

High-Strength Corrugated Paper Box

Field of the Invention

The present invention relates to a corrugated paper box. In particular, the present invention relates to a high-strength corrugated paper box.

Background of the Invention

Corrugated paper boxes are widely used and stronger than paperboards of the same thickness. Fig. 1 of the drawings illustrates a piece of conventional corrugated paper 1 consisting of a top sheet 11, a bottom sheet 12 and two layers of wavy structures 13 having different pitches between the top and bottom sheets 11 and 12. A light, foldable paper box can be formed by cutting the corrugated paper 1 into a desired shape and folding the cut corrugated paper 1. However, the joint section of the paper box is liable to be damaged. Further, the strength of a large-size corrugated paper box could not be improved. As a result, the size of the corrugated paper box for containing objects such as liquid that might create high impact to the container is limited. Further, the thickness of the corrugated paper box is limited, as the periphery of the top sheet 11 would be different from that of the bottom sheet 11 after folding, which would lead to breakage at the folding line.

Summary of the Invention

A corrugated paper box in accordance with the present invention comprises a hollow body and a top cover mounted on an open upper end of the hollow body. The top cover includes a first cover and a second cover.

The first cover includes a substantially triangular body having two relatively shorter sides and a relatively longer side. A flap extends downward from each relatively shorter side of the first cover.

The second cover includes a substantially triangular body having two relatively shorter sides and a relatively longer side. A flap extends downward from each relatively shorter side of the second cover. A foldable covering piece extends outward from the relatively longer side of the second cover.

5 The substantially triangular body of the first cover and the substantially triangular body of the second cover together cover most part of the open upper end of the hollow body, with an opening being defined between the relatively longer side of the first cover and the relatively longer side of the second cover.

 The foldable covering piece is movable between an open position not
10 covering the opening a closing position for closing the opening. The flaps of the first cover and the second cover are bonded to the outer periphery of the hollow body.

 Preferably, the hollow body is rectangular in section and includes a continuous web of corrugated paper wound to form a plurality of layers of
15 corrugated paper.

 Preferably, the foldable covering piece includes two flaps on two sides thereof. The flaps on the foldable covering piece are bonded to the outer periphery of the hollow body.

 Preferably, the hollow body includes a folding line at each of two
20 diagonally opposed corners thereof.

 Preferably, a folding line is defined between a vertex between the relatively shorter sides of the first cover and a vertex between the relatively shorter sides of the second cover, allowing folding of the top cover.

 Preferably, a bottom plate is mounted to a lower end of the hollow body.

25 In an embodiment of the invention, the bottom plate includes a first bottom piece and a second bottom piece. The first bottom piece includes a

substantially triangular body having two relatively shorter sides and a relatively longer side. A flap extends upward from each relatively shorter side of the first bottom piece. The second bottom piece includes a substantially triangular body having two relatively shorter sides and a relatively longer side. A flap extends upward from each relatively shorter side of the second bottom piece. The flaps of the first bottom piece and the second bottom piece are bonded to the outer periphery of the hollow body. Preferably, a folding line is defined between a vertex between the relatively shorter sides of the first bottom piece and a vertex between the relatively shorter sides of the second bottom piece, allowing folding of the bottom plate.

In another embodiment of the invention, the bottom plate includes a base with a plurality of flaps extending upward from a periphery of the base. The flaps of the base are bonded to the outer periphery of the hollow body.

Other objectives, advantages, and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

Brief Description of the Drawings

Fig. 1 is a perspective view of a piece of conventional corrugated paper.

Fig. 2 is a perspective view of an embodiment of a corrugated paper box in accordance with the present invention.

Fig. 3 is an exploded perspective view of the corrugated paper box in accordance with the present invention.

Fig. 4 is a top view illustrating formation of a body of the corrugated paper box in accordance with the present invention.

Fig. 5 is a view similar to Fig. 4, wherein the body of the corrugated paper box has been formed.

Fig. 6 is a top view illustrating folding of the body and a top cover of the corrugated paper box in accordance with the present invention.

Fig. 7 is a sectional view illustrating a use of the corrugated paper box in accordance with the present invention.

5 Fig. 8 is a perspective view of the corrugated paper box in Fig. 7, wherein the top cover is in a closing position.

Fig. 9 is a perspective view illustrating a modified embodiment of the corrugated paper box in accordance with the present invention.

10 Fig. 10 is an exploded perspective view of the corrugated paper box in Fig. 9.

Detailed Description of the Preferred Embodiments

Referring to Figs. 2 and 3, an embodiment of a corrugated paper box 2 in accordance with the present invention comprises a body 21, a top cover 22 mounted on an upper end of the body 21, and a bottom plate 23 mounted to a lower end of the body 21.

The body 21 is hollow and rectangular in section. Further, the body 21 includes a plurality of layers of corrugated paper 3. As illustrated in Fig. 4, the body 21 is formed by winding a continuous web of corrugated paper 3 around a core 4. The core 4 has an outer periphery the same as an inner periphery of the body 21. The web of corrugated paper 3 includes a substrate 32 and a layer of wavy structure 31 on a side of the substrate 32. The web of corrugated paper 3 has a width equal to a height of the resultant body 21. Adhesive is applied to a side of the corrugated paper 3. An end of the web of corrugated paper 3 is placed on the core 4 and the web of corrugated paper 3 is then wound around the core 4 until a desired thickness is reached. A hollow body 21 having a seamless outer periphery is thus obtained, as shown in Fig. 5.

The core 4 may be placed into a conventional corrugated paper box (not shown), and the corrugated paper 3 is wound around the corrugated paper box to obtain the required hollow body 21.

The core 4 is not limited to a parallelepiped. In other words, the core 4
5 may be cylindrical, ellipsoid, or of other shape, providing a hollow body 21 of the desired shape. Alternatively, the mold (not shown) may be used to press the hollow body 21 before drying of the adhesive to obtain the desired shape.

The thickness of the hollow body 21 can be increased without causing breakage of the corrugated paper 3 and without leaving a seam in the outer
10 periphery of the hollow body 21 while improving the strength of the hollow body 21. Thus, the hollow body 21 may be used to contain objects (such as liquids) that may generate impact to the hollow body 21 during transport. The hollow body 21 may include folding lines 211 at two diagonally opposed corners thereof to allow folding for storage and transport purposes, as shown in Fig. 6.

15 Referring to Figs. 2 and 3, the top cover 22 includes a first cover 221 and a second cover 222 that together cover the upper end of the hollow body 21. In the illustrated embodiment, the first cover 221 includes a substantially triangular body having two relatively shorter sides 221a and a relatively longer side 223, with a flap 224 extending downward from each relatively shorter side 221a. The
20 second cover 222 also includes a substantially triangular body having two relatively shorter sides 222a and a relatively longer side 227, with a flap 224 extending downward from each relatively shorter side 222a. Further, a foldable covering piece 226 extends outward from the relatively longer side 227.

When the first cover 221 and the second cover 222 are mounted on the
25 upper end of the hollow body 21, the triangular bodies of the first and second covers 221 and 222 cover most part of the upper end of the hollow body 21, with

an opening 212 being defined between the relatively longer side 223 of the first cover 221 and the relatively longer side 227 of the second cover 222 when the foldable covering piece 226 is in an open position. Each flap 224 of the first and second cover 221 and 222 are bonded by adhesive to four sides of the outer periphery of the hollow body 21. The foldable covering piece 226 can be moved to a closing position for closing the opening 212, as shown in Fig. 8. Preferably, the foldable covering piece 226 has a size greater than the opening 212. In the illustrated embodiment, the foldable covering piece 226 includes two flaps 226a on two sides thereof. A slit 225 is defined between each flap 226a and an associated flap 224 of the second cover 222. The flaps 226a can be bonded by adhesive to two sides of the periphery of the hollow body 21 when the foldable covering piece 226 is in the closing position. Preferably, a folding line 228 is defined between a vertex between the relatively shorter sides 221a of the first cover 221 and a vertex between the relatively shorter sides 222a of the second cover 221, allowing folding of the top cover 22 when not in use, as shown in Fig. 6.

Still referring to Figs. 2 and 3, the bottom plate 23 includes a base 237 and four flaps 236 extending upward from four sides of the base 237. In the illustrated embodiment, the base 237 is in the form of a pallet. Further, a lining member 238 made of corrugated paper can be fixed on the base 237 and surrounded by the flaps 236. The hollow body 21 is mounted on the base 237, with the lower end of the hollow body 21 being located in a space between the flaps 236 and the lining member 238, and with the flaps 236 being bonded by adhesive to the four sides of the outer periphery of the hollow body 21.

The corrugated paper box 2 thus formed has no seam in the outer periphery thereof and thus has a high strength. The corrugated paper box 2 with

the above-mentioned structure is particularly suitable for containing liquid 5 that may generate impact to the container during transport, as shown in Fig. 7. A bag 6 is mounted in the hollow body 21 and includes an inlet 61 in a top thereof. An outlet 63 is defined in a lower portion of the hollow body 21 and sealed by a cap (not labeled) or the like.

The liquid 5 is filled into the hollow body 21 via a pipe 62 that extends through the opening 212 of the top cover 21. After filling, the opening 212 is closed by the covering piece 226, as mentioned above. A corrugated paper box 2 suitable for transport of liquid 5 is thus provided, as shown in Fig. 8. Breakage of the corrugated paper box 2 during transport is avoided even if it is subjected to external impact that would result in vibration of the liquid 5, which, in turn, generates impact from an interior of the hollow body 21.

Figs. 9 and 10 illustrate a modified embodiment of the bottom plate 23. In this embodiment, the bottom plate 23 includes a first bottom piece 231 and a second bottom piece 232. The first bottom piece 231 includes a substantially triangular body having two relatively shorter sides 231a and a relatively longer side 233, with a flap 234 extending upward from each relatively shorter side 231a. The second bottom piece 232 also includes a substantially triangular body having two relatively shorter sides 232a and a relatively longer side 233, with a flap 224 extending upward from each relatively shorter side 232a.

When the lower end of the hollow body 21 is mounted on top of the first bottom piece 231 and the second bottom piece 232, the triangular bodies of the first and second bottom pieces 231 and 232 cover the lower end of the hollow body 21. Each flap 234 of the first and second bottom pieces 231 and 232 are bonded by adhesive to four sides of the outer periphery of the hollow body 21. Preferably, a folding line 239 is defined between a vertex between the relatively

shorter sides 231a of the first bottom piece 231 and a vertex between the relatively shorter sides 232a of the second bottom piece 231, allowing folding of the bottom plate 23 when not in use.

Although specific embodiments have been illustrated and described,
5 numerous modifications and variations are still possible without departing from the essence of the invention. The scope of the invention is limited by the accompanying claims.

Claims:

1. A corrugated paper box comprising:

a hollow body (21) including an open upper end and an outer periphery;

and

5 a top cover (22) mounted on the open upper end of the hollow body, the top cover (22) including a first cover (221) and a second cover (222);

the first cover (221) including a substantially triangular body having two relatively shorter sides (221a) and a relatively longer side (223), a flap (224) extending downward from each said relatively shorter side (221a) of the first
10 cover;

the second cover (222) including a substantially triangular body having two relatively shorter sides (222a) and a relatively longer side (227), a flap (224) extending downward from each said relatively shorter side (221a) of the second cover (222), a foldable covering piece (226) extending outward from the
15 relatively longer side (227) of the second cover (222);

the substantially triangular body of the first cover (221) and the substantially triangular body of the second cover (222) together covering most part of the open upper end of the hollow body (21), with an opening (212) being defined between the relatively longer side (223) of the first cover (221) and the
20 relatively longer side (227) of the second cover (222);

the foldable covering piece (226) being movable between an open position not covering the opening (212) and a closing position for closing the opening (212); and

the flaps (224) of the first cover (221) and the second cover (222) being
25 bonded to the outer periphery of the hollow body (21).

2. The corrugated paper box as claimed in claim 1, wherein the hollow body (21) includes a plurality of layers of corrugated paper (3).

3. The corrugated paper box as claimed in claim 1, wherein the foldable covering piece (226) includes two flaps (226a) on two sides thereof, the flaps (226a) on the foldable covering piece (226) being bonded to the outer periphery of the hollow body (21).

4. The corrugated paper box as claimed in claim 1, wherein the hollow body is one of parallelepiped, cylindrical, and ellipsoid.

5. The corrugated paper box as claimed in claim 1, wherein the hollow body (21) includes a folding line (211) at each of two diagonally opposed corners thereof.

6. The corrugated paper box as claimed in claim 1, further including a folding line (228) defined between a vertex between the relatively shorter sides (221a) of the first cover (221) and a vertex between the relatively shorter sides (222a) of the second cover (222), allowing folding of the top cover (22).

7. The corrugated paper box as claimed in claim 1, further including a bottom plate (23) mounted to a lower end of the hollow body (21).

8. The corrugated paper box as claimed in claim 7, wherein the bottom plate (23) includes a first bottom piece (231) and a second bottom piece (232), the first bottom piece (231) including a substantially triangular body having two relatively shorter sides (231a) and a relatively longer side (233), a flap (234) extending upward from each said relatively shorter side (231a) of the first bottom piece (231), the second bottom piece (232) including a substantially triangular body having two relatively shorter sides (232a) and a relatively longer side (233), a flap (234) extending upward from each said relatively shorter side (231a) of the second bottom piece (232), the flaps (234) of the first bottom piece (231) and the

second bottom piece (232) being bonded to the outer periphery of the hollow body (21).

9. The corrugated paper box as claimed in claim 8, further including a folding line (239) defined between a vertex between the relatively shorter sides (231a) of the first bottom piece (231) and a vertex between the relatively shorter sides (232a) of the second bottom piece (232), allowing folding of the bottom plate (23).

10. The corrugated paper box as claimed in claim 7, wherein the bottom plate (23) includes a base (237) with a plurality of flaps (236) extending upward from a periphery of the base, the flaps (236) of the base (237) being bonded to the outer periphery of the hollow body (21).