A. WORCESTER.

PIECING MACHINE FOR PAPER BOX BLANKS.

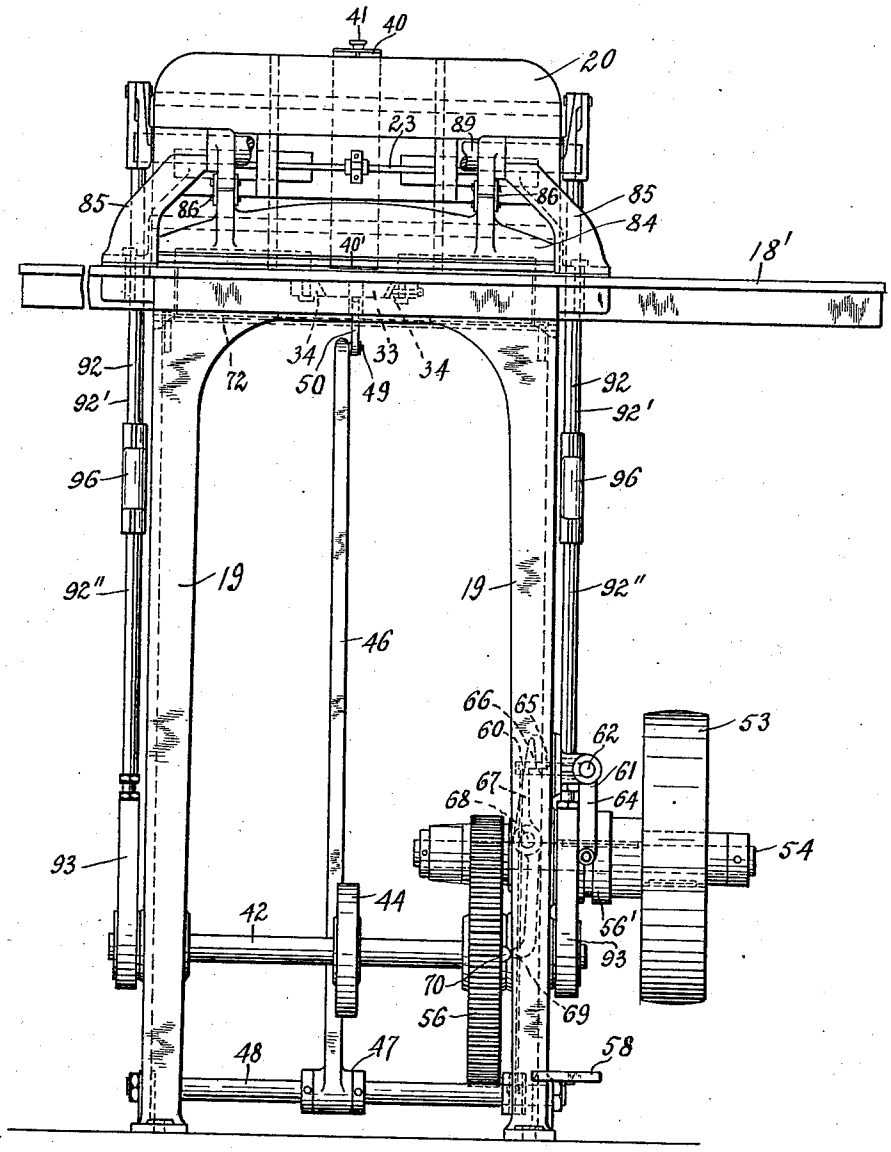
APPLICATION FILED FEB. 15, 1912.

1,041,554.

Patented Oct. 15, 1912.

3 SHEETS—SHEET 1.

Fig. 1.



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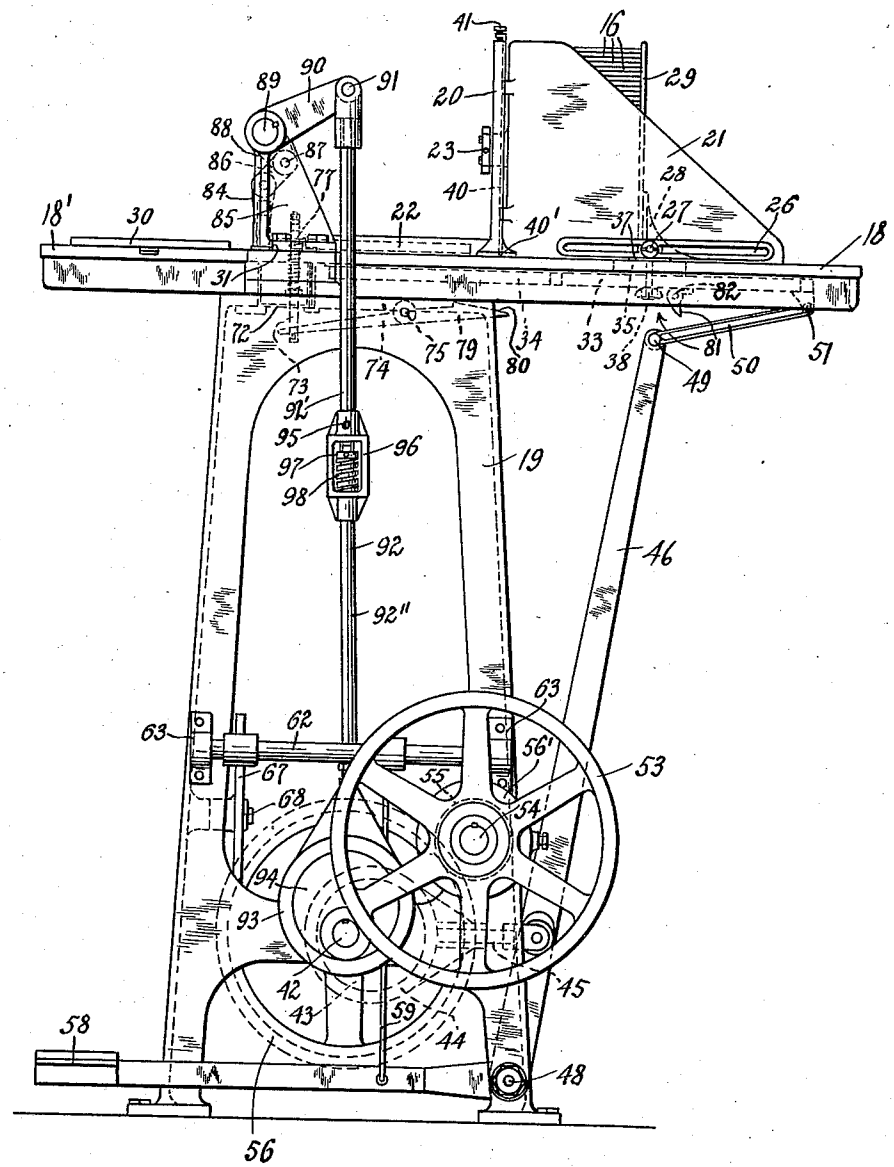
3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 4.

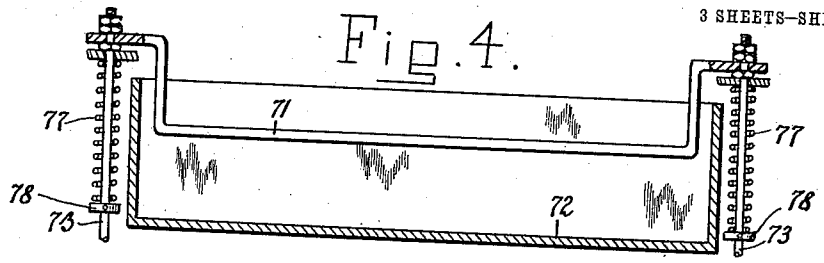


Fig. 3.

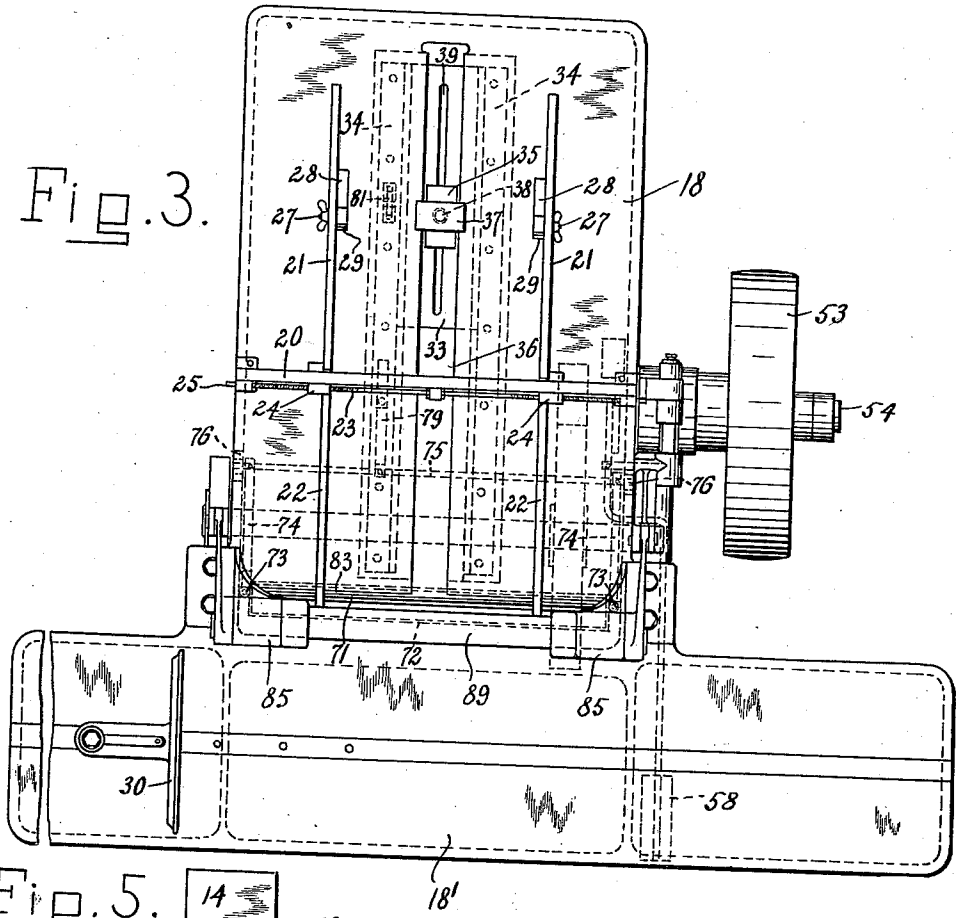


Fig. 5.

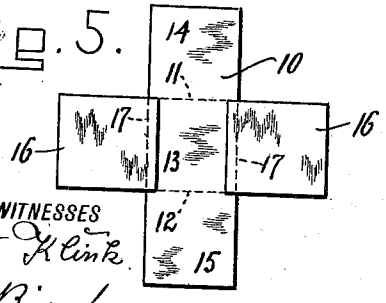
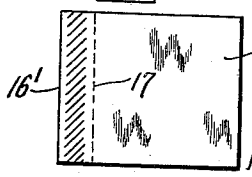


Fig. 6.



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PIECING-MACHINE FOR PAPER-BOX BLANKS.

1,041,554. Specification of Letters Patent. Patented Oct. 15, 1912.

Application filed February 15, 1912. Serial No. 677,652.

To all whom it may concern:

Be it known that I, ALBERT WORCESTER, a subject of the King of England, and resident of the city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Piecing-Machines for Paper-Box Blanks, of which the following is a specification.

The present invention relates to a piecing machine for paper-box blanks.

One of the objects of the invention is to provide a simple and efficient machine, by means of which a piecing of paper-box blanks, which had been done as far as known heretofore by hand, is performed in a quick and reliable manner.

With these and other objects in view, which will more fully appear as the nature of the invention is better understood, the same consists in the combination, arrangement and construction of parts hereinafter fully described, pointed out in the appended claim and illustrated in the accompanying drawings, it being understood that many changes may be made in the size and proportion of the several parts and minor details of construction within the scope of the appended claim without departing from the spirit or sacrificing any of the advantages of the invention.

One of the many possible embodiments of the invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a front elevation of a piecing machine constructed in accordance with the present invention; Fig. 2 is a side elevation thereof; Fig. 3 is a plan view of the same; Fig. 4 is a sectional view of the paste applying mechanism; Fig. 5 is a plan view of the pieced paper-box blank; and Fig. 6 is a similar view of one of the pieces thereof.

In order to make the objects and operation of the machine clear, first the box blank shown in Fig. 5 of the drawings will be described. This blank is formed of a piece of card board, indicated by the numeral 10; said card board being scored along lines 11 and 12 on its underside. By so scoring the blank, it is divided into three sections, of which the middle section 13 forms the bottom of the box, and the sections 14 and 15 two sides thereof. The other two sides of the box are formed by pasting to the middle section 13 of the piece 10 pieces 16, 16, which are scored on their undersides along lines 17, 17, said scored lines coinciding, when the blank is finished, with the edges of the section 13.

Referring now more particularly to Figs. 1 to 4, inclusive, the numeral 18 designates a substantially horizontal table, which is, as shown in Fig. 3 of the drawings, T-shaped. This table is mounted upon a frame-work, comprising standards or legs 19, 19, to which the said table may be fastened by screws or otherwise in the well known manner. Upon the table is mounted a transverse stationary plate 20, which, together with the longitudinally arranged side plates 21, 21, forms a receptacle into which a stack of pieces 16, 16 is placed, as clearly shown in Fig. 2 of the drawings. The side plates 21, 21 are provided with longitudinal extensions 22, 22, which extend in front of the stationary plate 20 toward the pressing means hereinafter to be described.

The size of the receptacle holding the stack of pieces 16 is made adjustable. For this purpose a screw threaded transverse rod 23 is rotatably mounted upon the transverse plate 20, the threads upon said rod meshing with screw threaded blocks 24, 24, which are attached to the side plates 21, 21. The screw threads run in opposite directions upon this rod from its ends toward its middle line, and, for actuating said rod, one of its ends is squared, as shown at 25, to be engaged by a wrench or other suitable tool. By this arrangement, the width of the receptacle may be varied in the well known manner, its length being adjustable by providing the said plates 21, 21 with slots 26, 26, through which extend clamping screws 27 in engagement with blocks 28, 28, to which vertical guide strips 29, 29 are attached.

The card board pieces 10 are placed by hand one after the other upon the front portion 18′ of the table 18, the proper position of said pieces being assured by providing said table with a stop 30, the position of which may be adjusted according to the requirements, and against which one of the smaller sides of the piece 10 is placed, while the larger side of said piece will be brought to abut against stops 31, 31 in rear of the stop 30. The pieces 16 are fed from their receptacle above described to the portion 18′

of the table by a feeding device, which comprises a feeding bar 33, reciprocatably arranged upon the underside of the table 18 in guides 34, 34. Upon this feeding bar is mounted a block 35, which is slidably arranged in a longitudinal slot 36 in the table 18, and carries a feeding blade 37 upon the upper surface of the table. The feeding blade and the block are attached to the feeding bar 33 by a set screw 38, and their positions may be varied, as the sizes of the card board pieces 16 vary, by providing said bar 33 with a longitudinal slot 39, which is engaged by the clamping screw 38. As the feeding bar 33 is reciprocated in a manner hereinafter to be described, the feeding blade 37 will push the lowermost of the stack of pieces 16 toward the front end of the machine, said pieces being guided in their movement by the longitudinal extensions 22, 22 of the side plates 21. The transverse plate 20 must, of course, be arranged some distance above the upper surface of the table to permit of such motion of the pieces 16. To prevent the feeding of more than one piece 16 at a time, a vertical strip 40 is carried by the transverse plate 20 in such a manner that the position of its lower edge 40′ relative to the upper surface of the table may be adjusted as the thicknesses of the card boards to be fed vary. The adjusting means comprises, for instance, a set screw 41.

Reciprocating motion is imparted to the feeding bar 33 from a driving shaft 42, which is rotatably mounted in the standards 19, 19, and to which is keyed or otherwise attached an eccentric 43, the strap 44 of which is connected by means of a link 45 to a lever 46, which is pivoted at 47 to a stationary tie-rod 48, the latter connecting the standards 19, 19. The upper end of the lever 46 is pivotally connected at 49 with one end of a link 50, the other end of which is pivoted at 51 to the feeding bar 33. Motion is imparted to the driving shaft 42 by the intermediary of a pulley 53, rotatably mounted upon a shaft 54, and connected with a gear 55 by means of a suitable clutch 56′. The gear 55 meshes with a gear 56, which is keyed to the shaft 42. The clutch is adapted to be actuated by a treadle 58, which is fulcrumed to the tie-rod 48. This treadle is connected by means of an actuating bar 59 with the arm 60 of a bellcrank lever 61, the latter being rigidly attached to a rocking shaft 62, which is mounted in bearings 63, 63, carried by the standards 19. The arm 64 of the bell crank lever 61 engages the clutch 56′. By depressing the treadle 58, the pulley 53 will be connected with the gear 55, whereby the driving shaft 42 will be rotated. The rocking shaft 62 is provided with a projection 65, which, when the treadle is depressed, is engaged by the nose 66 of a two armed lever 67. The lever 67 is fulcrumed at 68 to one of the standards 19, and provided upon its lower end with a cam-shaped face 69, resting normally against the face of the gear 56. The face of this gear is provided with a lug 70, which in its rotation will act upon the cam-shaped end of the lever 67 and force the same into a vertical position, as shown in Fig. 1 of the drawings, disengaging thereby its nose 66 from the projection 65 upon the shaft 62, whereby the clutch is shifted, preferably under the action of a spring, and the driving connection between the shaft 42 and the pulley 53 discontinued.

Paste is applied to the underside of the piece 16 between its edge 16′ and the score line 17 while the piece 16 is being fed toward the piece 10. The means for applying the paste comprises a bar 71, which is normally arranged in a paste trough 72, the latter being fastened to the underside of the table 18 under the stops 31, 31. This bar is carried by two supporting rods 73, 73, which are pivotally attached to levers 74, 74, the latter being rigidly fastened to a rocking shaft 75, which is journaled in bearings 76 upon the underside of the table 18. The supporting rods 73, 73 are guided in their up and down movements by the frame of the machine, and the transverse bar 71 is normally kept in the trough 72 by springs 77, 77, which bear against the frame of the machine and against disks 78 upon the spindles 73. To the rocking shaft 75 is furthermore fixedly attached an arm 79, having an inclined upper face 80 in the path of a cam 81, which is attached to the feeding bar 33. This cam is pivoted to the said feeding bar at 82 in such a manner that it is adapted to swing in the direction of the arrow, shown in Fig. 2 of the drawings, but cannot move in the opposite direction beyond the position shown in Fig. 2 of the drawings. When the paste board piece 16 is being fed to the piece 10 upon the front end of the table, the cam 81 will act upon the inclined upper face 80 of the arm 79, and lift thus the transverse bar 71 out of the paste trough 72. The table 18 being provided above the bar 71 with a slot 83, the said transverse bar will apply paste to the forward edge of the underside of the piece 16, more particularly the location of the several parts of the machine is such that the paste will be applied between the edge 16′ and the score line 17, but will not extend from said edge to the score line, as clearly shown by oblique lines in Fig. 6 of the drawings. As soon as the cam 81 leaves the inclined surface 80 of the arm 79, the springs 77 will lower the paste applying bar 71 in the trough to be covered there with paste for the next operation. When the feeding bar 33 moves backward, the cam 81, by reason of its being pivotally

attached to the feeding bar in the manner above described, will ride over the lever 79 without actuating the same.

After the paste is applied to the card board 16, the same is fed by the feeding blade 37 forward until its score line 17 coincides with the edge of the section 13 of the card board piece 10. The overlapping portions of the pieces 10 and 16 are then subjected to pressure. The mechanism by which the pressure is applied comprises a die 84, which is reciprocably mounted in standards 85, 85, and pivoted to lugs 86, 86. These lugs are in a similar manner attached at 87, 87 to levers 88, 88, which are keyed or otherwise fastened to a shaft 89, the latter being oscillatably mounted on the standards 85, 85. Upon the ends of the shaft 89 are keyed levers 90, 90, pivotally connected at 91, 91 to actuating rods 92, 92, which, in turn, are fastened to the straps 93, 93 of eccentrics 94, 94, the latter being keyed to the driving shaft 42.

The operation of the machine is as follows: A stack of card board pieces 16 is placed into the receptacle formed by the transverse plate 20 and the side plates 21. The position of the vertical strip 40 is then adjusted to correspond to the thickness of an individual card board piece. The operator places first a piece 10 upon the portion 18′ of the table in contact with the stops 30 and 31. As the pulley 53 rotates and the operator depresses the treadle 58, the clutch will be actuated and rotation will be imparted to the driving shaft 42. The feeding blade 37 will thus move the lowermost of the stack of pieces 16 toward the die 84. As soon as the cam 81 actuates in the manner above described the paste applying bar 71, the latter will be lifted and the paste applied to the underside of the moving piece 16, which is forwarded until its score line 17 coincides with the edge of the middle section 13 of the piece 10. As soon as it arrives in this position, the eccentric 94 will act and depress the die 84, whereby the overlapping portions of the two pieces are pressed together. In the further rotation of the driving shaft 42, the feeding blade 37 returns to its normal position and the die 84 is raised. As soon as the lug 70 contacts with the cam face 69 of the lever 67, the clutch will be shifted, whereby the shaft 42 is disconnected from the pulley 53. The piece 10 is then reversed on the portion 18′ of the table and a second piece 16 is attached to its opposite edge in the manner now described.

In order to permit the die 84 to exert pressure for a considerable time upon the overlapping portions of the pieces 10 and 16, the actuating rods 92 may be made of two sections, denoted by the numerals 92′ and 92″. To the sections 92′ are attached, for instance, by means of pins 95, sleeve-like guides 96, in which are slidably arranged the upper ends of the sections 92″ of the actuating rods 92. These upper ends carry disks 97, against which and against the lower ends of the guides 96 bear springs 98. In operation the die 84 will be lowered in the manner above described, and in the further rotation of the eccentrics 94, the springs 98 will be first compressed, leaving the die 84 in contact with the box blank for a considerable time. When the springs 98 are compressed, the sections 92″ of the actuating rods will exert a pull upon the sections 92′ thereof and raise the die 84. A further object of this arrangement is to permit the machine to operate upon card boards of varying thicknesses.

What I claim is:—

In a piecing machine for paper-box blanks, the combination with a table provided upon its front portion with a plurality of stops for predetermining the position of a piece of card board placed thereon and with a receptacle adapted to contain a stack of card boards, of a reciprocable bar carrying means for feeding the lowermost of the stack of card-boards onto said table to said first card board so that portions of said first card board and the card board fed thereto overlap each other, paste applying means shiftably arranged upon the underside of said table, means attached to said bar for forcing said paste applying means to a portion of the underside of the card board fed from said stack while moving from said stack toward said first named card board, and means for applying pressure to the overlapping portions of the two card boards.

Signed at New York, in the county of New York and State of New York, this 8th day of February, A. D. 1912.

ALBERT WORCESTER.

Witnesses:
SIGMUND HERZOG,
S. BIRNBAUM.