

May 29, 1951

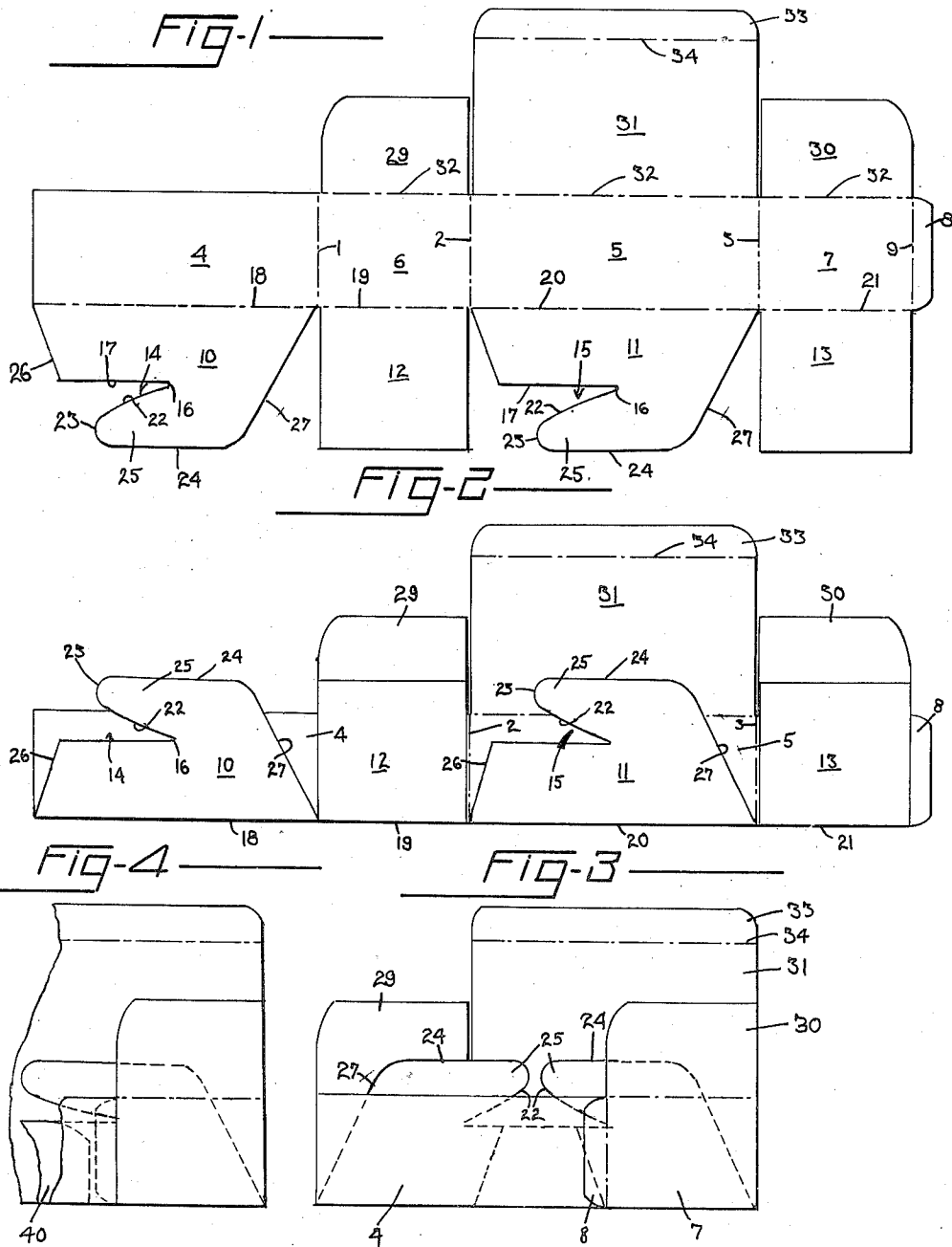
L. C. MICHETTI

2,554,677

FOLDABLE BOX

Filed Aug. 16, 1947

2 Sheets-Sheet 1



INVENTOR.

LOUIS C. MICHETTI

BY

Boyer, Mohr & Beckley
ATTORNEYS

May 29, 1951

L. C. MICHETTI

2,554,677

FOLDABLE BOX

Filed Aug. 16, 1947

2 Sheets-Sheet 2

FIG. 5

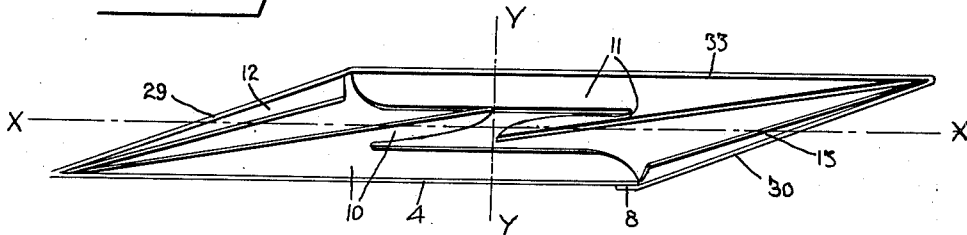
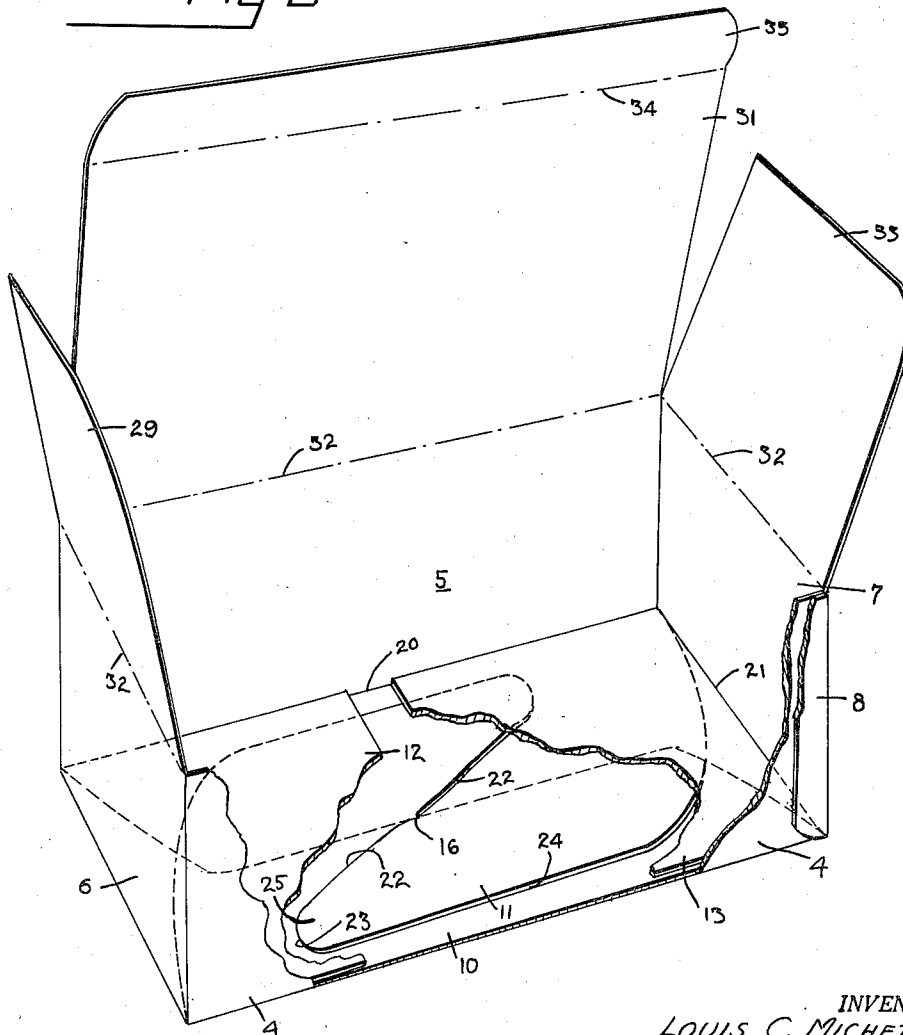


FIG. 6



INVENTOR.
LOUIS C. MICHETTI
BY
Boyer, Mohler & Berkley
ATTORNEYS

UNITED STATES PATENT OFFICE

2,554,677

FOLDABLE BOX

Louis C. Michetti, San Francisco, Calif., assignor
to Noble Andre, doing business as Andre Paper
Box Company, San Francisco, Calif.

Application August 16, 1947, Serial No. 769,052

1 Claim. (Cl. 229—35)

1

This invention relates to folding boxes of the type in which the sides of the box and the bottom are folded flat for shipment or storage, and are adapted to automatically outfold to set-up form upon moving the sides to positions extending at right angles to each other.

Boxes have been made heretofore that will accomplish this result provided certain of the bottom flaps are glued together so that opening of the sides will transmit a positive downward pull on the bottom flaps. Prior attempts have also resulted in an undesirable number of angularly extending free edges being exposed on the upper surface of the bottom which is objectionable for certain purposes, such, for example as florist boxes.

One of the principal objects of the present invention is the provision of a folding box that is adapted to be unfolded from a flat folded position into a set-up form with the bottom and sides at right angles to each other and which box overcomes the above objections.

Another object of the invention is the provision of a folding box of the "snap-open" type which requires only one point of pre-securement of the parts of the blank forming the box.

Another object of the invention is the provision of a blank from relatively resilient semi-rigid sheet material for forming a flat folded box that is of a more simple construction than heretofore, and in which blank and folded box bottom flaps are provided that are unsecured to each other by glue, staples, cement, or any other means, but which flaps are so arranged as to automatically move into interlocking relationship at right angles to the sides of the box under the inherent resiliency of the material and movement of the box sides to rectangular position relative to each other.

Other objects and advantages will appear in the description and in the drawings.

In the drawings,

Fig. 1 is a plan view of a blank from which the box is formed.

Fig. 2 is a plan view illustrating the first step in folding the blank to form the box.

Fig. 3 is a plan view of the next step of securing ends of the blank together.

Fig. 4 is a modified form of end structure in which the end tab can be secured to the inner surface of one side of the box instead of the outer surface.

Fig. 5 is a top edge view of the completed box in folded position with the box partially opened to show the positions of the interlocking tabs on two of the bottom flaps.

2

Fig. 6 is a perspective view of the folded box of Figs. 3, 5 unfolded to its set-up position, with certain portions broken away and in cross section to show structure.

In detail, the blank from which the box is formed comprises a strip of relatively resilient semi-rigid sheet material such as cardboard, cellulose acetate, or other plastic or composition material having similar properties. This strip is formed with a plurality of parallel, spaced folding creases 1, 2, 3 extending transversely across the strip defining a pair of equal length sections 4, 5 and a pair of equal length sections 6, 7 in alternate arrangement longitudinally of the strip, the section 4 being one of the end sections between one end of the strip and the folding crease 1 and section 7 being the opposite end section of the strip between folding crease 3 and a narrow glue flap 8 and the crease 9.

Section 6 is between sections 4, 5, and section 5 is between sections 6, 7.

These sections 4 to 7 inclusive form the four lateral sides of the box when the glue flap 8 is secured to the opposite end of the strip and the adjacent sections of said strip extend at right angles to each other.

At this point it is pertinent to note that the glue flap 8 is the only element that is pre-secured by glue or any other means to any other portion of the box. Of course staples or any other suitable means may be employed as a medium for securement of said flap to the other end of the main strip.

The sections 4, 5 are of the same size and shape and will form two of the opposite sides of the box when the latter is set up, while sections 6, 7 are also of equal size and will form the other two sides. The sections 4, 5 and sections 6, 7 may be of the same size, but in oblong boxes one pair is longer, longitudinally of the blank, than the other pair.

Along one of the corresponding edges of the sections 4 to 7 are bottom flaps 10, 11, 12, 13. The flaps 10, 11 are integral with sections 4, 5, while flaps 12, 13 are integral with sections 6, 7.

The flaps in each instance preferably extend substantially the full length of the section to which it is secured, although, as later will be described, the flap 10 which is farthest the glue flap 8 may be of slightly less width should it be desirable to glue the flap 8 to the inner side of the opposite end section 4 so as to conceal it.

The bottom flaps 10, 11 are of the same shape and size and are formed with recesses 14, 15 respectively that open laterally outwardly in the same direction from one of the lateral edges of said flaps when the blank is fully open as seen

in Figs. 1, 2 and before the blank is fully folded with the ends of the same secured together.

These recesses are preferably identical in shape and so only the flap 10 will be described in detail at this point. The recess 14 is generally of V-shape with the open side at the divergent ends of the V and the apex 16 is preferably positioned at a point centrally of the length of the flap 10 in direction longitudinally of the blank, which point is also at a distance midway between the length of the section 6 or 7 in direction longitudinally of said blank.

The one side or edge 17 of the V-shaped recess that is nearest the section 4 is preferably parallel with the adjacent edge of said section, and which latter edge is at right angles to the crease lines 1 to 3 and is also defined by a folding crease 18, while corresponding longitudinal extensions 19, 20, 21 of crease 18 also define the junctions between flap 12 and section 6, and between flap 11 and section 5, and between flap 13 and section 7.

The opposite edge 22 of recess 14 preferably curves outwardly relative to edge 17 from apex 16 to a point close to the outer end thereof, and it then terminates in a generally circular edge 23 connecting with the outer edge 24 of flap 10 that is parallel with crease 18.

The edge 22 defines the inner edge of a tab 25, while edge 24, or part of the latter, forms the opposite edge, with the edge 23 defining the end of said tab.

The end edge of that portion of flap 10 that is between the tab 25 and crease 18 is obliquely formed at 26 joining the edge 17 to one end of the crease 18, while the opposite edge of the flap 10 is obliquely slanted as at 27 to join the outer edge 24 to the opposite end of crease 18.

The flaps 12, 13 which are along the folding creases 19, 21 are preferably substantially rectangular and of the same shape and size. They are also preferably the same width of flaps 10, 11 in direction away from the folding creases 19, 21 but they may be longer or shorter as desired.

Along the edge of the blank opposite the aligned creases 18 to 21 the sections 6, 7 may respectively be formed with extensions 29, 30 while the sections 5 may be formed with an extension 31.

The extensions 29 to 31 are integrally joined with the sections 5 to 7 along a folding crease 32 that is parallel with creases 18 to 21.

The extensions 29, 30 are of the same shape and size and are preferably substantially rectangular, and the extension 31 is also substantially rectangular. These extensions 29 to 31 are cover flaps and extensions 29, 30 are adapted to fold to positions above and in opposed relation to the bottom flaps 12, 13 when the box is set up, while flap 31 is adapted to overlie said flaps 29, 30 and to extend completely across the upper side of the box. A strip 33 along the outer edge of flap 31 is adapted to fold along folding crease 34 when said flap is in box closing position for overlying the upper marginal position of the section 4 either inside or outside of the box when the box is in set up position.

While the cover flaps 29 to 31 have been described in detail, these may be omitted and a separate and separable cover formed in the conventional manner for closing the box. The type of cover above described is, in itself, commonly employed in prior boxes of this general type.

In forming the folded box the flaps 10 to 13 are first folded along creases 18 to 21 to one side

of the sections 4 to 7 as seen in Fig. 2 in which the flap 10 overlies section 4, flap 12 overlies section 6, flap 11 overlies section 5 and flap 13 overlies section 7.

5 The next step is to fold the end section 4 and its flap 10 along crease 1 over the section 6 and flap 12. As the section 4 and flap 10 are longer in the particular blank illustrated than the section 6 and flap 12, the said section 4 and its section 10 will also extend partially over the section 5 and its bottom flap 11 as seen in Fig. 3.

The section 7 and its flap 13 are then folded along crease 3 so that the said section and its flap overlie the section 5 and flap 11. The glue flap 8 when in this position will overlie the end marginal portion of the section 4 and is glued to said portion. Flaps 10 to 13 will be between the opposed lengths of the blank strip consisting of sections 4 to 7 when the glue flap 8 is secured to the said end marginal portion of section 4.

15 The folded blank as seen in Fig. 3 is now completed, and upon unfolding or outfolding the sections 4 to 7 so as to square up the said sections for forming the four sides of the box, the bottom flaps will automatically move to horizontal positions forming the bottom of the box with the flaps 10, 11 interlocked so as to support the contents of the box, while flaps 12, 13 overlie the interlocked flaps 10, 11.

30 The inherent resiliency of the material of the blank tends to constantly and yieldably urge the flaps 10, 11 away from the sections 4, 5 after folding along creases 18, 20 and the same thing happens to flaps 12, 13 after folding along creases 19, 21. The flaps 12, 13 tend to spring away from the sections 6, 7. When the folded blanks are in a stack and folded flat, it is obvious that the flaps 10 to 13 will be held substantially flat against the sections to which they are secured. However, upon picking up one of the folded boxes, they will slightly spring toward open position and the tabs 25 on flaps 10, 11 will spring in opposite directions and into intersecting planes so that the tabs 25 (Fig. 5) will be at opposite sides of a central line $x-x$ disposed between the sides 10, 11. These tabs are relatively close together in generally end to end relationship at opposite sides of a line $y-y$ extending at right angles to line $x-x$ (Fig. 5) so that only a slight further opening of the box toward a position squaring the adjacent pairs of sections 4 to 7 with each other will result in the tabs 25 moving into overlapping relationship, whereby the final movement of the sections 4 to 7 to rectangular relationship will result in the flaps moving to interlocked position with the apices 16 substantially together as seen in Fig. 6. As soon as the flaps 10, 11 are horizontal or in interlocked relationship, the flaps 12, 13 are free to spring to coplanar relationship overlying the flaps 10, 11. Flaps 12, 13 can be of a length to meet at the center of the box, thus covering the flaps 10, 11 and forming a substantially smooth upper surface for the contents of the box.

In the form of box so far described, it will be seen that the single glue flap 8 is on the outside of the box. In position said flap on the inside of the box, the flap 40 (Fig. 4) which corresponds with the flap 10 of Fig. 1 must be slightly cut away along the free end edge of said flap so as to permit the said flap to pass the glue flap 8 when the section 7 and said flap are folded over against section 5 and flap 11 prior to the folding of section 4 and flap 10.

Obviously the glue flap 8 may be on section 4 instead of being on section 7, in which case the

5

flap 13 would be shortened instead of flap 10 as to permit the glue flap to be on the inside of the box instead of being on the outside.

It is to be understood that the detailed description and drawings are not to be considered as being restrictive of the invention to the precise details so described and shown, inasmuch as the said description and drawings are merely illustrative of the preferred form. For example the exact contour of the edges of flaps 10, 11 may be varied. The edges 22 may be curved instead of being straight, and the edges 26 may be perpendicular to the edges 17. Other variations may be made without departing from the invention.

I claim:

A folding box formed from a blank of semi-rigid sheet material folded along parallel crease lines to provide four lateral side walls, said side walls being secured together for folding flat with two pairs thereof in opposed relation and for outfolding to open rectangular position, a pair of bottom flaps respectively secured to two of the said side walls that are in opposed relation when said side walls are outfolded, said pair of bottom flaps being offset relative to each other in substantially edge to edge relation and respectively secured to one of the side walls of each of said

6

two pairs when said side walls are folded flat, complementary recesses formed in the adjacent edges of said flaps when in said edge to edge relationship opening toward each other, tabs formed on said flaps outwardly of said recesses relative to the side walls carrying said flaps, the inner edge of each tab curving outwardly to the free end of the tab and forming the outer edge of each recess, the free ends of the tabs being in almost edge to edge meeting relationship when the box is folded flat whereby said flaps will engage each other upon movement of said side walls to outfolded position and will interlock with each other in a position closing the bottom side of the box.

LOUIS C. MICHETTI.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
772,381	Seegmiller	Oct. 18, 1904
2,327,710	Himes	Aug. 24, 1943
2,388,190	Smart	Oct. 30, 1945