United States Patent [19]

Kleinhaut

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[45] **Aug. 13, 1974**

[54] **ONE PIECE COLLAPSIBLE PAPER BOX**

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[73] Assignee: **Bagprint Ltd.,** Long Island City, N.Y.

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[52] **U.S. Cl.** ..... **229/16 A,** 229/41 B, 229/52 A, 229/54 C, 229/55

[51] **Int. Cl.**.... **B65d 5/36,** B65d 33/02, B65d 33/06

[58] **Field of Search**..... 229/16 A, 16 R, 52 A, 55, 229/44 R, 41 B, 54 C, 45

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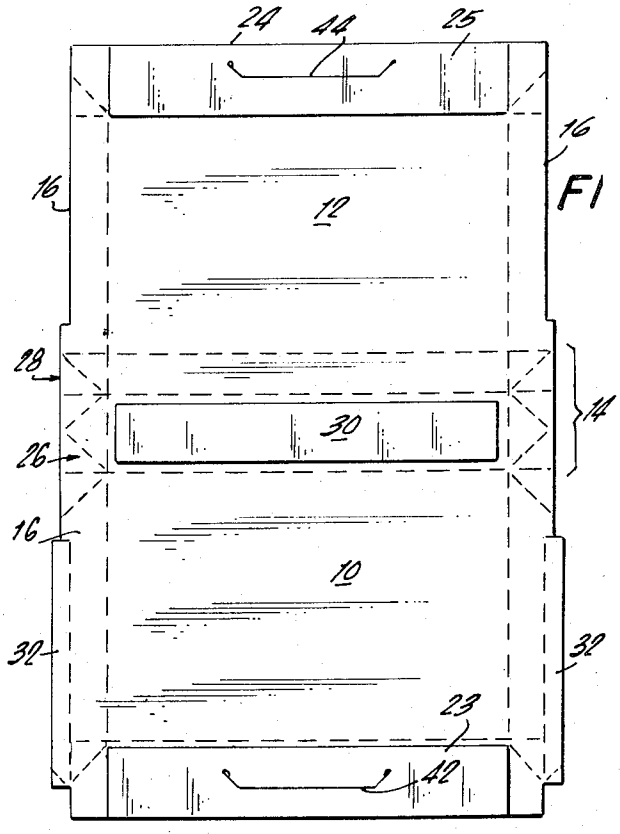
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Assistant Examiner—Bruce H. Bernstein
Attorney, Agent, or Firm—Linda G. Bierman; Jordan B. Bierman; Bierman & Bierman

[57] **ABSTRACT**

A collapsible paper box is provided having front and rear panels connected by a bottom portion which lies along one of the panels when the box is collapsed and is movable to permit expansion of the box. The panels are connected along opposite sides by collapsible elements running the length of the box, said elements having a slot along one end thereof. The elements are provided with folds adjacent the slot to permit the upper portion of the front and rear panels to be folded one on the other to close the box. In addition, means for strengthening the side elements of the box are provided, said means adopted to move into operative position only after the box is expanded.

6 Claims, 13 Drawing Figures



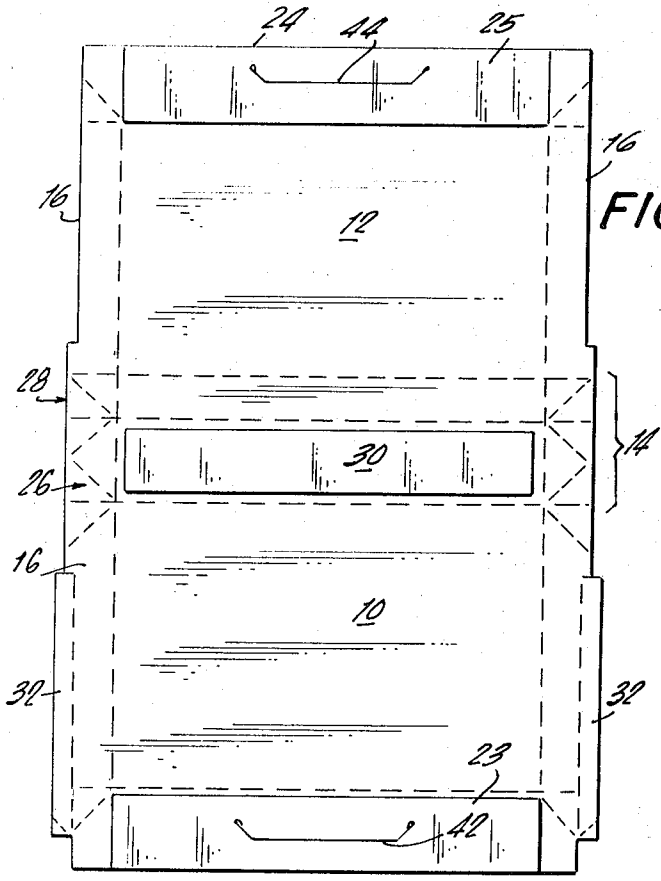


FIG. 1

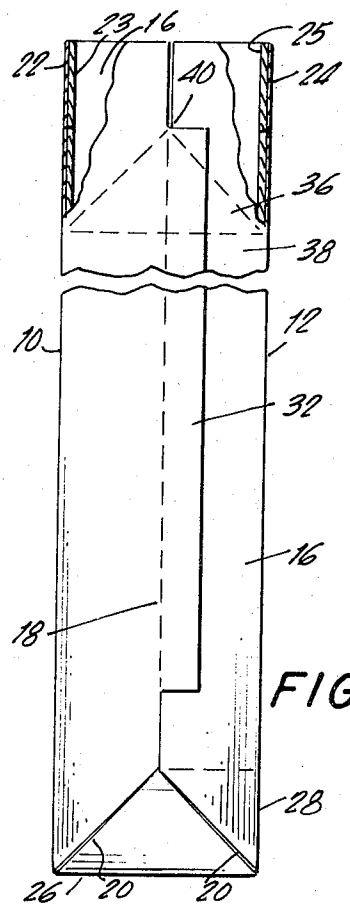


FIG. 2

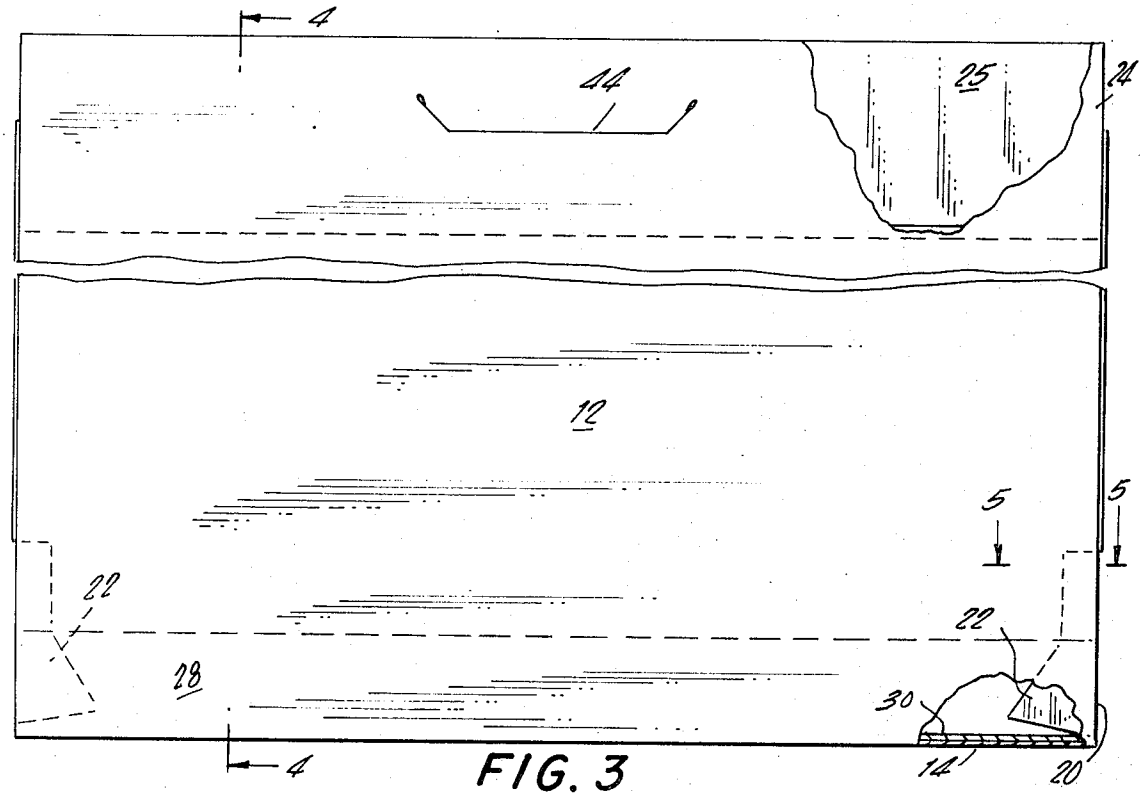
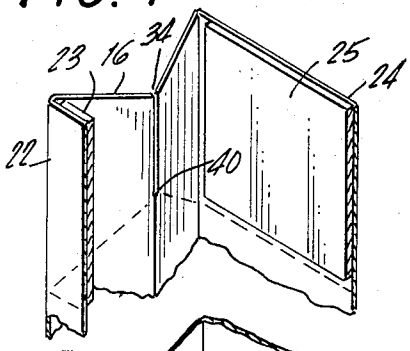
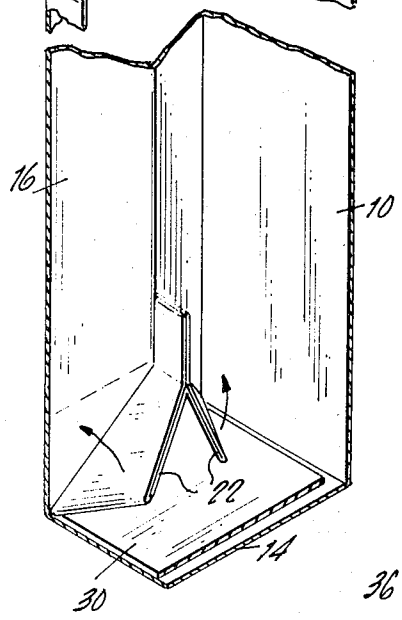


FIG. 3

FIG. 4





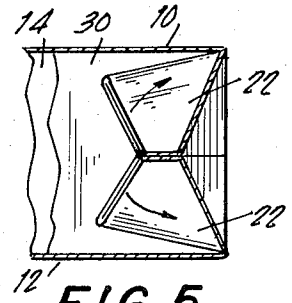


FIG. 5

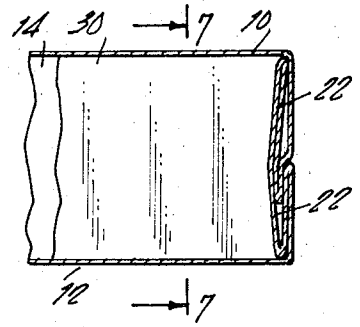


FIG. 6

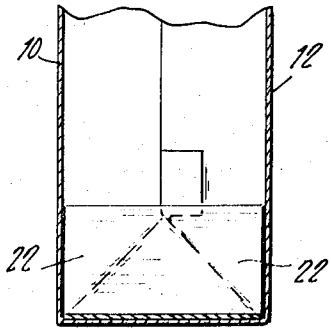


FIG. 7

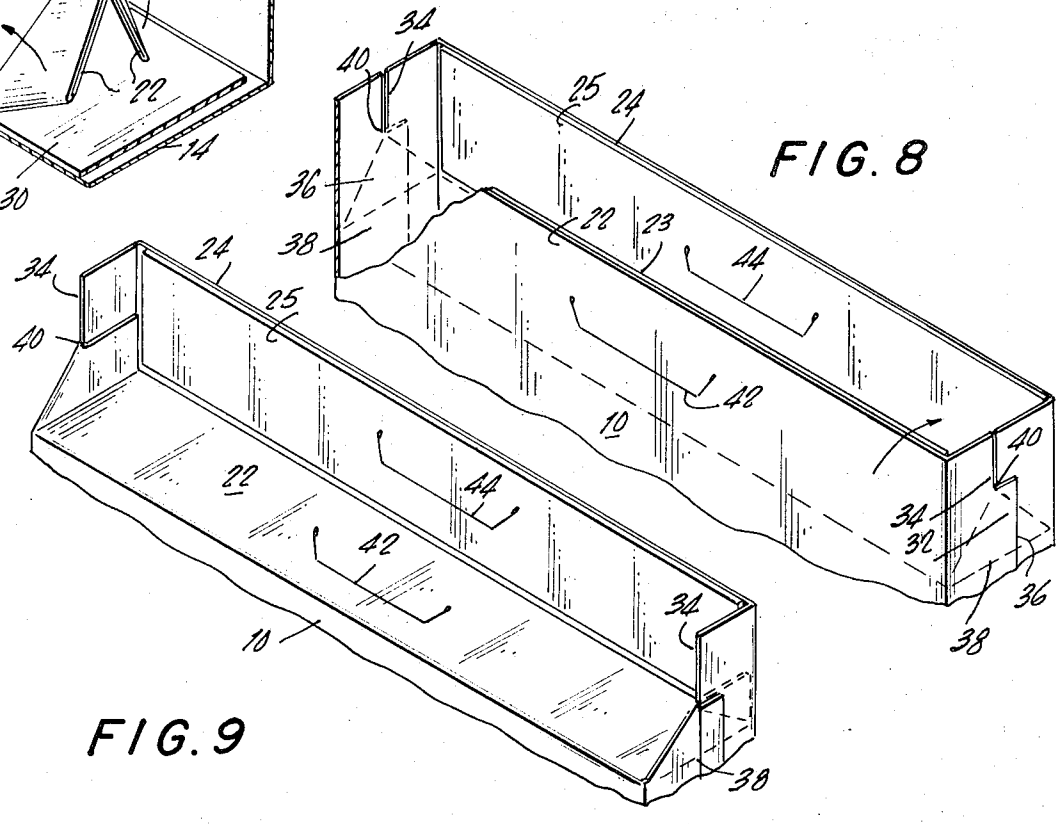


FIG. 8

FIG. 9

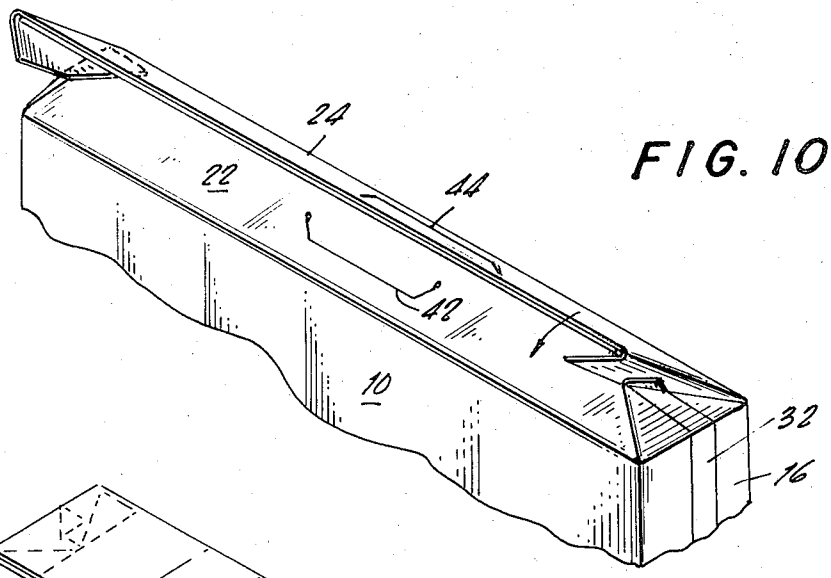


FIG. 10

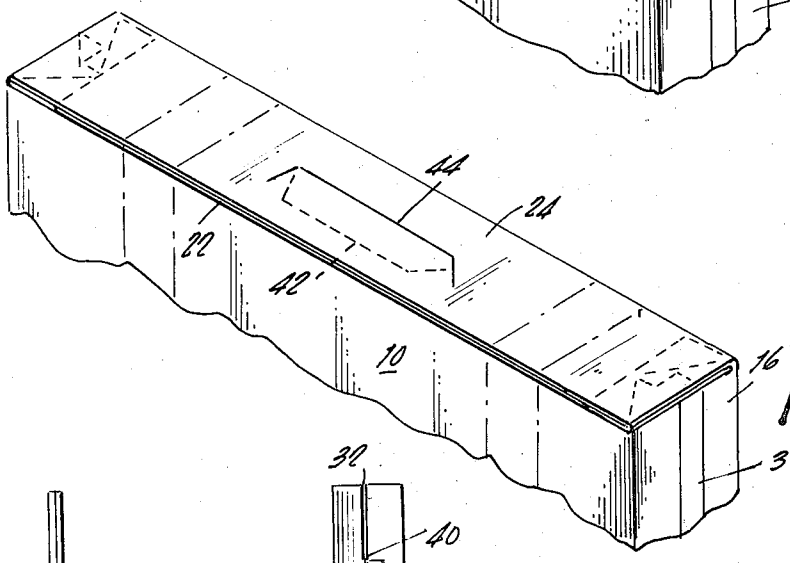


FIG. 11

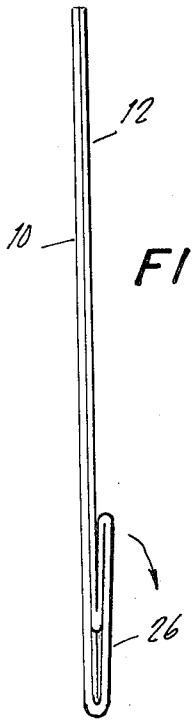


FIG. 12

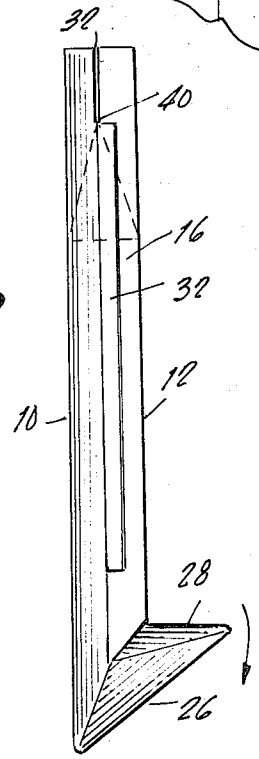


FIG. 13

ONE PIECE COLLAPSIBLE PAPER BOX

The present invention relates to the field of paper box construction and more specifically is directed to a collapsible paper box having a unique means of imparting structural rigidity to its sides as well as a novel method of closure.

In recent years, retail stores, especially large ones, have been shipping an increasing amount of merchandise through the mails or the various other parcel delivery services.

In accordance with the present invention, a collapsible paper box preferably made from a unitary blank of paper such as Kraft Paper board, which is strong enough to provide the necessary structural rigidity, is provided. The box comprises a front panel and a rear panel and a structurally re-inforced bottom portion folded in a manner which allows complete collapsibility of the box. Two foldable side elements are provided connecting the panels. Each of these elements has a central longitudinal fold and two angled folds at its base, to enable the box to collapse.

Two top members are provided, one connected to each panel. On the interior of each of these top members is placed an extra piece of board to impart added structural rigidity thereto. Each of these extra pieces of board covers the entire interior of the member to which it is attached. The upper portion of each of the side elements is provided with a slot and a triangular fold. The slot and fold configuration allows one of the top members to be folded perpendicular to the panel to which it is connected and the other top member to be folded on top of the first member to facilitate closure of the box. The box can then be sealed by a single strip of tape, and once sealed it is substantially air tight.

If desired, an extra panel can be mounted on the bottom portion to provide extra structural rigidity. Furthermore, two oppositely oriented U-shaped slots may be provided, one on each top member. When the top members are in folded position, the U-shaped slots will overlap and two points of intersection will be obtained. If desired, a handle, can be affixed to the box through these points of intersection.

Another aspect of the instant invention is the provision of means for adding rigidity to the side walls of the box when open. To achieve this, a plurality of wings are located on the interior of each of the side elements. One of these wings is provided along each of the angled folds. When the side elements are unfolded, these wings are positioned adjacent the surface of the side element and provide the element with extra structural rigidity.

A preferred embodiment is depicted in the accompanying drawings of the present invention, wherein like numerals refer to like parts.

FIG. **1** is a plan view of the box prior to assembly.

FIG. **2** is a plan view of the side element of the box.

FIG. **3** is a plan view of the rear panel and adjacent top member as well as a portion cut-a-way showing part of a wing.

FIG. **4** is a cut-a-way perspective view of the interior of a side element showing the wing structure.

FIG. **5** is a top cut-a-way view showing the wings in open position.

FIG. **6** is a top cut-a-way view showing the wings in closed position.

FIG. **7** is a front view of the wings in closed position as seen along lines **7—7** of FIG. **6.**

FIG. **8** is a perspective view of the top members in open position.

FIG. **9** is a perspective view of the first step of the closure operation showing the first top member folded.

FIG. **10** is a perspective view of the second step of the closure operation, showing the second top member being folded.

FIG. **11** is a perspective view of the top of the box subsequent to closure.

FIG. **12** is a side view of the box in collapsed position.

FIG. **13** is a side view showing the box as it is in unfolded form and collapsible position.

The collapsible paper box which is the subject of this application, is composed of front panel **10** and a rear panel **12,** which are connected by a bottom portion **14** as clearly shown in FIG. **1.** Connected to the front panel **10** is top member **22.** Similarly, another top member **24** is connected to the rear panel **12.** Each of these top members, **22** and **24,** are provided with extra structural rigidity through the inclusion of rigidity panels **23** and **25** respectively. These rigidity panels **23** and **25** are positioned on the interior of each of the top members respectively and cover the entire length of each of the members. The bottom portion **14** is made up of a first part **26** and a second part **28.** Mounted on the first part **26** of bottom portion **14,** is a rigidity panel **30** made of paper or cardboard or the like to impart extra structural stability to the bottom portion **14.**

As seen in FIG. **1,** the entire box is constructed from a single blank. The rigidity panels which are placed on the interiors of the bottom portion and the two top members respectivel are glued in place prior to the construction of the box. To construct the box from the blank, the box is folded along the dashed lines into a U-shape. The sides **16** are folded perpendicularly to the panels **10** and **12** and tab elements **32,** which overlap the side elements are used to fasten the sides together. The fastening is accomplished by adhesive provided on the underside of tab elements **32** such that once folded into the correct position the sides can be secured to each other and the box permanently constructed, as shown in FIGS. **2** and **3.** The side element **16** has a central longitudinal fold **18** which extends from the top of the box most of the way down the middle of element **16.** The angle folds **20** are provided from each corner of the bottom of the side element **16** to the bottom of central longitudinal fold **18.** The combination of the longitudinal fold **18** and the angle folds **20** permit the box to collapse into a completely flat configuration as illustrated in FIGS. **12** and **13.**

In order to facilitate the collapsibility of the box, the bottom portion **14** is divided into two parts, the first part **26** of the bottom portion **14** forms the actual bottom of the box and will be positioned perpendicular to the fold panel **10** and rear panel **12,** when the box is unfolded and ready for use. The second part **28** of the bottom portion **14** forms a connection between the first part **26** and the rear panel **12.** When the box is collapsed, the second part **28** enables the first part **26** to fold to a position substantially parallel to the front and rear panels. When the box is unfolded and ready for use second part **28** forms a part of the rear of the box and is essentially coplanar with rear panel **12.**

FIG. 3 shows a side view of the rear of the box. At the lower right hand corner, a cut-a-way shows a side view of wing 22. FIG. 4 is a cut-a-way view more clearly showing wings 22 in an open position. FIG. 5 is a top view showing wings 22 in a similar position. When the box is completely opened the wings 22, which are located along angle folds 20, will move to a position in which the surface of the wing is adjacent to the interior of the side element 16 as indicated by the arrows in FIGS. 4 and 5. Once the wings are in final position, they will serve to give the sides of the box extra structural rigidity. This is clearly shown in FIGS. 6 and 7.

As seen in FIG. 8, the central longitudinal fold 18 has a slot 34 which extends a part way from the top of side element 16. The box is closed by positioning top member 22 perpendicular to panel 10 as shown in FIG. 9. Triangular folds 36 are provided for this purpose. The base 38 of the triangular fold 36 is coplanar with the connections between top panel 10 and top member 22 as well as rear panel 12 and top member 24. The apex of the triangle 40 is located at the lower end of slot 34.

After top panel 22 is folded as indicated in FIG. 9, top panel 24 is folded over it as indicated in FIG. 10. FIG. 11 shows the top of the box after the folding operation is completed.

A U-shaped slit 42 is provided in the top panel 22. A similarly shaped slit 44 is provided on top 24. When the top members 22 and 24 are in closed position as shown in FIG. 11, the U-shaped slits 42 and 44 will be oppositely oriented as well as overlapping each other. Because of this orientation and positioning, two points of intersection 46 and 48 will be produced. If desired, a handle (not shown) can be inserted into the holes 46 and 48 to provide more convenient handling.

It is understood that variations and modifications may be made which are not specifically described herein but which will be obvious to those skilled in the art. It is intended to cover all such modifications and variations which fall within the spirit and scope of the invention as defined in the appended claims.

What we claim is:

1. A collapsible paper box comprising a front and a rear panel, a bottom portion connecting said panels, said bottom portion lying in a position substantially parallel to said panels when the box is collapsed and being movable to a position which permits expansion of the box,

two collapsible side elements connected along opposite sides of said panels and running the length of the box, each of said elements having a slot along the top end thereof and folds adjacent said slot, said slot being substantially on the centerline of each of said elements and the upper portions of said folds diverging downwardly from the lower end of said slot, whereby said panels can be folded on one another to close said box, and means for strengthening the sides of the box when said box is in expanded position.

2. The box according to claim 1, wherein said means comprises a plurality of wings mounted on the interior of said elements such that when said elements are expanded, the surface of wings are positioned adjacent said element and impart structural rigidity thereto.

3. A collapsible paper box comprising

a front and rear panel

a bottom portion connecting said panels such that said portion is substantially parallel the plane of said panels when the box is collapsed,

a first and a second side element connecting said panels along the length of the box, each of said elements having a central longitudinal fold extending from the top of the element to a point at least partway down said element and two angled folds each of which extends from one corner of the bottom portion to the end of the central fold,

a plurality of wings mounted on the interior of said elements along the angled folds on each of said elements such that when said element is unfolded a surface of each of said wings is positioned adjacent said element such that strength and rigidity is imparted thereto,

a first and a second top member each being connected to a different one of said panels at a point diametrically opposite the point of connection of said bottom portion, each of said longitudinal folds having a slot extending from the top of said fold along said fold a distance less then the width of one of said top members and a triangular fold on each element, the base of said triangular fold being coplanar with the connection of said members to said panels and the apex of said triangular fold being the lowest point on said slot such that one of said top members can be folded on the other to facilitate closure of said box.

4. The box according to claim 3 wherein said bottom portion comprises a first part and a second part, said first part connecting one of said panels and said second part such that when said portion is unfolded said first part is substantially perpendicular to both of said panels and said second part connecting said first part to the other panel and being in substantially the same plane as the other panel when said portion is unfolded.

5. The box according to claim 3 further comprising a plurality of rigidity panels one of which is mounted on the interior surface of the first part of said bottom portion, and of each of the top members, respectively.

6. The box according to claim 3 whrein each of said top members has an oppositely oriented U-shaped slot such that when said members are in the closed position said slots overlap and two points of intersection are present such that a handle having a flange at each end may be secured to the members at the points of intersection.

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