

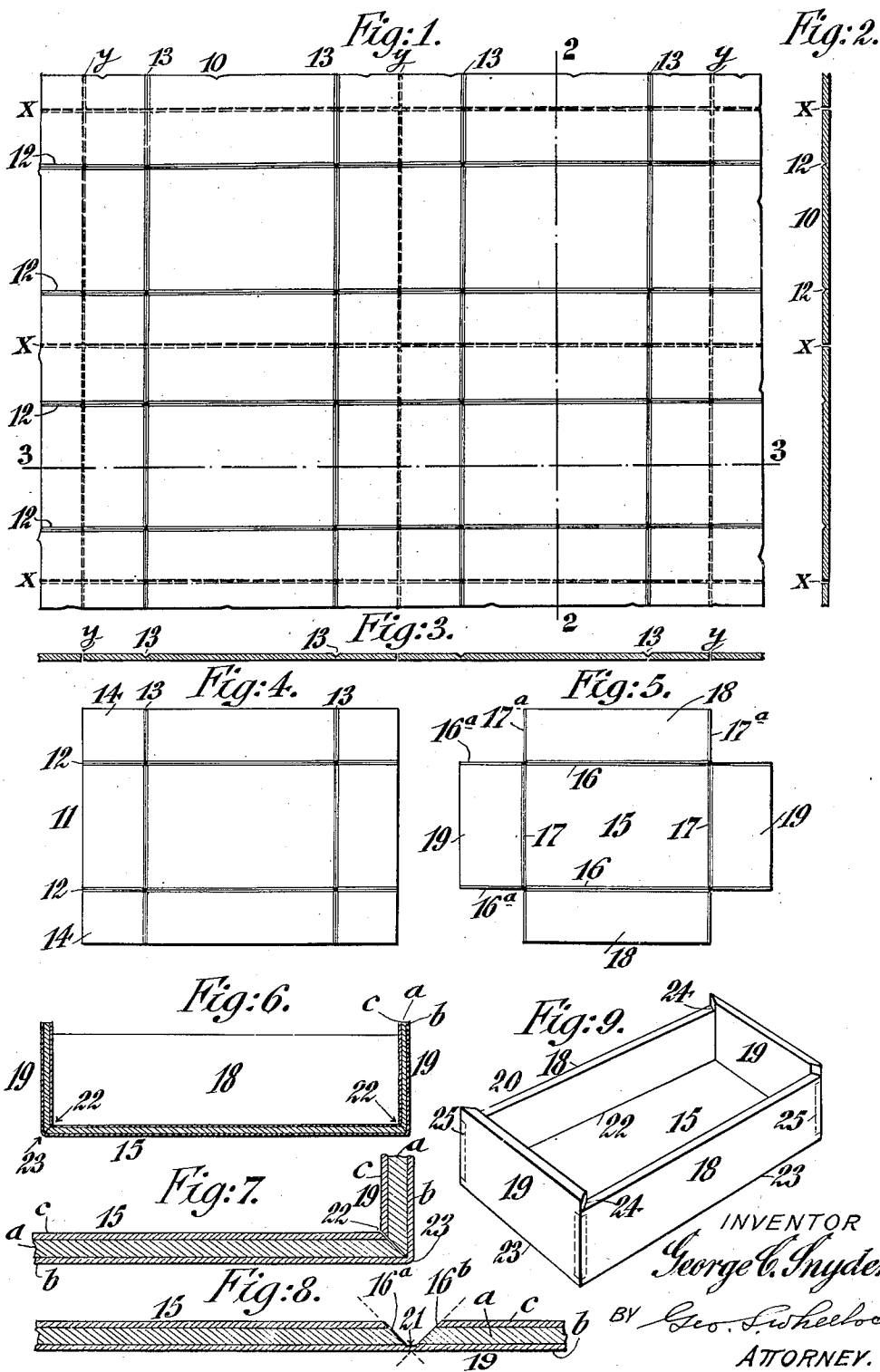
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G. C. SNYDER

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BOX AND METHOD OF MAKING THE SAME

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GEORGE C. SNYDER, OF LONG ISLAND CITY, NEW YORK, ASSIGNOR TO THE GUARDIAN TRUST COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO

BOX AND METHOD OF MAKING THE SAME

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This invention relates to boxes, and more particularly to cigar boxes and the like, made preferably entirely or largely of laminated paper board. In my prior application, Serial No. 260,787, filed March 10, 1928, of which this application is a partial division and continuation there are disclosed various forms of boxes as well as the preferred laminated construction of the main bodies of such boxes and the preferred methods of manufacture. Said application, however, does not disclose specially constructed cigar boxes.

Aforesaid application discloses a method of making boxes, including providing fabricated solid paper board having tough and strong surface material capable of being bent to an angle without breaking, cutting a groove into the opposite surface of the board so as to produce complementary bevels at both sides of the groove, and spacing the bevels apart at the bottom of the groove; an object of such method being to enable the formation of a box with relatively sharp unbroken edges and to enable bends to be made at such edges without danger of breaking apart the walls of the box.

Another object of the invention is to provide through the medium of such method a box blank of pre-formed paper board, including a core of material having a substantially complete finishing of superficial material which is superior in toughness and strength to the material of the core, and is of less depth than the thickness of the core, the blank being provided with grooves extending through the core approximately up to such superficial material, the toughness and strength of the superficial material being such that it may be bent into angles without breaking when the board is so bent from opposite sides of the grooves as to bring the side surfaces of the grooves into abutment.

Another of the objects of the present invention is to provide a precision box body which may readily be made so as to be absolutely smooth on the inside, with sharp angular inside corners, some of the outside corners being preferably not so sharp.

Another object of the invention is to provide an all paper cigar box body, the paper being laminated to form solid flat laminated stock, and the box body being so constructed as to form a substantially rigid and efficient box body for withstanding the pressure of cigars packed therein, which box body may, if desired, be formed with ends which are relatively high as compared with the sides of the box, as is now the common practice, and which body may be provided with any suitable lid and any suitable fastening.

Further objects of the invention are to provide improved laminated stock, preferably for cigar boxes, to provide suitable blanks for forming such boxes, and to provide an economical method of making such boxes.

With these and other objects in view the present invention consists of certain features of construction and combinations of parts, as well as the method, to be hereinafter described and then claimed with reference to the accompanying drawings illustrating desirable embodiments of the invention and in which:

Figure 1 is a plan of laminated stock from which a number of box blanks may be made, the edges of the view being formed on broken lines indicating an indefinite size of stock;

Fig. 2 is a cross-section on the line 2—2, Fig. 1, showing the stock severed to form blanks;

Fig. 3 is a section on the line 3—3, Fig. 1, also showing severed stock;

Fig. 4 is a plan of a blank before its corners have been removed;

Fig. 5 is a plan of the completed blank;

Fig. 6 is a longitudinal sectional view showing an improved cigar box body;

Fig. 7 is an enlarged fragmentary view of Fig. 6;

Fig. 8 is a broken cross-section of the stock showing how grooves are formed therein, and

Fig. 9 is a perspective view of the improved cigar box body.

Referring to Figs. 1 to 4 inclusive, a sheet 10 of solid and compact paper board or the like represents a large sheet of indefinite size

in the flat. The sheet may be of such size as to include a number of fields, such as 11, Fig. 4, within the area of each of which a box-body blank is to be formed. The sheet is composed of laminated paper material, in any suitable number of laminations, three laminations *a*, *b* and *c* of solid, flat, sheets of paper being shown in Fig. 8, the cross-sections Figs. 2 and 3 not admitting of such clear illustration as Fig. 8. One way of making laminated material is fully disclosed in my aforesaid application. Thereby the paper board may be made on the job; or the laminated paper board may be supplied from a board mill to the box manufacturer. The outer laminations *b*, *c* may be of any suitable sheet material, such as kraft or jute paper, which is tough and strong, while the interior lamination *a* may be of any suitable inferior grade of sheet or sheets of paper such as chip paper, preferably of greater thickness than the outer laminations so as to provide for the finished box a body of reasonably thick paper board. It is obvious that other materials might be used in place of paper or supplementing paper.

In order to lay out the laminated sheet or stock 10 into fields such as the one 11, Fig. 4, the sheet is first provided at one surface with grooves 12 which extend in one direction and grooves 13 which intersect the grooves 12 and extend substantially at right angles thereto. Hence each field, such as 11, is similarly grooved. The grooving may be performed substantially as in my aforesaid application, and the portion of the sheet which corresponds with each field 11 is defined by lines of separation *x*, *y* in the sheet, which are indicated in broken lines in Fig. 1 and in full lines in Figs. 2 and 3. This means that the sheet 10 is severed at *x*, *y*, into field portions 11 along intersecting lines which are parallel with the grooves 12 and also parallel with grooves 13, so that each of the field portions or incomplete blanks severed from the sheet will be shaped and grooved substantially as represented in Fig. 4, wherein rectangular corner-portions 14 are present between the adjacent ends of grooves 12, 13.

The grooving may, for example, be done by adapting suitable cutters to well known scoring machines, the severing of the sheet into field portions such as 11 being done in any suitable way. Each field portion 11 is then subjected to such cutting action as to remove each of the four corners 14, so that the result is a box-body blank, such as shown in Fig. 5. Such blank comprises a rectangular main body portion or panel 15 which is bordered by grooves 16, 17, and the body portion 15 is, at the other side of the grooves, provided with flaps, extensions or panels 18, 19, four in number, separated by rectangular spaces which are left by removing the corner

portions 14 of the partially completed blank shown in Fig. 4.

Now referring again to Fig. 8 it will be seen that the depth of each groove is such as to extend through at least one lamination of the laminated sheet material, the drawing showing that the groove extends into two laminations *c*, *a*. The cutting of each groove 12, 13 of the laminated sheet is preferably such that not only is each groove of angular shape in cross-section, but the side walls 16*a*, 16*b* of each groove 16 (and the same for each groove 17) are cut at right angles the one to the other. The intersecting broken lines in Figure 8 indicate that the planes of the side walls intersect at the opposite surface of the sheet and not within the confines of the sheet, so as to leave a slight necessary space between the closest points of the opposed bevels to facilitate the desired form of bend along the lines of the grooves without breaking the material of the blank when bent. This rule should be approximately followed for forming bevel joints, whether the ungrooved portion be thick or thin, in order that when the sides of the material at the grooves are brought together to form a mitre joint there must remain sufficient material at the opposite sides of each groove to place the material at each joint under slight compression when a box body is bent up into ultimate formation and the flaps of the extensions are secured; and further so that the outer face shall not dangerously break or crack on the line of the bend. From Fig. 5 it will be noted that when the corner-portions 14 of the partially formed blank of Fig. 4 are removed, one side of each adjacent groove has been removed, so that of the grooves 16, only the half section 16*a* at each lateral edge of flaps 19 remains, and the same is the case with respect to the groove 17, as only the half groove 17*a* remains at each lateral edge of the flaps 18. To do this the cut for the corner removal is made directly between and parallel with the side walls of the groove.

Consequently, the laminated flat blank of Fig. 5 will have complete grooves 16, 17, bordering the main portion or panel 17, while the lateral edges of the flaps or panels 18, 19 will each have but one-half of a groove. In other words, the angular grooving forms bevels at each side of a groove, preferably at a forty-five degree angle to the plane of the blank, and the lateral edges of the flaps 18, 19 are each beveled at a forty-five degree angle to such plane.

The precision blank herein shown and described is admirably adapted for forming into the bodies of cigar boxes, for example, as thereby a cigar box manufacturer can readily make up box bodies and complete the boxes by the use of machines and tools which are readily available. To form up a box body 20 as shown in Figs. 6, 7 and 9 the main

body portion 15 may be held in some suitable manner, and the flaps or panels 18, 19 folded over in the direction of the grooves in the blank until the same are at right angles to the main panel or body portion 15. Glue may be previously applied to the beveled edges of the flaps or panels 18, 19, and the flaps being suitably held in position and pressed together at their side edges, vertical seams will be formed at the corners of the box body. The blank may have been previously so deeply cut, as shown in Fig. 8, that some of the material of the outer lamination *b* may be removed, as at 21, especially if the said outer lamination be of sufficiently thick tough paper.

In bending up the blank the outer lamination is to form the outer one of the box to be constructed, and when the said lamination is bent, from the outside inwardly, and the beveled surfaces or walls at the grooves 16, 17 brought together, a closed miter joint 22 is formed, (Figs. 6 and 7), the outer lamination *b* extending around and forming thereat a slightly rounded edge 23 at each of the four edges of the bottom of the box. If desired glue may be previously applied to the beveled surfaces of the grooves 16, 17, but this is unnecessary when the lateral beveled edges of the flaps or panels 18, 19 are brought together at right angular corners, and glued together or secured in some other fashion.

It will be seen that when the box blank is bent to shape a box-body, the beveled walls of the grooves 16, 17 will abut directly together and determine the right angular position of the bent up flaps or panels with respect to the body portion 15. A little pressure should be used preferably, so as to form absolutely closed joints 22, and also to hold the adjacent lateral edges of the flaps or panels in position to form right angular corners for the box. It will be seen that the main panel 15 of the blank ultimately forms the bottom of the box-body and that the side and end panels 18, 19 of the blank eventually form the respective side and end walls of the box-body. When the beveled edges of the side and end walls are secured together at the corners of the box body, vertical seams 24 are formed in the laminated box-body, or in other words in the outer lamination. The inner laminations may possibly be so formed at the vertical seams as not to be beveled, but to nevertheless abut and form rigid corners to the box. Instead of, or together with, glue in the vertical seams at the corners of the box-body, ordinary corner stays 25 of thin paper or other suitable material may be glued to the outside of the corners, over the seams, to reinforce them as indicated in dotted lines in Fig. 9, this being done either by hand or by a suitable corner stay applying machine after the box has been set up. A suitable lid and fastening may then be ap-

plied to the box body for completing the box.

While the present invention comprehends broadly, laminated stock or box board shown and described, (and claimed in part at least) it will be seen that a most important feature of this invention, whether the stock or board is made with the described laminations or in any other suitable manner, or with other suitable material, for an embodiment of that feature, resides in the use of stock or board wherein at least the surface which is to become the outside surface of the box is formed by superficial material of suitable slight depth, and which, as compared with the heart or core exemplified by the intermediate layer *a*, is preferably much stronger, tougher and more durable; and in any event is pliable without breaking or cracking when bent at substantially a right angle or in a sharp curve, which cannot be said of the material of the heart or core of preferred inferior material. Excellent advantage is taken of these characteristics of such surface paper-material when the stock or board is grooved in a manner like or substantially equivalent to the grooving specifically shown, as in such case the outer corners of the box will not visibly break or crack, but will follow sharp curves or lines of bends which are sustained by the resistance afforded by the abutting edges of the right angularly disposed portions of the walls at points within the intact outer corners, and there will therefore preferably be no strain on the said corners.

Obviously the present invention is susceptible to more or less modification, not only with respect to the method, but in other respects without departing from the spirit of the invention as defined in the appended claims.

What I claim as new, is:

1. A box blank, of laminated sheet material having a rectangular main body, and flaps extending from the four side boundaries of the main body, the blank having grooves which define such boundaries, the side walls of the respective grooves being at substantially right angles to each other and the grooves meeting at the spaces between the flaps, said groove side walls being spaced away from each other, at their closest points, and the inner side walls of such grooves being extended along the side edges of the flaps to provide correspondingly beveled edges.

2. A box formed from a preformed blank of paper board having a rectangular main body and flaps, the flaps extending from the four side boundaries of the main body and joined together in abutment at the vertical edges of the box to provide the box with side walls and end walls, and the paper board including a core of material relatively inferior in quality but of substantial thickness and having a substantially complete finishing of relatively slight depth at the outside of the

box which is of superficial material superior in toughness and strength to the material of the core, and which is bent on unbroken lines throughout the length of the bottom edges of the box, the core having, at the bottom of the box, edges with complementary bevels arranged in abutting relation out to the bends of the superior material, so as to sustain such bends, and the abutting edges of the side and end walls being also beveled to the same degree.

3. A box having integrally connected walls disposed at angles to each other, such walls being composed of preformed paper board including a core of material relatively inferior in quality but of substantial thickness and having a substantially complete finishing of relatively slight depth at the outside of the box which is of superficial material superior in toughness and strength to the material of the core, and which is bent on unbroken lines, at those edges of the box which are located outside the core, the core having, at such angles, edges with complementary bevels arranged in abutting relation out to the bends of the superior material so as to sustain such bends.

4. A box blank, comprised of preformed paper board including a core of material relatively inferior in quality but of substantial thickness and having a substantially complete finishing of superficial material which is superior in toughness and strength to the material of the core, and is of less depth than the thickness of the core, the blank being provided with straight grooves extending through the core approximately up to the superficial material, the toughness and strength of the superficial material being such that it may be bent into angles without breaking when the board is so bent from opposite sides of the grooves as to bring the side surfaces of the grooves into abutment.

5. The method of making boxes, including providing fabricated solid paper board having relatively tough and strong surface material capable of being bent to an angle without breaking, cutting a groove into the opposite surface of the board so as to produce complementary bevels at both sides of the groove, and spacing the bevels apart at the bottom of the groove.

6. The method of making boxes, including providing fabricated solid paper board having relatively tough and strong surface material capable of being bent to an angle of ninety degrees without breaking, cutting a groove into the opposite surface of the board so as to produce complementary bevels at both sides of the groove, spacing the bevels apart at the bottom of the groove, extending the cutting to a depth such that the spacing shall provide sufficient width of the surface material to withstand bending until

the complementary bevels contact with each other, and the planes of inclination of the bevels being caused to substantially intersect at the exterior of the surface material.

7. The method of making boxes, including providing fabricated solid paper board having relatively tough and strong surface material capable of being bent to an angle of ninety degrees without breaking, cutting a groove into the opposite surface of the board so as to produce complementary bevels at both sides of the groove, spacing the bevels apart at the bottom of the groove, cutting other similar grooves into the so cut surface to thereby provide the necessary grooves for a plurality of box walls in a single blank, bending the blank on the lines of the grooves until the complementary bevels of the respective grooves contact with each other, and so forming the box with relatively sharp unbroken outer surfaces on the lines of the bends in the said surface material.

GEORGE C. SNYDER.