Jan. 28, 1947. S. CONESCU 2,414,854

FIBERBOARD FOLDING BOX CONSTRUCTION

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FIG. 1.

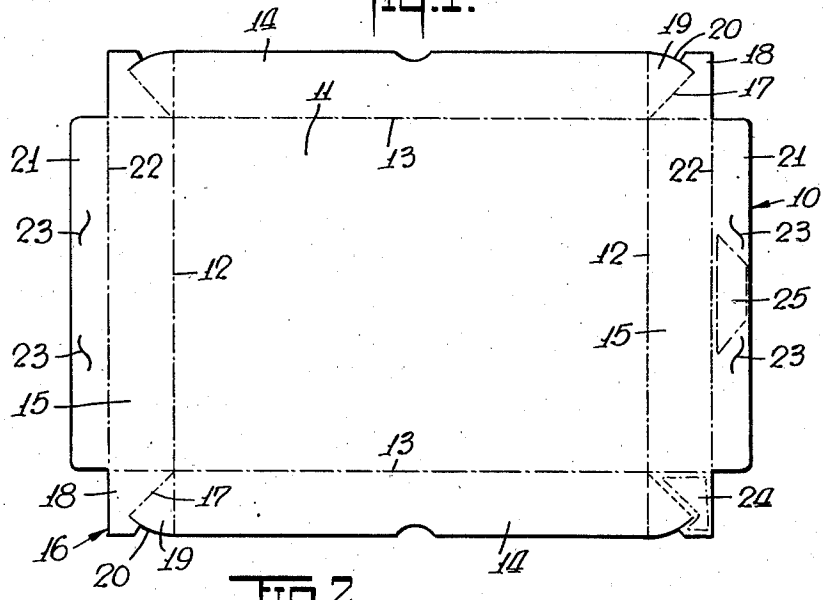


FIG. 2.

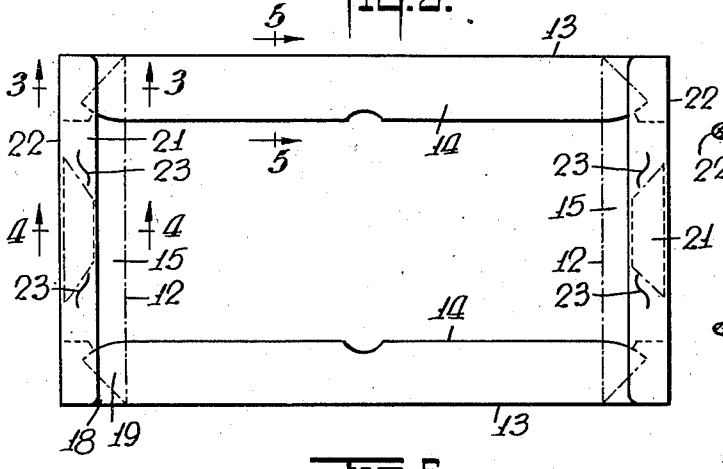


FIG. 3.

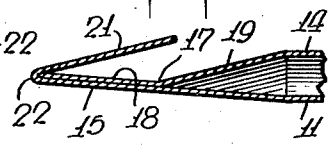


FIG. 4.

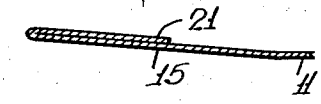


FIG. 5.

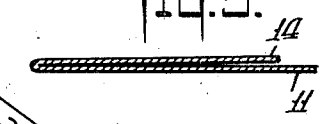
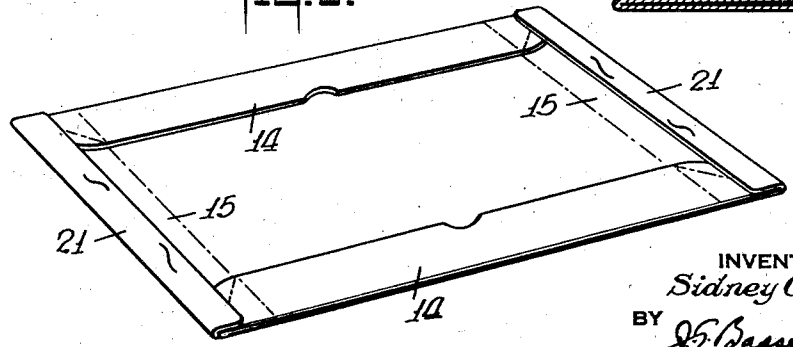


FIG. 6.



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FIBERBOARD FOLDING BOX CONSTRUCTION

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Fig. 7.

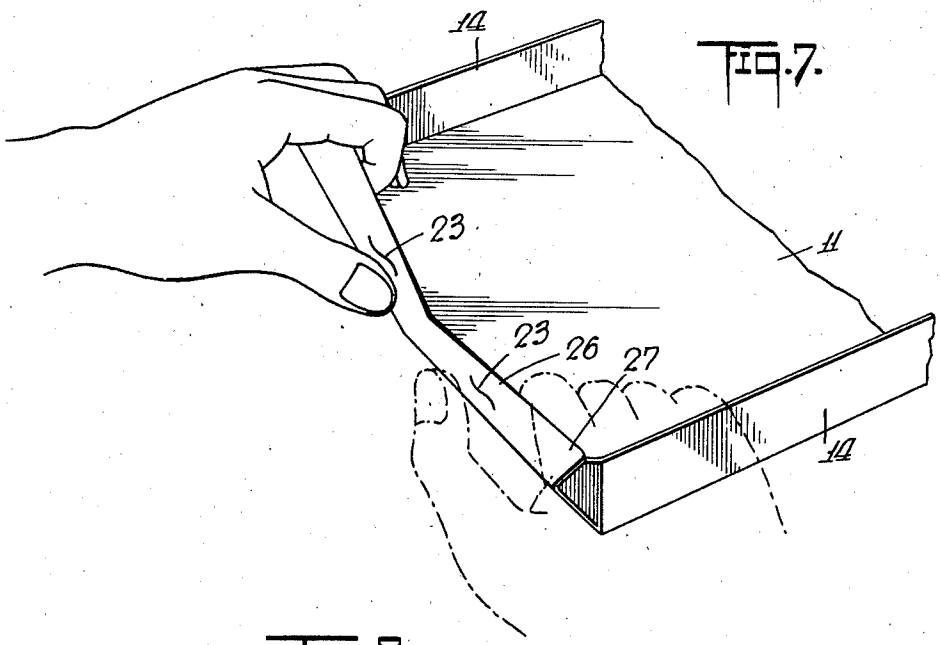


Fig. 8.

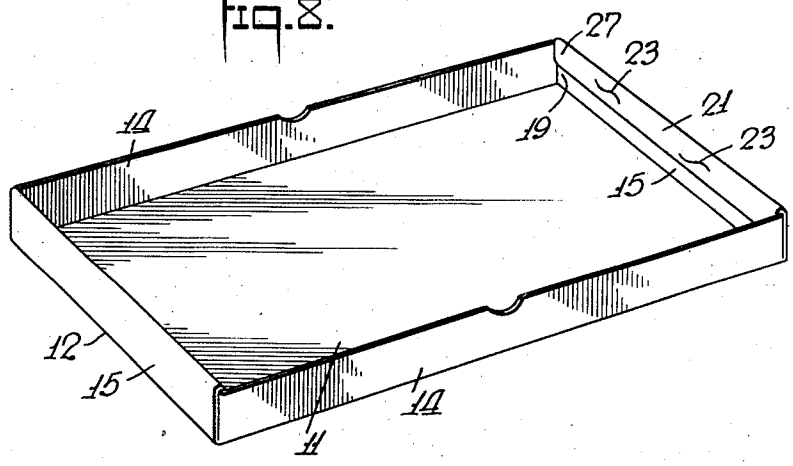
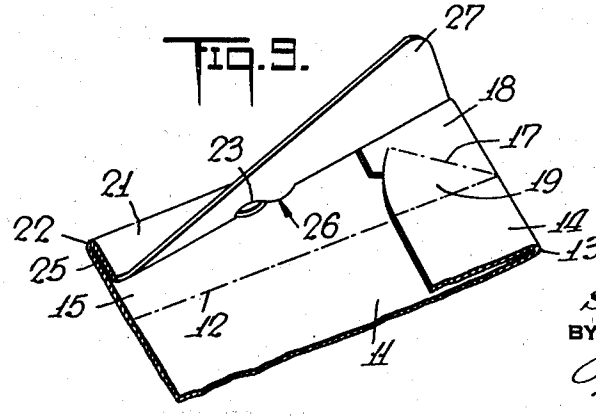


Fig. 9.



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UNITED STATES PATENT OFFICE

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FIBERBOARD FOLDING BOX CONSTRUCTION

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Application December 30, 1944, Serial No. 570,542

6 Claims. (Cl. 229—31)

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This invention relates to folding boxes and more particularly to a folding box locking flap to hold folding boxes in set up condition.

This application is a continuation-in-part of my application Serial No. 519,919½, deposited January 27, 1944, and given the filing date of March 6, 1944.

It is an object of my invention to provide a paper or cardboard box which is of the folding type and may be stored in collapsed condition in partially assembled relationship, but may be quickly set up. Generally, my invention relates to improvements in a type of folding box having folding sections and a locking flap of the character shown in the patent to Myers No. 1,188,092, of June 20, 1916.

In the Myers type of folding box, the body member or tray constituting either the bottom or top, has hinged thereto end panels and side panels about crease lines, and to each of the contiguous edges of the side panels and end panels there are interposed folding webs to direct the panels to lie flat against the body member or, in the set up condition, to direct the panels in the upright condition, with said webs lying against one of the panels which carries a flap folded over the webs to lock them in the contacting position, and hold the panels in set up condition.

In this construction, the flap is generally medially connected to leave the ends of the flap free for spreading over the web and frequently adjacent the medially connected portion weakened lines of fold or slits are provided to facilitate the spreading of the ends of the flaps, for their locking action.

This method of connecting the medial portions of the flap has led to difficulties resulting in tearing of the locking flap where staples are used to connect the locking flap adjacent its medial portion to the panel mounting the same. Where I have connected the locking flap by pasting, frequent destruction of the connection has been experienced, as well as awkwardness in lifting the free edges of the locking flap to the web engaging position.

Accordingly, it is an object of my invention to provide, in a folding box of the type aforementioned which has a body member comprising end panels and side panels hinged to the body member and connected to each other at contiguous corners by interposed diagonally folding webs and a locking flap to fold over said web wherein the flap has a medially connected portion leaving the ends of the flap free for spreading over the web, hinging portions for the flap. These hinging portions are contoured to wedge or brace the free ends of the locking flap and provide bracing or wedging edges for frictionally deflecting said flap ends to a spread position. Still more particularly, it is my object to provide in a locking flap of a folding box, hinging portions in the nature of incisions of S-shaped construction, to facilitate the hinging of the free edges of the flap. Still more particularly, it is my objective to provide, in a locking flap of a folding box hinging portions which brace or wedge the free ends of the flap so that the flap may be moved into web engaging position with great facility, and without destroying or altering the medial connection between the flap and the panel mounting the same.

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By my invention, my improved construction not only speeds up the operation of setting up the box but permits glue connections to be used for the locking flap, with equal facility with staples.

Still more particularly, it is an object of my invention to provide in a folding box of the type described, a locking flap construction which is conducive to rapid setting up of the folding box and which minimizes losses in handling boxes of this type of box construction.

To attain these objects and such further objects as may appear herein or be hereinafter pointed out, I make reference to the accompanying drawings, forming a part hereof, in which—

Figure 1 is a plan view of a blank for a folding paper box tray member in accordance with my invention;

Figure 2 is a plan view showing the blank with the panels in folded condition, lying flat;

Figure 3 is a fragmentary section taken on the line 3—3 of Figure 2;

Figure 4 is a fragmentary section taken on the line 4—4 of Figure 2;

Figure 5 is a fragmentary section taken on the line 5—5 of Figure 2;

Figure 6 is a perspective view of the tray member of my folding box, in the flat condition;

Figure 7 is a fragmentary perspective view illustrating the method of setting up the tray portion;

Figure 8 is a perspective view showing the tray portion set up;

Figure 9 is a fragmentary perspective view showing a detail of the locking flap.

Making reference to the drawings, 10 is a blank from which there is formed the body member 11. Crease lines 12, 12 and 13, 13 outline side panels 14, 14 and end panels 15, 15, leaving corner webs 16 outlined by the diagonal crease line 17, to de-

fine web segments 18 and 19. The segment 19 is arcuately shaped at 20, leaving the remnant of polygonal outline unaltered, for purposes which will appear more clearly as this description proceeds. From the end panels 15, 15 there are extended flaps 21, 21 defined by the crease line 22. With this construction I form generally S-shaped incisions 23, whose axial line is angularly directed to diverge toward the crease line 22, and desirably on a line from the edge of the flap directed to intersect the crease line at its extreme ends.

The blank 10 thus provided may be fed through a folding machine, during which operation applicators apply a film of adhesive 24 to the web segments 18, and remnant above described, and then the blank is fed through a folding contrivance to hinge the panels 14, 14 about the crease lines 13, 13 to bring the adhesive 24 in contact with the panels 15, 15.

At this stage, the blank is run at right angles through a folding contrivance, and as an incident thereof an applicator applies an adhesive film 25 adjacent the medial line of the flap 21 between the incisions 23, preferably of a general trapezoidal contour. Thereupon the flaps 21 are folded about the crease line 22, to bring the flap 21 in the plane of the panels 15, and connect the flap 21 adjacent its medial portion between the incisions 23, 23 by engagement of the adhesive film 25 with the body of the panel 15. While a glue film is illustrated and is preferred by me, other fastening means may be employed to connect the medial portion of the panel 21 to the medial portion of the panel 15 in the area between the incisions 23.

The incisions I have provided, particularly angularly directed and diverging toward the extreme ends of the crease line 22, contribute desirable performance, especially with the connecting means which I have illustrated in the form of glue or paste 25 for uniting the medial portion of the flap 21 to the panel 15, as will be more definitely particularized hereinafter. Upon bringing the flap 21 into engagement with the panel 15, an assembly more particularly illustrated in Figures 2 and 3 will be achieved.

When films 24 and 25 have dried, the tray-like segment may be set up by prying up the edges of the panel 14 and pressing the thumbs against the hinge line formed by the incisions 23, especially deflecting the lobe 26 against the inner surface of the panel 15. Enough frictional action is thereby received to temporarily wedge the free ends 27 of the flap 21 in a deflected condition, to facilitate directing the free edges 27 over the corner web 16. The arcuate edges 20 combine to direct the flap 21 into locking engagement over the segment 19, to bring the segment 20 into engagement with the panel 15.

By the employment of hinge cuts or incisions 23 of divergent character, minimum spreading of the flap ends 27 is necessary and I thereby minimize the stress on the medially connected portion of the flap 21. This enables me successfully to use glue for connecting the flap 21 to the panel 15, eliminating the necessity for the use of more rigid fastening elements, such as staples, though not excluding the employment of such fastening means.

By the employment of hinging cuts of the contour illustrated, especially ones which employ hinging lobes 26 which are deflectable into engagement with the inner face of the flap 15, I may in a measure brace the free edges 27 of the locking flap 21 in the deflected position, with sufficient friction so that the operator's hands may be free to set up the panel 14 and not find that the free ends 27 snap back into the folded position before this latter operation can be performed.

The bracing action of the lobe 26 contributes materially to the speed of operation in setting up the box tray under conditions preventing applying any undue stress to the connecting portion adjacent the medial section of the flap 21 as force of the character heretofore necessary in resisting the tendency of the flap 21 to return to its normal folded condition need not be applied.

As the flap ends 27 are brought over the web 16 in the position shown in Figure 8, the lobe 26 is deflected from its edging or bracing position, to permit the natural resiliency of the locking flap 21 to cause the flap 21 to reassume the folded position shown in Figure 2 and to hold the segment 19 in position against the panel 15, to form the corner of the tray.

By this construction it will be observed that I need not localize the attaching connection for the flap 21 close to the crease line 22 but I may extend the connection for a substantial area, thereby stiffening the panel 15 to a substantial extent, especially where I employ the film coating 25 as described.

My construction thereby enables me to use adhesive for uniting the flap 21 to its panel 15 instead of the more expensive staples. This not only permits a continuous folding operation in the manufacture of the box tray but makes possible the use of this connecting means without sacrificing the yieldability incident to the localized connection experienced with staples.

The location of the hinging incisions of the character set forth not only facilitates the location of the folding flap but by symmetrically disposing the S-shaped incisions about a line diverging from the medial connected portion to the crease line 22, the stress and strain upon the glue joint is minimized.

I have also found that the stresses incident to locating the locking flap 27 in position within a wide variation in depth of the side panels 14, 15 do not undesirably affect the location of the locking flap over the web 16 in its folded position and that this is accomplished by the arcuate edge 20 of the segment 19. Thus, while with boxes of rather shallow depth no considerable problem is involved in placing the locking flap in position over the corner web, with deeper boxes greater deflection is ordinarily necessary and the construction which I have provided in the form of the arcuate edge 20 for the segment 19 does not make the variation in depth of the boxes any material problem in this regard.

In the claims, where I refer to a "body member" I mean to include thereby that portion of a folding box in the form of a tray which may constitute the bottom or top, whether separable or hinged together.

In general, it willl be observed that I provide a folding box which is economical in construction and which can be set up with such simplicity and ease as to minimize losses in handling.

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

1. In a folding box having hinged side and end panels which are edgewise connected to each other by a diagonally folding web arranged to lie in the set up condition of the box against one of

the panels, said last mentioned panel carrying a locking flap defined by a fold, said flap having a substantially medial portion thereof connected to said panel to leave the ends free for spreading over said web, the combination wherein said flap is provided with hinging cuts to each side of said connected portion, diverging angularly substantially from the medial portion to the extremity of the fold for said flap and having a portion thereof contoured to provide an outwardly projecting portion which frictionally contacts the said panel to hold the bent flap braced when the flap is spread for setting up the box.

2. In a folding box having a body section to which side and end panels are hinged about crease lines, with the panels connected to each other at contiguous edges by a folding web to direct at least one of the panels to be flat against the body member or to be set up, with said web braced in contact against the other panel wherein said last panel carries a flap on one edge to lock said web in the contacting position, said flap having a medial portion connected to said panel, leaving the ends thereof free for spreading over said web, and incised with hinging cuts to each side of said portion, said hinging cuts diverging substantially from said medial portion to the extremity of the edge carrying the flap, the contour of said cuts providing an outwardly projecting portion which frictionally contacts the said panel to hold the bent flap braced when the flap is spread for setting up the box.

3. In a folding box having a body section to which side and end panels are hinged about crease lines, with the panels connected to each other at contiguous edges by a folding web to direct at least one of the panels to be flat against the body member or to be set up, with said web braced in contact against the other panel wherein said last panel carries a flap on one edge to lock said web in the contacting position, said flap having a medial portion connected to said panel, leaving the ends thereof free for spreading over said web, and incised with S-shaped hinging cuts to each side of said portion, said hinging cuts diverging substantially from said medial portion to the extremity of the edge carrying the flap, said cuts providing wedging lobes having a projecting portion which frictionally contacts the said panel to hold the bent flap braced when the flap is spread for setting up the box.

4. In a folding box having a body section to which side and end panels are hinged about crease lines, with the panels connected to each other at contiguous edges by a folding web to direct at least one of the panels to be flat against

the body member or to be set up, with said web braced in contact against the other panel wherein said last panel carries a flap on one edge to lock said web in the contacting position, said flap having a medial portion connected to said panel by a film of adhesive, leaving the ends thereof free for spreading over said web and incised with hinging cuts to each side of said portion to facilitate said spreading operation, said hinging cuts lying along lines diverging substantially from the medial portion to the extremities of the edge defining the flap, the contour of said cuts including offset portions providing an outwardly projecting portion which frictionally contacts the said panel to hold the bent flap braced when the flap is spread for setting up the box.

5. In a folding box having a body member to which there are hinged about crease lines a pair of side and a pair of end panels, edgewise connected to each other by an interposed diagonal folding web to direct at least a pair of the panels to be flat against the body member or to be set upright thereto, with said web braced in contact against one of the panels, said last panel carrying a flap folded over the same to lock said web in the contacting position aforesaid, said flap having a medial portion connected to said panel, leaving the ends thereof free for spreading over said web and incised with hinging cuts to each side of said portion to facilitate said spreading operation diverging from the medial portion to the extremities of the fold for said flap, the contour of said cuts including offset portions providing an outwardly projecting portion which frictionally contacts the said panel to hold the bent flap braced when the flap is spread for setting up the box.

6. In a folding box having hinged side and end panels which are edgewise connected to each other by a diagonally folding web arranged to lie in the set up condition of the box against one of the panels, said last mentioned panel carrying a locking flap having a substantially medial portion thereof connected to said panel to leave the ends free for spreading over said web, the combination wherein said flap is provided with S-shaped cuts to each side of said connected portion, located on a line diverging from said connected portion to the extremities of the crease line of said flap, the lobes of said cuts having an outwardly projecting portion which frictionally contacts the said panel to hold the bent flap braced when the flap is spread for setting up the box.

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