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(54) **COLLAPSIBLE BOX**

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(57) **ABSTRACT**

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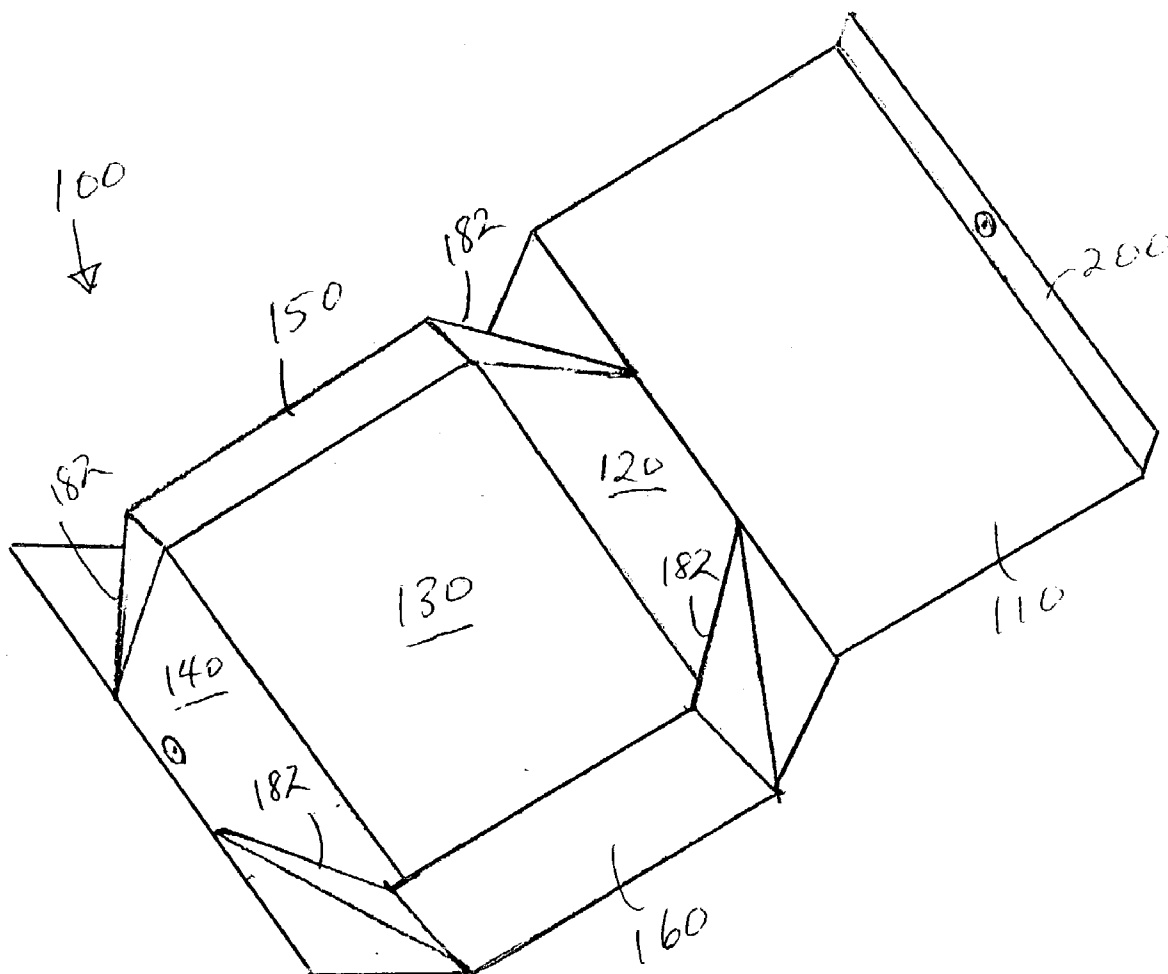
A packaging structure comprising a collapsible box is provided. The packaging structure is easily transformed from a unconstructed form to a usable box and provides improved storage and transportation efficiencies. In one embodiment, the packaging structure comprises a plurality of main body panels foldably connected; a lift panel foldably connected to a first panel of the main body panels; and a connector foldably connected between the lift panel and a second panel of the main body panels, wherein the lift panel and the connector are movably disposed between a substantially flat position and a lifted position.

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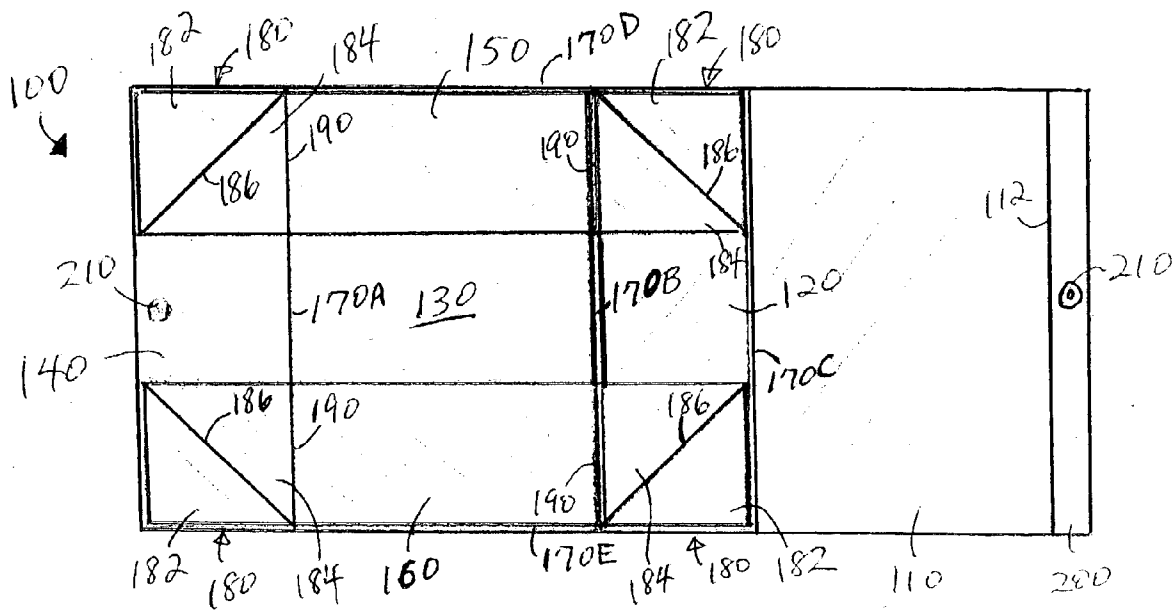


Fig. 1

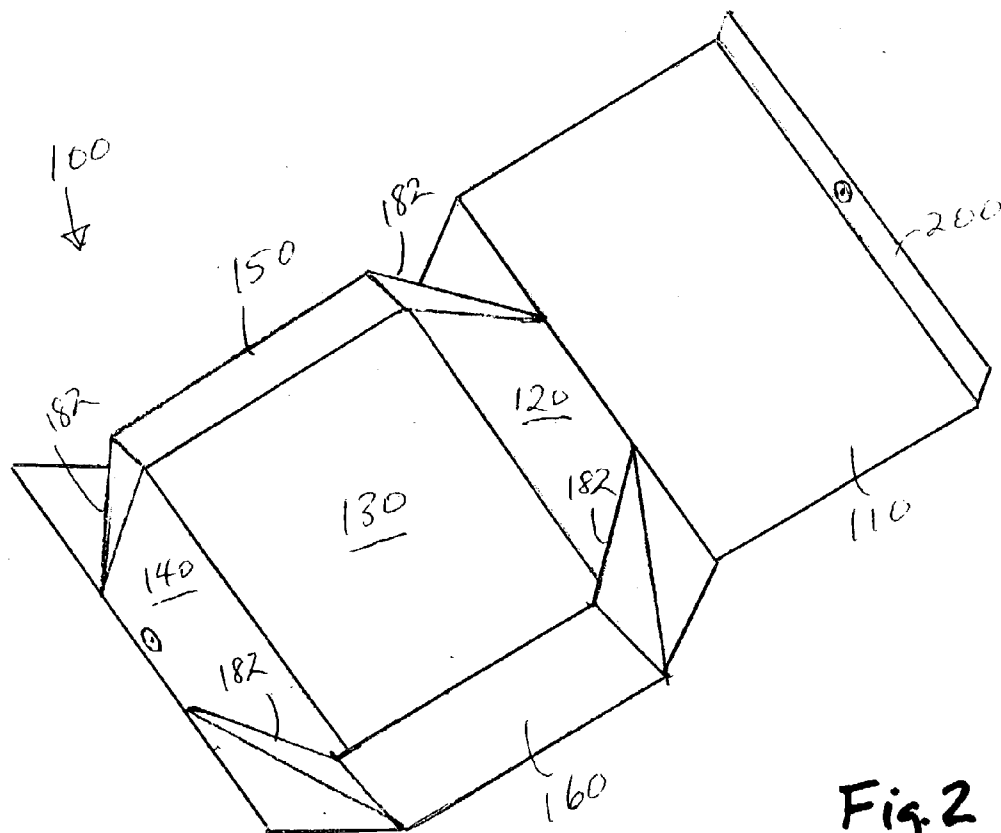
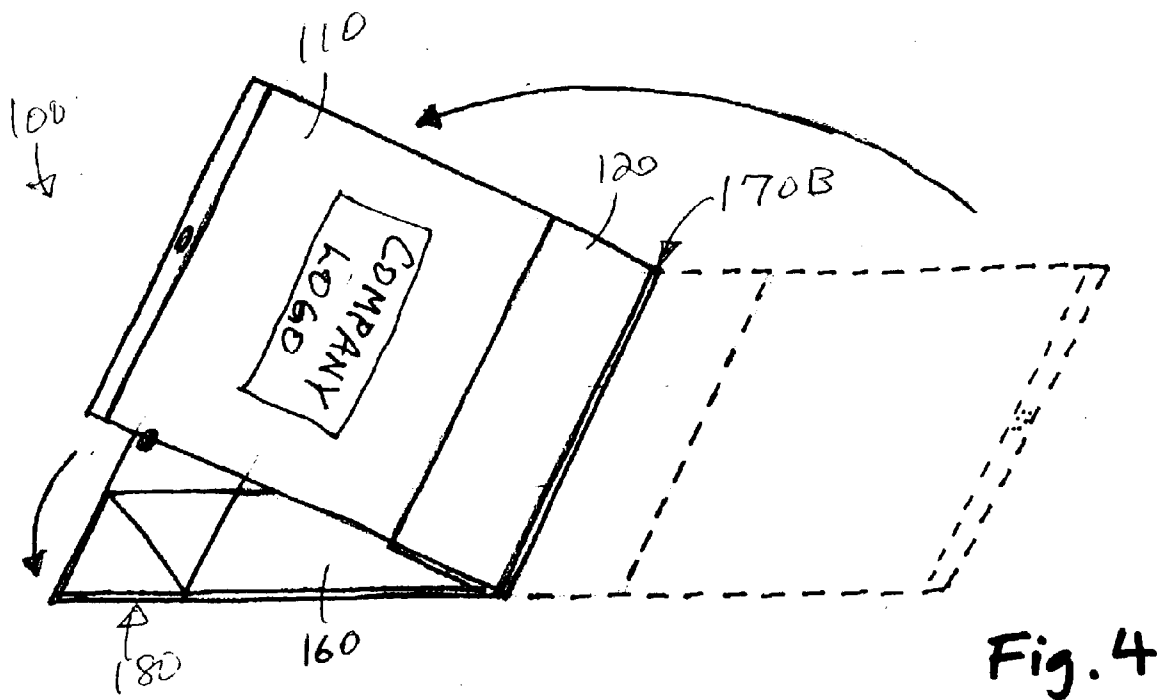
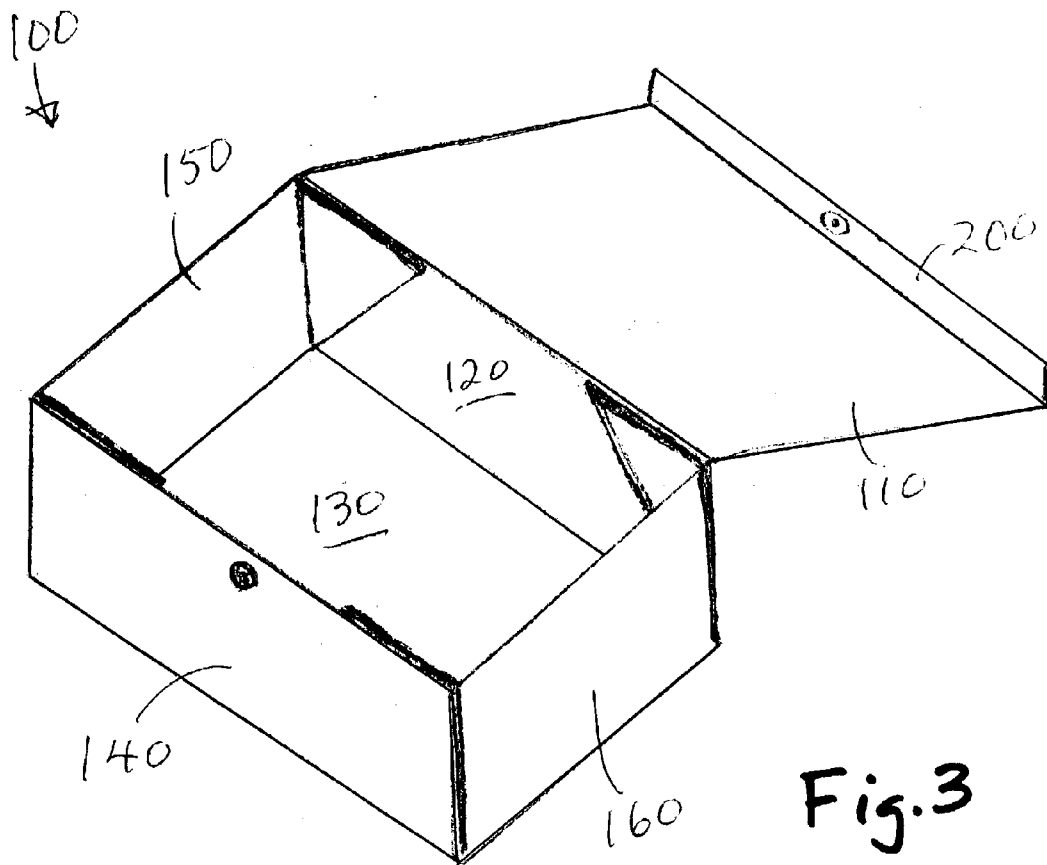


Fig. 2



COLLAPSIBLE BOX

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention generally relates to a packaging structure. More particularly, the present invention relates to a collapsible box.

[0003] 2. Description of the Related Art

[0004] Cardboard boxes are commonly utilized as containers and are generally available in many sizes and shapes. Many cardboard boxes are fully constructed by box manufacturers and delivered to customers as non-foldable boxes in ready-to-use forms. However, there are several disadvantages of a non-foldable cardboard box because the three-dimensional structure requires a large amount of space for transportation and storage, resulting in various economic inefficiencies. At the same time, an empty cardboard box may be easily damaged during transportation from the box manufacturer to its customers.

[0005] Foldable cardboard boxes, especially when designed as flat sheets, improve the storage and transportation inefficiencies. However, foldable cardboard boxes generally require several steps of manually folding and tucking various parts of the cardboard box to construct the box for use. Additionally, an adhesive (e.g., glue and/or tape) may be required to hold the foldable box after being constructed. However, these manual steps of constructing a foldable box generally require tremendous time and labor costs. For example, additional time spent to make a box by a store clerk who is completing a purchasing transaction results in generally unacceptable delays and inefficiencies at the check-out register. Such delays and inefficiencies may be reduced if the foldable boxes are made ahead of time so that the boxes are ready for use. However, the storage space requirements of fully constructed boxes again may present problems.

[0006] Therefore, there remains a need for a packaging structure which is easily transformed from an unconstructed form to a usable box. There also remains a need for a packaging structure which provides improved storage and transportation efficiencies.

SUMMARY OF THE INVENTION

[0007] Embodiments of the invention generally provide packaging structures which are easily transformed from an unconstructed form to a usable box and provide improved storage and transportation efficiencies.

[0008] In one embodiment, the packaging structure comprises a plurality of main body panels foldably connected; a lift panel foldably connected to a first panel of the main body panels; and a connector foldably connected between the lift panel and a second panel of the main body panels, wherein the lift panel and the connector are movably disposed between a substantially flat position and a lifted position.

[0009] In another embodiment, a packaging system is provided. The packaging system comprises a main body comprising a front panel, a bottom panel, a back panel, and a top panel foldably connected; a left side panel foldably connected to a left edge of the bottom panel; a right side panel foldably connected to a right edge of the bottom panel;

and one or more connectors foldably connected between each side panel and one or more of the front panel and back panel.

[0010] In yet another embodiment, the packaging structure comprises a main body comprising a front panel, a bottom panel, a back panel, and a top panel foldably connected in sequence; a left side panel foldably connected to a left edge of the bottom panel; a right side panel foldably connected to a right edge of the bottom panel; a plurality of connectors foldably connected between the left side panel and the front and back panels and between the right side panel and the front and back panels; wherein the side panels are selectively foldable between a flat position against the bottom panel and an upright position which concurrently lifts the front and back panels to upright positions.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] So that the manner in which the above recited features, advantages and objects of the present invention are attained and can be understood in detail, a more particular description of the invention, briefly summarized above, may be had by reference to the embodiments thereof which are illustrated in the appended drawings.

[0012] It is to be noted, however, that the appended drawings illustrate only typical embodiments of this invention and are therefore not to be considered limiting of its scope, for the invention may admit to other equally effective embodiments.

[0013] FIG. 1 is a top view of a collapsible box in a flat position according to one embodiment of the invention.

[0014] FIG. 2 is a perspective view of a collapsible box with side panels in transition to an upright position according to one embodiment of the invention.

[0015] FIG. 3 is a perspective view of a collapsible box with side panels in an upright position according to one embodiment of the invention.

[0016] FIG. 4 is a top view of a collapsible box in transition to a compact position according to one embodiment of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0017] Embodiments of the invention generally provide packaging structures which are easily transformed from an unconstructed form to a usable box and provide improved storage and transportation efficiencies.

[0018] FIG. 1 is a top view of a collapsible box in a flat position according to one embodiment of the invention. The exemplar collapsible box described herein can be collapsed down to substantially flat layers of card board and may be further folded to improve efficiencies in storage and transportation of large quantities of the collapsible boxes. Although a rectangular collapsible box is illustrated, collapsible boxes having other shapes are also contemplated. Generally, the collapsible box 100 comprises a top panel 110, a back panel 120, a bottom panel 130, a front panel 140, a left side panel 150 and a right side panel 160. As shown in FIG. 1, the top panel 110, the back panel 120, the bottom panel 130 and the front panel 140 are foldably connected in sequence. In an unconstructed form, the panels provide a

substantially flat layout with the side panels **150** and **160** disposed as a top layer. The top panel **110**, the back panel **120**, the bottom panel **130** and the front panel **140** forms a bottom layer (or main body layer).

[0019] In one embodiment, each panel may comprise medium or heavy weight cardboard, and sheets of paper (relatively much lighter weight compared to the cardboard) may be glued to the panels, with small gaps between adjacent panels (e.g., $\frac{1}{32}$ to $\frac{1}{8}$ inch gaps for $\frac{1}{16}$ inch thick panels), to provide the foldable connections between the panels. Alternatively, the panels may be taped together by strips of plastic or paper tapes to provide the foldable connections between the panels. In one embodiment, for a rectangular box as shown in **FIG. 1**, foldable connections **170** exist between a bottom edge of the front panel and a front edge of the bottom panel, between a bottom edge of the back panel and a back edge of the bottom panel, between a back edge of the top panel and a top edge of the back panel, and between a bottom edge of each of the left and right side panels and the left and right edges, respectively, of the bottom panel.

[0020] A plurality of connectors **180** are disposed to connect the side panels **150** and **160** to the front and back panels **140** and **120**. The connectors **180** facilitate lifting of the front and back panels **140** and **120** toward an upright position when the side panels **150** and **160** are being lifted to an upright position. In one embodiment, each connector **180** comprises a first and a second triangular panels **182** and **184** which are foldably connected to form a substantially square-shaped panel with a diagonal foldable connection **186**. The first triangular panel **182** is fixedly attached (e.g., glued) to the interior surface of the front panel (or back panel), and the second triangular panel **184** is foldably connected to a side edge **190** of a side panel. In another embodiment, each connector **180** comprises a triangular panel **182** having a first side foldably connected to a side edge **190** of a side panel and a hypotenuse edge foldably connected to an interior surface of the front panel **140** (or back panel **120**).

[0021] The collapsible box may also include an enclosure flap **200** which is foldably attached to a front edge **112** of the top panel **110**. A releasable fastener **210** may be attached to the enclosure flap **200** and the front panel **140** to facilitate closure of the collapsible box **100**. In one embodiment, the releasable fastener **210** comprises a magnetic fastener set (e.g., a set of two magnets or a set of a magnet and a metal piece). Other releasable fasteners are contemplated for releasably holding the enclosure flap (or the top panel) against the front panel.

[0022] To change the collapsible box **100** from a flat layout to a three-dimensional box, a user may lift the side panels **150** and **160** to an upright position. **FIG. 2** is a perspective view of a collapsible box **100** with side panels **150** and **160** in transition to an upright position according to one embodiment of the invention. As the side panels **150** and **160** are lifted, the front panel **140** and the back panel **120** are concurrently lifted because of the connectors **180** between the side panels **150** and **160** and the front and back panels **140** and **120**.

[0023] **FIG. 3** is a perspective view of a collapsible box **100** with side panels **150** and **160** in an upright position according to one embodiment of the invention. With the side

panels **150** and **160** held in the upright position, the collapsible box **100** may be filled with one or more objects to be stored in the box. For example, the collapsible box may be utilized in a gift shop, and a store clerk may place one or more purchased gift items into the collapsible box. The collapsible box **100** may include a decorated exterior, and additional gift wrapping would not be necessary, saving time and money for both the merchant and the customer. The collapsible box **100** may also be decorated with a store's emblem, logo or a trademark.

[0024] In another embodiment, the collapsible box **100** may be folded from a flat layout to a compact position to further facilitate storage and transport of large quantities of collapsible boxes. **FIG. 4** is a perspective view of a collapsible box **100** in transition from a flat layout to a compact position according to one embodiment of the invention. To facilitate folding of the collapsible box **100**, the foldable connection **170B** between the back panel and the bottom panel may be extended to provide a wider gap which accommodates for the combined thickness of the side panel (one of **150** and **160**) and the connector **180**. In the compact position, a plurality of collapsible boxes are easily stored and/or transported, increasing efficiencies in storage space requirements and transportation costs.

[0025] Although the described embodiment illustrates a rectangular box, it is contemplated that boxes having other shapes may be constructed utilizing connectors adapted to lift one or more panels as a user lifts one or more other panels foldably connected to the connectors. Furthermore, the orientation of the collapsible box as described is illustrative of one embodiment of the invention, and various orientations of the collapsible box are contemplated to accommodate the intended usage of the box.

[0026] While the foregoing is directed to embodiments of the present invention, other and further embodiments of the invention may be devised without departing from the basic scope thereof, and the scope thereof is determined by the claims that follow.

1. A packaging structure, comprising:

a plurality of main body panels foldably connected;

a lift panel foldably connected to a first panel of the main body panels; and a connector foldably connected between the lift panel and a second panel of the main body panels, wherein the lift panel and the connector are movably disposed between a substantially flat position and a lifted position.

2. The packaging structure of claim 1, wherein the main body panels are sequentially connected as a flat layer.

3. The packaging structure of claim 1, wherein the main body panels are foldable against each other as a plurality of flat layers.

4. The packaging structure of claim 1, wherein, in the substantially flat position, the lift panel and the connector are disposed substantially flat against the main body panels.

5. The packaging structure of claim 1, wherein, in the lifted position, the lift panel, the connector, the first panel and the second panel are disposed at one or more angles with respect to each other.

6. The packaging structure of claim 5, wherein the first panel is disposed substantially perpendicularly to at least one of the lift panel, the connector and second panel.

7. The packaging structure of claim 1, wherein the main body panels comprise a front panel, a bottom panel, a back panel, and a top panel.

8. The packaging structure of claim 1, further comprising a flap foldably connected to one of the main body panels.

9. The packaging structure of claim 8, further comprising a set of fasteners, wherein a first fastener is disposed on the flap and a second fastener is disposed on one of the main body panels.

10. A packaging system, comprising:

a main body comprising a front panel, a bottom panel, a back panel, and a top panel foldably connected;

a left side panel foldably connected to a left edge of the bottom panel;

a right side panel foldably connected to a right edge of the bottom panel; and

one or more connectors foldably connected between each side panel and one or more of the front panel and back panel.

11. The packaging system of claim 10, wherein each connector comprises a triangular panel having a first edge attached to one of left and right side panels and a second edge attached to one of front and back panels.

12. The packaging system of claim 10, further comprising a sheet adhering the front panel, the bottom panel, the back panel and the top panel.

13. The packaging system of claim 12, wherein the sheet provide foldable connections between the panels.

14. The packaging system of claim 10, wherein the main body further comprises a flap foldably connected to one of the top panel and the front panel.

15. The packaging system of claim 14, further comprising a fastener set disposed on at least one of the flap and the front panel.

16. The packaging system of claim 10, wherein a foldable connection between the bottom panel and the back panel provides sufficient width for folding the packaging system in flat layers.

17. A packaging structure, comprising:

a main body comprising a front panel, a bottom panel, a back panel, and a top panel foldably connected in sequence;

a left side panel foldably connected to a left edge of the bottom panel;

a right side panel foldably connected to a right edge of the bottom panel;

a plurality of connectors foldably connected between the left side panel and the front and back panels and between the right side panel and the front and back panels;

wherein the side panels are selectively foldable between a flat position against the bottom panel and an upright position which concurrently lifts the front and back panels to upright positions.

18. The packaging structure of claim 17, wherein each connector comprises a triangular panel having a first edge attached to one of left and right side panels and a second edge attached to one of front and back panels.

19. The packaging structure of claim 17, wherein the main body further comprises a flap foldably connected to the front panel and a fastener set disposed on at least one of the flap and the front panel.

20. The packaging structure of claim 17, wherein a foldable connection between the bottom panel and the back panel provides sufficient width for folding the packaging structure in flat layers.

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