Aug. 19, 1969 N. J. ASMAN 3,462,065

FOLDABLE CARTON AND BLANK WITH TRIANGLE SHAPED CORNER

Filed Feb. 26, 1968 2 Sheets-Sheet 1

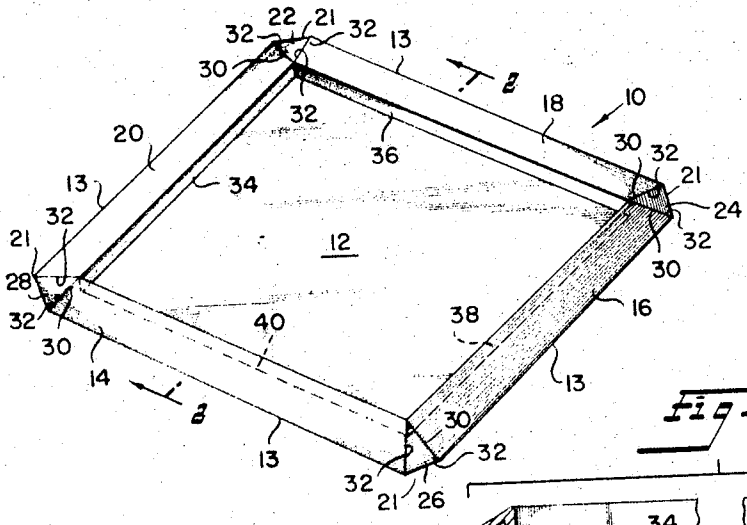


Fig. 1

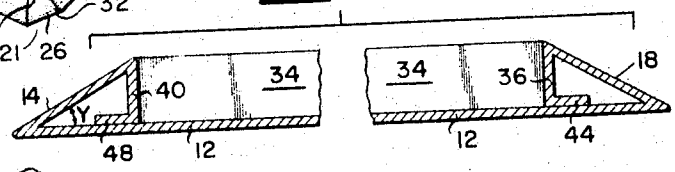


Fig. 2

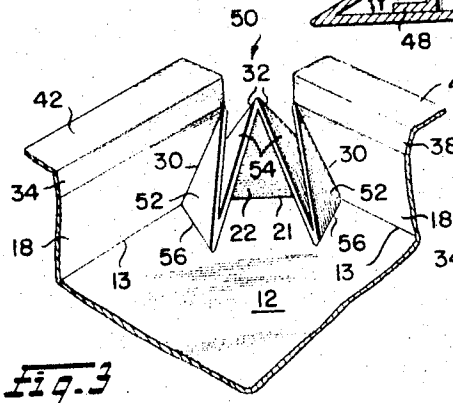


Fig. 3

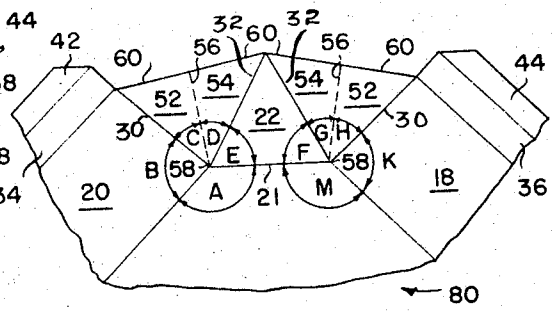


Fig. 4

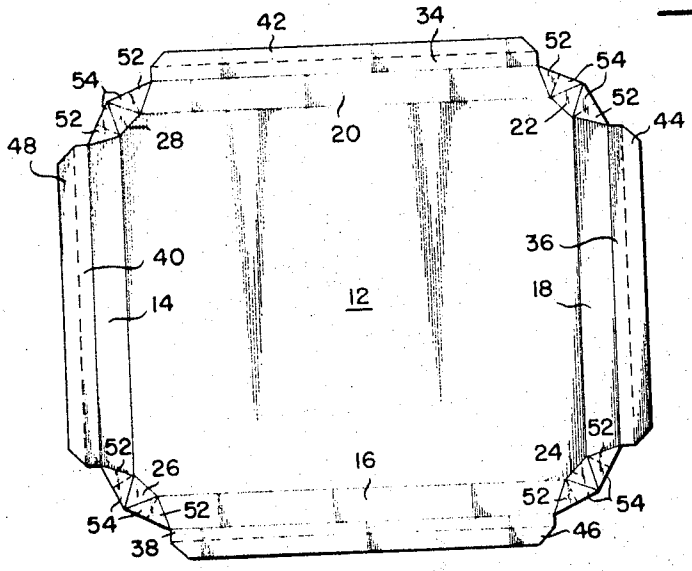


Fig. 5

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FOLDABLE CARTON AND BLANK WITH TRIANGLE SHAPED CORNER

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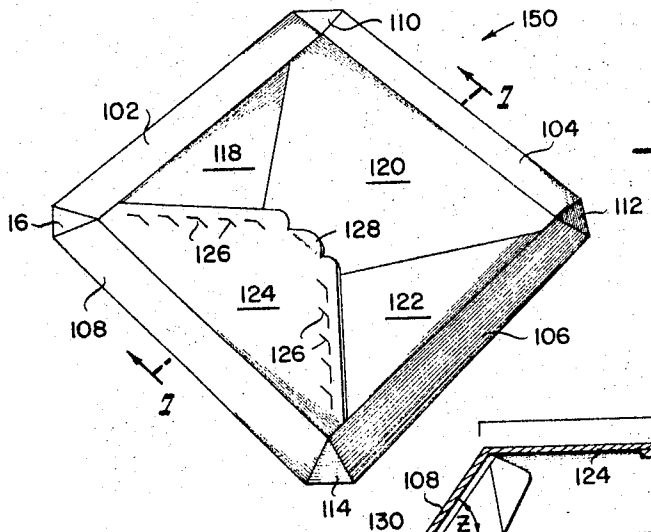


Fig. 6

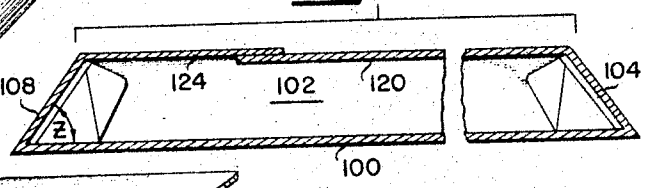


Fig. 7

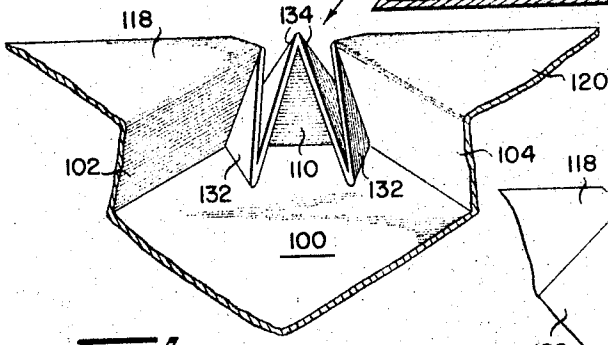


Fig. 8

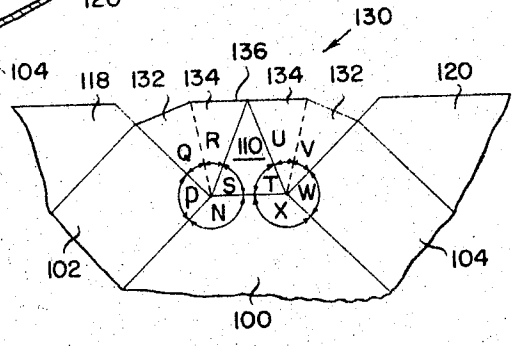


Fig. 9

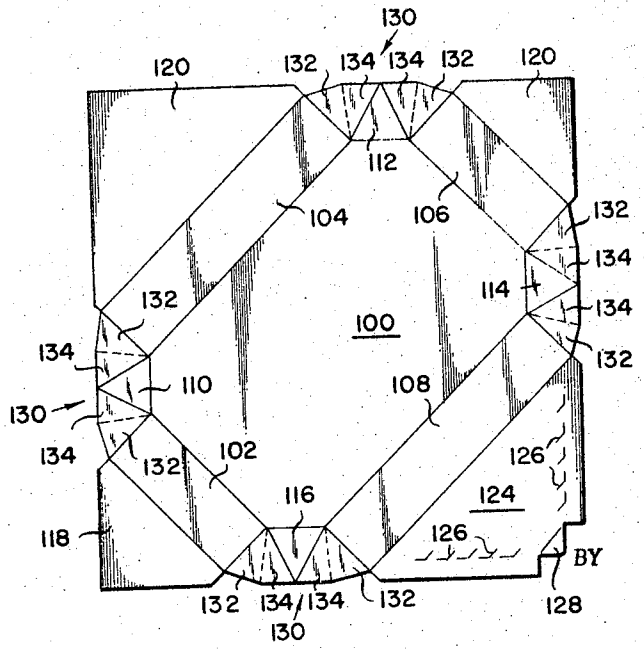


Fig. 10

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United States Patent Office 3,462,065
Patented Aug. 19, 1969

3,462,065

FOLDABLE CARTON AND BLANK WITH TRIANGLE SHAPED CORNER

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Filed Feb. 26, 1968, Ser. No. 708,281
Int. Cl. B65d 5/24
U.S. Cl. 229—31 18 Claims

ABSTRACT OF THE DISCLOSURE

A carbon blank having bottom and side panels and having a web corner comprising five triangular panels hingedly connected to one another and to adjacent side panels. Only the center triangular panel has its base in edge-to-edge contact with the bottom panel. A carton is constructed from the blank by forming a pleat on each side of the center panel to permit abutment of side edges of the center panel with side edges of adjacent side panels. An attractive triangular shaped corner is thus produced which is reinforced by said pleats.

BACKGROUND OF THE INVENTION

This invention pertains to foldable carton blanks and to cartons erected from such blanks. In particular, the invention pertains to an improved carton with an attractive triangularly faced one-piece continuous and reinforced corner construction, and to a carton blank from which such a carton can be erected.

Cartons having bottom and side panels variously formed of one uncut piece of material are well known, the corners being constructed with a plurality of triangular panels folded in a variety of ways. See, for instance, U.S. Patents 3,116,866 Boran and 2,311,403 Lighter. The cartons illustrated in these patents are not provided with triangularly shaped corner panel faces which merge smoothly with other side panel faces in order to produce an attractively shaped carton. It is highly desirable to produce such a carton having triangularly shaped corner panel faces which merge smoothly with other side panel faces from a one-piece essentially uncut carton blank which can be simply erected and which in addition provides reinforcement for the carton at its attractive triangular corners.

BRIEF SUMMARY OF THE INVENTION

These shortcomings of the aforementioned prior art are effectively overcome in the present invention wherein a carton blank is provided having a web corner comprising five essentially triangular panels hingedly connected to one another and to adjacent side panels. The center triangular panel has its base positioned in edge-to-edge contact with the carton's bottom panel. The pair of triangular panels on each side of the center triangular panel have their bases inserted so that the sides opposite the base radiate in fan-like fashion away from the bottom panel of the carton.

A carton is constructed from the carton blank by forming a pleat from each pair of triangular panels on each side of the center triangular panel. The pleats are shaped to permit the abutment of two side edges of the center triangular panel with side edges of two adjacent side panels.

DETAILED DESCRIPTION

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

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

FIG. 2 is a cross sectional view of the carton of FIG. 1 taken along line 2—2 and drawn to a larger scale;

FIG. 3 is a fragmentary perspective view of a carton blank of this invention shown partially erected into a carton corner;

FIG. 4 is a fragmentary plan view of one embodiment of a carton blank of this invention shown prior to erection;

FIG. 5 is a plan view of one embodiment of a carton blank of this invention;

FIG. 6 is a perspective view of another embodiment of the carton of this invention;

FIG. 7 is a cross sectional view of the carton in FIG. 6 taken along line 7—7;

FIG. 8 is a fragmentary perspective view of another embodiment of a carton blank of this invention shown partially erected into a carton corner;

FIG. 9 is a fragmentary plan view of a carton blank of this invention shown prior to erection; and,

FIG. 10 is a plan view of another embodiment of a carton blank of this invention.

Referring now to FIG. 1, a carton indicated generally at **10** is shown having a bottom panel **12**. Hingedly connected to bottom panel **12** along linear fold lines **13** are side panels **14, 16, 18** and **20**. Hingedly secured to bottom panel **12** along linear fold lines **21** are triangular corner center panels **22, 24, 26** and **28**. Side edges **30** of each side panel abut adjacent side edges **32** of each corner center panel. Wall panels **34, 36, 38** and **40** are hingedly secured one to each of said side panels.

FIG. 2, a cross sectional view of the carton **10** taken along line 2—2 of FIG. 1, shows the relative elevations of the various parts of the erected carton. Base panels **42, 44, 46, 48** (not shown in FIG. 1) are hingedly secured one to each of said wall panels.

FIG. 3 shows in perspective a partially erected corner of a carton **10**. Bridge panels **50** provide a hinged connection between the side edge **30** of each side panel to a side edge **32** of a triangular center panel. Bridge panels **50** are composed of two adjacent hingedly connected corner panel portions **52** and **54** separated from one another by fold lines **56**. Side panel edges **30**, fold lines **56** and center panel edges **32** all intersect at corners **58** of bottom panel **12**.

In the final assembly of carton **10** corner panel portions **52** and **54** are brought into face-to-face contact with one another to form a corner pleat. This causes the side edges **32** of each corner center panel to be brought into abutting relationship with side edges **30** of adjacent side panels. If desired, to further strengthen the corner assembly, each of thus formed pleats **52–54** can be brought into and held securely in face-to-face contact with its adjacent side panel.

FIG. 4 shows a corner portion of a carton blank **80** of this invention from which the corner assembly of FIG. 3 was partially erected. FIG. 5 shows a plan view of a carton blank **80**. The outside edges **60** of corner panel portions **52** and **54** are arranged so as to be perpendicular to fold lines **56** (FIG. 4).

The angles made by the edges of all of the panels and panel portions which intersect corners **58** are designated in FIG. 4 as angles A, B, C, D, E, F, G, H, K and M. In order to produce a carton with a proper corner, that is a corner which permits the abutment of center panel edges **32** with adjacent side panel edges **30** it is necessary that corner panel portion angles C and D (and similarly with angles G and H) be substantially equal to one another. Angles C and D need not necessarily be equal to angles G and H. For a proper corner it is also necessary that for each bridge panel the length of its edge **30** be substantially equal to the length of its edge **32**.

FIG. 6 shows another embodiment of the carton of

this invention. The carton, indicated generally at **150**, includes a bottom panel **100** (FIGS. 7–10) to which is hingedly secured side panels **102, 104, 106** and **108**, and triangular center panels **110, 112, 114** and **116**. Cover panels **118, 120, 122** and **124** are hingedly secured one to each of the side panels. Slits **126** and pull tab **128**, all on cover panel **124**, facilitate the opening of a sealed carton.

FIG. 7, taken along line **7—7** of FIG. 6 shows the respective elevations of various portions of the carton.

FIG. 8 shows a partially erected carton corner from the carton of FIG. 6. Bridge panels **130** hingedly connect the side edges of the side panels to adjacent side edges of the center panel. Each bridge panel is composed of two adjacent hingedly connected corner panel portions **132** and **134**. In the final assembly of the carton, corner panel portions **132** and **134** are brought into face-to-face contact with one another to form a corner pleat. This is accomplished in such a manner as to cause the side panels to abut the central panels along their respective side edges.

FIG. 9 identifies the angles made by the edges of all panels and panel portions which intersect the bottom panel corners an angles N, P, Q, R, S, T, U, V, W and X. FIG. 10 shows a blank of this invention from which the carton of FIG. 6 can be erected. To ensure a proper blank it is necessary for the corner panel portion angles Q and R, (and similarly angles U and V) to be substantially equal to one another. It is also necessary that in each bridge panel **130** the length of its side edge in common with a side panel be substantially equal to the length of its side edge in common with a central panel.

In the carton blank of FIGS. 9 and 10 the outside edges **136** of corner panel portions **134** have been designed to lie along the same line as the outside edges of cover panels **118–124**.

In one working embodiment of the invention, a carton was constructed which was similar in appearance to that shown in FIGS. 1 and 2. The carton was erected from a carton blank similar in appearance to that shown in FIGS. 3, 4 and 5. In particular, bottom panel **12** was made in the shape of a hexagon having opposite sides parallel to one another. Every second side of the bottom panel had a rectangular side panel hingedly secured to it. Rectangular wall panels having attached thereto trapezoidal base panels were hingedly secured to each side panel. The corner angles were approximately as follows: A, 135 degrees; B, 90 degrees; C, 33 degrees; D, 33 degrees; E, 69 degrees; F, 69 degrees; G, 33 degrees; H, 33 degrees; K, 90 degrees, and M, 135 degrees. Side panel side edges **30** were all equal in length to center panel side edges **32**, all measuring $1\frac{3}{16}$ inches. Outside edges **60** of corner panel portions **52** and **54** were made perpendicular to fold lines **56**. Upon erection an attractive carton was formed having strong triangular corners. The carton was used to house and frame a toy which fit exactly between wall panels **34, 36, 38** and **40**.

Many variations of the above illustrated and described cartons and carton blanks are possible without departing from the invention disclosed herein. The shape of the bottom panel can be that of almost any polygon. The shape of the side panels may be rectangular, trapezoidal or otherwise as desired. Side panels of different shapes may be secured to the same bottom panel. The sizes of angles A, B, C, D, E, F, G, H, K and M (FIG. 4) and similarly with angles N, P, Q, R, S, T, U, V, W and X, can be varied to produce a variety of corner constructions, remembering that angle C must be kept equal to angle D, angle G equal to angle H, and similarly with angles Q and R and angles U and V. The shapes of the outside edges of the corner panel portions may be varied. Additional panels of any shape desired, or no panels at all, may be secured to the side panels. By proper selection of the angles A, B, C, etc. (FIG. 4) or of angles N, P, Q, etc. (FIG. 9), the angle Y (FIG. 2) or similarly the angle Z (FIG. 7) between the bottom panel and a side panel can be made to vary from slightly more than zero degree to slightly less than 180 degrees.

In assembling a carton, adhesive material may be used to secure the two corner panel portions of each pleat together or to secure a pleat to a side panel.

The carton and blank can be constructed from any desirable material such as paper, paperboard, metal or plastic foil, laminates, etc.

What is claimed is:

1. A blank erectable into a carton comprising:
- (a) a bottom panel having two first linear edges connected by a second linear edge to form two corners,
- (b) a pair of side panels hingedly connected one to each of said two first linear edges adjacent said corners,
- (c) a triangular center panel hingedly connected to, and having as a base, said second linear edge,
- (d) a pair of bridge panels hingedly connecting said pair of side panels to said triangular center panel, each said bridge panel having one side edge in common with its adjacent side panel and another side edge, substantially equal in length to said one side edge, in common with said center panel,
  - each said bridge panel comprising two adjacent hingedly connected corner panel portions, each said corner panel portion having two linear side edges intersecting one of said bottom panel corners, the angles between said two linear side edges of each of said adjacent corner panel portions being substantially equal to one another,
  - each said bridge panel being foldable into a pleat when said blank is erected to permit the abutment of a side edge of each side panel with an adjacent side edge of said center panel.

2. A blank as defined in claim **1** wherein the angles between said two linear side edges of all said corner panel portions are substantially equal to one another.

3. A blank as defined in claim **2** wherein said bottom panel is a polygon having opposite sides in parallel relationship.

4. A blank as defined in claim **3** wherein said polygon is an octagon.

5. A blank as defined in claim **4** wherein said side panels are rectangular.

6. A blank as defined in claim **4** wherein said side panels are trapezoidal.

7. A blank as defined in claim **5** wherein additional panels are hingedly secured one to each of said side panels.

8. A blank as defined in claim **7** wherein said triangular center panel forms an isosceles triangle.

9. A blank as defined in claim **8** wherein the angles defined by said two bottom panel corners are substantially equal to one another.

10. A carton comprising:
- (a) a bottom panel having two first linear edges connected by a second linear edge to form two corners,
- (b) a pair of side panels hingedly connected one to each of said two first linear edges adjacent said corners,
- (c) a triangular center panel hingedly connected to and having as a base, said second linear edge,
  - said triangular center panel having two side edges each in abutting relationship with an adjacent side edge of an adjacent side panel,
- (d) a pair of bridge panels hingedly connecting said triangular center panel to said abutting side panels, each said bridge panel having one said edge in common with its adjacent side panel and another side edge, substantially equal in length to said one side edge, in common with said center panel,
  - each said bridge panel comprising two adjacent hingedly connected corner panel portions, each said corner panel portion having two linear side edges intersecting one of said bottom panel corners, the angles between said two linear side edges of each of said adjacent corner panel

portions being substantially equal to one another, each said bridge panel defining a pleat, said pleat comprising two adjacent corner panel portions disposed in confronting relationship with one another.

11. A carton as defined in claim **10** wherein the angles between said two linear side edges of all said corner panel portions are substantially equal to one another.

12. A carton as defined in claim **11** wherein said bottom panel is a polygon having opposite sides in parallel relationship.

13. A carton as defined in claim **12** wherein said polygon is an octagon.

14. A carton as defined in claim **13** wherein said side panels are rectangular.

15. A carton as defined in claim **13** wherein said side panels are trapezoidal.

16. A carton as defined in claim **14** wherein additional panels are hingedly secured one to each of said side panels.

17. A carton as defined in claim **16** wherein said triangular center panel forms an isosceles triangle.

18. A carton as defined in claim **17** wherein the angles defined by said two bottom panel corners are substantially equal to one another.

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U.S. Cl. X.R.

220—62; 229—32