

June 11, 1946.

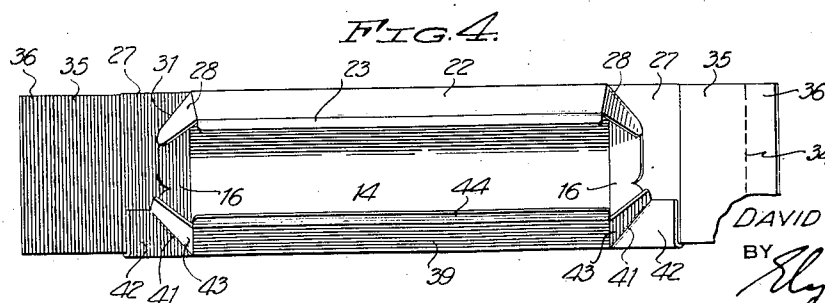
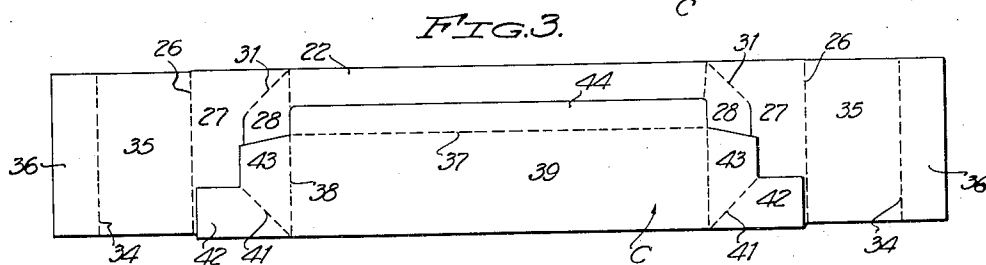
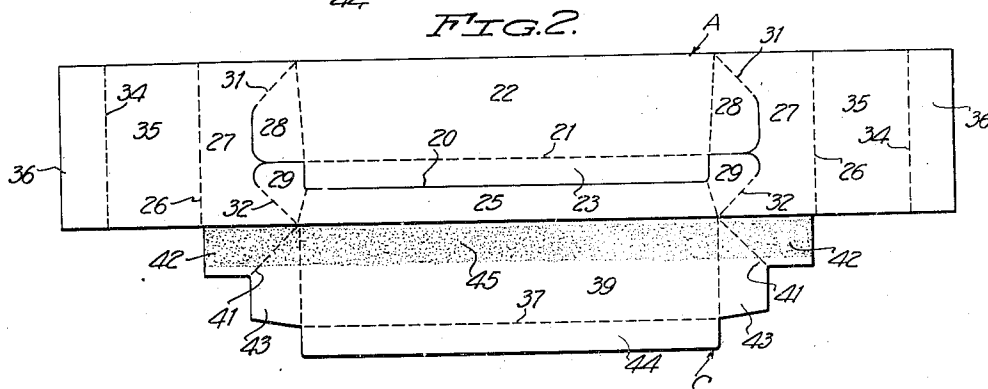
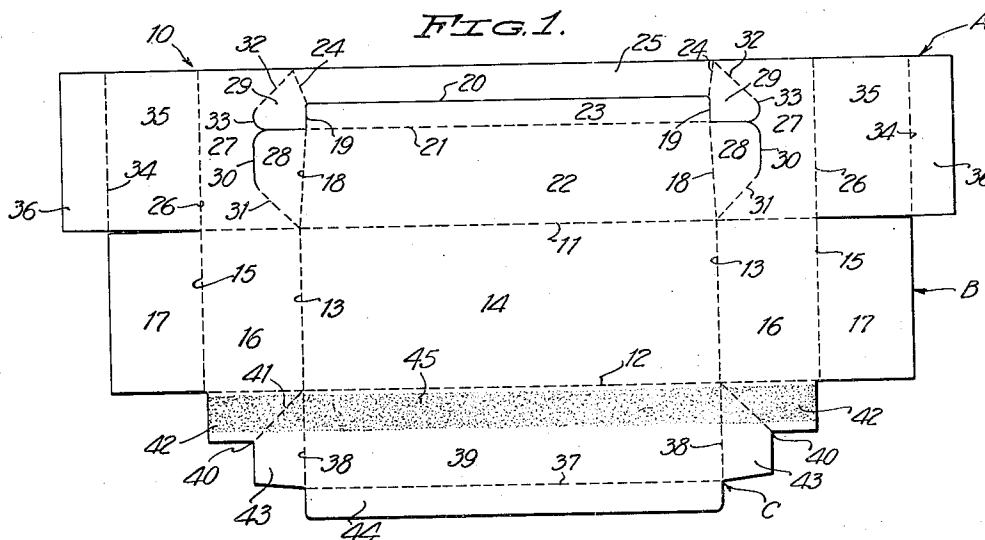
D. LEVKOFF

2,401,944

FOLDING BOX

Filed May 24, 1945

2 Sheets-Sheet 1



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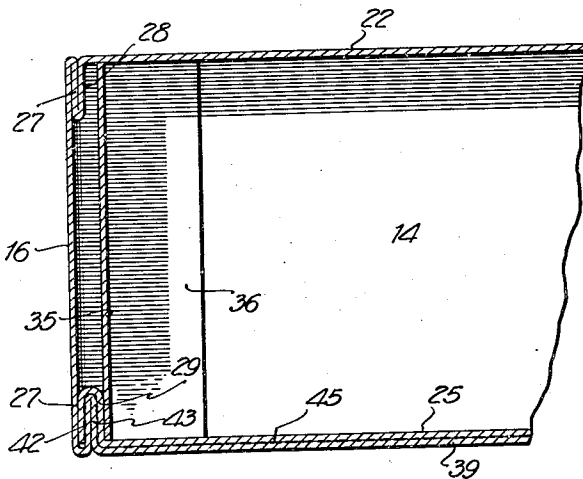
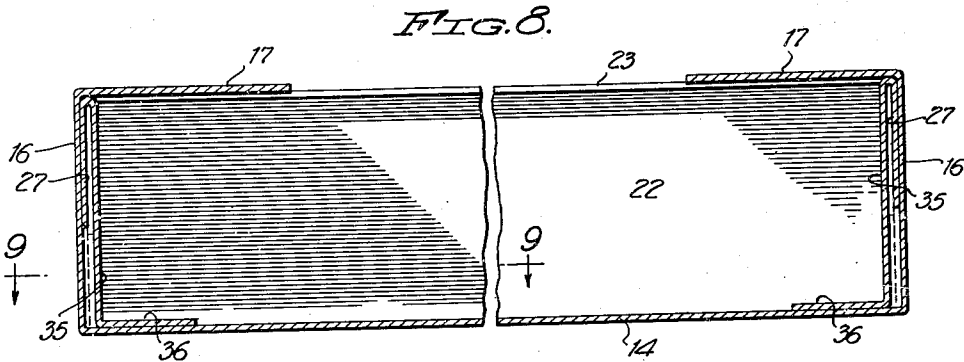
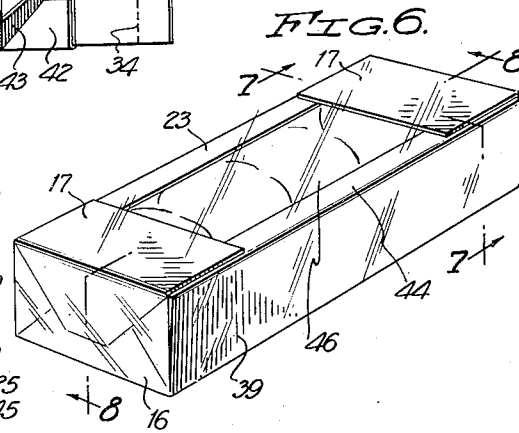
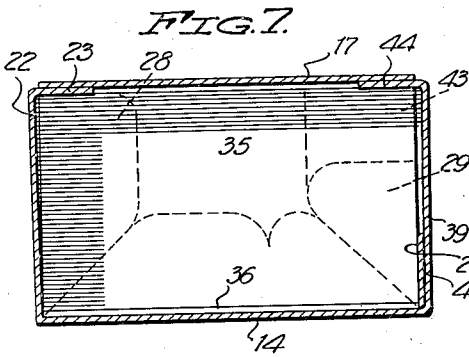
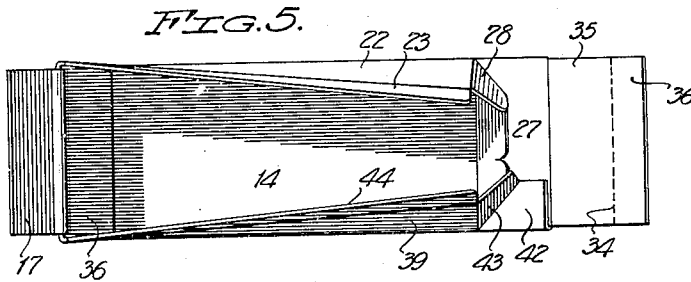
D. LEVKOFF

2,401,944

FOLDING BOX

Filed May 24, 1945

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,401,944

FOLDING BOX

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Application May 24, 1945, Serial No. 595,525

5 Claims. (Cl. 229—31)

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This invention relates to improvements in folding cardboard boxes which may be stored and shipped in a flat condition and readily set up for use by a simple manipulation on the part of an operator.

This invention is primarily an improvement over the construction of folding boxes set forth in my prior U. S. Letters Patent No. 2,274,714, dated March 3, 1942, and No. 2,342,551, dated February 22, 1944. In the construction of boxes set forth in the aforesaid patents, the height of the side walls of the box was limited to not more than one-half the width of the bottom wall due to the fact that the side walls were formed by centrally slitting the panel of a single blank of cardboard which was equal to the width of the bottom wall panel. The main purpose of this invention is to construct a tray-like box from a single blank of cardboard by slitting a section of the blank in a novel manner to form side walls which are greater than one-half the width of the bottom wall, thus permitting the making of boxes of greater depth than those produced by my previous patents.

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 the inner side of a cardboard blank from which the improved box is constructed.

Figure 2 is a plan view of the blank partially folded preparatory to gluing.

Figure 3 is a plan view of the blank completely folded and glued.

Figure 4 is a top plan view of the box in partially set up position.

Figure 5 is a top plan view of the box illustrating one end in fully set up locked position and the other end in partially set up position.

Figure 6 is a perspective view of the box in fully set up position and enclosed in a transparent wrapper.

Figures 7, 8 and 9 are detail sectional views on the line 7—7, 8—8, and 9—9 respectively of Figures 6 and 8, the transparent wrapper being omitted.

Referring to the drawings by reference characters, the numeral 10 designates a substantially rectangular shaped blank of foldable cardboard which is hinge scored from the outer face thereof on the spaced longitudinal lines 11 and 12 which divides the same lengthwise into foldable sections A, B and C. The sections A and B are of substantially equal width while the section C is narrower.

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The section B is the intermediate section of the blank and is scored on the transverse spaced lines 13—13, which lines predetermine the length of the box. The score lines 13—13, 11, and 12 define a rectangular shaped bottom wall panel 14.

Integral with the bottom wall panel 14 and connected to the ends thereof along the hinge scores 13—13 and bounded by the end portions of the scores 11—12 and transverse scores 15—15 are rectangular shaped outer end wall panels 16—16.

Integral with the outer end wall panels 16—16 and connected thereto along the hinge scores 15—15 are end flaps 17—17 which are free of the adjacent panels A and C.

The section A is provided with inwardly converging hinge scores 18—18 which have their inner ends meeting at the intersection of the scores 11—13. The other ends of the hinge scores 18—18 terminate at the ends of transverse slits 19—19 which are joined by a longitudinal slit 20. The slit 20 is disposed adjacent the free longitudinal edge of the panel A. A hinge score 21 extends parallel to the slit 20 and meets the inner ends of the transverse slits 19—19.

The area of the blank bounded by the longitudinal scores 11—21 and 18—18 constitutes a rectangular shaped side wall panel 22.

The area of the blank bounded by the score 21, slit 20, and slits 19—19 constitutes a side flap 23.

Outwardly diverging hinge scores 24—24 extend from the respective ends of the slit 20 to the adjacent longitudinal edge of the blank. The area of the blank bounded by the slit 20, adjacent longitudinal edge of the blank, and scores 24—24, define a gluing flap 25.

The panel A is scored transversely on the hinge scores 26—26 which are in alinement with and continuations of hinge scores 13—13 respectively. The areas of the blank bounded by hinge scores 18, 24 and slits 19, hinge scores 11 and 26 and adjacent longitudinal edge of the blank constitutes inner end wall panels 27—27.

Each end wall panel 27 has a pair of folding corner webs 28 and 29 formed therefrom. The web 28 is formed by providing a substantially right angle shaped slit 30 in the panel 27, one end of which joins the inner end of the adjacent slit 19 while the other end is joined by one end of a diagonal hinge score 31, the other end of which terminates at the adjacent intersection of the scores 11 and 18.

The web 29 is formed by a diagonal hinge score 32 which has its inner end terminating at a

curved slit 33 which extends from the slit 30 while its other end extends to the adjacent edge of the blank and meets the score 24.

The section A is provided with transverse scores 34—34 in alignment with the free end edges of the section B to provide inner end wall locking flaps 35—35 of a size approximately that of the outer end wall panels 16—16 and inner end wall panels 27—27 for reasons to be hereafter appreciated. Connected to the locking flaps 35—35 along the hinge scores 34—34 are bottom wall flaps 36—36.

The section C is scored longitudinally on the hinge score 37 parallel to the hinge score 12. The section C is scored transversely on the parallel hinge scores 38—38 which constitute continuations of the hinge scores 13—13. The hinge scores 12, 37 and 38—38 define a rectangular side wall panel 39 which is complementary to the side wall panel 22.

Integral with the ends of the panel 39 and connected thereto along hinge scores 38—38 and also with adjacent ends of the panels 16—16 along hinge scores 12—12 are L-shaped corner webs 40—40. Each corner web 40 is divided by a diagonal hinge score 41 into an attaching glue tab portion 42 and a free folding portion 43.

The material between the hinge score 37 and adjacent longitudinal edge of the blank constitutes a side flap 44 which is complementary to the side flap 23.

The cutting and hinge scoring of the blank 10 having been described, I shall now explain the manner in which the blank is glued and folded to form a normally flat collapsed box as shown in Figure 3 for subsequent hand or machine folding to an erected set up position for use as shown in Figures 4 to 9 inclusive.

The first folding operation is illustrated in Figure 2 wherein the section A of the blank 10 is folded inwardly upon the hinge score 11 and downwardly flat upon section B in overlying relation thereto. The free longitudinal edge of section A aligns with the longitudinal hinge score 12.

The second folding operation is illustrated in Figure 2. Subsequent to the second folding operation, glue 45 is applied in strip form along the length of the section C adjacent the longitudinal hinge score 12. The glue strip may be applied by the glue roller of an automatic paper box making machine and it extends the length of the side panel 39 and across portions of the corner web 40. The glue strip area 45 is of a width substantially equal to the width of the glue flap 25 for upon the second folding operation, the section C is folded inwardly and downwardly flat upon the section A as best illustrated in Figure 3. The glue strip area 45 of the section C connects the glue flap 25 to side wall panel 39, and the corner webs 40—40 to the respective inner end wall panels 27—27 whereupon the diagonal hinge scores 41—41 align with the diagonal hinge scores 32—32 which they overlie. The blank 10 has now been folded and glued to what is termed the collapsed position of the folding box and the same is stacked, shipped and stored in this flat collapsed position until such time as the box is to be set up for use.

Figure 4 illustrates the box in a partially set up position, wherein the side and end walls have started their pivotal movement to erected position. The box may be set up by grasping the locking flaps 35—35 and underlying flaps 17—17 and simultaneously pushing inwardly thereon which causes the side wall panels 22 and

39 to swing outwardly on their hinge scores 11 and 12 respectively while the outer end wall panels likewise swing on their hinge scores 13—13. During swinging movement of the side and end wall panels to a position at right angle to the bottom wall 14, the corner webs also fold on the diagonal scores 31, aligned scores 32—41 which permits the sections 28—28 to fold flat against the inner end wall panels 27—27 and the sections 43—43 to fold flat against the sections 42—42, the latter being glued to the end wall panels 27—27. After the side and end wall panels have been erected in the manner just described, the same are locked against accidental unfolding by folding the locking flaps 35—35 inwardly and downwardly to flatly engage and conceal the folded sections 28—28 and 43—43 of the corner webs. In Figure 5 the left end locking flap has been folded to locking position wherein the end edges thereof and like edges of the flaps 36 frictionally engage the inner sides of the side walls 22 and 39. As the locking flaps 35—35 are folded inwardly, the flaps 36—36 fold on the scores 34—34 and flatly engage the bottom wall panel 14. The box is in set up position to receive merchandise, and after the merchandise is placed in the box, the narrow side flaps 23 and 44 are folded inwardly to a horizontal position followed by the down folding of the end flaps 17—17 to a horizontal position in overlapping relation to the adjacent ends of the side flaps 23—44. The ends of the side flaps 23—44 also engage the infolded flaps 35—35 and act to prevent accidental infolding of the same prior to the placing of merchandise into the box.

In Figure 6 of the drawings I have illustrated the folding box in fully set up position with merchandise packaged therein, and with a wrapping of Cellophane 46 enclosing the same. The side flaps 23—44 and end flaps 17—17 act as a window frame about the top of the box to lend attractiveness thereto and on which advertising matter may be printed and displayed to view.

The box may be set up from its collapsed position shown in Figure 3 and subsequently wrapped after packing by standard automatic folding and wrapping machines. It will also be understood that the box may be readily and easily set up by hand, for it is only necessary for an operator to grasp the ends of the collapsed box shown in Figure 3 and by rapid finger manipulation effect the infolding and locking of the end wall structure.

While I have shown and described what I consider to be the preferred embodiment of my invention, I wish it to be understood that such changes in construction, material, and design as come within the scope of the appended claims may be resorted to if desired without departing from the spirit of my invention as set forth therein.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A folding box comprising a single blank of cardboard which is cut, scored, and folded to provide a rectangular shaped bottom wall panel, opposed side wall panels integral with the bottom wall panel, opposed outer end wall panels integral with the bottom wall panel, inner end wall panels integral with the outer end wall panels and flatly folded thereagainst, a glue flap, folding corner webs connecting the ends of the glue flap to the respective inner end wall panels, folding corner webs directly connecting the ends

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of one of the side wall panels to the inner end wall panels, the other side wall panel being secured by gluing to the glue flap, complementary folding corner webs connecting the last-mentioned side wall panel to the adjacent ends of the outer end wall panels, and inwardly folded locking flaps integral with the inner end wall panels for overlying the inner end wall panels and the folded corner webs to prevent infolding thereof.

2. A folding rectangular cardboard 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, said one-piece panel being of a length and width substantially the same as that of the bottom wall panel and having transverse fold lines adjacent each end defining an intermediate panel and inner end wall panels, said one-piece panel further having a longitudinal slit disposed adjacent the free side edge of the blank entirely across the intermediate panel and separating the same into a side wall forming panel and a glue flap, said slit extending into the inner end wall panels and terminating therein, the edges of the slit along the side wall forming panel and the glue flap forming the respective top edges thereof, diagonal hinge scores extending from the bottom corners of the side wall panel and corresponding corners of the glue flap to the respective adjacent terminal ends of the slit and being disposed at a substantially forty-five degree angle relative to the bottom edge of the side wall panel and glue flap to provide folding corner webs, a second side wall panel integral with the bottom wall and having one of its sides connected to the other side thereof along a hinge score, said second side wall panel being of a length and height the same as the first-mentioned side wall panel,

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outer end wall panels integral with the bottom wall panel and adjacent inner wall panels and connected thereto along hinge scores, corner webs integral with the ends of the second side wall panel and adjacent ends of the outer end wall panels and connected thereto along hinge scores, and diagonal hinge scores extending across the last-named corner webs from the bottom corners of the second side wall panel.

3. A folding rectangular cardboard box blank as set forth in claim 2 including locking flaps integral with the outer end wall panels and connected thereto along hinge scores for infolding over the inner wall panels and folded corner webs for securing the folded blank in box forming position for use.

4. A folding rectangular cardboard box blank as set forth in claim 2 including side flaps integral with the top edges of the side wall panels and connected thereto along hinge scores, and end flaps integral with the outer end wall panels and connected thereto along hinge scores, said side and end wall flaps adapted to frame the open top of the box when the blank is folded to set up position.

5. A folding rectangular cardboard box blank as set forth in claim 2 including locking flaps integral with the outer end wall panels and connected thereto along hinge scores for infolding over the inner wall panels and folded corner webs for securing the folded blank in box forming position for use, side flaps integral with the top edges of the side walls and connected thereto along hinge scores, and end flaps integral with the outer end wall panels and connected thereto along hinge scores, said side and end wall flaps adapted to cooperate and provide a frame at the open top of the box when the blank is folded and locked in set up position.

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