United States Patent [19]

Lund, Jr.

[11] **3,923,234**

[45] **Dec. 2, 1975**

[54] **DOUBLE WEB CORNER CARTON**

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[73] Assignee: **Hoerner Waldorf Corporation**, St. Paul, Minn.

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[52] **U.S. Cl.** ..... **229/37 E**; 206/424; 206/521; 229/40

[51] **Int. Cl.**[2] **B65D 5/02**

[58] **Field of Search** ..... 229/37 E, 37 R, 39 R, 40; 206/424, 521

[56] **References Cited**

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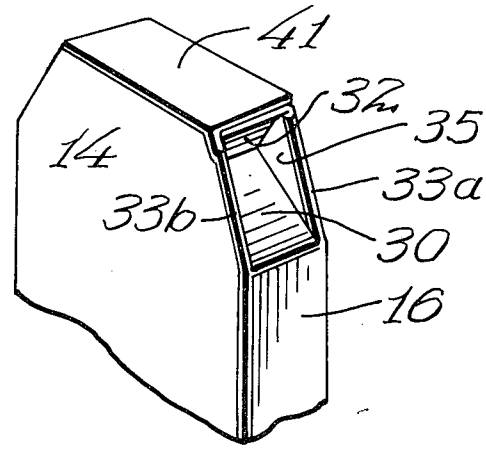
3,309,005	3/1967	Pilger	229/37 X
3,403,839	10/1968	Farquhar	229/40
3,512,697	5/1970	Robinson	229/39 R
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Primary Examiner—William I. Price
Assistant Examiner—Stephen P. Garbe
Attorney, Agent, or Firm—Jerry F. Best

[57] **ABSTRACT**

A double web corner configuration for a carton giving improved strength to a carton designed to hold an object such as a tray with rounded or angled corners where lateral crushing strength resistance is required. A first inwardly folded web is connected to an outwardly or reversed folded web structure which thereby provides improved crush resistance to the minor axis of the carton.

2 Claims, 7 Drawing Figures



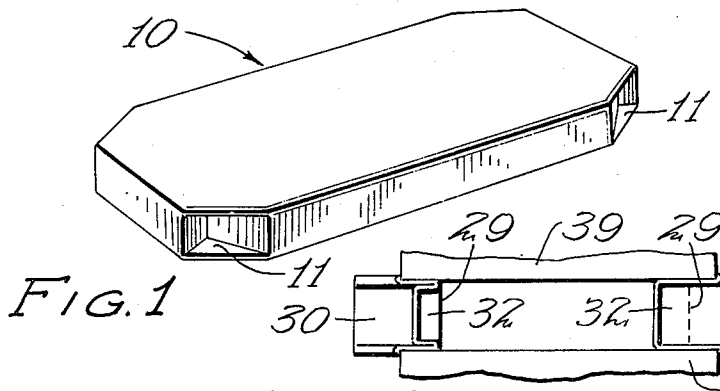


FIG. 1

FIG. 7

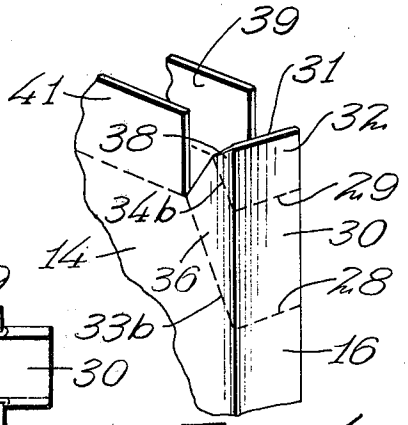


FIG. 4

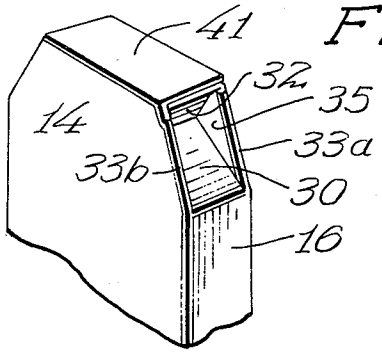


FIG. 2

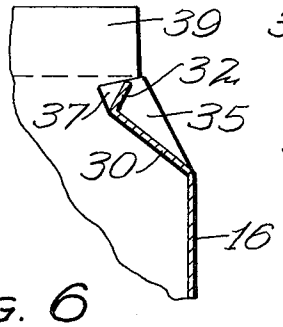


FIG. 6

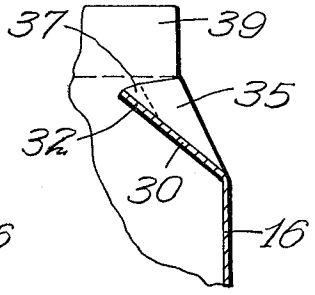


FIG. 5

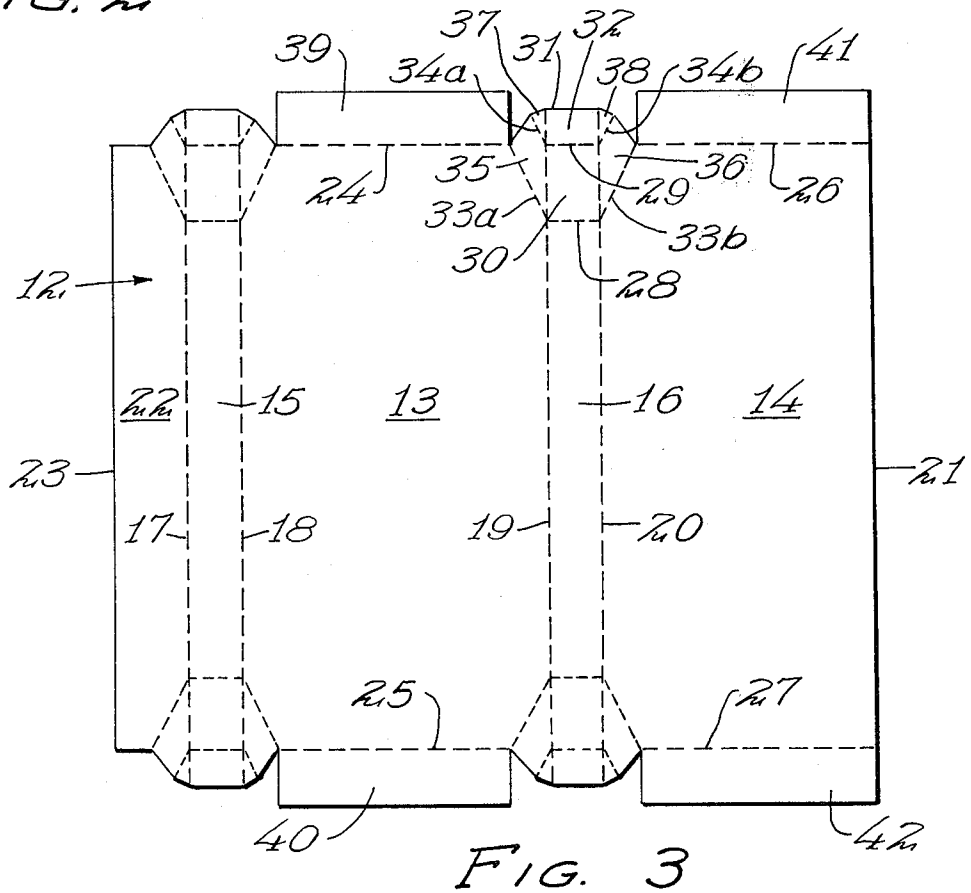


FIG. 3

DOUBLE WEB CORNER CARTON

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to paperboard boxes which have particular means for closing the ends of the box and blanks for making same, and more particularly to boxes having corner structures which provide an angled outside corner with a double folded flap structure adapted to be folded inwardly and then reversed to form a double flap reinforcing structure providing improved crush strength across the narrow dimensions of the carton in the corner area.

2. Description of the Prior Art

In the food industry, customer acceptance and market penetration often depend upon the appearance of the package in which the merchandise is shipped and stored and displayed. Certain items in the frozen food line are presently packaged in foil trays which may be oval or may have rounded corners and are used as cooking and serving trays for the convenience of the customer. These packages are generally much longer and wider than they are in height and it is necessary to provide a carton which is less resistant to crushing since if the foil tray is deformed it will not assume its original shape. Where an oval or rounded corner tray is placed in a standard rectangular carton, those corners of the tray are spaced inwardly from the corner structure of the carton and are more susceptible to crushing since the panels of the carton can be deflected more toward the center of the carton. For this reason a need exists for a carton which will have improved strength adjacent to the edges of the foil tray. U.S. Pat. No. 3,512,697 to Robinson illustrates a carton which is primarily designed for other types of frozen food not having a foil tray and while some crush resistance is retained with that design, it has been determined that even greater crushing strength is desired for these consumer items.

SUMMARY OF THE INVENTION

Accordingly, an improved carton having a double reinforcing panel arrangement is provided wherein a section of the side wall is folded inwardly and a second section is folded outwardly with accompanying angular side reinforcing panels connected thereto which improve the strength in the corners of the carton and also provide for retention of foil trays or plastic trays having a flange or lip around the top edge thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

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

FIG. 2 is a closer view in perspective of one end of the carton shown in FIG. 1 and more closely illustrating the corner;

FIG. 3 is a blank shown in plan view adapted to be erected into a carton similar to the one shown in FIG. 1;

FIG. 4 is a perspective view of the blank shown in FIG. 3 folded into a tube and prior to final folding of the corner structure;

FIG. 5 is a side sectional elevation view of the corner shown in FIG. 4 showing the second folding step in assembling the corner structure;

FIG. 6 is a side sectional elevation view of the structure of FIG. 5 illustrating the second folding step in erecting the corner structure;

FIG. 7 is a top plan view of a partially erected carton with the top cover flaps in open position illustrating on the right hand side the corner structure in the intermediate folding step shown in FIG. 5, and on the left hand side the final folded configuration of the corner structure as shown in FIG. 6.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

As can be seen in the drawings, and in particular FIG. 1, the carton style which is not suited for this type of corner structure is one which is narrow in comparison to its width and length and yet is adapted to contain an item whose edges are susceptible to crushing or deformation. The carton is shown generally as **10** and the corner structure generally as **11**. The carton and corner structure **10** and **11** may be folded and erected from a blank such as that shown in FIG. **3** and identified generally as **12**. The blank consists of two substantially rectangular face panels **13** and **14** which are foldably connected in alternate fashion to side walls **15** and **16**. The side wall **15** is defined by two parallel fold lines **17** and **18** which are arranged vertically and parallel to one another and form a portion of the corner structure at both the top and bottom ends of the side panel **15**. Similarly the side wall **16** is defined by parallel vertical fold lines **19** and **20** which also serve as lateral edges of the adjacent face panels. As can be seen in the blank of FIG. **3**, the corner structure extends into the adjacent face panels, and for that reason the face panel **14** is abbreviated in width along the outer lateral edge **21** and an additional length or glue flap **22** is located on the opposite side of the blank along the lateral edge **23** which allows the corner structures at the top and bottom of the side walls **15** to be formed in their natural geometry. The overlapped panels **14** and **22** are then made equidistant so that the tube is rectangular in cross section.

The top and bottom edges of the face panel **13** are defined by fold lines **24** and **25**, respectively, and likewise the top and bottom edges of the face panel **14** are defined by the horizontal fold lines **26** and **27**. For purposes of simplicity, only the corner structure which is positioned at the top of the side wall **16** in the blank of FIG. **3** will be described, and it should be understood that the other corner structures are the same.

The top of the side wall **16** incorporates the corner structure and includes a first horizontal fold line extending across the side wall **16** designated as **28**. A second horizontal fold line is positioned above the first horizontal fold line **28** and is shown as **29**. These two horizontal fold lines **28** and **29**, in combination with the vertical fold lines **19** and **20** serve to define a first inwardly foldable support panel **30**. The edge **31** of the side wall **16** together with the second horizontal fold line **29** serve to define a second rectangular panel which will be termed an outwardly foldable support panel **32**. On either side of the inwardly foldably support panel **30** are positioned first diagonal fold lines **33***a* and **33***b* which extend upwardly into the adjacent face panels **13** and **14** from the ends of the first horizontal fold line **28** and which terminate at the top edge of the adjacent face panels **13** and **14**, which are shown in FIG. **3** as fold lines **24** and **26**, respectively. Likewise there are second diagonal fold lines **34***a* and **34***b* which

extend upwardly from the opposite ends of the second horizontal fold line **29**.

It should be understood that the diagonal pairs of lines **33***a*, **33***b*, **34***a* and **34***b* need not be parallel to one another and the choice of angles is one of desired geometry. The lateral fold line **19** together with the diagonal lines **33***a* and **34***a* define a four-sided first angular reinforcing panel **35** which is positioned beside the inwardly foldable support panel **30** and whose function will be described later. There is a similar panel **36** on the opposite side of the inwardly foldable panel **30** and there are two small triangular or second angular reinforcing panels **37** and **38** on either side of the outwardly foldable support panel **32**. The panels **37** and **38** are defined by the adjacent fold lines **34***a* and **19**, as well as **20** and **34***b*.

The top and bottom edges of the face panels **13** and **14** have attached thereto outer closure flaps **39, 40, 41** and **42**. It is desirable to dimension the closure **11** so the top edge **31** of the outwardly foldable support panel is positioned below the edges **24** and **26** of the face panels **13** and **14** to allow the closure flaps **39** and **41** to close tightly on the top of the carton **10** and prevent dust from entering since the contents are usually foodstuffs.

The procedure for folding and erecting the carton includes gluing the panels **14** and **22** to create a tube of rectangular cross section, one corner of which is shown in FIG. **4**. From the initial position shown in FIG. **4** the two panels **30** and **32** are pushed inwardly, which during the process bellows out the face panels **14** and **13** and assume the straight, inwardly inclined position shown in FIG. **5**. The drawing of FIG. **6** shows how the outwardly folded flap **32** is reversed and brought back to the outside corner into its final position as viewable both in FIG. **6** and FIG. **2**. By virtue of this combination of support panels being at an angle to one another, a much greater degree of strength through the minor axis of the carton is obtained and the crush strength of the two support panels angular to one another must be overcome for significant deflection. As can be seen on the left hand side of FIG. **7**, the first and second angular reinforcing panels on either side of the outwardly folded support panel **32** lie in juxtaposition with one another against the inside surface of the face panels **13** and **14**. If there is a lip or narrow ridge around the surface of the foil tray (not shown) it may be positioned between the panel and the double thickness as shown to prevent the tray from moving laterally within the carton.

FIG. **6** illustrates how the top edge **31** of the outwardly foldable support panel **32** may be set back in its final position from the edge of the two cover flaps **39** and **41** on at least one end so that the consumer may have a point on the carton where he can grasp the two cover flaps **39** and **41** and tear them away to open the carton.

In accordance with the Patent Statutes, I have described the principles of construction and operation of my improvement in a DOUBLE WEB CORNER CARTON; and while I have endeavored to set forth the best embodiment thereof, I desire to have it understood that obvious changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. In a blank for a carton having a pair of parallel face panels, said face panels having parallel vertical lateral edges and parallel horizontal top and bottom edges, and side walls foldably connecting adjacent lateral edges of said face panels, a corner structure, comprising:

a first fold line extending horizontally across a first of said side walls and spaced from the top end thereof;

first diagonal fold lines in each of said face panels extending upwardly from the ends of said first fold line in said first side wall and terminating along said top edges of said face panels;

a second horizontal fold line extending across said first side wall and positioned in vertical alignment with said top edges of said face panels, said first side wall extending vertically beyond said top edges of said face panels;

second diagonal fold lines extending upwardly from the ends of said second horizontal fold line;

first angular reinforcing panels positioned along each lateral edge of said first side wall and defined by the lateral edges of said side wall, said first and said second diagonal fold lines;

second angular reinforcing panels positioned along each lateral side of said first side wall and above said first angular panels, said second panels defined by the lateral edges of said first side wall and said second diagonal fold lines.

2. In a carton having a pair of parallel face panels, said face panels having parallel vertical lateral edges and parallel horizontal top and bottom edges, and side walls foldably connecting said lateral edges of said face panels into a rectangular tube, a corner structure, comprising:

a first fold line extending horizontally across a first of said side walls and spaced from the top end thereof;

said first side wall having formed therein an inwardly foldable support panel defined by said lateral edges adjoining said first side wall and said first fold line, a second horizontal fold line extending across said first side wall and positioned in vertical alignment with said top edges of said face panels, said inwardly foldable panel inclined toward the center of said carton about said first fold line;

said first side wall having formed therein and at the upper edge thereof an outwardly foldable support panel hingedly connected along said second fold line to said inwardly folded panel, said outwardly foldable panel positioned in angular relationship to said inwardly foldable support panel toward said top edge of said carton face panels;

first angular reinforcing panels positioned parallel to each of said face panels and on the inside surface thereof, said first reinforcing panels hingedly connected to the sides of said inwardly foldable support panel and to each of said face panels along first diagonal fold lines extending from the ends of said first horizontal fold line upwardly to said top edges of said face panels;

second angular reinforcing panels hingedly connected along the lateral edges of said outwardly folded panel, and to said first angular reinforcing panels along second diagonal fold lines extending from the ends of said second horizontal fold line, said second angular panels arranged in juxtaposition with the inside surface of each respective first angular reinforcing panel; and,

means for closing the exposed end of said carton along said top edges of said face panels.

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