No. 651,982. Patented June 19, 1900.

H. B. SMITH.

METHOD OF SHAPING PAPER BOX BLANKS.

(Application filed Mar. 8, 1900.)

(No Model.)

Fig. 1.

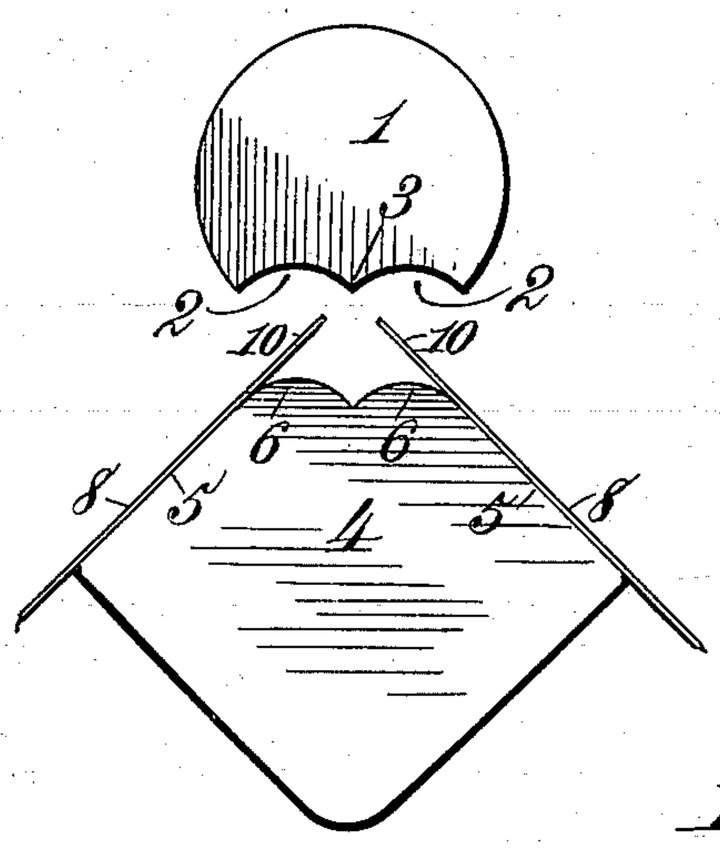


Fig. 2.

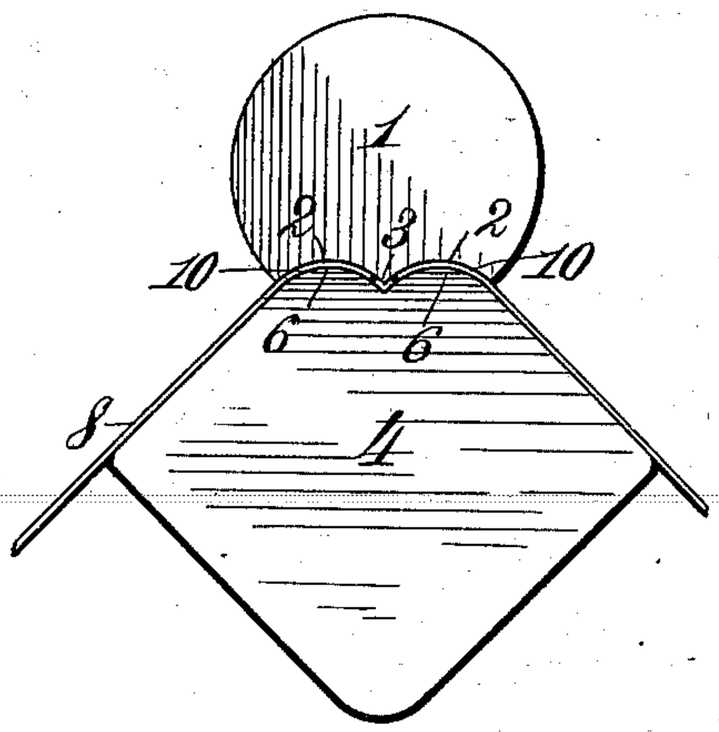


Fig. 3.

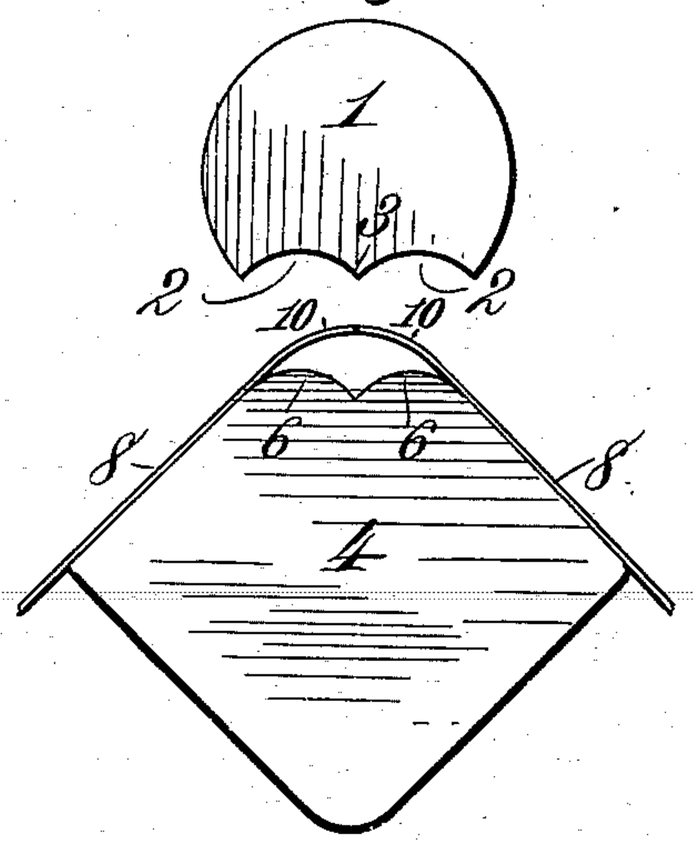
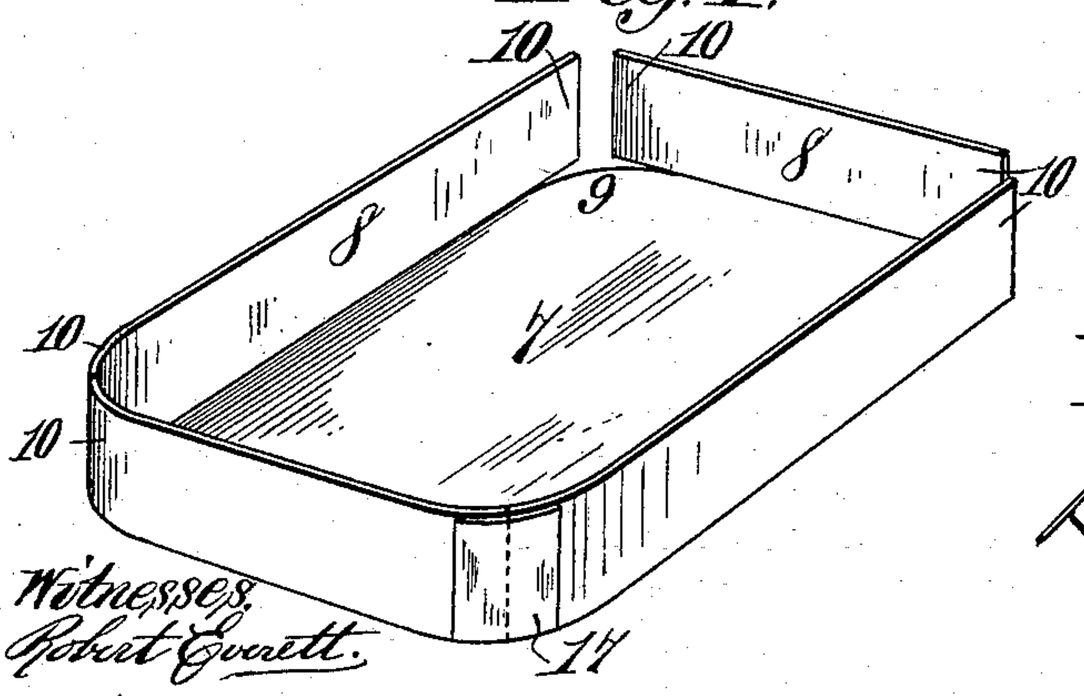


Fig. 4.



Witnesses.
Robert Everett.
W. H. Clarke

Fig. 5.

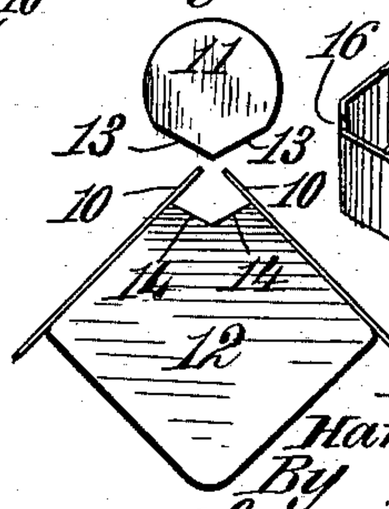
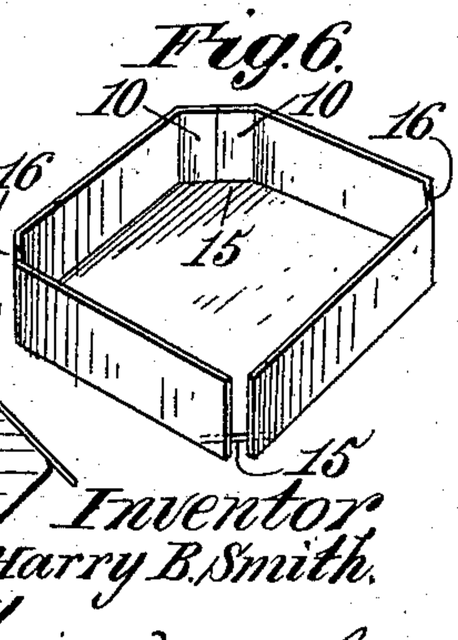


Fig. 6.



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By
J. Granville Meyers
Attiy.

UNITED STATES PATENT OFFICE.

HARRY B. SMITH, OF NEW YORK, N. Y.

METHOD OF SHAPING PAPER-BOX BLANKS.

SPECIFICATION forming part of Letters Patent No. 651,982, dated June 19, 1900.

Application filed March 8, 1900. Serial No. 7,802. (No model.)

To all whom it may concern:

Be it known that I, HARRY B. SMITH, a citizen of the United States, residing at New York, (Brooklyn,) in the county of Kings and State of New York, have invented certain new and useful Improvements in Methods of Shaping Box-Blanks in the Manufacture of Paper Boxes, of which the following is a specification.

The present invention relates to an improved method of shaping the corners of ornamental boxes, and especially paper boxes having cut-away corners.

In the manufacture of paper boxes of the character referred to it is necessary that all the bent ends of the boxes be secured in place by corner-stays or by an exterior covering-strip or the like.

In an application for Letters Patent filed by me on the 11th day of November, 1899, and serially numbered 736,661, I show and describe a box having cut-away corners, the flaps forming the sides of the box being so formed that when bent into shape their ends abut one another and conform to the configuration of the cut-away portions, said ends being secured together by metallic or other stays applied thereto simultaneously with the shaping operation and operating to hold the ends of the flaps in place.

It is the prime object of the present invention to provide a novel method of manufacturing paper boxes of the character described in my said former application for patent by means of which paper stays may be employed in the place of metallic stays before referred to and by means of which the bent ends of the flaps are caused to retain their shape while the adhesive employed for cementing the stays in place is drying, whereby the corners may be formed with great rapidity, accuracy, and uniformity.

To these ends my invention consists in the novel method hereinafter described, and particularly pointed out in the claims following the description, reference being had to the accompanying drawings, forming a part of this specification, and wherein I have shown simple means for carrying the method into practical effect.

In the said drawings, Figure 1 is an end view of a male and female die adapted to manufacture boxes having round corners, a box-blank being shown in place on the female die before the ends of the flaps have been operated on by the male die. Fig. 2 is a similar view showing the parts in the position they assume after the male die has pressed the flaps onto the female die. Fig. 3 is a similar view showing the male die retracted and the flaps in their finished shape. Fig. 4 is a perspective view of a box, two of the corners being shown before they have been bent up into shape and the other two corners being shown as having been bent up into shape. Fig. 5 is a view similar to Fig. 1, illustrating dies for the formation of angular corners; and Fig. 6 is a view similar to Fig. 4, showing a box having angular cut-away corners.

In order that the invention may be clearly and readily understood, it should be explained that in applying paper corner-stays or similar fastenings to the ends of boxes having cut-away corners the ends or flaps after they have been bent into the shape they are to permanently assume have to be held in such shape while the stay is being pasted thereto and while the paste is drying. Otherwise, owing to the inherent elasticity or resiliency of the paper-stock, the ends or flaps will spring outward and apart in an endeavor to assume their original shape and will become separated from the stay, and even if the paste or adhesive should succeed in resisting such tendency of the flaps to spring outward and apart their meeting ends are apt to form an abrupt angle or juncture, spoiling the symmetry of the corner and giving it an unsightly appearance, while at the same time rendering the stay liable to rupture.

By means of my improved method of shaping the corners the disadvantages and objections referred to are entirely obviated, as will be readily understood.

Referring to Figs. 1 to 3 of the drawings, the numeral 1 indicates a male die, the operative face of which is constituted by two parallel longitudinal grooves or corrugations 2, the inner adjacent edges of which unite to form a central longitudinal rib 3 the opposite edges of which are concaved, as shown. Each of said grooves or corrugations is formed on the arc of a common circle having arcs comprising the same number of degrees.

The numeral 4 indicates the female die, preferably rectangular or triangular in cross-section and having straight converging sides 5, disposed at a right angle to one another and forming a rest or support for the side of the box. The operative face of the female die is formed of two parallel longitudinal ribs or beads 6, convex or partially cylindrical in cross-section, as shown, and corresponding in contour to the concave grooves or corrugations of the male die.

Referring to Fig. 4, the numeral 7 indicates the bottom of the box, and 8 the sides thereof. As shown in said figure and as described in my said previous application for patent, the corners of the bottom are cut away and rounded, as at 9, and the ends of the flaps 10 are cut off transversely in such manner that when they are bent or curved to conform to the cut-away rounded corners of the bottom of the box their adjacent ends will just abut.

In shaping the corners the box is placed on the female die, as shown in Fig. 1, and the male die is moved downward thereon until it assumes the position shown in Fig. 2, and strong pressure being applied to the male die the flaps 10 will be bent by said dies into the shape shown in Fig. 2, or, in other words, the flaps 10 will be bent beyond or past the edge of the rounded corner of the bottom 9 or beyond or past the shape they are designed to finally and permanently assume. The male die is then retracted, releasing the flaps, when by the inherent elasticity or resiliency of the paper-stock the flaps will spring outward, assuming the position shown in Fig. 3, which is the shape of the finished corner. This shape will be maintained by the flaps, owing to the fact that the pressure to which they were subjected to between the dies has in a measure deprived them to a certain extent of their elasticity or resiliency or has in a degree overcome such elasticity or resiliency. The paper corner-stays after the flaps have been bent up or shaped in the manner described may now be pasted or otherwise cemented to the corners without any extraneous means being resorted to for clamping the flaps in place, said flaps retaining their shape during the pasting operation and while the paste is drying or setting, as set forth. Boxes having angular cut-away corners may in similar manner be constructed.

Referring to Fig. 5, the numeral 11 indicates the male die, and 12 the female die. The operative face of the male die is formed by two flat converging faces 13, arranged at an obtuse angle to one another, as shown, while the operative face of the female die is formed by two flat faces 14, which are parallel to the faces 13 of the male die.

The box shown in Fig. 6 is similar to that before described and shown in Fig. 4, excepting that the cut-away corners 15 of the bottom of the box are rectilinear instead of rounded. The box having been placed on the female die, as shown, the male die is caused to descend, its flat faces pressing the flaps 10 down against the flat faces 14 of the female die or forcing said flaps beyond or past the edge of the cut-away corner and beyond the shape they are designed to finally and permanently assume. The male die is then retracted, upon which the flaps 10 by their inherent elasticity or resiliency will assume the position shown in Fig. 6, which is the shape of the finished corner. The paper stay may then be applied to the corner of the box in the manner before described.

It will be evident to those skilled in the art that other means may be employed for carrying my improved method into effect and that boxes having ornamental cut-away corners of various configurations or fanciful shapes may be made in the manner described, and I do not claim in this application either the boxes or the means employed for making or shaping the corners, nor do I confine or limit myself thereto.

In the foregoing description I have referred to the means for fastening the ends of the flaps to form the completed corners as consisting of paper corner-stays which overlap the ends of the flaps and are pasted thereto; but it will be manifest that other forms of fastening devices may be employed for the purpose. For example, strips of paper may be passed entirely around and pasted to the sides of the box or the usual outer covering of paper may serve the same purpose, and when so employed I wish to have it understood that I include such as being comprehended in the term "stays."

Having described my invention, what I claim is—

1. The method herein described of shaping the flaps of box-blanks in the manufacture of boxes having cut-away corners, consisting in bending the ends of the flaps past or beyond the shape they are intended to finally and permanently assume and then releasing said flaps to permit them to assume the desired shape, substantially as described.

2. The method herein described of shaping the flaps of box-blanks in the manufacture of boxes having cut-away corners, consisting in first bending up at right angles the sides of the box-blank having cut-away corners, then bending inwardly the ends of the flaps past or beyond the edges of the cut-away corners, and finally releasing said flaps to permit them to assume their desired final and permanent shape, substantially as described and for the purpose specified.

3. The method herein described of shaping the cut-away corners of boxes, consisting in bending the ends of the flaps inward past or beyond the cut-away corners of the box-blank, then releasing them to permit said flaps to assume their desired final and permanent shape, and finally affixing stays thereto, substantially as described.

4. The method herein described of shaping the cut-away corners of boxes, consisting in

bending the ends of the flaps inward past or beyond the cut-away corners of the box-blank, subjecting said flaps to pressure on opposite sides while in said position, and then releasing said flaps to permit them to assume their desired final and permanent shape, substantially as described and for the purpose specified.

5. The method herein described of shaping the cut-away corners of boxes, consisting in first bending up at right angles the sides of the box-blank having cut-away corners, then bending the ends of the flaps inwardly toward one another, and finally affixing stays thereto by an adhesive, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HARRY B. SMITH.

Witnesses:
PHILIP S. SMITH,
JULIUS LEHRENKRAUSS, Jr.