March 3, 1942. D. LEVKOFF 2,274,714

FOLDING BOX

Filed May 18, 1940 2 Sheets-Sheet 1

FIG. 1.

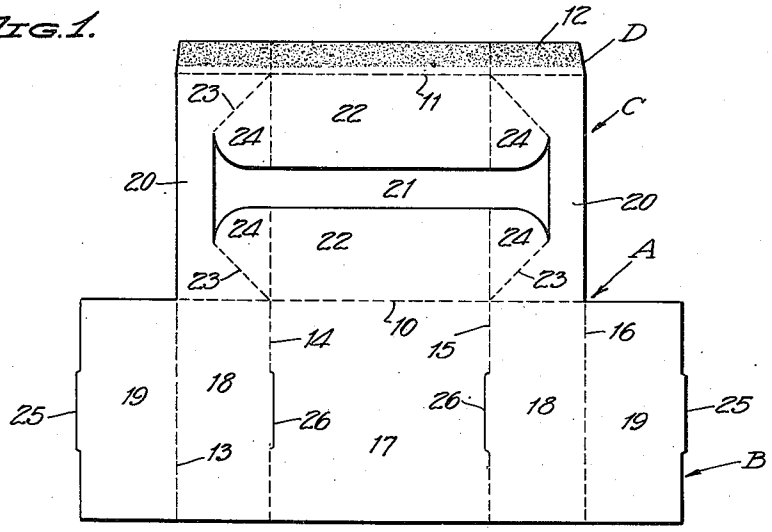


FIG. 2.

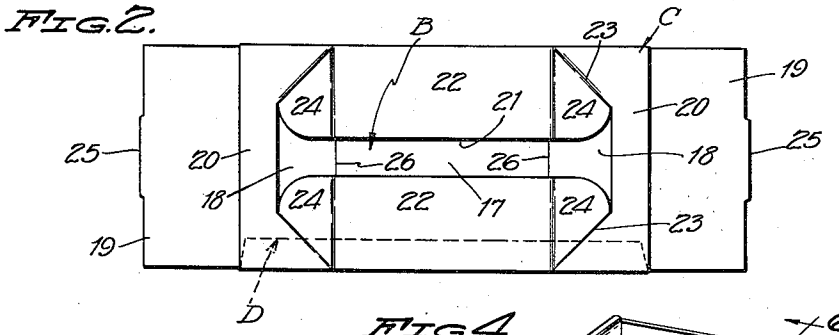


FIG. 4.

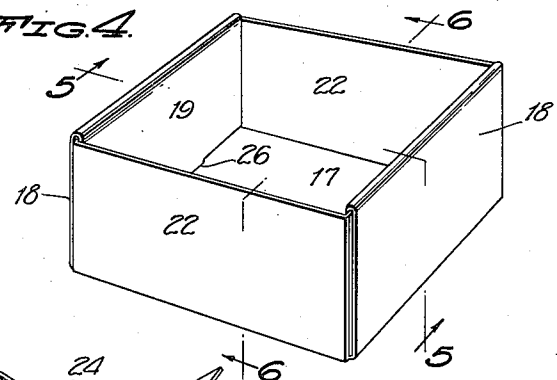
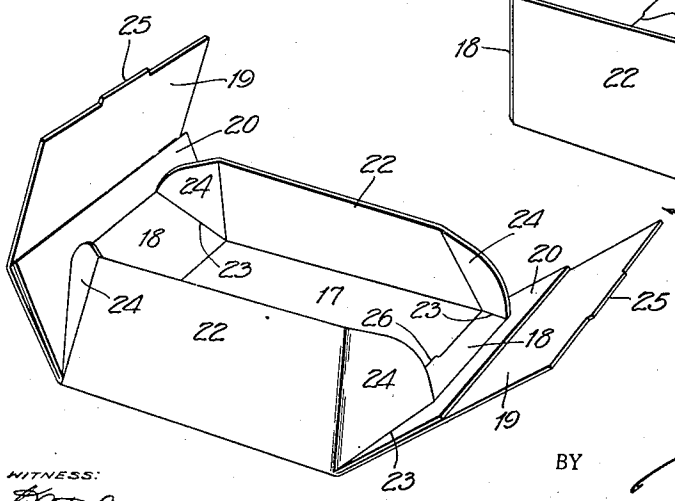


FIG. 3.



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FOLDING BOX

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FIG. 5.

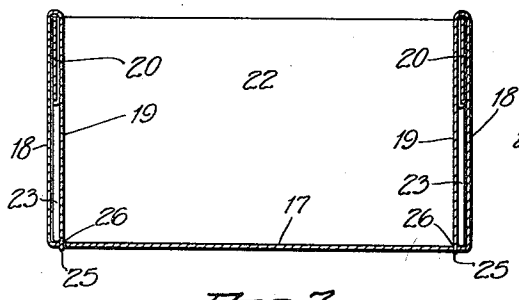


FIG. 6.

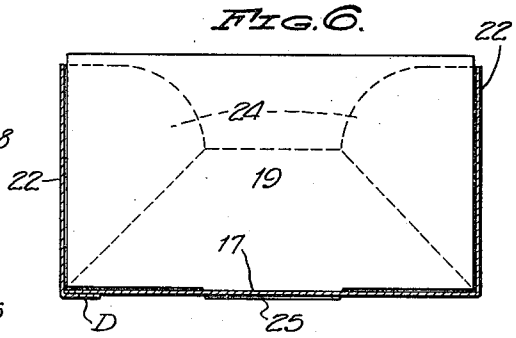


FIG. 7.

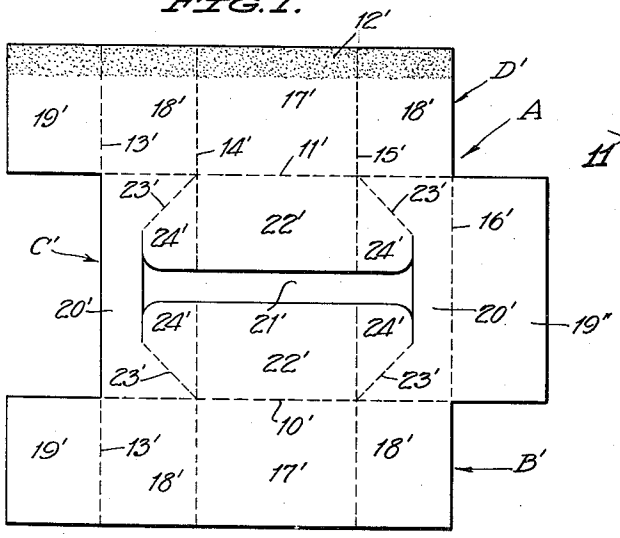


FIG. 9.

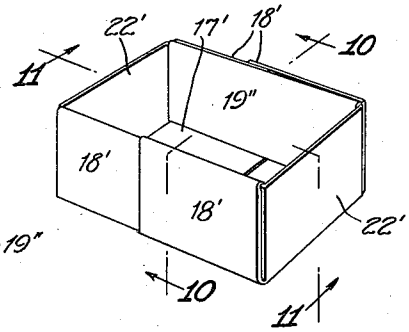


FIG. 8.

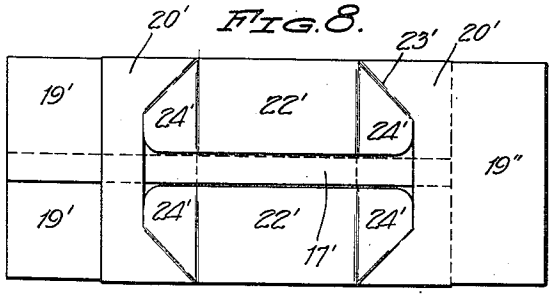


FIG. 10.

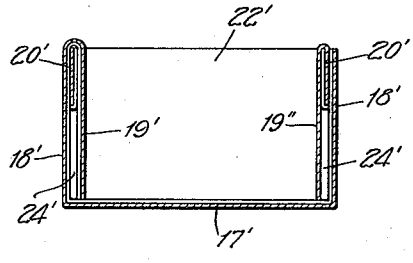
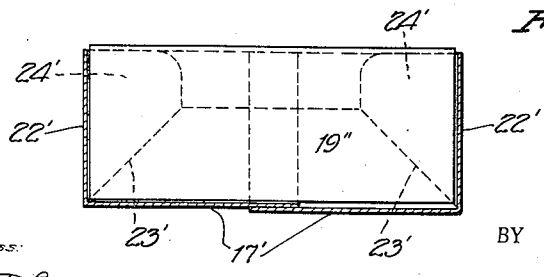


FIG. 11.



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FOLDING BOX

David Levkoff, Brooklyn, N. Y.

Application May 18, 1940, Serial No. 335,905

4 Claims. (Cl. 229—34)

This invention relates to folding boxes of the knock-down, set-up type.

The primary object of the invention resides in a collapsible cardboard box which is cut from a single blank of cardboard stock, partially folded and secured to form a normally collapsed structure, which collapsed structure, may by a rapid and easy manipulation of an operator, be set up into box formation for use.

Another feature of the invention is to provide a collapsible four sided box which is constructed of a single blank of cardboard in which the side walls of the box are formed from portions of the blank inwardly of the confining edges thereof, whereby a saving of stock is obtained over such box blanks which have their side walls projecting from the body portion of the blank.

A further feature of the invention is the provision of a collapsible cardboard box which is rigid when set up for use, and in which the flaps for locking the box in set up position also serve to reinforce the opposed end walls.

Other novel features of the invention will become apparent as the following specification is read in conjunction with the accompanying drawings, in which:

Figure 1 is a plan view of an inner side of the blank from which one form of the invention is constructed.

Figure 2 is a top plan view of the box in collapsed condition.

Figure 3 is a perspective view of the box in partially erected position.

Figure 4 is a perspective view of the box in set up position for use.

Figure 5 is a vertical sectional view on the line 5—5 of Figure 4.

Figure 6 is a vertical sectional view on the line 6—6 of Figure 4.

Figure 7 is a plan view of the blank from which a modified form of box is constructed.

Figure 8 is a top plan view of the modified form of box in collapsed condition.

Figure 9 is a perspective view of the modified form of box in fully erected position for use.

Figure 10 is a vertical sectional view on the line 10—10 of Figure 9.

Figure 11 is a vertical sectional view on the line 11—11 of Figure 9.

Referring to the form of the invention illustrated in Figures 1 to 6 inclusive, and at present to Figure 1, the letter A designates a substantially rectangular shaped blank of foldable cardboard which is scored longitudinally on the score line 10 approximately midway of its width to divide the blank into two foldable sections B and C, and on a score line 11 inwardly of one of the longitudinal edges to provide a section D which has glue 12 applied to the inner side thereof. The blank A is scored transversely on the parallel score lines 13, 14, 15 and 16, which together with the score line 10, divides the section B into a bottom wall 17, outer end walls 18—18, and locking flaps 19—19.

The sections B and D may be termed end sections of the blank which section C may be termed an intermediate section of the blank. The score lines 10, 11, and 14 define one auxiliary end wall 20, while a second auxiliary end wall 20 is bounded by the score lines 10, 11, and 15. That portion of the section C between the auxiliary end walls 20—20 is severed by a slit or slot 21 which extends entirely thereacross and terminates substantially midway the height of the auxiliary end walls 20—20. The slit or slot 21 divides a portion of the section C into a pair of side walls 22—22, one of which is bounded by the score lines 10, 14, and 15, and the other by the score lines 11, 14, and 15. The width of the slot 21 predetermines the height of the side walls, the maximum identical height of both side walls being formed by a slit instead of a slot. The ends of the slit or slot 21 extend into the auxiliary end walls 20—20 and are joined by four diagonal score lines 23 which extend to the four bottom corners of the side walls 22—22. The diagonal score lines 23 are disposed at a substantially forty-five degree angle relative to the score lines with which they connect, and in this instance the walls adjacent the ends of the slot 21 are curved so as to meet with the score lines 23. The score lines 23 divide each inner end wall into a substantially triangular shape folding web section 24.

To effect a folding of the blank A for gluing, the same is folded on the score line 10 so that the sectiton C overlies one side of the section B, whereupon the section or glue flap D is folded on the score line 11 to lie against and adhere to the other side of the section B as clearly illustrated in Figure 2 of the drawings. The box may now be said to be in collapsed position for all walls are flat and the collapsed boxes may be stacked for compact shipping and storage purposes.

To set up the box for use from the collapsed position illustrated in Figure 2, the operator with both hands, grasps the respective side walls 22 and pulls outwardly thereon which causes the respective side walls to hinge on the lines 10 and 11, and simultaneously effects a breaking of the webs

24 on the diagonal score line 23 which permits the inner end walls 20—20 and outer end walls 18—18 to move to upstanding position by hinging on the respective score lines 14 and 15. As the side walls, auxiliary and outer end walls move into erect position, the webs 24 fold upon and assume a flat position against the auxiliary end walls, whereupon the flaps 19—19 may be manually folded inwardly on the score lines 14 and 16 to a position flat against the auxiliary end walls 20—20 and folded webs 24. The flaps 19 may be cut to a size which requires that they be forcibly wedged into engagement with the side and bottom walls of the box whereby they may be frictionally held, or as shown in the drawing, the bottom edges of the flaps 19 may have projecting tongues 25 which enter respective slots 26 in the bottom wall 17 in line with the score lines 14 and 15. The box is now in complete set up position as illustrated in Figures 4 to 6 inclusive, and any conventional form of cardboard cover of the slip-on type may be applied over the open top thereof.

In Figures 1 to 6 inclusive, the glue seam is disposed along the bottom wall 17 of the box, but it is possible to construct a folding box which performs the same function by positioning the glue seam centrally across the bottom as illustrated in Figures 7 to 11 inclusive, and this form of the invention will now be fully described.

In the form of the invention illustrated in Figures 7 to 11 inclusive, the letter A' designates the substantially rectangular blank of cardboard from which the folding box is constructed and which is scored longitudinally on the parallel score lines 10'—11' which divides the blank into end sections B' and D' and an intermediate section C'. The blank A' is scored transversely on the parallel score lines 13', 14', 15', and 16', which with the score lines 10' and 11' divide the end sections B' and D' into bottom wall sections 17'—17', outer end wall sections 18'—18', and a pair of locking flap sections 19'—19'. The combined width of the sections B'—D' is greater than the width of the section C' so that when the box is initially folded for glueing, the sections B' and D' overlap, and the inner side of the overlapping portion of the section D' is provided with glue 12'.

Formed from the section C' is a pair of auxiliary end walls 20'—20', one of the end walls 20' being bounded by the score lines 10', 11', and 14', and by an edge of the blank, while the other end wall 20' is bounded by the score lines 10', 11', 15', and 16'. That portion between the auxiliary end wall sections 20'—20' is severed by a slit or slot 21' which extends entirely thereacross, and terminates substantially midway of the height of the auxiliary end wall sections 20'—20'. The slit or slot 21' divides a portion of the section C' into a pair of side wall sections 22'—22'. The ends of the slit or slot 21' which extend into the end walls 20'—20' are joined by four diagonal score lines 23' which extend to the four bottom corners of the side walls 22'—22'. The diagonal score lines 23' are disposed at a substantially forty-five degree angle relative to the intersecting score lines with which they connect. Each inner end wall section 20' is provided with a pair of the diagonal score lines 23' which divide each end wall section 20' into a pair of substantially triangular shape folding web sections 24'.

So far, I have only described a pair of coacting flap sections 19'—19' which fold inwardly over one of the auxiliary end walls 20', and if desired, a similar pair of flap sections 19'—19' may be arranged for like folding over the other auxiliary end wall 20'. However, by forming the second inwardly folding flap 19'' coextensive with the other inner end wall section 20', I am able to cut the blank A' from stock without any loss, except that portion of the blank which is removed to form the slot 21', but if only a slit is formed instead of a slot there is no loss of stock. The flap 19'' is taken from that end of an adjacent blank A' which is cut to form the flap sections 19'—19'.

To effect a folding of the blank A' for glueing, the same is folded on the score lines 10'—11' so that the sections B' and D' overlap with the glue side 12' of the section D' overlapping the adjacent portion of the section B' as illustrated in Figure 8 of the drawing. When in this position the box is in collapsed position and may be set up by manually grasping the side walls 22'—22' and pulling outwardly thereon which simultaneously moves the inner and outer end walls to erect position, during which time the webs 24' fold flat against the auxiliary end walls 20'—20'. The flap sections 19'—19' having been fixedly connected by the glueing operation, they form a single flap which with the flap 19'' are folded inwardly and downwardly against the inner end walls and folded webs 24'. In this form the flaps 19' and 19'' have a tight frictional wedge fit between their free edges and adjacent walls of the box as illustrated in Figures 9 to 11 inclusive. Articles packed in the box when in set up position will act to prevent any tendency of the flaps 19'—19'' from accidentally unfolding.

In the preceding specification, I have referred to a four sided box which may be square, or rectangular in configuration, and to distinguish the opposed upstanding walls of the box, I have referred to a pair of opposed walls as being side walls, and the other pair as being end walls. However, all of the upstanding walls may be referred to as side walls if desired, and any interpretation of the appended claims should be so construed.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

1. A folding rectangular cardboard box blank including a rectangular panel forming at least a portion of the bottom wall, a rectangular one-piece panel integral with the bottom wall panel and of a width substantially equal to that of the bottom wall and of a length equal to the combined length of the bottom and end walls of the box formed by said blank, said one-piece panel having transverse fold lines adjacent each end defining an intermediate side wall forming panel and auxiliary end wall panels, said one-piece panel further having a longitudinal medial slot extending entirely across the side wall forming panel and separating the same into separate side wall panels, said slot extending into the auxiliary end wall panels with its ends terminating in the auxiliary end wall panels substantially midway of the height thereof, the edges of the slot along the side wall forming panel forming the top edges of the side wall panels and the bottom edges of the side wall panels lying along the outer edges of the said one piece panel, diagonal hinge scores extending from the bottom corners of the side wall panels to the respective adjacent terminal ends of the slot and being disposed at a substantially forty-five degree angle relative to the bottom edges of the adjacent side wall panels

to provide folding corner webs, and end wall panels integrally connected to the respective auxiliary end wall panels along hinge scores for folding inwardly against the respective auxiliary end wall panels when the blank is folded to erected box forming position.

2. A folding rectangular carboard box blank including a rectangular bottom wall panel, a rectangular one-piece panel integral with the bottom wall panel and having one of its sides connected thereto along a hinge score, a glue flap connected to the other opposite side of the one-piece panel, said one-piece panel being of a width substantially equal to that of the bottom wall panel and of a length equal to the combined length of the bottom wall panel and end walls of the box formed by said blank, said one-piece panel having transverse fold lines adjacent each end defining an intermediate side wall forming panel and auxiliary end wall panels, said one-piece panel further having a longitudinal medial slot extending entirely across the side wall forming panel and separating the same into separate side wall panels, said slot extending into the auxiliary end wall panels with its ends terminating in the auxiliary end wall panels substantially midway of the height thereof, the edges of the slot along the side wall forming panel forming the top edges of the side wall panels and the bottom edges of the side wall panels lying along the outer edges of the said one-piece panel, diagonal hinge scores extending from the bottom corners of the side wall panels to the respective adjacent terminal ends of the slot and being disposed at a substantially forty-five degree angle relative to the bottom edges of the adjacent side wall panels to provide folding corner webs, and end wall panels integrally connected to the respective auxiliary end wall panels along hinge scores for folding inwardly against the respective auxiliary end wall panels when the blank is folded to erected box forming position.

3. A folding cardboard box blank as set forth in claim 2, including locking flap panels connected to the respective end wall panels along hinge scores and being foldable inwardly against the respective auxiliary end wall panels for securing the folded blank in box forming position for use.

4. A folding rectangular cardboard box blank including a pair of rectangular panel sections which combined form a rectangular bottom wall, a rectangular one-piece panel integral with the bottom wall panels and of a width substantially equal to that of the bottom wall and of a length equal to the combined length of the bottom and end walls of the box formed by said blank, said one-piece panel having transverse fold lines adjacent each end defining an intermediate side wall forming panel and auxiliary end wall panels, said one-piece panel further having a longitudinal medial slot extending entirely across the side wall forming panel and separating the same into separate side wall panels, said slot extending into the auxiliary end wall panels with its ends terminating in the auxiliary end wall panels substantially midway of the height thereof, the edges of the slot along the side wall forming panel forming the top edges of the side wall panels and the bottom edges of the side wall panels lying along the outer edges of the said one-piece panel, diagonal hinge scores extending from the bottom corners of the side wall panels to the respective adjacent terminal ends of the slot and being disposed at a substantially forty-five degree angle relative to the bottom edges of the adjacent side wall panels to provide folding corner webs, and end wall locking panels integrally connected to the respective end wall panels along hinge scores for folding inwardly against the respective auxiliary end wall panels when the blank is folded to erected box forming position.

DAVID LEVKOFF.