No. 648,638. Patented May 1, 1900.

H. B. SMITH.

DIE FOR BOX STAYING MACHINES.

(Application filed Dec. 21, 1899.)

(No Model.)

Fig. 1.

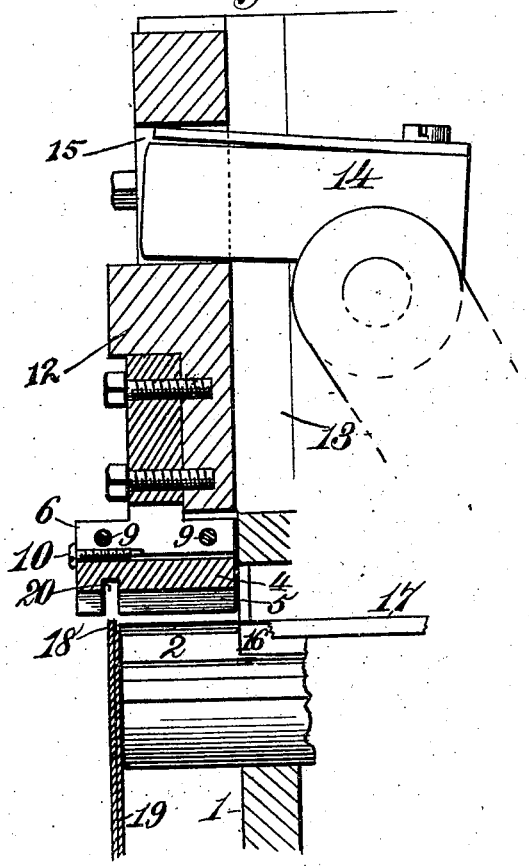


Fig. 2.

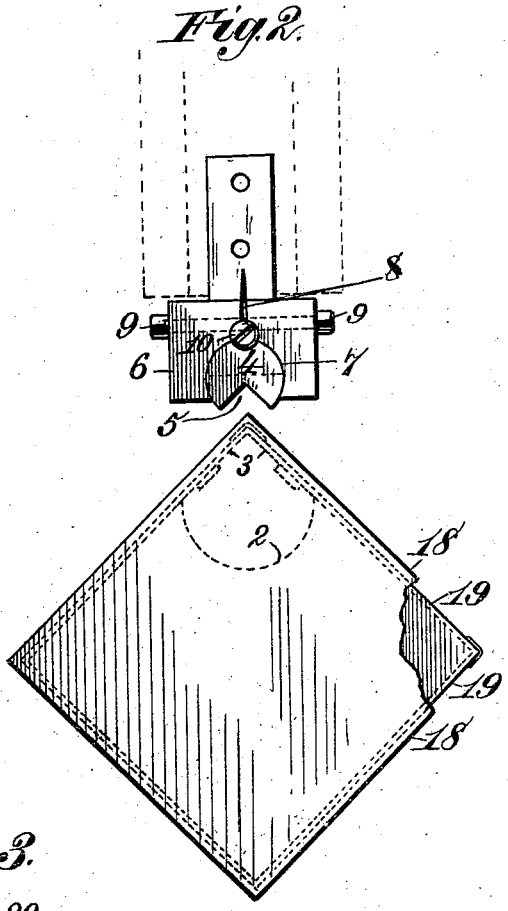


Fig. 3.

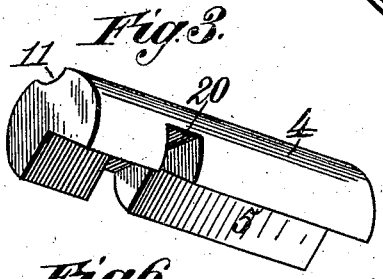


Fig. 4.

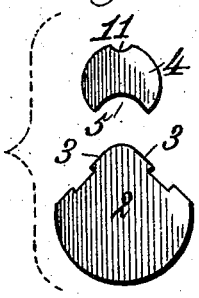


Fig. 5.

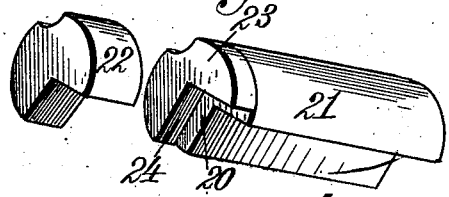
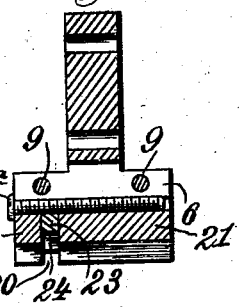


Fig. 6.



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UNITED STATES PATENT OFFICE.

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

DIE FOR BOX-STAYING MACHINES.

SPECIFICATION forming part of Letters Patent No. 648,638, dated May 1, 1900.

Application filed December 21, 1899. Serial No. 741,077. (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 Dies for Box-Staying Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to machines for applying the corner-stays to the edges of paper boxes; and it has for its object to provide an improved die for use in connection with such machines by means of which the corner-stays may be readily, accurately, and expeditiously applied to the corners of boxes having extended bottoms—that is to say, boxes the bottoms of which project laterally beyond the sides of the box.

It also has for its object to provide a die of the character described that is adapted to apply the corner-stays to boxes of different heights.

To these ends my invention consists in a die constructed and operating in the manner 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.

For the purpose of more clearly explaining the construction and purpose of my improved die and the manner of using the same I have illustrated such portions of a well-known type of box-jointing machines as appears to be necessary or best suited for the purpose, the machine selected for the purpose being that shown in the patent to M. D. Knowlton, No. 447,955, and dated March 10, 1891. It will be understood, however, that said machine forms no part of this invention, which resides entirely in the die, and that said die is equally well adapted for use in various other well-known machines of the same general type or in any machine which may be preferred and which is suitable for the purpose in hand.

I will briefly describe so much of said machine as will be necessary to explain the operation of my improved die and the construction of the latter in detail, reference being had to the accompanying drawings, wherein—

Figure 1 is a vertical sectional view of a portion of the machine. Fig. 2 is a front elevation of a portion thereof, showing the box in position for receiving a corner-stay. Fig. 3 is a detail perspective view of my improved die. Fig. 4 is an end view of my improved die constructed to apply stays to boxes having round corners and showing the anvil for receiving the impact of the die. Fig. 5 is a detail perspective view of a modification showing the die made in sections, and Fig. 6 is a detail sectional view showing the manner of securing the sections of the die in place on the machine.

In the type of machine herein illustrated a stationary anvil is employed, over which the corners of the box are successively placed, while the clamping-die is arranged to reciprocate above and toward and from the anvil, the strip from which the corner-stays are made being fed endwise between the die and anvil and is severed into proper lengths by a cutting edge formed on the end of the die, acting in conjunction with a stationary die-cutter. The anvil is adjustable endwise with relation to the frame of the machine and the die-cutter, so as to accommodate itself to boxes of different heights.

Referring to the drawings, the numeral 1 indicates the frame of the machine, and 2 the anvil, constructed in the form of a rod or bar and supported horizontally in the frame of the machine, as most clearly shown in Figs. 1 and 2 of the drawings. The anvil extends at its outer end through and beyond the frame 1 and is secured therein by any suitable means, so that it may project more or less to any desired distance beyond the vertical face of the frame. In the construction shown the anvil is made semicircular on its under side and is provided on its upper side with flat working faces 3, arranged at right angles to each other, with their apex or meeting edge uppermost.

The numeral 4 indicates the die, consisting of a rod provided on its under side with a longitudinal V-shaped groove 5, corresponding in configuration and dimension to the angular working face 3 of the anvil. The

die is grasped and rigidly secured in a vertically-movable support constructed as follows:

The numeral 6 indicates a block having a longitudinal groove or recess 7 formed in its under side, said groove or recess being partially cylindrical in cross-section—that is to say, the walls of the groove or recess are formed on the arc of a circle of approximately two hundred and seventy degrees, or at least greater than one hundred and eighty degrees. The block is split or divided centrally in line with said groove or recess, as at 8, and passing transversely through said block are screws 9. The die 4 is inserted endwise in the groove or recess 7 of the block and is prevented from turning axially therein by a screw 10, which is screwed into the end face of the block and projects into a groove 11, formed in the upper side of the die. After the die has been inserted in the block the screws 9 are tightened up, thereby tightly clamping the die in place. The block is attached to and carried by a slide 12, arranged to reciprocate vertically in suitable ways formed in a head-block 13, supported on the frame of the machine. The slide is reciprocated by a pivoted bell-crank lever 14, oscillated by any suitable means, the short arm of said bell-crank lever being loosely fitted in a slot 15, formed in the slide.

Fixed over the inner portion of the anvil 2 is an inverted-V-shaped die-cutter 16, so arranged relatively to the reciprocating die 4 that the outer end of the die-cutter will lie in close proximity to the inner or rear end of the die when the latter descends.

In practice the sides of the corner of the box to be stayed are placed on the anvil 2, with the bottom of the box resting against the end of the anvil. The stay-strip 17, which may consist either of a metallic or paper strip or tape, is fed endwise between the die and anvil either by hand or any suitable feed mechanism and the die caused to descend. As the inner or rear end of the die moves past the face of the die-cutter 16, it shears off or severs the stay from the strip or tape, and the die immediately thereafter forcibly presses the stay down upon and about the corner of the box supported on the anvil. If the paper stay is employed, it will have a suitable adhesive applied to its under side, and if a metallic stay be used suitable fastening devices will be provided—as, for example, by punching or indenting the stay, whereby burs or small prongs are formed on the under side of the stay, which enter or penetrate the sides of the box and are flattened down on the anvil by the die. The stays are of course successively applied to the other corners of the box in like manner.

All the parts constructed and operating in the manner above described are old and well known and form no part of the present invention, but must necessarily be clearly understood in order to fully understand the purpose and operation of my improved die, which I will now describe.

A die constructed as above described is not suited for applying corner-stays to boxes having extended or laterally-projecting bottoms, as shown in Figs. 1 and 2, wherein the numeral 18 indicates the laterally-projecting bottom of the box, and 19 the sides of the latter, owing to the liability of the die upsetting, mashing down, or otherwise distorting or injurying the projecting portion of the bottom of the box, and in order to adapt the die to such boxes I form a transverse slot or mortise 20 in the under side of the die, which intersects the V-shaped groove 5 and forms a recess into which the extended portion of the bottom of the box is adapted to project without touching any portion of the die and which permits the working faces of the die to engage and forcibly press the stay about the corner of the box throughout the length of the box, thereby avoiding all injury to the extended bottom of the box. As shown most clearly in Fig. 2 of the drawings, the transverse slot or mortise 20 extends to at least the center of the die, while the bottom of the V-shaped groove does not extend to the center, thereby affording room for the corners of the extended bottom to enter the recess without coming in contact with the body of the die. As most clearly shown in Figs. 1 and 3, the slot or mortise 20 is formed in the die intermediate the longitudinal center of the latter and one of its ends, thereby dividing the die into two portions of unequal length, by which arrangement the die is adapted to apply stays to boxes of two different depths or having sides of two different heights. It will be evident that when the die is arranged as shown in Fig. 1 the die will operate to cut off a stay from the strip 17 and apply it along the entire length of the corner of a box the sides of which are coextensive with that portion of the die extending from the recess 20 to the inner end of the die and that the extended portion of the bottom 18 of the box will project into said recess, and thereby escape injury. By removing the die, reversing it end for end, replacing it, and then adjusting the anvil 2 inward the machine is adapted for applying stays to boxes the heights of which are equal to the shorter portion of the die in manner the same as that before described. In this manner the same die may be employed for severing the stays and for applying them to boxes of different sizes.

In Figs. 5 and 6 I have shown a modified construction of die, wherein instead of making the die in a single integral piece it is made in separate sections. Referring to said figures, the numerals 21 and 22 respectively indicate the two sections of the die, each having the same general configuration as the die before described, but of less length, the two sections being of unequal length, as shown in Fig. 5. Arranged between the adjacent

ends of the sections 21 and 22 is a distance-block 23 of the same general shape in cross-section as the said sections having the V-shaped groove 5^a cut deeper therein than in the sections, whereby when the parts are assembled to form a complete die a V-shaped recess 24 is formed between the adjacent ends of the die corresponding to the recess 20, before described, and in which the extended portions of the bottom of the box are adapted to project. The die-sections are secured in a block 6 in the same manner as the die 4, before described, the screw 10^a in this form of the device extending along substantially the entire length of the die to permit the reversal of the sections. By removing the die-sections and reversing them end to end it is evident that the die will be suited to boxes of different sizes in the same manner as the die 4.

It will be obvious that stays may be applied to boxes having rounded corners by making the working face of the anvil rounded and correspondingly shaping the groove in the die, as shown in Fig. 4.

Having described my invention, what I claim is—

1. A die for applying corner-stays to boxes having extended bottoms, said die having a longitudinal groove and a transverse slot or mortise intersecting said grooved portion to form a recess for the reception of the extended portion of the bottom of the box, substantially as described.

2. A die for applying corner-stays to boxes having extended bottoms, said die having a longitudinal groove and a transverse slot or mortise intersecting said grooved portion to form a recess for the reception of the extended portion of the bottom of the box, said slot or mortise being formed between the longitudinal center and one end of the die, substantially as described and for the purpose specified.

3. A die for applying corner-stays to boxes having extended bottoms, said die having converging walls on its under side to provide a longitudinal groove and a transverse slot or mortise intersecting said grooved portion and being of a depth greater than that of the groove to form a recess for the reception of the extended portion of the bottom of the box, substantially as described.

4. A die for applying corner-stays to boxes having extended bottoms, said die having a longitudinal groove and made in separable sections, and a segmental distance-block interposed between the adjacent ends of the sections and forming a recess for the reception of the extended portion of the bottom of the box, substantially as described.

5. A die for applying corner-stays to boxes having extended bottoms, said die having a longitudinal groove and made in separable sections, of unequal length, and a distance-block interposed between the adjacent ends of said sections and having a groove formed in its periphery corresponding in shape to but of greater size than the groove in the die-sections, substantially as shown and described and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

HARRY B. SMITH.

Witnesses:
PHILIP S. SMITH,
DIEDRICK ABBES.