HIGH-STRENGTH DOUBLE WALL/TRIPLE WALL BOX, BOX FORM, AND METHOD OF CREATING SAME

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ABSTRACT

A pre-folded automatic bottom box form made from a unitary blank of material. The form has a blank of corrugated material that is die cut and creased so as to form a series of panels and flaps arranged in three rows of four panels or flaps each and a fourth row with two panels, all arranged in four columns, a first row comprising four panels that end up in the box as an automatic bottom, a second row comprising four panels that end up in the box as sidewall and end wall panels, a third row contiguous with the second row and comprising four panels that end up in the box as reinforcing sidewall and end wall panels, and a fourth row coupled to the third row and comprising first and second panels making additional end wall reinforcing panels.
Figure 4A
HIGH-STRENGTH DOUBLE WALL/TRIPLE WALL BOX, BOX FORM, AND METHOD OF CREATING SAME

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority of Provisional Application Ser. No. 61/603,649 filed on Feb. 27, 2012, the contents and teachings of which are hereby incorporated by reference in their entirety.

FIELD

[0002] This disclosure relates to a box.

BACKGROUND

[0003] Box stacking strength is dictated primarily by the quantity of vertical walls (sidewalls and end walls) with their corrugations running in the vertical direction. Panels with corrugations running horizontally contribute little to crush resistance. It is thus desirable to increase the quantity of sidewall and end wall panels with vertical corrugations in both file bottom and automatic bottom style file storage boxes.

SUMMARY

[0004] This disclosure features a box for file storage and the like. The box is made from a unitary blank of material that is partially preassembled by the manufacturer into a box form. The box form is then assembled (typically by the user) into the final box. The box, when assembled, has four interconnected vertical walls (two sidewalls and two end walls) that define an open storage volume between them. The vertical walls are typically each rectangular in shape, to define a generally rectangular prism-shaped storage volume.

[0005] Featured herein are two different box designs that achieve superior stacking strength for record file boxes. When complete, one design forms double wall length panels and quadruple wall width panels with a manually assembled, double thick flat bottom. The other design forms double wall length panels and triple wall width panels along with an auto assembly easy fold bottom design. The first design is a file bottom design with a double thick flat bottom that is formed when the bottom is manually assembled, creating a smooth surface that is less prone to catching on storage shelving. Automatic bottom style box styles have bottoms that assemble and fold into place automatically as the box form is pushed into the assembled box. The automatic bottom has an irregular surface that can catch on shelving. Automatic bottom style boxes are thus very easy to assemble, but are typically not well suited for use in situations in which the boxes are going to be stored on shelves.

[0006] In an embodiment a pre-folded automatic bottom box form is made from a unitary blank of material and comprises a blank of corrugated material that is die cut and creased so as to form a series of panels and flaps arranged in three rows of four panels or flaps each and a fourth row with two panels, all arranged in four columns, a first row comprising four panels that define an automatic bottom of the box, a second row comprising four panels that define sidewall and end wall panels of the box, a third row contiguous with the second row and comprising four panels that define reinforcing sidewall and end wall panels of the box, and a fourth row coupled to the third row and comprising first and second panels that form additional end wall reinforcing panels. The two panels of the fourth row are folded onto and fastened to the two contiguous panels of the third row, such as by using an adhesive. The blank is then folded along two fold lines located between columns, and the edges of the end panels of the second row are fastened together, to create the completed form. The edges of the end panels of the second row can be fastened together by gluing, stitching or stapling. Also featured is a box created from this pre-folded box form.

[0007] In another embodiment a pre-folded file bottom box form is made from a unitary blank of material and comprises a blank of corrugated material that is die cut and creased so as to form a series of panels and flaps arranged in three rows of four panels or flaps each and a fourth row with two panels, all arranged in four columns, a first row comprising four panels that end up in the box as the bottom and end wall reinforcing flaps, a second row comprising four panels that end up in the box as sidewall and end wall panels, a third row contiguous with the second row and comprising four panels that end up in the box as reinforcing sidewall and end wall panels, and a fourth row coupled to the third row and comprising first and second panels making additional end wall reinforcing panels. The two panels of the fourth row are folded onto and fastened to the two contiguous panels of the third row, such as using an adhesive. The blank is then folded along two fold lines located between columns, and the edges of the end panels of the second row are fastened together, to create the completed form. The edges of the end panels of the second row can be fastened together by gluing, stitching or stapling. Also featured is a box created from this pre-folded box form.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The foregoing and other objects, features and advantages will be apparent from the following description of particular embodiments of the innovation, as illustrated in the accompanying drawings in which reference characters refer to the same parts throughout the different views. The drawings are not necessarily to scale, emphasis instead being placed upon illustrating the principles of various embodiments of the innovation.

[0009] FIG. 1 shows a blank used to create an automatic lock bottom type file storage box, before it is folded and glued to create the box form.

[0010] FIGS. 2A and 2B show both sides of the flat box form made from the blank of FIG. 1.

[0011] FIG. 3 shows a blank used to create a file bottom type file storage box, before it is folded and glued to create the box form.

[0012] FIGS. 4A and 4B show both sides of the flat box form made from the blank of FIG. 3.

DETAILED DESCRIPTION

[0013] One arrangement of an automatic bottom file storage box is formed from the unitary blank of material 10 shown in FIG. 1. Blank 10 may be constructed of any material that will form a stiff panel surface. Preferably, blank 10 is made from a single thickness corrugated material (corrugated paper or corrugated plastic); that is a material with two layers of linerboard separated by a single layer of fluted material. Such a corrugated material can be constructed from different substances, as is known in the art. The material can have several different constructions. Corrugated material is typically constructed from fiber materials or plastic materials.
Blank 10 is formed through die cutting and creasing of corrugated material as is known in the art. Blank 10 essentially defines four rows of panels and flaps labeled A, B, C, and D, and four columns of panels and flaps labeled E, F, G, and H. As illustrated, the panels in each column are foldably coupled to each other. Accordingly, in column E, panels 32, 34, and 52 are foldably coupled to each other along seams 33 and 35, respectively. In column F, panels 12, 14, 16, 56, and 58 are foldably coupled to each other along seams 13, 15, 17, and 57, respectively. In column G, panels 42, 44, and 54 are foldably coupled to each other along seams 43 and 45, respectively. In column H, panels 22, 24, 26, 60, and 62 are foldably coupled to each other along seams 23, 35, 27, and 61, respectively. Additionally, the panels 32, 14, 42, and 24 in row C define spaces 70, 71, and 72 disposed therebetween which allow independent relative movement among the panels 32, 14, 42, 24. Accordingly, panel 32 can be folded along seam 33 independent from panel 14, panel 14 can be folded along seam 15 independent from panels 32 and 42, and panel 42 can be rotated along seam 42 independent from panels 14 and 24.

Panels 12, 14, and 16, once assembled, form a first triple thickness end wall, with the corrugation in all three panels running vertically along axis 82 to maximize crush resistance. Similarly, panels 22, 24, and 26, once assembled, form a second triple thickness end wall, with the corrugation in all three panels running vertically along axis 82 to maximize crush resistance. Panels 42 and 44, once assembled, form a first double thickness sidewall, with the corrugation in both panels running vertically along axis 82 to maximize crush resistance. Similarly, panels 32 and 34, once assembled, form a second double thickness sidewall, with the corrugation in both panels running vertically along axis 82 to maximize crush resistance. Panels or flaps 52, 54, 56 and 60 form the bottom of the box with panel 54 on the inside and overlying the other panels to provide load bearing strength to the inside bottom of the box. Portion 58 of panel 56 is secured to panel 52, and portion 62 of panel 60 is secured to panel 54 to create an automatic bottom.

During assembly, the pre-folded box form is created from blank 10 as follows. Beginning with form 10 as shown in FIG. 1, an assembler folds panels 12 and 22 about seams 13 and 23 and onto panels 14 and 24, respectively. The assembler then secures panel 12 to panel 14, as well as panel 22 to panel 24, using a fastening mechanism, such as an adhesive, to form sets of double walled panels. The assembler then folds flap 52 onto panel 34 along fold line or score 35 and folds flap 56 along fold line or score 17 to panel 16 while, at substantially the same time, reverse folding flap 58 along score 57 in the opposite direction. With such assembly, flap 58 is disposed against flap 57 while flap 57 is disposed against panel 16. The assembler then folds flap 54 along score 45 onto panel 44. Next, the assembler folds flap 60 along score 27 onto panel 26 while reverse folding flap 62 along score 61. The assembler then folds panel 34 along score 72 and panel 26 along score 74 such that flap extension 80 contacts one of the interior or exterior of flap 34 and couples to the flap 34 via an adhesive or other attachment mechanism. This creates the flat, pre-folded box form 82 shown in FIGS. 2A and 2B.

To assemble the box form into a box, an end user opens the flat pre-folded box form to form a rectangle (i.e., such that the adjacent walls of columns E, F, G, and H are substantially perpendicular to each other). As this box is squared up to form a rectangle, bottom panels 52, 56, 54, and 60, which have been preassembled and adhered to one another, pull themselves into position by the force of squaring the box so that flaps 52, 56, 54, and 60 are now substantially parallel to the floor and substantially perpendicular to the sidewalls 34, 16, 44, and 26. Flap 54 is disposed on the innermost portion of the bottom of the box with the other flaps supporting it.

To assemble the box form 82 into a box, an end user folds combined panels 12 and 14 (i.e., a double walled panel) along seam 15 and onto panel 16. The user then folds combined panels 22 and 24 (i.e., a double walled panel) along seam 25 and onto panel 26. This forms opposing triple paneled walls of the box. The user then folds panel 32 along seam 33 onto panel 34 and folds panel 42 along seam 43 and onto panel 44. This forms opposing double paneled walls of the box. This completes the assembly.

The above-described configuration increases the number of width panels to three (i.e., the combination of panels 12, 14, and 16 and the combination of panels 22, 24, and 26) and increases the number of side wall panels to two (i.e., the combination of panels 42 and 44 and the combination of panels 32 and 34) relative to conventional boxes. The configuration increases the vertical strength of the final assembled box compared to conventional boxes.

One arrangement of a file bottom file storage box is formed from the unitary blank of material 100 shown in FIG. 3. Blank 100 may be constructed of any material that forms a stiff panel surface. Preferably, blank 100 is made from a single thickness corrugated material (corrugated paper or corrugated plastic); that is a material with two layers of linerboard separated by a single layer of fluted material. Such a corrugated material can be constructed from different substances, as is known in the art. The material can have several different constructions. Corrugated material is typically constructed from fiber materials or plastic materials.

Blank 100 is formed through die cutting and creasing of corrugated material as is known in the art. Blank 100 essentially defines four rows of panels and flaps labeled A, B, C, and D, and four columns of panels and flaps labeled E, F, G, and H. Panels 112, 114, 116, and 156 are configured to form one quadruple thickness end wall, with the corrugation in three of the panels (112, 114 and 116) running vertically along axis 182 to maximize crush resistance. Similarly, panels 122, 124, 126 and 158 are configured to form a second quadruple thickness end wall, with the corrugation in three of the panels (122, 124 and 126) running vertically along axis 182 to maximize crush resistance. Panels 142 and 144 are configured to form a double thickness sidewall, with the corrugation in both panels running vertically along axis 182 to maximize crush resistance. Additionally, panels 132 and 134 are configured to form a double thickness sidewall, with the corrugation in both panels running vertically along axis 182 to maximize crush resistance. Panels 152 and 154 are configured to form the bottom of the box, with panel 152 configured to be disposed on an interior portion of the box.

During assembly, the pre-folded box form is created from blank 100 as follows. Beginning with form 100 as shown in FIG. 3, an assembler folds panels 112 and 122 about seams 113 and 123 and onto panels 114 and 124, respectively. The assembler then secures panel 112 to panel 114, as well as panel 122 to panel 124, using a fastening mechanism, such as an adhesive. The assembler then folds the form 100 along fold lines 172, and 174, respectively, and secures extension flap
To assemble the box form into a box, an end user opens the flat pre-folded box form to form a rectangle (i.e., such that the adjacent walls of columns E, F, G, and H are substantially perpendicular to each other) and folds certain panels into the box, thereby allowing the panels to mechanically interlock and form the bottom of the box.

For example, the end user forms the box bottom by rotating panel 152 along line 135 up into the box interior and against panel 134. The end user then folds flaps 156 and 158 about lines 155, 157, respectively, and onto panel 154. The end user then rotates panel 154 along line 145, into the interior of the box, and disposés the panel 154 against panel 144. The end user can then rotate the panel 154 down 90 degrees to panel 144 about line 145 to form the outer bottom of the box and can fold flaps 156 and 158 up from the panel 154 and about lines 155 and 157, respectively, until the flaps 156 and 158 contact walls 116 and 126, respectively. The end user can then rotate panel 152 about line 135 and down onto panel 154 to form the inner bottom of the box.

Next, the end user can fold the combination of panels 112 and 114 (panel 112 having been previously secured to panel 114) about seam 115 and over panels 116 and 156. Additionally, the end user can fold the combination of panels 122 and 124 (panel 122 having been previously secured to panel 124) about seam 125 and over panels 126 and 158. This forms opposing box walls having quadruple wall width panels. The end user can then fold panel 142 about seam 143 to contact panel 144 and can fold panel 132 about seam 133 to contact panel 134. This forms opposing box walls having double wall length panels.

The above-described configuration increases the number of sidewall panels to four (i.e., the combination of panels 112, 114, 116, 156 and the combination of panels 122, 124, 126, 158) and increases the number of end wall panels to two (i.e., the combination of panels 132 and 134) relative to conventional boxes. The configuration increases the vertical strength of the final assembled box compared to conventional boxes.

While various embodiments of the innovation have been particularly shown and described, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the innovation as defined by the appended claims.

What is claimed is:

1. A pre-folded automatic bottom box form made from a unitary blank of material, comprising:
   a blank of corrugated material that is die cut and creased so as to form a series of panels and flaps arranged in three rows of four panels or flaps each and a fourth row with two panels, all arranged in four columns, a first row comprising four panels that end up in the box as an automatic bottom, a second row comprising four panels that end up in the box as a second row comprising four panels that end up in the box as reinforcing wide and end wall panels, a third row contiguous with the second row comprising four panels that end up in the box as reinforcing wide and end wall panels, and a fourth row coupled to the third row and comprising first and second panels making additional end wall reinforcing panels;
   wherein the two panels of the fourth row are configured to be folded onto, and secured to, the two contiguous panels of the third row; and
   wherein the blank is configured to be folded along two fold lines located between columns, and the edges of the end panels of the second row are configured to be fastened together to create a completed box.

2. A box created from the pre-folded file bottom box form of claim 1.

3. The box form of claim 1 wherein the edges of the end panels of the second row are fastened together by one of gluing, stitching, or stapling.

4. A pre-folded file bottom box form made from a unitary blank of material, comprising:
   a blank of corrugated material that is die cut and creased so as to form a series of panels and flaps arranged in three rows of four panels or flaps each and a fourth row with two panels, all arranged in four columns, a first row comprising four panels that end up in the box as the bottom and end wall reinforcing flaps, a second row comprising four panels that end up in the box as the bottom and end wall reinforcing flaps, a third row contiguous with the second row comprising four panels that end up in the box as reinforcing wide and end wall panels, and a fourth row coupled to the third row and comprising first and second panels making additional end wall reinforcing panels;
   wherein the two panels of the fourth row are configured to be folded onto, and secured to, the two contiguous panels of the third row; and
   wherein the blank is configured to be folded along two fold lines located between columns, and the edges of the end panels of the second row are configured to be fastened together, to create a completed box.

5. A box created from the pre-folded file bottom box form of claim 4.

6. The box form of claim 4 wherein the edges of the end panels of the second row are fastened together by one of gluing, stitching, or stapling.

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