April 24, 1934. W. S. JACKSON 1,956,124

PAPER BOX

Filed Oct. 9, 1933

Fig. 1

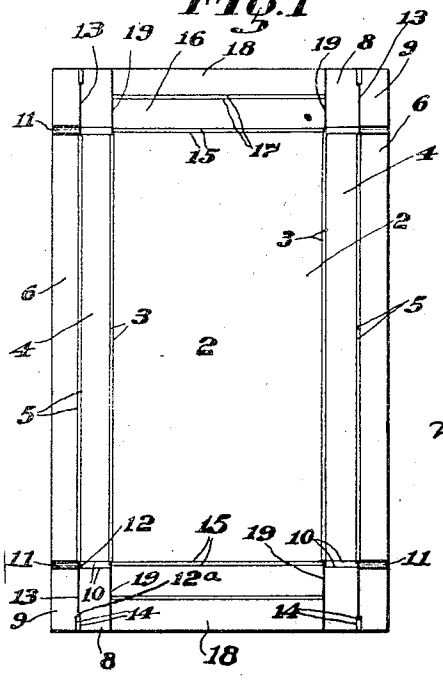
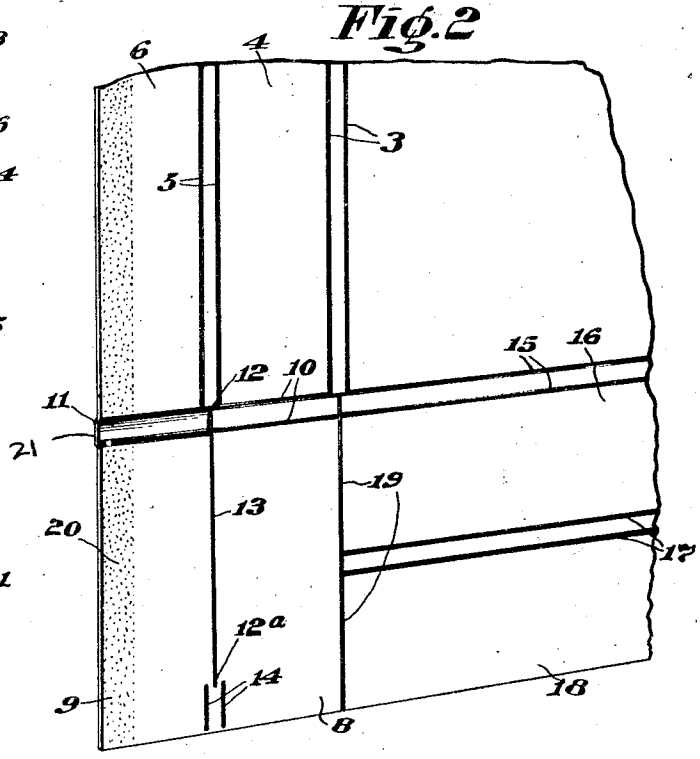


Fig. 2



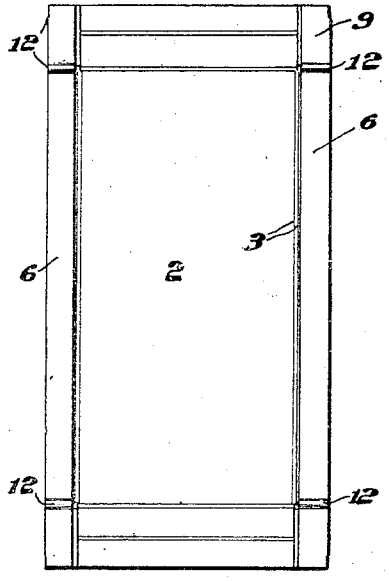
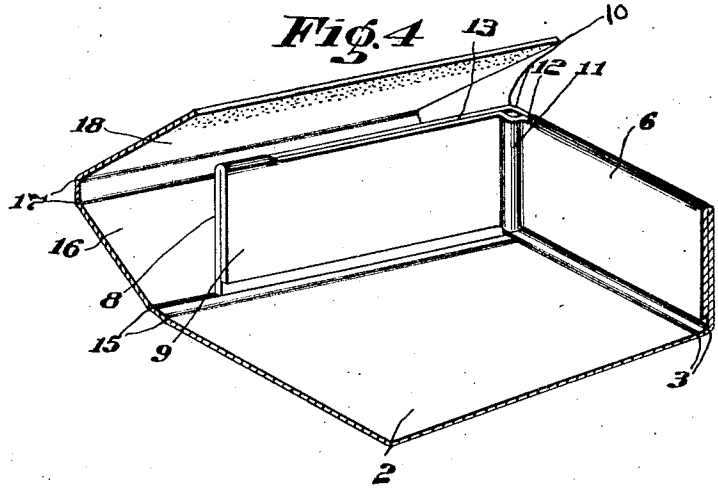


Fig. 3

Fig. 4



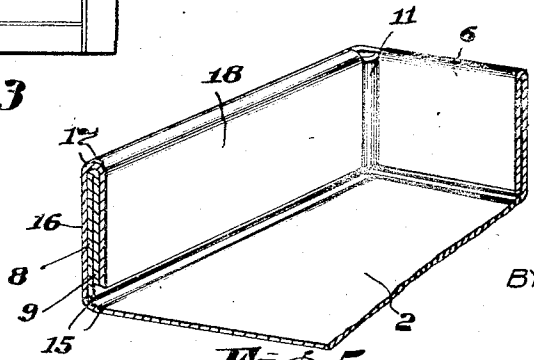


Fig. 5

INVENTOR:

William S. Jackson

BY Rinaldo & Rinaldo

ATTORNEY

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1,956,124

PAPER BOX

William S. Jackson, Walpole, Mass., assignor to Bird & Son, Inc., East Walpole, Mass., a corporation of Massachusetts

Application October 9, 1933, Serial No. 692,842

6 Claims. (Cl. 229—34)

This invention relates to a paper box and has particularly to do with an improved paper box or carton having as the characteristic feature thereof a novel corner construction which relieves strain at the corners and by so doing prevents cracking of the box material at the corner folds.

In box construction it has been the common practice to make at least the edge portions of the sides of both the base and cover of the box of two layers of cardboard, usually formed by folding an extended side portion inwardly at the exposed edge of the cover or base. This double layer side strip is usually pasted together, after which the double layer is folded on itself at a 90 degree angle to form the corner of the box. I have found that the cracking of the outer layer of the corner which has so frequently occurred during the corner forming folding operation, can be entirely eliminated by providing that the inner layer of the material automatically removes itself from the inner apex of the angle thereby relieving the strain which has heretofore occurred through the tensile stress initiated through the required bending and stretching of the outer layer around the inner layer. As will appear, I further relieve the strains incident to the corner forming operation by providing that the two layers of cardboard, although pasted together, are at the same time free for a limited relative movement. It will be found that the box blank constructed according to my invention could be bent to an angle of even 180° without cracking the outer layer.

In the drawing, Fig. 1 is a plan view of a flat blank for a box cover completely scored and slitted;

Fig. 2 is a perspective view of the left-hand lower corner of the blank of Fig. 1, somewhat enlarged in order to better show the scoring and slitting;

Fig. 3 is a plan view showing the blank of Fig. 1 after the longitudinal side edges have been folded over to provide a double thickness of material for the side walls;

Fig. 4 is a perspective view of an inside corner, somewhat enlarged, illustrating subsequent steps in the folding or setting-up of the box; and

Fig. 5 is a perspective view of the completed box corner.

Referring to the drawing in which like reference numerals represent like parts, Figs. 1–4 inclusive, for convenience, illustrate the invention with respect to a box cover, but the same explanation and description applies equally well to any box construction such as the box proper or base, the only substantial difference between the cover and the base being in the relative dimensions of the respective parts. In Fig. 1, is shown the preferred form of flat blank for a box cover, for example a shoe box cover, having the scoring and slitting indicated to define a central portion 2 (the inside surface of the box cover being shown) separated by the common double longitudinal scoring 3, from the side wings 4 which are in turn separated by the scoring 5 from the side wing flaps 6. Said side wings 4 and side wing flaps 6 have attached thereto at the ends thereof, extensions 8 and 9 which are separated from the side wings and side wing flaps respectively by the scoring 10 and 11. The scoring 10 may be the ordinary double scoring similar to that of 3 and 5, but the scoring 11 preferably comprises a single groove or channel of a width approximately equal to the distance between the outer edges of the scoring 10 and forming a slight convexity on the reverse side of the paper as shown at 21.

The extensions 8 and 9 are preferably separated for a major portion of their length by the slit 13, which extends from the point 12 approximately midway between the scorings 5 and adjacent the inner scoring 10 as indicated to the point 12a some distance back from the edge of the cardboard,—the slit 13 being parallel to the scorings 5. The scoring 14 forms a continuation of the scoring 5 commencing slightly inside the point 12a and running to the edge.

At the ends of the central portion 2, but separated therefrom by the scoring 15, are end wings 16, and attached thereto, though separated therefrom by the scoring 17, are the end wing flaps 18, said end wings and end wing flaps being separated from the extensions 8 by the slits 19 extending from between the scorings 3 to the edge as indicated in Fig. 2.

The box cover blank of Fig. 1 having now been completely scored and slit as described, is then fed to a pasting machine which applies a strip of paste 20 along the marginal edge of both side wing flaps 6 as indicated in Fig. 2. It will be noted that due to the concavity of the channel 11, the paste strip 20 is broken for the width of the channel 11, the cardboard at that portion not coming in contact with the paste applying means. After the pasting operation the blank is given a preliminary folding operation to provide a double layer for the side walls. In this operation the blank is folded along the lines of the scorings 5 and aligned slits 13 so that the two side wing flaps 6 are bent upwardly at right angles (from

the plane of the paper as viewed in Fig. 1) and then downwardly through a total angle of 180° so as to overlie in face-to-face contact the side wings 4, the extensions 9 being similarly folded so as to overlie in face-to-face contact the extensions 8 (see Fig. 3). Whatever pressure may be required to adhere the pasted portions 20 is applied during this operation and it will be noted that the entire marginal portion of the wing flaps 6 will be adhered to the wing 4 except at the channel groove 11 which will not adhere.

The flat blank with double layer side wall portions is now ready to be folded at the proper portions to set up the box base or cover. As indicated in Fig. 4 which shows enlarged the upper right-hand corner of the blank of Fig. 3, the blank is set up into completed form by first folding along the scorings 3 of the side wings 6 followed by the inward folding of the attached extensions 8 and 9 on the now contiguous scorings 10 and 11. When this takes place, the crease 11, because of its initial convexity, bulges inwardly in alignment with and opposite the inside corner of the outer layer thus moving away from the corner area between the scorings 10 and removing the surplus material around which the outer layer is required to bend, thereby relieving the tensile strain on the outer layer of the box cover.

By the provision of the slotted portion 13 which by the initial double layer side wall forming operation extends along the exposed edge of the side wall as shown, I enable the layer 8 to yield or slide a slight distance relative to the layer 9, particularly at the top near the crease. I have found that even though the layers 8 and 9 are joined both by the paste strip 20 and also integrally at the scored portion 14, yet there is opportunity for a limited sliding motion at and near the slit 13 which produces a slight bulge between the layers 8 and 9. It will be noted that as the slit 13 crosses the line of the crease on which the layers 8 and 9 are folded, and continues through the corner to the point 12, there is complete freedom for movement at the small portion where the crease formed by bending on the scoring 5 is again bent on itself when the layers 8 and 9 are turned in along the crease 10. As cracks are frequently initiated at this point of high strain, the provision of the slit 13 at that portion is particularly effective to prevent the formation of cracks. In this manner I have provided a still further means for relieving the tension on the outer layer 8 and so effectively insure against splitting or cracking of the corner that the end portions 8 and 9 could be bent even a full 180° without any tendency to give in the corner.

Following the bending-in of the extension as shown in Fig. 4, the end wings 16 with their flaps 18 are folded as shown along the respective scorings 15 and 17 so that the end wings 16 come into face-to-face contact with the extensions 8 and the end wing flaps 18 come into face-to-face contact with the extensions 9, a suitable adhesive being applied and the layers forming the end wall being pressed together as well known in the art. Fig. 5 illustrates the completely formed corner and it will be found in practice that a box cover constructed as described is capable of withstanding the hard usage to which boxes such as shoe-boxes are subjected by being roughly pulled from a stock of boxes by the clerk's pulling on the end wall of the cover. The invention is of equal applicability and use both for the box proper and box cover before mentiond and serves the same purpose to prevent the cracking or breaking out of the corners by reason of relieving the strains on said exterior corner areas.

Having described my invention, what I wish to claim and secure by Letters Patent is:

1. As an article of manufacture, a box structure having a substantially plane central portion bounded at opposite edges by side walls approximately perpendicular to the central portion, each of said side walls comprising two layers of material secured together, a double layer end extension on each of said side walls adapted to be bent inwardly to form the corner between an end and side wall of the box structure the inner layer having an inwardly bulging corner crease aligned with and opposite the inside corner portion of the outer layer thereby providing a corner relieving portion for said outer layer.

2. As an article of manufacture, a box structure having a substantially plane central portion bounded at opposite edges by side walls approximately perpendicular to the central portion, each of said side walls comprising a double layer of material formed by folding a marginal portion of the material on itself to form the exposed edge of the side wall, a double layer end extension on each of said side walls adapted to be bent inwardly to form the corner between an end and side wall of the box structure, the inner layer having an inwardly bulging corner crease aligned with and opposite the inside corner portion of the outer layer thereby providing a corner relieving portion for said outer layer.

3. As an article of manufacture, a box structure having a substantially plane central portion bounded at opposite edges by side walls approximately perpendicular to the central portion, each of said side walls comprising a double layer of material formed by folding on itself and adhering together a marginal portion of the material to form the exposed edge of the side wall, a double layer end extension on each of said side walls adapted to be bent inwardly to form the corner between an end and side wall of the box structure, the inner layer having a non-adhering inwardly bulging corner crease aligned with and opposite the inside corner portion of the outer layer thereby providing a corner relieving portion for said outer layer.

4. As an article of manufacture, a box structure having a substantially plane central portion bounded at opposite edges by side walls approximately perpendicular to the central portion, each of said side walls comprising a double layer of material formed by folding a marginal portion of the material on itself to form the exposed edge of the side wall, a double layer end extension on each of said side walls, adapted to be bent inwardly to form the corner between an end and side wall of the box structure, said layers being disconnected by a slit extending from the corner along a portion only of the said exposed edge longitudinally of the end wall whereby the layers forming the end wall may have a slight relative movement at and near the corner during the corner folding operation.

5. As an article of manufacture, a box structure having a substantially plane central portion bounded at opposite edges by side walls approximately perpendicular to the central portion, each of said side walls comprising a double layer of material formed by folding a marginal portion of the material on itself to form the exposed edge of the side wall, a double layer end extension on each of said side walls adapted to be bent inwardly to form the corner between an end and

side wall of the box structure, said layers being disconnected by a slit extending along a portion of the said exposed edge from the corner longitudinally of the end wall whereby the layers forming the end wall may have a slight relative movement at and near the corner during the corner folding operation and the inner layer having an inwardly bulging corner crease aligned with and opposite the inside corner portion of the outer layer thereby providing a corner relieving portion for said outer layer.

6. As an article of manufacture, a box structure having a substantially plane central portion bounded at opposite edges by side walls approximately perpendicular to the central portion, each of said side walls comprising a double layer of material formed by folding a marginal portion of the material on itself to form the exposed edge of the side wall, a double layer end extension on each of said side walls adapted to be bent inwardly to form the corner between an end and side wall of the box structure, said layers being disconnected by a slit extending from the corner along a portion only of the said exposed edge longitudinally of the end wall whereby the layers forming the end wall may have a slight relative movement at and near the corner during the corner folding operation and the inner layer having an inwardly bulging corner crease aligned with and opposite the inside corner portion of the outer layer thereby providing a corner relieving portion for said outer layer.

WILLIAM S. JACKSON.