blank of laminated material including two spaced plies of paper or the like separated by a corrugated core of paper or the like, and wherein the blank is oriented so that the corrugations extend generally diagonally of the rectangular structures defined therein.

BRIEF DESCRIPTION OF THE PRIOR ART

The prior art relating to generally rectangular blanks having rectangular areas delimited by pairs of parallel score lines to define upstanding side walls and hingedly connected triangular shaped top flap portions is represented by the patents to Pryor 3,252,650, Bemiss 2,987,237 and Stubbs 1,774,299. A significant problem in the art of corrugated cardboard cartons is to provide sufficiently rigid wall structure to afford a resultant rigid and durable container which will withstand the rigors of shipment through the mail and the like. In addition, suitable reinforcing and locking structure should be afforded to prevent unintended collapse and/or opening of the structure during transit thereof. While the aforementioned patents generally show triangular flap cartons made from rectangular blanks, the cartons shown possess the shortcomings of being inadequately provided with structural means for facilitating a secure closure once assembled and a rigid and durable container which may be easily assembled and adequately protect the contents wrapped therein against unintended or accidental destruction of the container or access to the interior thereof. Thus, a need has arisen to provide a cardboard carton formed from a generally rectangular blank having the desirable qualities discussed herein.

SUMMARY OF THE INVENTION

This invention is directed, in brief, to the provision

of a cardboard carton formed from a laminated blank of outer plies and a corrugated core. The best mode contemplated by us for carrying out the invention comprises a blank wherein the corrugations extend generally diagonally relative to the component portions of the rectangular blank. The blank includes a generally rectangular base area surrounded by pairs of parallel score lines defining side wall portions which terminate in triangular flap portions. In a preferred form, opposite pairs of narrow side wall portions have laterally extending gussets with locking tabs at the top portions of the gussets. Adjacent transversely extending top flap structures have U-shaped cutouts in one face of the lamination for receiving the tabs on the gussets when the gussets are folded inwardly upon the adjacent side panel and the side panel is folded inwardly towards the rectangular blank section. As the subsequent triangular top portions are folded upon each other, the tabs securely lock in the undersides thereof.

In another form, locking nibs extend outwardly from side edges of opposite flaps and laterally adjacent side walls have notches for receiving the locking nibs.

In addition, the diametrically opposed top flap portions are provided with mutually adherent cementitious substance such as contact cement or the like, so that when opposite flaps are folded upon each other the coated underside of one flap will tenaciously adhere to the coated upper side of the other flap to secure the carton together as a closed unit. A means such as the well-known zipper opening may be provided for gaining easy access to the interior of the carton by the intended recipient or user thereof.

Other features of the invention will be readily apparent to those skilled in the art from the following description, taken in connection with the annexed drawing:

DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a plan view of a carton blank made in accordance with the principles of this invention;

FIGURE 1A is a fragmentary end elevational view of the blank shown in FIGURE 1;

FIGURE 2 is a perspective view of a carton formed from the blank shown in FIGURE 1 by folding portions of the blank upon itself about the fold lines thereof, further illustrating a zipper type opening;

FIGURE 3 is a plan view of a modified form of this invention;

FIGURE 4 is a plan view of another modified form of this invention;

FIGURE 5 is a fragmentary enlarged sectional view showing the relationship of components of the carton blank of FIGURE 4 when the blank is folded upon itself to form a carton;

FIGURE 6 is a plan view of the blank shown in FIGURE 1 with portions thereof folded upon itself in an intermediate step of forming the enclosure as shown in FIGURE 2; and

FIGURE 7 is a fragmentary enlarged sectional view through the assembled portion of the blank shown in FIGURE 6 illustrating the relationship of the components of the blank in the assembled condition.

DESCRIPTION OF THE PREFERRED EMBODIMENT

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail embodiments of the invention with the understanding that the present disclosure is to be considered an exemplification of the principles of the invention and the embodiments illustrated. The scope of the invention will be pointed out in the appended claims.

Referring now to the drawings, the carton of this invention is formed from a rectangular blank, such as the illustrated square blank **10**, preferably of the type comprising a lamination of corrugation **11** sandwiched between two outer plies **11***a* and **11***b*. Preferably the corrugations run parallel and transverse to the opposed pair of edges of the blank, or, in other words, diagonally of the elements of the blank to be described. The blank **10** includes a generally rectangularly shaped bottom panel **12** defined by parallel fold lines **14** and **16** extending along the length of the long sides of the rectangle as illustrated, and pairs of spaced parallel fold lines **18** and **20** generally transverse to lines **14** and **16** and extending along the width or short sides of the panel **12** illustrated. (Where bottom panel **12** is square, all sides will be of equal length.) Fold lines **22** and **24** extend generally parallel to fold lines **14** and **16**, respectively, and define therebetween long side panels **26** and **28**, respectively. Fold lines **30** and **32** extend generally parallel to fold lines **18** and **20**, respectively, and define therebetween short side panels **34** and **36**, respectively. Filling out substantially the remainder of the rectangular blank are substantially triangularly shaped large flaps **38** and **40** lying outside of fold lines **22** and **24**, respectively, and triangularly shaped small flaps **42** and **44** lying outside of fold lines **30** and **32**, respectively.

A substantial portion of the blank areas between the side wall panels is utilized to provide corner gussets **46**, **48**, **50** and **52**. Gussets **46** and **48** are articulated to opposite ends of side wall panel **34** by fold lines **54** and **56**, respectively. Similarly, gussets **50** and **52** are articulated to opposite ends of side wall panel **36** by means of fold lines **58** and **60**, respectively. In addition, gussets **48** and **52** are separated from side panel **26** and flap **38** by cuts **62** and **64**, respectively, each of which extends completely through the blank and terminates in inwardly directed offset cut portions **62***a* and **64***a*, respectively. Similarly, gussets **46** and **50** are separated from side panel **28** and flap **40** by cuts **66** and **68**, respectively, each of which extends completely through the blank and which further terminates in inwardly directed portions **66***a* and **68***a*, respectively. Each of the inwardly directed portions **62***a*, **64***a*, **66***a* and **68***a* terminates generally in the area of the intersection of fold lines **14**, **20**, **16** and **18**, or, in other words, approximately in the area of the four corners of the bottom panel **12**.

Opposite side edges **70** and **72** of flap **42** and **74** and **76** of flap **44** are spaced inwardly from the articulating lines **54–56**, respectively, and **58–60**, respectively, a distance generally equal to the thickness of the blank. In turn, these gusset articulating lines such as **56** and **60** are spaced inwardly from fold line **14** and **54** and **58** are spaced inwardly from fold line **16** also a distance generally equal to the thickness of the blank for a purpose to be explained later.

Each of corner gussets **46**, **48** and **50**, **52** is provided with a generally outwardly extending locking tab **78**, **80**, **82** and **84**, respectively. The underside of the triangular flaps **38** and **40** are provided with U-shaped cutouts, such as the cutouts **86** and **88** in flap **38** and **90** and **92** in flap **40**. These cutouts are located along the fold lines **22** and **24** and also adjacent the cut edges **62**, **64**, **66** and **68** so that, when the carton is folded upon itself in the assembled condition, the several tabs **78** through **84** will engage the notches, with tab **78** engaging notch **90**, tab **80** engaging notch **86**, tab **82** engaging notch **88** and tab **84** engaging notch **92**; to securely lock the gussets in position and prevent unintended or accidental withdrawal therefrom. Preferably the U-shaped cutouts extend only through the sheet **11***b* of the laminations so as to not protrude through the exterior of the completed carton, retaining a smooth exterior and a clean overall appearance.

A generally circular cutout is formed in the blank in the areas between the short triangular flaps and the corner gussets, such as the cutout **94** mostly in gusset **46**, the cutout **96** mostly in gusset **48**, the cutout **90***a* mostly in gusset **52** and the cutout **100** mostly in gusset **50**. These cutouts provide a clearance for the tabs so as to facilitate a good grab of each of the locking tabs in each of the U-shaped notches when the box or carton is in the assembled condition.

Adhesive means are provided on opposite triangular flaps to provide a means for maintaining the carton in the closed condition when the several elements are folded upon each other. Preferably, the adhesive comprises the type which tenaciously adheres to itself, but does not adhere to dissimilar subjects, such as the type known as contact cements or the like. Also, it is preferable that the adhesive be located on diametrically opposite portions of the blank such as providing a disposition of adhesive **102** on face **38***a* of flap **38** and further disposing a portion **104** on face **40***a* of flap **40**. This provides the advantage that when the blanks are stacked in a flattened condition, the adhesive portions will not come in direct contact with each other and yet, when the flaps are folded upon themselves to provide the completed carton, portion **102** will directly underlie portion **104** so that the two may intimately engage and tenaciously adhere to each other to maintain the enclosure afforded by the several folding steps.

It is also preferable that the entire periphery of the blank be serrated so as to prevent the likelihood of annoying finger cuts or the like as is common with straight cardboard or paper edges. If desired, a zipper type opening **106** well known in the art could be provided for gaining access to the package by the intended recipient or user thereof.

In assembly, the short side panels **34** and **36** are folded inwardly about the lines **18** and **20** to a generally upright position. Then the flaps **42** and **44** are folded about fold lines **30** and **32**, respectively, so that they generally overlie the base panel **12**. The corner gussets **46**, **48**, **50** and **52** are folded inwardly about the lines **54**, **56**, **58** and **60**, respectively, until they lie just inside of, and extend parallel to, the fold lines **14** and **16**.

As best seen in FIGURE 6, the gussets, such as **48** and **52** lie just outside the edges of the small triangular flap, such as the edges **70** and **76**, so that the tabs **80** and **82** may project slightly above the top surface of flaps **42** and **44**. Yet, the gussets also lie just inside the fold lines for the long side panels such as the fold line **14**, so that when the side panels are folded upwardly, the gussets will not interfere with the upward folding movement of the side panels. The following steps in assembly are to fold one long side panel such as the panel **26** upwardly about the fold line **14** and then fold the adjacent triangular flap inwardly about the fold line such as fold line **22** so that the flap **38** having the adhesive **102** on the face **38***a* thereof will be facing upwardly or outwardly as shown in FIGURE 6. With the parts so oriented, the final step of assembly may be accomplished by folding side panel **28** upwardly about fold line **16** and then folding triangular flap **40** about line **24** to bring the adhesive portion **104** into facial contact with adhesive portion **102** causing tenacious adherence thereof. When the triangular panels **40** and **38** are folded downwardly over the panels **42** and **44**, the tabs **80**, **82**, **84** and **78** engage in the notches **86**, **88**, **92** and **90**, respectively, as seen in FIGURE 7. This locks the side panels **34** and **36** in their respective flaps **42** and **44** against withdrawal from the completed package. In addition, it holds the corner gussets **46**, **48**, **50** and **52** in an upright position wherein they exercise the function of providing added upstanding beam strength to the carton resisting the imposition of heavy loads in maintaining the carton in its assembled condition and protecting the contents thereof against crushing.

It is to be further noted that the fold lines for the side panels, such as fold lines **18** and **20**, extend slightly in-

side of the cut edges **62**, **66** and **64**, **68**, respectively, which define the side edges of flaps **38** and **40**, so that when the side panels **34** and **36** are folded upwardly they are coextensive in the assembled condition with the edges defined by lines **62**, **64**, **66** and **68** and do not protrude outwardly therefrom. It is to be further noted that the terminal ends of the cut **62–68** are directed inwardly as at **62***a*, **64***a*, **66***a* and **68***a* so that when the several gussets **46** through **52** are folded inwardly and the short side panels are folded about the fold lines **18** and **20**, there will be no stress imposed tending to force the assembly outwardly. In other words, the bottom line formed by the bottom edge of the gusset will lie, in the assembled condition, coplanar with the top of the bottom panel **12**, assuming this position without the tendency for the gusset to be forced upwardly and away from the panel, other than the tendency that would be imposed thereupon by the resistance in fold lines such as **18** and **20**. The gussets **46** through **52** also serve to enclose each of the four corners of the completed carton and the locking tabs, by preventing the reserve withdrawal of the structure associated with panels **30**, **36** and flaps **42**, **44**, insure that the four corners will be maintained in a closed condition. Because the blank is cut from cardboard stock so that the corrugations run on a diagonal relative to the several panels, the gussets, when in the upright assembled position present mutually inwardly and upwardly directed beam elements in the form of corrugations themselves which extend at a generally 45° angle relative to the bottom panel **12** giving added strength to the gussets as well as to the locking tabs, which is important to maintain the structure in a locked and assembled condition.

A simplified form of the cardboard carton of this invention is shown in FIGURE 3. There the blank **110** includes the generally rectangular base portion **112** defined by parallel fold lines **114** and **116**, along the long sides of the rectangle, and parallel fold lines **118** and **120**, along the short sides of the panel. Fold lines **122** and **124** extend generally parallel to fold lines **114** and **116**, respectively, and define therebetween long side panels **126** and **128**, respectively. Fold lines **130** and **132** extend generally parallel to fold lines **118** and **120**, respectively, defined therebetween short side panels **134** and **136**, respectively.

Large triangularly shaped flaps **138** and **140** lie outside of fold lines **122** and **124**, respectively, and small triangularly shaped flaps **142** and **144** lie outside of fold lines **130** and **132**, respectively. It is to be noted that the blank **110** shown herein is not provided with the corner gusset or locking tab structure. However, the blank is formed of corrugated cardboard, preferably with the corrugations running diagonally of the blank. Also, face **138***a* of flap **138** is provided with cementitious material or adhesive **102'** whereas the diametrically opposite face of flap **140** (not shown) is provided with a similar adhesive in a manner similar to that described with the structure of the carton **10**. The zipper type opening **106** is also provided. In the simplified embodiment, the sides **134** and **136** are folded upwardly and the flaps **142** and **144** are folded inwardly and then the flap **140** is folded upwardly and inwardly with the flap **138** folded thereover and sealed thereto to form the completed enclosure.

Another modified form of this invention is shown in FIGURE 4. There the generally rectangular carton blank **210** is preferably formed of corrugated lamination with the corrugations extending diagonally of the blank. Blank **210** includes the generally rectangular base portion **212** defined by parallel fold lines **214** and **216** extending along the length of the long sides of the rectangle and pairs of spaced parallel fold lines **218** and **220** extending along the width or short sides of the panel **212**. Fold lines **222** and **224** extend generally parallel to fold lines **214** and **216**, respectively, and define therebetween long side panels **226** and **228**, respectively. Fold lines **230** and **232** extend generally parallel to fold lines **218** and **220**, respectively, defined therebetween short side panels **234** and **236**, respectively.

Large triangularly shaped flaps **238** and **240** lie outside of fold lines **222** and **224**, respectively. Small triangularly shaped flaps **242** and **244** lie outside of fold lines **230**, **232**. A zipper type opening **206** is provided on flap **238**. One face **240***a* of flap **240** is provided with adhesive **204** and the other diametrically opposite face of flap **238** (not shown) is provided with a similar adhesive as shown and described with respect to the embodiment **10** illustrated in FIGURES 1 and 6.

Opposite side edges of flaps **242** and **244** are provided with outwardly extending nibs **278**, **280** and **282**, **284**, respectively, preferably at the intersection of the diagonal and straight side portions of the flaps. In addition, the long side walls **226** and **228** are provided with surface cutouts **286**, **288** and **290–292**. When the package is assembled, it is intended that the nibs **280** and **282** would engage in the surface cuts **286** and **288** and the nibs **278** and **274** would engage in the surface cuts **290** and **292** in the upright side walls **226** and **228**, as shown in greater detail in FIGURE 5. This arrangement performs a similar function to that of the several locking tabs **78**, **80**, **82** and **84** shown in the embodiment, preventing the unintended or accidental reverse withdrawal of the side panels **234**, **236** and flaps **242**, **244**. However, no corner gussets are provided with the structure shown in FIGURE 4.

The other stages of the assembly of this carton are similar to that defined with respect to the embodiment **10** in that one of long flaps is first folded inwardly with adhesive facing upwardly and the other long flap is folded inwardly over the rest of the structure with a mutually opposed adhesive coated surface so that the two may tenaciously engage together and complete the enclosure.

It can be seen from the foregoing that the present invention provides a carton blank which may be easily and quickly assembled into a substantial, rigid, generally stress free container, securely held against unintentional or accidental disassembly. It can be further seen that by forming the blank from corrugated cardboard stock so that the corrugations run parallel to pairs of edges and transverse to other pairs of edges, very little material of the basic cardboard stock is wasted in providing the blank of this invention. In fact, in the preferred form shown in FIGURE 1, only the minute area between the four gussets and the flaps **42** and **44** is wasted material.

The foregoing detailed description is given for clearness of understanding only and no unnecessary limitations are to be understood therefrom, as some modifications will be obvious to those skilled in the art.

What is claimed is:

1. A box or carton formed from a generally rectangular blank comprising: a generally rectangularly shaped main panel, two pairs of generally transversely oriented pairs of inner and outer fold lines spaced about the periphery of the main panel and defining first and second opposed pairs of side walls thereby, with first and second opposed pairs of side flaps articulated to said first and second opposed pairs of side walls, respectively, by means of the outermost of said pairs of fold lines, the inner fold line of one of said pairs of fold lines extending across the periphery of the rectangular panel inwardly of the ends of the transversely oriented pairs of side walls, thereby adapting the side walls delimited by said inwardly positioned inner fold lines to be folded about the main panel and lie within said transversely oriented side panels when said transversely oriented side panels are folded about the inner fold lines connecting the same to the main panel, following which said side flaps may be folded inwardly over the outer fold lines in superposition relative to the main panels to form an enclosure thereby; and locking means for retaining the several panels and flaps in a closed condition, said inwardly positioned inner fold line extends across the main

panel inwardly from the ends of said transversely oriented side panels a distance at least equal to the thickness of the side panels, locking gussets are articulated by means of a hinge line to said side panels defined by said inwardly positioned inner fold lines with the locking gussets having an outwardly facing locking tab spaced from the hinge line articulating the gusset to its related side panel, the lateral extent of the flap connected to the first pair of side panels terminates inwardly of the hinge line articulating the locking gusset to the side panel, the locking gusset and related side panels are notched inwardly of the outer fold line on either side of the hinge line articulating the locking gusset to the side panel.

2. A carton formed from a generally rectangular blank, comprising: a generally rectangularly shaped main panel including a first pair of generally parallel spaced inner and outer fold lines defining a first pair of generally parallel side walls on opposite sides of the periphery of the main panel and a second pair of generally parallel inner and outer spaced fold lines defining a second pair of side walls along the periphery of the main panel; first and second opposed pairs of side flaps articulated to said first and second opposed pairs of side walls, respectively, by means of the outermost of the pairs of fold lines, adapting the flaps to be folded inwardly over the main panel when the side walls are folded upwardly relative thereto about the innermost of the pairs of spaced fold lines; the first pair of side walls having gussets extending outwardly of the opposite ends thereof and articulated thereto by means of a fold line, such gusset extensions being foldable inwardly of the side wall by means of said fold lines when the respective side walls are folded upwardly about the main panel so that the gussets will lie in a plane generally parallel to the laterally adjacent side walls of the second pair and forming reinforcing structure therefor, the gussets being provided with outwardly facing locking tabs located on the gussets spaced from the fold line by means of which the gussets are articulated to the related side walls, the gussets are notched inwardly of the outermost fold line articulating the flap to the panel to which the gussets are related, said notch extending outwardly toward the locking tab from the fold line articulating the gusset to the side panel, the side flaps articulated to the second pair of side walls are provided with notches in the underside thereof, said notches formed inwardly of the opposite ends of the side flaps and terminating short thereof.

3. A carton formed from a generally rectangular blank comprising a generally rectangular shaped main panel including a first pair of generally parallel spaced fold lines determining a first pair of generally parallel side walls about opposite ends of the periphery of the main panel and a second pair of generally parallel spaced fold lines defining a second pair of generally parallel side walls spaced about opposite sides of the periphery of the main panel extending transversely of the said first pair of side walls, first and second opposed pairs of side flaps articulated to said first and second opposed pairs of side walls, respectively, by means of the outermost pairs of fold lines, thereby adapting said flaps to be folded inwardly over the main panel when the side walls are folded upwardly relative thereto about the innermost of said pairs of spaced fold line; the first pair of side flaps having generally laterally extending locking tabs thereon for engagement with the second pair of side walls and flaps to lock the carton in a closed condition when the walls and flaps are folded upwardly and inwardly upon each other, the second pair of side walls is provided with locking notches spaced inwardly from the terminal ends thereof for receiving the locking tabs of the first pair of side flaps.

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DAVID M. BOCKENEK, Primary Examiner

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