A. WORCESTER.

BOX COVERING MACHINE.

APPLICATION FILED JAN. 20, 1913.

1,067,092.

Patented July 8, 1913.

3 SHEETS—SHEET 1.

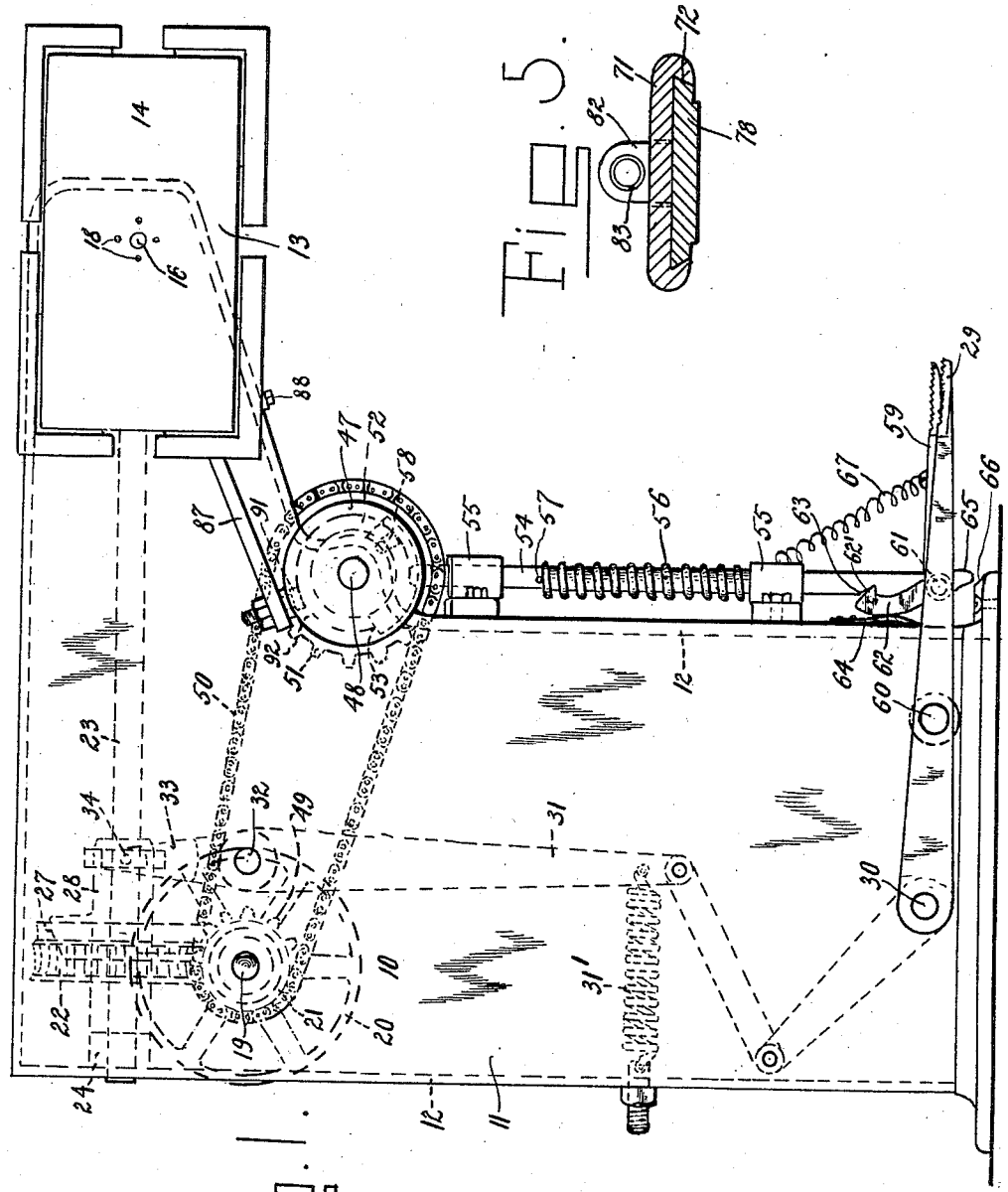


Fig. 1.

Fig. 5.

WITNESSES

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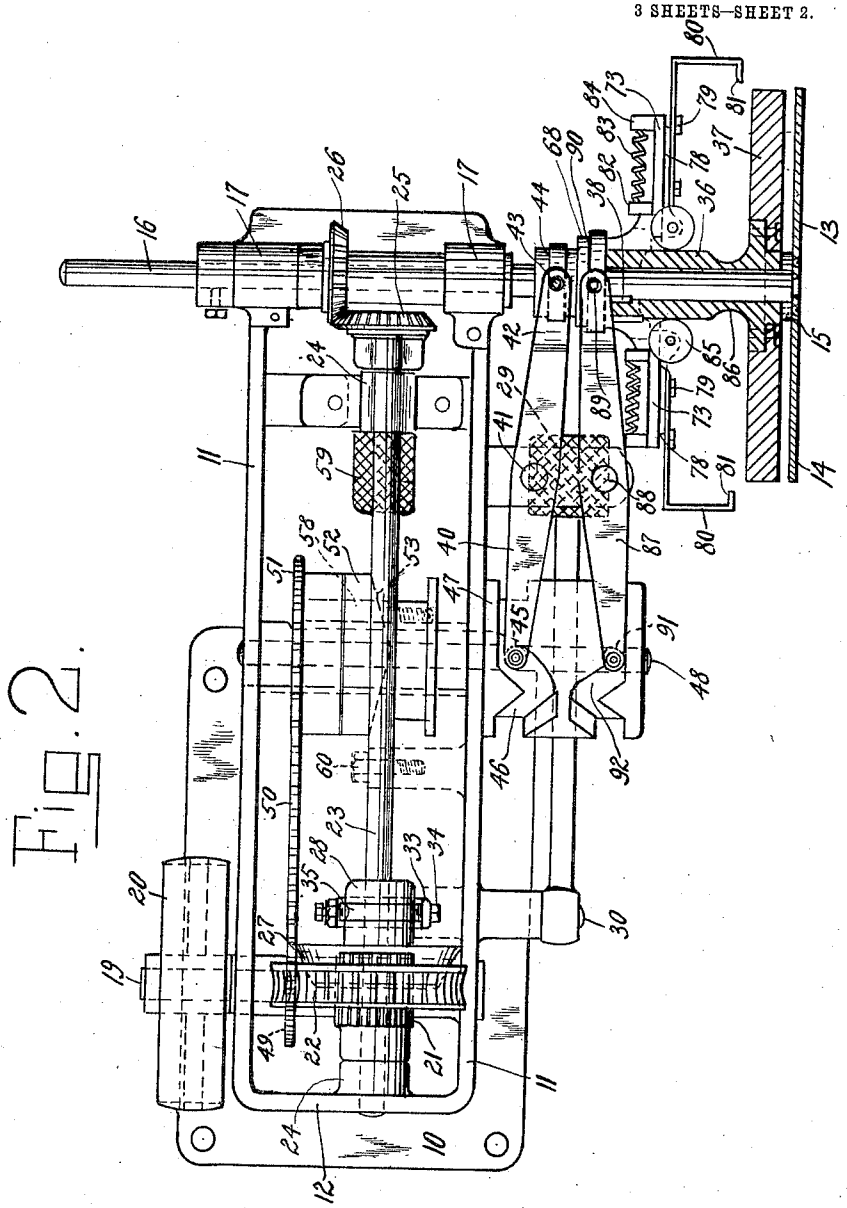
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3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 4.

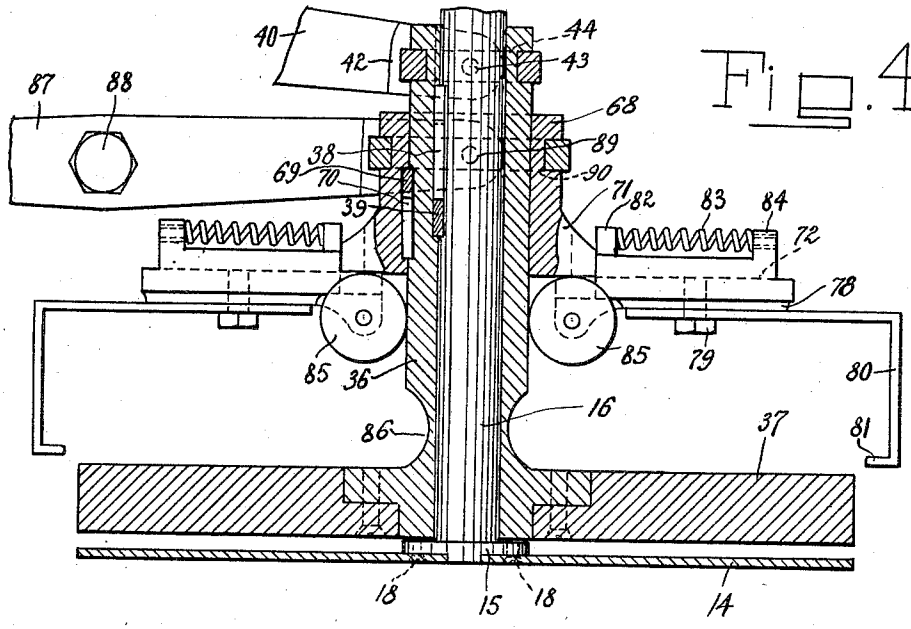
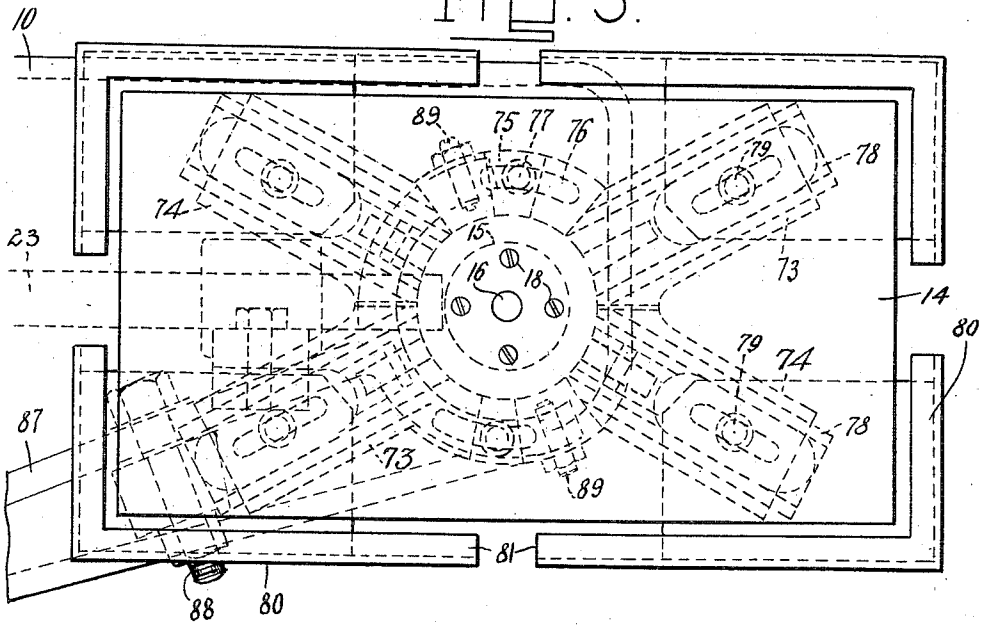


Fig. 3.



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UNITED STATES PATENT OFFICE.

ALBERT WORCESTER, OF NEW YORK, N. Y.

BOX-COVERING MACHINE.

1,067,092. Specification of Letters Patent. Patented July 8, 1913.

Application filed January 20, 1913. Serial No. 743,134.

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 Box-Covering Machines, of which the following is a specification.

The present invention relates to box covering machines, and more particularly to a machine for applying the covering material to the side walls of the box. In machines of this character a covering strip of paper, or similar material, is brought from a supply reel to the work-holder, such strip being coated with glue or other adhesive material before it is applied to the box or box blank on the work-holder, which is usually of the rotary type. After the said strip is pasted to the outer surfaces of the side walls of the box, it is turned in and folded so as to cover partly the inner surfaces of said side walls. These latter operations have been effected, as far as known, heretofore by hand.

One of the objects of the present invention is to provide a simple and efficient turn-in mechanism which is entirely automatic in its operation, and to combine the said turn-in mechanism with the rotary work-holder to produce a compact machine for the purpose at hand.

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 claims 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 details of construction within the scope of the appended claims 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 side elevation of the box covering machine constructed in accordance with the present invention; Fig. 2 is a plan view thereof, some parts being shown in section; Fig. 3 is a side elevation of the work-holder and the automatic turn-in mechanism coöperating therewith; Fig. 4 is a horizontal section taken through the device shown in Fig. 3; and Fig. 5 is a section taken through a detail of construction.

In the drawings, the numeral 10 indicates the main frame of the machine, comprising sides 11, 11, which are connected by transverse walls 12, 12. The work-holder is denoted by the numeral 13, and comprises a rectangular plate 14, which is attached to a flange 15 of a shaft 16, the latter being rotatably mounted in bearings 17, which may be made integral with the sides 11 of the main frame. The plate 14 is detachably fastened by means of screws 18 to the flange 15 of said shaft, and may be replaced according to the size of the box to be covered. Rotation is imparted to the shaft 16 from a driving shaft 19 by the intermediary of a suitable power transmitting mechanism which will be presently described. The driving shaft is rotated by a pulley 20, adapted to be driven from any suitable source of power by a belt. The driving shaft carries a worm 21, in mesh with a worm gear 22, which is loosely mounted upon a spindle 23, the latter being journaled in bearings 24, 24 upon the main frame. This spindle extends toward the shaft 16 and has keyed thereto a bevel gear 25 in mesh with a similar gear 26, which is attached to the shaft 16. The rotation of the worm gear 22 is transmitted to the spindle 23 by a suitable clutch, for instance a friction clutch, the stationary member of which is formed upon the worm gear 22, and the shiftable member 27 of which is made in the form of a cone, provided with a hub 28, the latter being seated upon the spindle 23 as to rotate therewith. The means for shifting the cone member 27 of the clutch comprises a treadle 29, fulcrumed at 30 to one of the sides of the main frame, and connected with an actuating lever 31, the latter being pivoted at 32 to the main frame, and its upper end being provided with a fork 33, upon which are held pins 34, 34 in engagement with a peripheral groove 35 in the hub 28. A spring 31′ returns the treadle and cone member 27 to their normal positions.

In rear of the work-holder 13 is slidably mounted upon the shaft 16 a sleeve 36. To this sleeve is detachably fastened a board 37, corresponding in shape and size to that of the plate 14. The board 37 is also exchangeable, according to the size of the box to be covered. In the shaft 16 is cut a spline 38, in which is seated a key 39, formed upon the

sleeve 36, such key causing the said sleeve to rotate with the shaft 16, but permitting the same to be shifted upon said shaft for a purpose hereinafter to be described. The shifting of the sleeve is effected by the intermediary of a lever 40, which is fulcrumed at 41 to the main frame of the machine. One end of this lever is provided with a fork 42, upon which are formed lugs 43 in engagement with a peripheral groove 44 in the sleeve 36, its other end carrying a roller 45, seated in a cam groove 46, which is formed in a disk 47, the latter being fixedly attached to a spindle 48, which receives rotation from the driving shaft 19. For this purpose the driving shaft carries a sprocket wheel 49, in engagement with a driving chain 50, the latter meshing with the teeth of a sprocket wheel 51, which is loosely mounted upon the spindle 48. The connection between the sprocket wheel 51 and the spindle 48 is made by a clutch 52, which is in the case shown in the drawings of the one-revolution pin clutch type, the wedge plate 53 of which is arc-shaped and attached to a rod 54, the latter being slidably arranged in guides 55, 55. A spring 56, coiled upon the rod 54 and bearing against the lower one of the guides 55 and against a pin 57 upon the rod, tends to hold the wedge plate 53 in its upper position and thus the pin 58 of one of the clutch members disengaged from its coöperating other clutch member. The rod 54 is actuated by means of a treadle 59, which is fulcrumed at 60 to the main frame, and has pivoted thereto at 61 a detent 62, the nose 62′ of which is normally held in a notch 63 in the rod 54 by means of a leaf spring 64. The detent has a downwardly projecting extension 65, in the path of which is held a stop 66 which serves to disengage the detent from the rod 54. A spring 67, secured to the treadle 59 and to one of the guides 55, tends to return the said treadle to its normal position.

On the sleeve 36 is slidably arranged a second sleeve, denoted by the numeral 68. This latter sleeve is provided with a key 69, seated in a spline 70 in the sleeve 36, whereby the said two sleeves will rotate together, but be permitted to change their relative positions in the direction of their longitudinal axes. Upon the sleeve 68 are held four radially extending blocks 71, having dove-tail shaped recesses 72. Two of these blocks are fixedly attached to the sleeve 68, more particularly those denoted by the numerals 73, 73, and two of the same, denoted by the numerals 74, 74, are adjustably held thereon in such a manner that they are adapted to move toward or away from the blocks 73. For this purpose they are provided with extensions 75, having slots 76, in which are seated set screws 77 in engagement with the sleeve 68. The purpose of this adjustment is to set the mechanism carried by said blocks according to the size of the box to be covered. In the recess of each block is held a dove-tailed slide 78, to which is adjustably secured by means of a clamping screw 79 a square 80, extending outward and toward the board 37. The free edges of the squares are bent inward, as shown at 81, toward the shaft 16. Upon the slides 78 are provided rearwardly extending projections 82, to which are fastened springs 83, the other ends thereof being secured to projections 84 upon the blocks 71. These springs hold rollers 85 upon the slides 78 continuously in contact with the sleeve 36, and lower the said rollers into a groove 86 in the sleeve 36 when the said rollers and the last mentioned groove register. For the purpose of reciprocating the sleeve 68 upon the sleeve 36 a lever 87 is fulcrumed at 88 to the frame of the machine. One end of this lever is fork-shaped and provided with lugs 89, which engage a groove 90 in the sleeve 68. The other end of the lever carries a roller 91, seated in a cam groove 92 of the disk 47.

The operation of this device is as follows: A plate 14 and a board 37 are attached to the shaft 16 and the sleeve 36, respectively, to correspond to the size of the box to be covered. The movable blocks 74 are shifted to the proper positions and the squares 80 adjusted upon the slides 78 in such a manner that their inwardly bent ends 81 are brought near the edges of the plate 14 and board 37. A card-board box which is to be covered with paper is then placed upon the plate 14 and the board 37, and the end of the paper strip which is wound upon the supply reel is taken hold of and placed into contact with one of the sides of the box. Paste is applied to the paper strip somewhere between the work-holder and the supply reel. The operator depresses then the treadle 29, whereby the cone member 27 of the friction clutch is forced into contact with its coöperating clutch member, thereby causing a rotation of the shaft 16 and the parts carried thereby. The revolving box receives upon its several side walls thus the covering strip, a cutter (not shown in the drawings) being operated at the proper time to sever the covering strip in the usual manner. The operator then removes his foot from the treadle 29, the spring 31′ returning the movable member 27 of the friction clutch to its inoperative position, whereby the shaft 16 and the box stop. The covering strip is applied to the box so that its free edge projects beyond the open end of the box. The operator holds the box on the plate 14 and depresses the treadle 59, by which operation the one-revolution pin clutch is rendered operative. The wedge plate 53 is forced by the spring 56 to its normal position when the extension 65 of the detent 62 contacts

with the stop 66 and is disengaged from the notch 63 in the rod 54. The treadle 59 is returned to its normal position by the spring 67, the leaf spring 64 causing then an engagement of the detent with the notch 63. While the spindle 48 completes one revolution, the following operations take place: The lever 40 forces the sleeve 36 toward the side of the main frame 10, and thereby moves the board 37 out of the box; at the same time the lever 87 moves the sleeve 68 toward the box, whereby the rollers 85 come into registering positions with the groove 86, to be lowered by the springs 83 into the same. By this operation the inwardly bent ends 81 of the squares 80 turn the projecting edge of the paper strip at right angles to the sides of the box, that is to say toward the center of the same. In the further rotation of the spindle 48, the squares 80 move toward the main frame 10 and away from each other, the rollers 85 being disengaged from the groove 86. At the same time the board 37 moves into the box, folds the covering strip into parallel relation to the inner surfaces of the side walls of the box. The shaft 16 is then rotated and the covering strip rubbed tight to the box by the operator. The covered box is then removed, a new blank placed upon the work-holder, and the operation now described is repeated.

What I claim is:—

1. In a box covering machine, the combination with a rotatable shaft, of a plate thereon forming a box support on which a covering strip is applied to the outer surfaces of the sides of the box, one edge of the covering strip projecting beyond the open end of the box, of means shiftably arranged upon said shaft for turning the projecting edge of the strip toward the center of the box, means shiftable relative to said first named means for folding the so turned edge into parallel relation to the inner surfaces of the sides of the box, a driving shaft, a clutch controlled driving connection between said first named shaft and said driving shaft, a disk having two cam grooves, a lever engaging one of said cam grooves and said turning means, a lever engaging the other one of said cam grooves and said folding means, and a clutch controlled mechanism between said driving shaft and said disk.

2. In a box covering machine, the combination with a rotatable shaft, of a plate thereon forming a box support on which a covering strip is applied to the outer surfaces of the sides of the box, one edge of the covering strip projecting beyond the open end of the box, a sleeve shiftably arranged upon said shaft provided with a peripheral groove, a second sleeve shiftably mounted upon said first named sleeve, radial slides upon said second named sleeve carrying squares having their free ends bent toward said shaft, rollers upon said slides contacting with said first named sleeve, means for lowering said rollers into said groove when the latter registers with said rollers, a board attached to said first named sleeve corresponding in shape and size to said plate, means for rotating said shaft at the will of the operator, and means for changing the relative positions of said sleeves in relation to said plate, whereby said squares turn the projecting edge of the strip toward the center of the box when said rollers are lowered into said groove and said board folds the so turned edge into parallel relation to the inner surfaces of the sides of the box when brought into the box.

3. In a box covering machine, the combination with a rotatable shaft, of a plate thereon forming a box support on which a covering strip is applied to the outer surfaces of the sides of the box, one edge of the covering strip projecting beyond the open end of the box, a sleeve shiftably arranged upon said shaft provided with a peripheral groove, a second sleeve shiftably mounted upon said first named sleeve, radial slides upon said second named sleeve carrying squares having their free ends bent toward said shaft, rollers upon said slides contacting with said first named sleeve, means for lowering said rollers into said groove when the latter registers with said rollers, a board attached to said first named sleeve corresponding in shape and size to said plate, means for rotating said shaft at the will of the operator, and means for changing the relative positions of said sleeves in relation to said plate, whereby said squares move toward said shaft and turn the projecting edge of the strip toward the center of the box when said rollers are lowered into said groove and said board folds the so turned edge into parallel relation to the inner surfaces of the sides of the box when brought into the box.

4. In a box covering machine, the combination with a rotary shaft, of a plate thereon forming a box support on which a covering strip is applied to the outer surfaces of the sides of the box, one edge of the covering strip projecting beyond the open end of the box, a sleeve shiftably arranged upon said shaft, a second sleeve shiftably mounted upon said first named sleeve, radial slides upon said second named sleeve carrying squares having their free ends bent toward said shaft, a board attached to said first named sleeve corresponding in shape and size to said plate, means for rotating said shaft at the will of the operator, means for moving said squares toward said shaft when the relative positions of said sleeves are changed, whereby said squares turn the

projecting edge of the strip toward the center of the box, said board folding the so turned edge into parallel relation to the inner surfaces of the sides of the box when brought into the box.

5. In a box covering machine, the combination with a rotatable shaft, of a plate thereon forming a box support on which a covering strip is applied to the outer surfaces of the sides of the box, one edge of the covering strip projecting beyond the open end of the box, a sleeve shiftably arranged upon said shaft, a second sleeve shiftably mounted upon said first named sleeve having radial blocks, the relative positions of said blocks being adapted to be changed, slides upon said blocks carrying squares having their free ends bent toward said shaft, a board attached to said first named sleeve corresponding in shape and size to said plate, means for changing the relative positions of said sleeves in relation to said plate, means for causing said squares to move toward said shaft, whereby the projecting edge of the strip is turned toward the center of the box, said board folding the so turned edge into parallel relation to the inner surfaces of the sides of the box when brought into the box.

6. In a box covering machine, the combination with a rotatable shaft, of a plate thereon forming a box support on which a covering strip is applied to the outer surfaces of the sides of the box, one edge of the covering strip projecting beyond the open end of the box, a sleeve shiftably arranged upon said shaft, a second sleeve shiftably mounted upon said first named sleeve having radial blocks, the relative positions of said blocks being adapted to be changed, slides upon said blocks carrying squares having their free ends bent toward said shaft, a board attached to said first named sleeve corresponding in shape and size to said plate, means for changing the relative positions of said sleeves in relation to said plate, and springs for causing said squares to move toward said shaft, whereby the projecting edge of the strip is turned toward the center of the box, said board folding the so turned edge into parallel relation to the inner surfaces of the sides of the box when brought into the box.

Signed at New York, in the county of New York and State of New York, this 16 day of January, A. D. 1913.

ALBERT WORCESTER.

Witnesses:
SAUL W. LEVY,
S. BIRNBAUM.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."