

Sept. 29, 1936.

C. L. CLAFF

2,056,093

METHOD OF MAKING PAPER BOXES

Filed Nov. 26, 1935

3 Sheets-Sheet 1

Fig. 1.

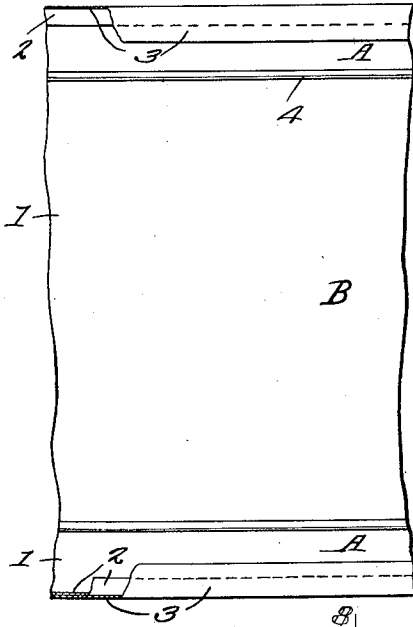


Fig. 2.

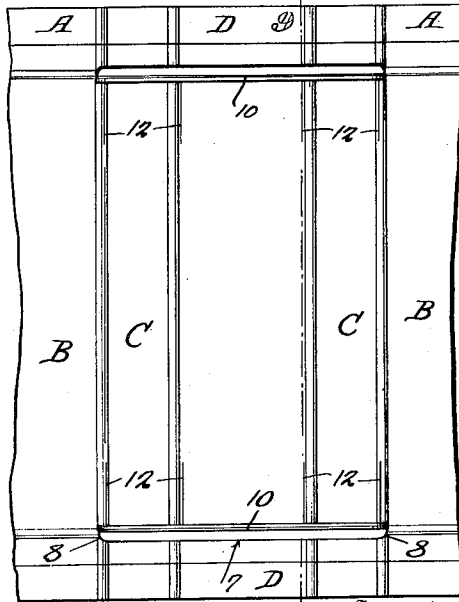
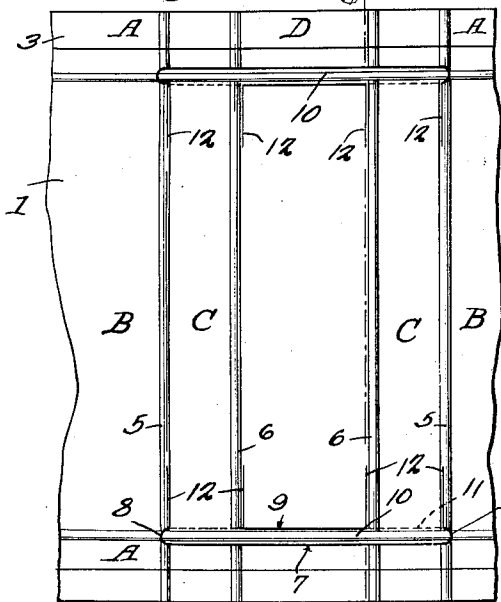
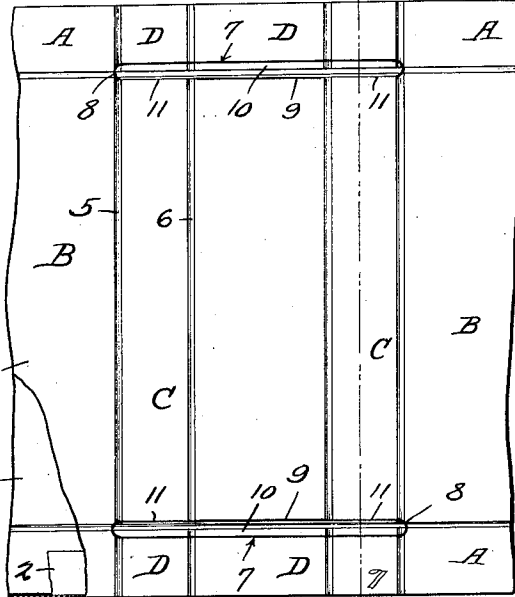


Fig. 3.

Fig. 4.

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3 Sheets-Sheet 2

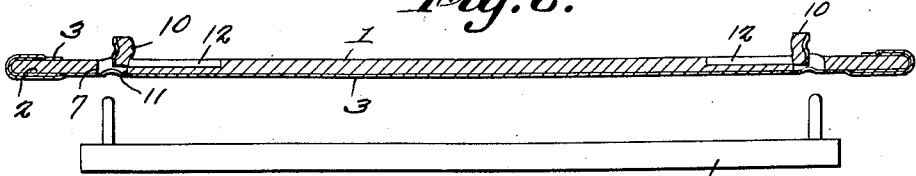
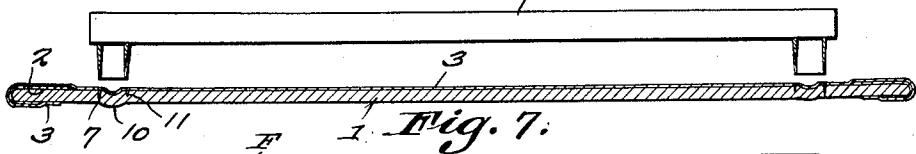
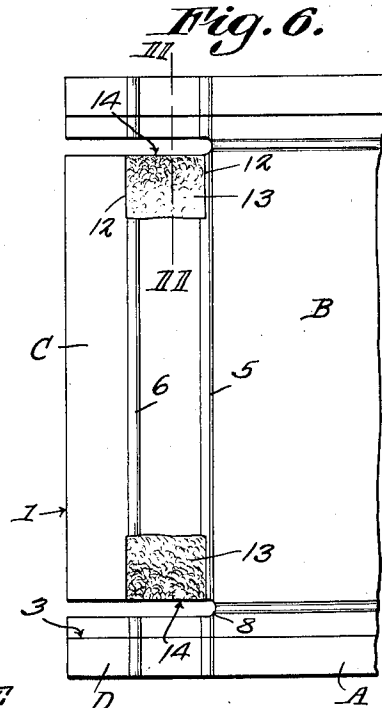
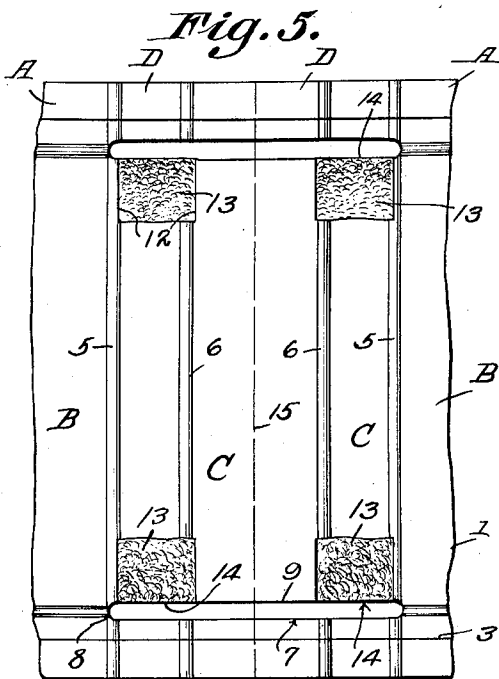


Fig. 9.

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METHOD OF MAKING PAPER BOXES

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3 Sheets-Sheet 3

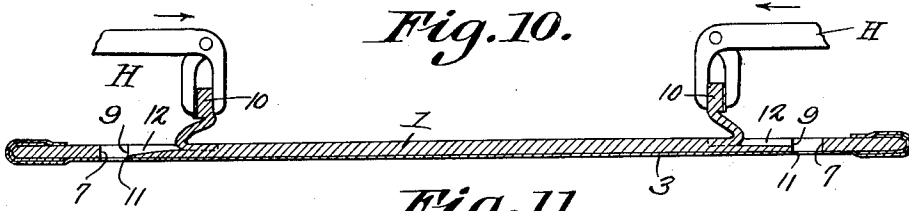


Fig. 10.

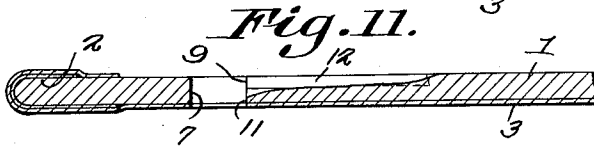


Fig. 11.

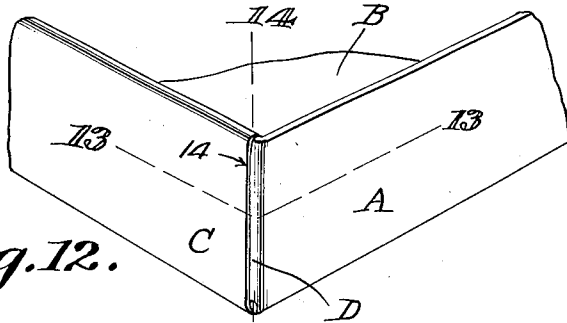


Fig. 12.

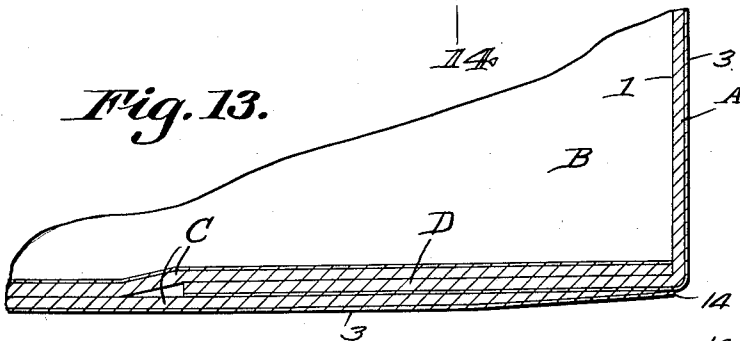


Fig. 13.

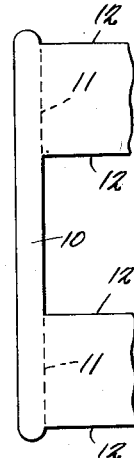


Fig. 15.

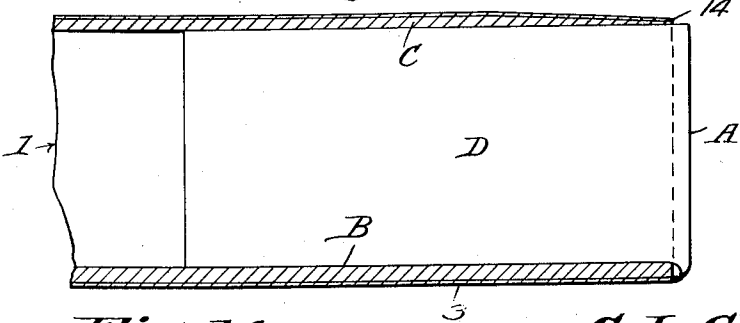


Fig. 14.

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UNITED STATES PATENT OFFICE

2,056,093

METHOD OF MAKING PAPER BOXES

Clarence Lloyd Claff, Randolph, Mass.

Application November 26, 1935, Serial No. 51,722

7 Claims. (Cl. 93—36)

This invention relates to a new and improved method of making paper boxes from webs of box board material.

Many boxes, such as shoe boxes and the like are formed with inturned end wings at the sides to which are affixed end folds. Because of the thickness of material used the raw, outer side edges of the end folds have been exposed and made an unsightly appearance. Various expedients have been employed to remove this objection. For example the box board material has been beveled at the edges by cutting or grinding and a layer of covering paper affixed to said material has been pressed back against and affixed to the inturned wings to conceal the edges of the box board material.

These methods have been objectionable because of the difficulty in adapting them to methods wherein boxes are produced from a continuous web of box board material having a web of covering paper affixed to one surface.

An object of the present invention is to thin the side edges of the end folds at the proper points prior to the separation of the blanks from the web, and without beveling by cutting or grinding.

In practice it has been found that a thickness of box board, when properly cut, can be peeled by tearing and an object of the invention is to take advantage of this characteristic by tearing off portions of the box board at the proper places so as to produce end folds with side edge portions which are reduced in thickness, thereby preventing the objectionable exposure of raw edges and also preventing the folds from bulking up to an undesirable extent where extended over the top edges of the inturned side wings.

Another object is to provide a continuous method of assembling the webs and reinforcing tapes, and then scoring, cutting and tearing the same to form a series of suitable shaped and prepared blanks, and finally severing the blanks from each other and setting them up into the desired boxes or box lids, it being understood that the term "box" as used herein is intended to apply to either a box lid or a box body.

With the foregoing and other objects in view which will appear as the description proceeds the invention consists of certain novel steps in the method hereinafter disclosed, it being understood that changes may be made therein without departing from the spirit of the invention as claimed.

In the accompanying drawings I have illustrated a portion of a completed box and the several steps whereby it is produced in accordance with the present invention.

In said drawings
Figure 1 is a plan view of portions of the webs

and reinforcing tapes assembled for the production of blanks therefrom.

Figure 2 is a plan view of the opposite side of the assembled box elements after they have been creased and cut.

Figure 3 is a similar view showing the side opposite to that illustrated in Figure 2.

Figure 4 is a view similar to Figure 3 showing the cut-outs punched away from their initial positions.

Figure 5 is a plan view like Figure 4 showing the condition of the web following the peeling operation.

Figure 6 shows one end of a blank following its severance from the web.

Figure 7 is a section through the web taken on line 7—7, Figure 2 and showing a die for producing slits and "cut-outs" preparatory to the peeling operation.

Figure 8 is a section on line 8—8, Figure 3, showing a means for producing transverse cut scores leading to the slits.

Figure 9 is a section on line 9—9, Figure 4 showing the step of punching the cut-outs into outstanding positions.

Figure 10 is a similar view showing the stop of gripping and pulling the cut-outs to peel the blank.

Figure 11 is an enlarged section through a portion of the blank on line 11—11, Figure 6.

Figure 12 is a perspective view of one corner portion of a box made by the present method.

Figure 13 is a section on line 13—13, Figure 12.

Figure 14 is a vertical section on line 14—14, Figure 12.

Figure 15 is a detail view of one of the portions peeled from the web during one step of the method.

In carrying out the method constituting the present invention a web 1 of box board material is preferably supplied at its edges with reinforcements 2 of kraft tape and another web 3 of covering paper is then affixed to one surface of web 1. The edges of this paper are then folded over the tapes 2 and edges of web 1 so as to produce a neat finish.

After the several box units 1, 2 and 3 have been assembled in a single web longitudinal creases 4 are formed therein to define the sides A and bottom B of a blank. The web is then acted upon by a suitable die for producing transverse creases 5 and 6 defining the end folds C and side wings D of the blanks and at the same time or during a subsequent operation the web is subjected to the action of suitable dies such as shown for example in Figures 7 and 8. The die E will produce longitudinal slits 7 in substantial alignment with the creases 4 and extending entirely across the end folds D and the transverse creases 5 and 6 defining said folds. Each slit 7 terminates

in laterally extended portions 8 intersecting the adjacent creases 4. The same dies can also be used for slitting the web at 9, each of these latter slits being located between and terminating at the creases 6. Slits 7 and 9 are parallel and spaced apart a distance sufficient to form an elongated relatively narrow lip or cut-out 10 extending across the group of creases 5 and 6.

During the slitting of the web the die E will also cut through the covering material and partly through the box board material in line with slits 9 and from the ends of said slits up to the terminal cuts 8. These scores 11 intersect the creases 5 and 6 and extend across the spaces between said creases as shown.

While the slits 7 and 9 and the scores 11 are being cut into the covering material 3 and box-board material 1 from one side of the web another die F can be utilized for cutting into the opposite side of the web where the box board 1 is exposed. This die F is formed to cut scores 12 into the box board material along lines parallel with the creases 5 and 6 from the terminal cuts 8 and the ends of slits 9 respectively. Thus there is provided between the scores 12 of each pair an area of box board material which extends across the crease 6. Obviously the formation of these scores 12 can be effected after the slits 7 and 9 and scores 11 have been cut, if so desired.

Following the slitting and scoring of the web as explained a suitable punch G is used to push the lips or cut-outs 10 to positions at angles to the uncovered surface of the web and as shown in Figures 4 and 9. Thus the lips or cut-outs are brought to position for engagement by suitably constructed grippers H. These grippers, while engaging the lips or cut-outs are moved toward each other with the result that those portions of the box board between the scores 12 will be peeled off with the lip and in the shape substantially as shown in Figure 15, leaving the web with thinned portions 13 extending to feather edges 14 along the sides of the end folds C and extending from creases 5 and across creases 6. (See Figure 5.)

After the foregoing operations the web is cut transversely midway between the creases along the line 15, thereby completing the blank which is subsequently set up into box form as indicated in Figures 12, 13 and 14. In other words the side wings D are returned after the sides A have been bent into positions perpendicular to the bottom B. The end folds C are then bent over and affixed to the wings D and the thinned side edges 14 thereof are pressed tightly to the wings so as to obliterate the raw edges of the box board which usually are exposed. As the thinned edges 14 also extend over the top edges of the wings D, as shown in Figure 14, they will not protrude objectionably at the top but can be pressed down against the wings D as illustrated.

What is claimed is:

1. The method of making paper boxes which includes the step of creasing and slitting a web to form a blank having an end fold, and a lip at each side of the fold and severed therefrom for a portion of its length, scoring one side of the web along the unsevered portion of the lip to provide a feather edge, and finally peeling from the opposite side of the web the unsevered portions joining the lip and web and leading to the scores.

2. The method of making paper boxes which includes the step of creasing and slitting a web

to form a blank having an end fold, and a lip at each side of the fold and severed therefrom for a portion of its length, scoring one side of the web along the unsevered portion of the lip to provide a feather edge, scoring the opposite side of the web to provide transverse areas extending to the unsevered sides of the lips, and finally peeling from the web those portions of the areas defined by the scores and leading to the lip.

3. The method of thinning the side edges of the end fold of a paper box blank which includes the step of forming slits and scores in the blank to define an area between the end fold and a side wing, cutting partly through the blank along lines extending laterally from the slits and into the end fold, thereby to define the area to be thinned, and then tearing said area to peel off a portion of its thickness.

4. The method of making a paper box having an end fold with thinned side edges, which includes the step of slitting a blank to define the fold and a lip at one side of the fold, scoring one side of the fold to define an area on the fold to be thinned, said area leading to the lip, scoring the opposite side of the blank between the lip and said defined area to produce a feather edge at the side of the fold, and then pulling the lip relative to the blank to peel off a portion of the thickness of the fold from said feather edge and throughout the defined area.

5. The method of making a paper box having end folds with thinned side edges, which includes the step of slitting a web to define a pair of end folds located end to end and a lip at each side of said pair, scoring one side of the web to define an area on each fold leading to the lip and adapted to be thinned, scoring the opposite side of the web between the lips and said defined areas, and then pulling the lips toward each other to peel off portions of the thickness of each fold throughout the defined areas and away from the last named scores, and an outer layer of covering material substantially coextensive with the outer blank of box-board material.

6. The method of making a paper box having end folds with thinned side edges, which includes the step of slitting a web to define a pair of end folds located end to end, side wings, and lips between the end folds of each pair and the side wings, scoring one side of the web to define areas in each fold leading to the lips and adapted to be thinned, scoring the opposite side of the web between the lips and said defined areas, pulling the lips to peel off portions of the thickness of the web throughout the defined areas thereby leaving edges of reduced thickness along the last named scores, separating the end folds, inturning the side wings, folding the end folds over the inturned side wings and affixing them thereto, and pressing the thinned edges against the wings.

7. The method of thinning a portion of a paper box blank which includes the step of cutting through the blank to partly sever a lip, scoring into one side of and partly through the blank adjacent to the lip to define one edge of the area to be thinned, scoring into the other side of and partly through the blank to define opposed sides of the area to be thinned, and then pulling the lip to peel off the material from the score in one side and between the scores in the other side.