H. L. STALEY & W. B. SIMMONS.

SHIPPING BOX.

APPLICATION FILED MAY 7, 1915.

1,162,524. Patented Nov. 30, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

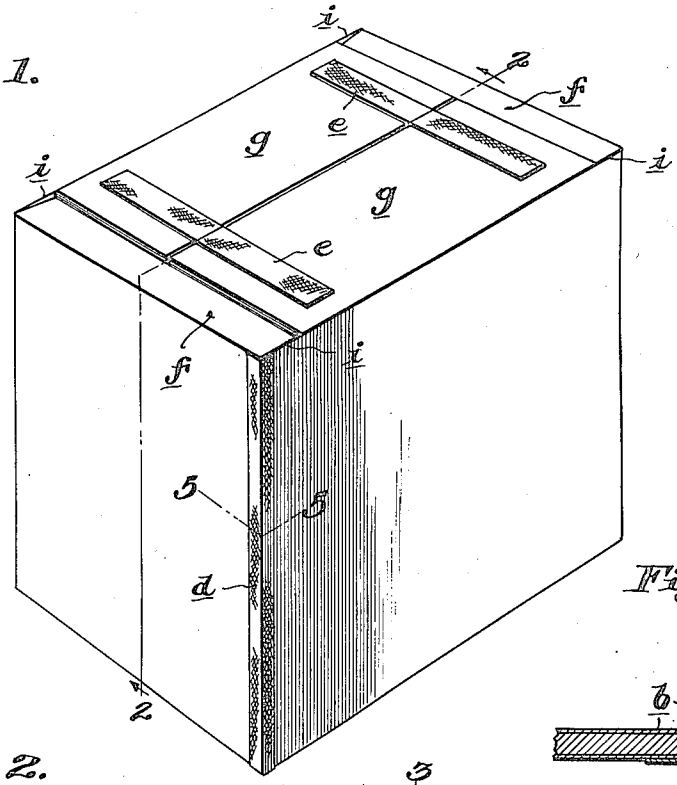


Fig. 5.

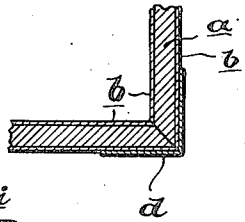


Fig. 2.

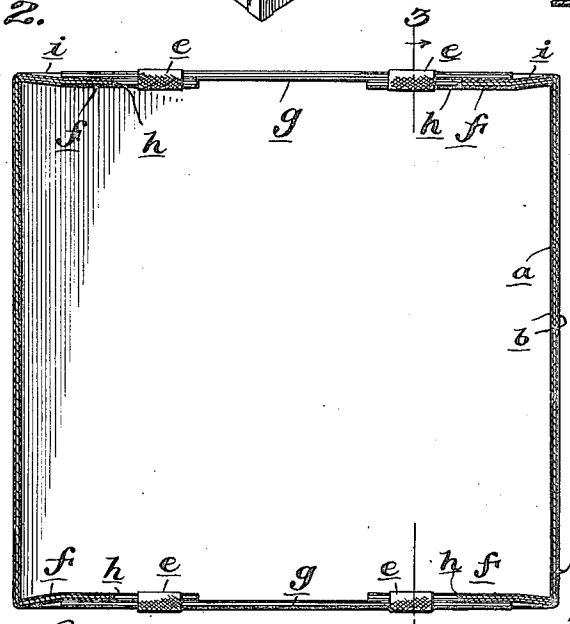
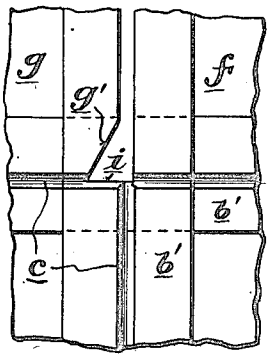


Fig. 11.



Witness

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2 SHEETS—SHEET 2.

Fig. 3.

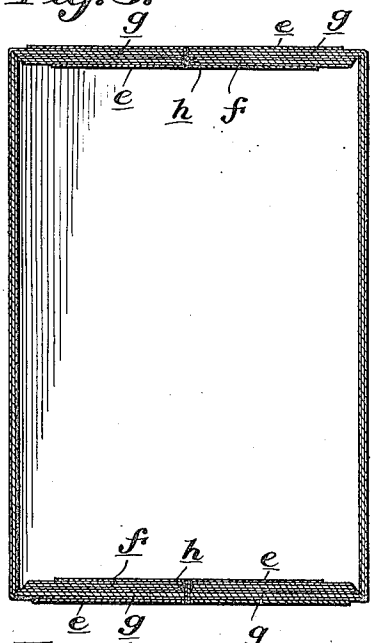


Fig. 4.

Fig. 6.

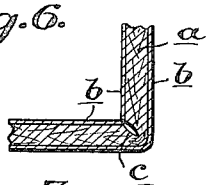


Fig. 7.

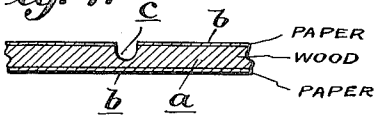


Fig. 8.

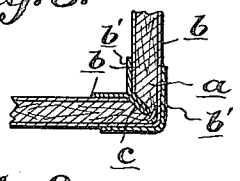
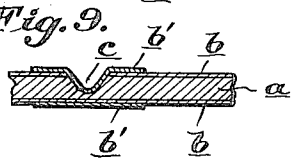


Fig. 9.



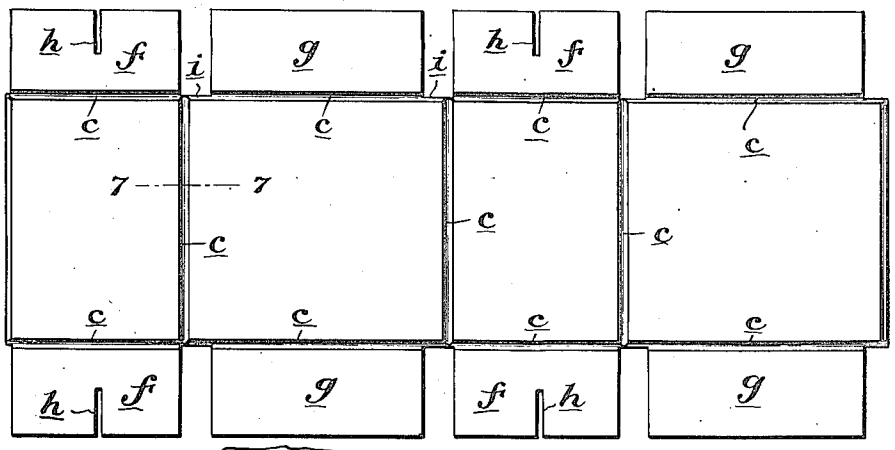
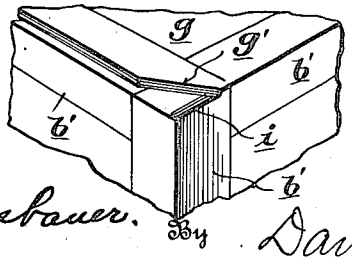


Fig. 10.



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UNITED STATES PATENT OFFICE.

HARRISON L. STALEY, OF MARTINSVILLE, INDIANA, AND WALTER B. SIMMONS, OF RICHMOND, VIRGINIA, ASSIGNORS TO WILTS VENEER COMPANY, OF RICHMOND, VIRGINIA, A CORPORATION OF NORTH CAROLINA.

SHIPPING-BOX.

1,162,524. Specification of Letters Patent. Patented Nov. 30, 1915.

Application filed May 7, 1915. Serial No. 26,523.

To all whom it may concern:

Be it known that we, HARRISON L. STALEY and WALTER B. SIMMONS, citizens of the United States of America, and residents, respectively, of Martinsville, county of Morgan, and State of Indiana, and Richmond, county of Henrico, and State of Virginia, have invented certain new and useful Improvements in Shipping-Boxes, of which the following is a full and clear specification, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of our shipping box closed and sealed; Fig. 2 a vertical sectional view on the line 2—2 of Fig. 1; Fig. 3 a vertical sectional view on the line 3—3 of Fig. 2; Fig. 4 a perspective view of the blank in the flat; Fig. 5 a horizontal sectional view on the line 5—5 of Fig. 1; Figs. 6, 7, 8 and 9 detail sectional views showing two varieties of corner bends; and Figs. 10 and 11 detail views of a modification.

This invention relates to that type of shipping cases or boxes formed of a single blank scored longitudinally and transversely to form panels and end flaps, the panels forming the side walls of the box and the end flaps the multi-ply top and bottom walls; and the object of this invention is to produce a box which shall be inexpensive to manufacture and which shall have a much greater rigidity than the laminated corrugated paper-board box now extensively used for shipping and packing purposes.

The material of which the blank is formed consists of a thin sheet of veneer of wood *a* having adhesively affixed to each of its faces a sheet of paper *b*, these paper sheets extending over the entire area of the wood sheet. The sheet of wood is ordinary veneer and is, therefore, by itself too weak and flimsy for use as a box-board, and, besides, it would present a comparatively rough interior surface, which in many cases would prevent it being used for shipping and packing boxes. The paper sheets are glued to the wood sheet under a heavy, preferably plunger, pressure and they are thereby brought into intimate contact with the wood and form virtually a part thereof, the product being in reality a composite veneer. We employ tough, flexible, unenameled paper, so that under the heavy pressure employed the fibers of the paper will fill up the exterior interstices in the surface of the wood. The glue is applied preferably in a cold and liquid state, so that it becomes practically absorbed into the wood and paper. Composite veneer made in this manner can be cut or sawed in the same manner as ordinary three-ply veneer, and it may also be grooved or gouged out along the fold lines without peeling or tearing away the paper from the wood.

Instead of merely scoring the blank along the fold lines thereof, as is usually done with this type of box, we gouge or cut out grooves *c*, these grooves forming the fold lines of the panels and flaps. The box is folded up and secured in the usual or in any improved manner. Along the meeting edges of the panels we apply the usual adhesive fastening strip *d*, and the flaps are fastened in the usual overlapped relation by means of adhesive tapes *e*. The flaps *f* are folded so as to form the inner layers of the top and bottom walls, and the other flaps *g* are folded over upon the said flaps *f* to form the outer plies of the top and bottom walls, these flaps *g* being long enough to bring their edges together along the longitudinal center of the box. These outer flaps *g* are fastened together and to the inner flaps *f* by the tapes *e* heretofore mentioned.

A preferred manner of applying the tapes is to cut slits *h* in the flaps *f*, paste the ends of the tapes to the under surface of the flaps *f* and extend the tapes up through the slits and between the opposing edges of the flaps *g*, and then paste the tapes down on the upper surfaces of the flaps *g*. In this way the flaps are securely fastened together in a very simple and inexpensive manner.

In order to prevent the side edges of the outer flaps *g* from pressing down on the top edges of the adjacent vertical walls of the box, we cut back the edges of these flaps so that when they are folded into position they lie upon the outer flaps *f* at a point remote from said adjacent vertical walls of the box. Thus shortening the flaps *g* forms a shoulder *i* at each end of the flap and brings the side edges of the flap inside of, and out of alinement with, the adjacent transverse fold grooves *c*, while both side edges of the inner flaps *f* are directly in alinement with said transverse fold grooves.

In this way, when the outer flaps are pressed down on the under flaps, direct pressure on the upper edges of the adjacent side walls is avoided, and all liability of rupture of the flaps along their hinge-like connection with the panels is avoided. It will be seen that by thus bringing the pressure of the top flaps upon the under flaps at a point back from the edges of the box, the under flaps are permitted to yield inwardly far enough to permit the upper surfaces of the top flaps to be approximately on a level with the upper edges of the vertical walls of the box, as shown particularly in Figs. 1 and 2. Thus cutting back the side edges of the outer flaps is rendered especially necessary in view of the nature of the material of which our box is formed.

The grooves *c* are cut through one layer of paper and approximately two-thirds or three-fourths of the way through the wood sheet, the uncut part of the wood and the uncut paper sheet on the other side serving as a hinge-like connection which will permit the blank to be readily folded into box form. We greatly prefer that the groove shall be approximately of U shape in cross section, as shown in Figs. 6, 7, 8 and 9, so that when the fold is made, sharp bending of the wood fiber and the paper will be avoided, thus enabling us to make a smooth, strong corner-fold; whereas, with a V-groove, the uncut wood fibers would be bent at a sharp angle and would thus be greatly weakened, which would render it likely that rough usage of the box in transportation would rupture the box along the corner-folds. With the U shaped grooves, however, the fibers will be bent on a curve, thus reducing the weakening of the fibers to a minimum, thereby providing a corner-fold which will have ample strength to resist all the usual strains boxes of this type are subjected to.

It will be understood that with this method of making the box, we are able to use a wood sheet of the thinness of the usual veneer sheet, that is, a sheet which is so thin that by itself it is so flimsy and flexible as to be of no value as a box-board; in other words, it will be understood that it is essential that the wood sheet shall be so thin as to have sufficient bending flexibility to bring into effect the reinforcing qualities of the two paper sheets.

A box made in accordance with our invention will be much cheaper to make than the veneer boxes now on the market and will have ample rigidity for shipping many commodities now shipped in the more costly veneer boxes and ordinary board boxes. Such a box possesses the same advantage as the well known pasteboard box in that it has a smooth all-paper interior finish, thereby rendering it unnecessary to use an extra paper lining in shipping certain products. It will be observed that the paper interior finish is practically continuous, as the folding of the panels and flaps brings the cut edges of the paper together in abutting relation, as shown in Fig. 6.

As shown in Figs. 10 and 11, it is not necessary that the flaps *g* shall have their ends cut back the full width of the flap. As shown in these figures, it will be sufficient to simply remove the portion of the edge of the flap adjacent to the body panel, as shown at *g'*, as it is only necessary to prevent excessive pressure of the folded flap upon that part of the vertical wall adjacent to the hinge of the flap. When pressure is thus removed from that part of the vertical wall adjacent to the hinge, the flexibility of both the upper and the lower flaps will permit them to yield sufficiently to fold into position.

When it is desired to make a particularly strong box, the box may be greatly strengthened by pasting tapes *b'*, of paper or cloth, preferably paper, along the fold lines, these tapes being placed either inside or outside of the fold, as shown in Figs. 8, 9, 10 and 11. The inner tape will be pasted down in groove *c*, following the contour thereof, the tape being wide enough to have its edges extend a short distance away from the groove and be pasted to the inner face of the inner paper layer *b*. It will be observed that the tapes *b'* tie down the adjacent edges of the main sheets *b* and form virtually continuations thereof, the sheets *b* and the tapes *b'* forming together a continuous paper covering for the interior of the box. It will be observed that these tapes greatly reinforce the hinge-like fold and materially strengthen the box against rupture along the fold lines. It will be observed that the U-groove *c*, when an inner tape is used, is made a little wider than is shown in Fig. 7, this being rendered necessary because when the parts are folded the two layers of the paper will be inclosed between the folded edges, as shown in Fig. 8. Thus inclosing two layers of the paper tape between the beveled edges of the folded walls provides a cushion which extends along all the corner-folds of the box, thereby enabling the box to resist the strains due to the rough usage that shipping cases usually receive in transportation. It will be seen also that the inner tape *b'*, being on the interior of the box, will be at all times protected against abrasion, so that even should the outer tape and the outer layer *b* of paper be disrupted in transportation, the corner of the box would still be sufficiently strong for ordinary usage.

It will be understood that the outer flaps *g* may be fastened in place by any other suitable tape arrangement, and it will be understood also that these flaps may be fastened

by being glued to the end flaps *f*. When the flaps *g* are glued to the flaps *f*, the manner of cutting back the edges of the flaps *g* shown in Figs. 10 and 11 will be especially desirable, in that the edges of the flaps *g* will extend practically to the end walls of the box so that the flaps *f* will present a more substantial support against which the flaps *g* are glued.

It will be further understood that it is important that the glue or other adhesive shall be of the slow-setting kind, as otherwise the adhesive would set, at least in spots, before absorption by the paper and wood and thus prevent that complete and intimate contact of the paper and wood which is essential to a perfect product. In our experiments so far, we have used an adhesive which does not become brittle when set, and we believe that an adhesive of this kind is the best for the purpose, since an adhesive which becomes brittle when set would tend to crack under flexing strain and would thus be apt to separate the paper from the wood.

Having thus described our invention, what we claim is:

1. A shipping case or box, constructed of a single folded blank consisting of a thin flexible sheet of wood having adhesively fastened to each of its faces a covering of tough flexible paper, the fold lines in the blank being made by a groove cut into the intermediate wood body, the width of the groove being such that when the blank is folded to form a box the inner paper covering is brought into closely abutting relation along each groove to thereby provide an all-paper interior surface and close cushioned joints along all the fold lines.

2. A shipping case or box, constructed of a single folded blank consisting of a thin flexible sheet of wood having adhesively fastened to each of its faces a covering of tough flexible paper, the fold lines in the blank being made by a groove cut into the intermediate wood body, said groove being approximately U-shaped in cross-section, the width of the groove being such that when the blank is folded to form a box the inner paper covering is brought into closely abutting relation along each groove to thereby provide an all-paper interior surface and close cushioned joints along all the fold lines.

3. A shipping case or box constructed of a single folded blank, this blank consisting of a thin flexible sheet of wood having adhesively fastened to each of its faces a sheet of tough flexible paper, the fold lines in the blank being made by a groove cut through one of the sheets of paper and into the intermediate wood body, a flexible tape being pasted down in each of said grooves, the edges of the tape extending over upon and being pasted to the adjacent margins of the inner paper layer so as to form virtually a continuation thereof, the width of the groove being such that when the blank is folded to form a box the tape part of the inner paper layer will be folded upon itself to form a close, reinforced, cushioned joint along each fold line.

4. A shipping case or box constructed of a single folded blank, this blank consisting of a thin flexible sheet of wood having adhesively fastened to each of its faces a sheet of tough flexible paper, the fold lines in the blank being made by a groove cut through one of the sheets of paper and into the intermediate wood body, a flexible tape being pasted down in each of said grooves with its edges extending over upon the adjacent edges of the inner paper layer, to which layer it is permanently pasted, and a reinforcing strip or tape *b'* pasted along each of the fold lines on the exterior of the outer paper sheet, for the purposes set forth.

5. A shipping case or box, constructed of a folded blank consisting of a thin, flexible sheet of wood having adhesively fastened to each of its faces a covering of tough, flexible paper, the fold lines of the blank being each made by a groove cut into the intermediate wood body and the inner covering of paper being adhesively fastened down in each of said grooves, the width of each groove being such that when the blank is folded to form a box the inner paper covering in the groove is also folded and brought into closely abutting relation along each groove to thereby provide an all-paper interior surface and close cushioned joints along the fold lines.

In testimony whereof we hereunto affix our signatures this 24th day of April, 1915.

HARRISON L. STALEY.
WALTER B. SIMMONS.

Witness:
CHARLOTTE B. BULL.