Sept. 3, 1946. J. L. OBERENDER 2,407,174

ENEVELOPE MACHINE

Filed March 23, 1944 2 Sheets-Sheet 1

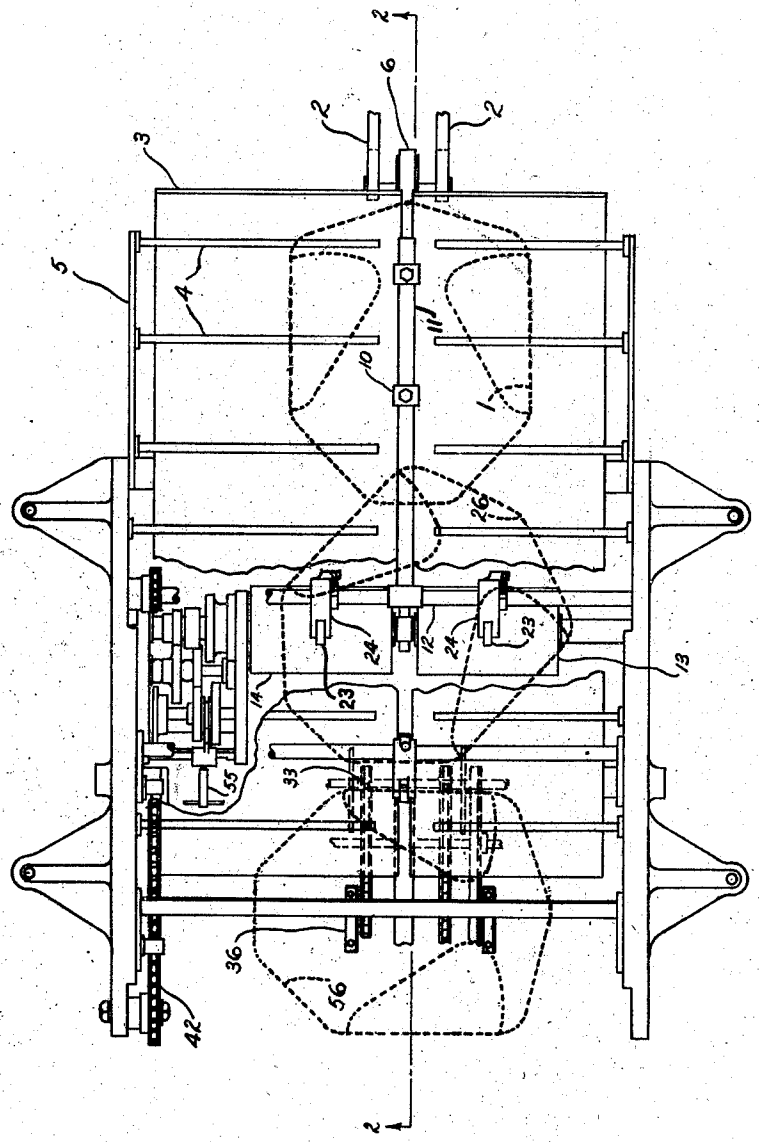


FIG. 1

INVENTOR.
J. L. OBERENDER
BY
Thomas W. J. Clark

Sept. 3, 1946. J. L. OBERENDER 2,407,174

ENEVELOPE MACHINE

Filed March 23, 1944 2 Sheets-Sheet 2

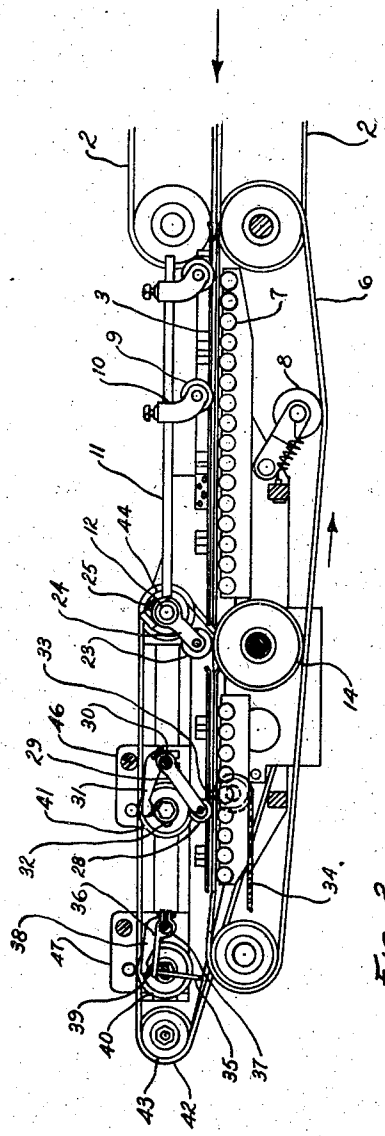


FIG. 2

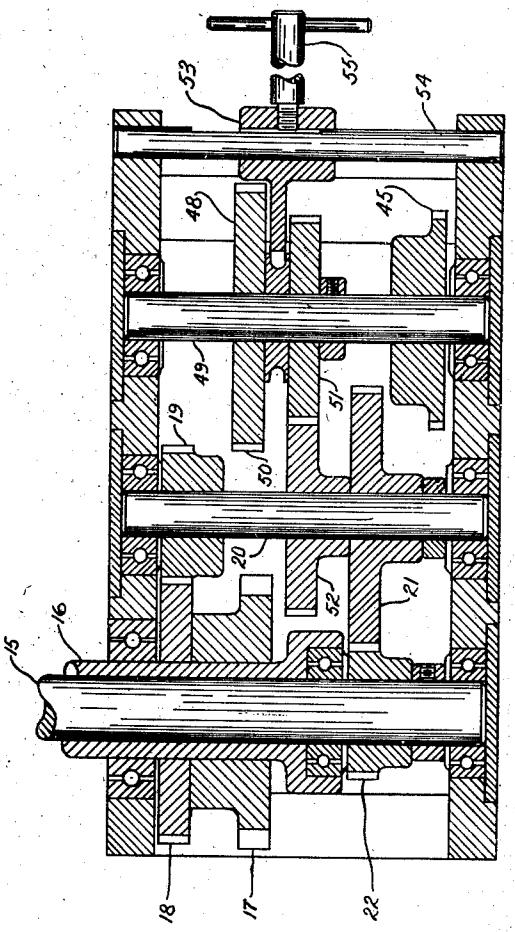


FIG. 3

INVENTOR.
J. L. OBERENDER

BY

Thomas W. J. Clark

Patented Sept. 3, 1946 2,407,174

UNITED STATES PATENT OFFICE

2,407,174

ENVELOPE MACHINE

John L. Oberender, Baltimore, Md., assignor to Oles Envelope Corporation, Baltimore, Md., a corporation of Maryland

Application March 23, 1944, Serial No. 527,755

11 Claims. (Cl. 271—2)

1

This invention relates to an improvement in envelope making machines and has particular reference to the part of the machine which receives the envelopes as they are forwarded in the plane of the envelope after one folding operation and turns them around usually 90° and forwards them for further folding and other operations.

Folding machines of this general type are illustrated by the patent to Labombarde and Sidebotham 1,253,054 patented January 8, 1918.

Mechanisms for turning the envelope between successive folding or other operations are illustrated by the patent to Goss Re. 18,463 dated May 17, 1932.

Among the objects of the instant invention are to make a turning device which will be positive in operation and which will impart the precisely required turn to the sheet or envelope whether it be 90° or substantially any other arc of a circle that might be desired. Other objects are to make such a device that may be adjusted for any size of envelope or sheet and that will accommodate substantially any weight of material. Another object is to make a turning device which will not lose its adjustment regardless of the period of its operation after once being placed in proper adjustment. Another object of the invention is to provide a turning section which continuously forwards the sheets during the turning and which may be timed to receive the sheets from the preceding operation of the complete machine and pass them on to that machine in timed relation for the next following operation.

Other objects and advantages of the invention will be apparent from the following description and the accompanying drawings in which Figure 1 shows a plan view of the device. Figure 2 shows a cross-sectional view substantially on line 2—2 of Figure 1. Figure 3 is an inverted sectional view of the gear train.

In the drawings similar numerals refer to similar parts throughout the several views.

Envelopes are received from a folding machine after having been folded on two edges as illustrated in dotted lines by the envelope 1. The carrier belts of the envelope machine such as those at 12 in the above patent to Goss are shown at 2. These delivery belts 2 pass the envelopes between them in the direction shown by the arrow in Figure 2 between the horizontally mounted plates 3, the upper plates 3 being supported by rods 4 projecting from the sides 5 of the machine, the lower plates 3 are supported from the bottom part of the machine. These plates maintain the envelope in its folded condition. The plates 3 are

2

divided, or spaced, substantially at their center longitudinally of the machine and beneath this space belt 6 passes to continue the forward movement of the envelope. The belt 6 is held up by rolls 7, and is held taut by roll 8. Longitudinally adjustable rolls 9 bear upon the upper face of the envelopes to hold them in frictional contact with the belt 6 to insure their continued forward movement. The brackets 10 holding rolls 9 are adjustable on rod 11 which is pivoted to shaft 12 mounted in the sides of the machine.

The turning mechanism proper consists of the two rolls 13 and 14. By means of the gear train shown in Figure 3 roll 13 is driven at a surface speed four times that of roll 14. Roll 13 is mounted on shaft 15 and roll 14 on hollow shaft 16. Sprocket 17 fast to hollow shaft 16 is driven by a chain from the envelope folding machine proper. Gear 18, likewise fast to hollow shaft 16 drives gear 19 at twice the speed of gear 18. Gear 19 is fast on shaft 20 as is also gear 21 which drives gear 22 fast to shaft 15 at twice the speed of gear 21.

The gears are all driven at a speed to coordinate the receipt and delivery of envelopes from the folding machine to the folding machine so that they will be received and delivered in timed relation with the other mechanisms of the folding machine.

Rolls 23 mounted in brackets 24 bear upon the sheet or envelope as it passes over rolls 13 and 14. These rolls 23 are held in frictional engagement with the envelopes by springs 25. Brackets 24 are laterally adjustable on shaft 12 and the location of their lateral adjustment determines the angle of turn given the envelopes as they pass over rolls 13 and 14. There is slippage between both turning rolls and the envelopes, rolls 23 forming as it were pivot points holding the envelope in contact with the two turning rolls at the desired points so that they will give the desired degree of turn to the envelopes due to their speed differential. Lateral movement of rolls 23 varies the location of the pivot points on the envelopes and consequently the points where they are gripped by the turning rolls and consequently the degree of turn given the envelopes. A partially turned envelope is shown at 26 in Figure 1.

Belt 6 passes between rolls 13 and 14 so that it does not interfere with the turning operation. Beyond the rolls 13 and 14 are similar plates 3 to receive the envelope and continue to maintain it in its folded condition. Belt 6 now again supported by rolls 7 continues the forward move-

ment of the envelope, rolls 7 are omitted between rolls 13 and 14. Roll 28 mounted in bracket 29 fast to shaft 30 bears on the envelope to maintain its frictional engagement with belt 6. Also fast on shaft 30 is rocker arm 31 bearing on cam 32 so that at the proper time roll 28 may be raised from the envelope to release the driving effect of belt 6 therefrom and allow the forward propulsion of the envelope by means of pins 33 on chains 34 driven from the receiving part of the folding machine proper.

Squaring up means or truing fingers 35 are mounted in brackets 36 fast to shaft 37. Rocker arm 38 bearing on cam 39 raise the fingers periodically from the path of the envelopes to allow their passage therebeyond.

Chains 34 on which are the pins 33 withdrawing the envelope in timed relation from the truing mechanism, feed it to the next folding or other operation of the envelope machine in a manner similar to chains 41 in the above designated patent of Goss. Cam 39 is driven by sprocket 40 and cam 32 is driven by sprocket 41 and both sprockets 40 and 41 are driven by chain 42 passing over sprockets 43 and 44 and under sprocket 45 in the gear train shown in Figure 3 so that the cams are driven in timed relation with the turning device which is, as stated, driven in timed relation with the other parts of the folding machine.

Shafts 30 and 37 and their rocking mechanism, are mounted in brackets 46 and 47, which are adjustable lengthwise of the machine, so that it may be accommodated to envelopes of different sizes. The position of the sprockets at the ends of chains 34 may likewise be moved to accommodate the machine to different sized envelopes.

With envelopes of different sizes it may be desirable to double the speed of this squaring up device and to accomplish that purpose cluster gear 48 is keyed to shaft 49 and has large gear 50. Gear 51 is shown in mesh with gear 52 fast to shaft 20. This drives the squaring up and releasing mechanism in timed relation with the rest of the machine when operating on certain sizes of envelopes. When operating on other sizes of envelopes the releasing and squaring up mechanism may be operated twice as fast by moving the cluster gear so that the large gear 50 meshes with small gear 19. The cluster gear may be moved by means of the tongue on bracket 53 which is adjustable on shaft 54 by screw 55.

It will be apparent that the longitudinal position of rolls 9 may be varied for different sizes of envelopes and that the lateral position of rolls 23 may be varied for similar reasons or to give a different degree of turn to the envelopes. A completely turned envelope is shown in dotted lines at 56 in Figure 1 after having been squared up by fingers 35 and released therefrom and after being engaged by pins 33 to carry the envelope forward for the folding or other operation. It will be apparent that a positive feed of a frictional nature is given the envelopes through the turning station which may be accommodated to any style or shape or size of envelope.

Various modifications may be made in the structure shown without departing from the invention.

What is claimed as new and is desired to be secured by Letters Patent is:

1. In an envelope machine, a sheet turning section comprising a pair of rolls and means to rotate them to continuously forward and turn the sheet in its own plane, means to feed a sheet thereto and to receive a sheet therefrom, said rolls being in substantial alignment and having their axes parallel one with the other and with the plane of movement of the sheet, one roll having a forwarding speed greater than the other, and laterally adjustable means, movable laterally to determine the angle of turn, bearing on the sheet opposite said rolls.

2. In an envelope machine, a sheet turning section comprising a pair of coaxial rolls parallel to the plane of sheet movement and means to rotate them to continuously forward and turn the sheet in its own plane, means to feed a sheet thereto and to receive a sheet therefrom, one of said rolls having a forwarding speed greater than the other, and laterally adjustable means, movable laterally to determine the angle of turn, bearing on the sheet opposite said rolls.

3. In an envelope machine, a sheet turning section comprising a pair of conveyors and means for moving them at different forwarding speeds to simultaneously move the sheet forward and turn the same in its own plane acting upon one face of the sheet, means to feed a sheet thereto and to receive it therefrom, and means movable transversely of the sheet on the face opposite said conveyors to hold the sheet in contact with both the conveyors, the transverse position of said means varying the degree of turn given the sheets.

4. In an envelope machine, a sheet turning section comprising means to turn a sheet in its own plane, a substantially centrally located belt and means to hold a sheet in contact therewith, said belt carrying a sheet to and from said turning means, said turning means comprising a pair of conveyors and means for moving them at different forwarding speeds to simultaneously move the sheet forward and turn the same acting upon one face of the sheet and means movable transversely of the sheet on the opposite face thereof to hold the sheet in contact with both the conveyors, the transverse position of said means varying the degree of turn given the sheets.

5. In an envelope machine, a sheet turning section comprising means to turn a sheet in its own plane, means holding the sheet above and below forming a passage way through which to pass a sheet to the turning means, an adjacent travelling member to carry a sheet through said way to the turning means, said turning means having a pair of conveyors and means for moving them at different forwarding speeds to simultaneously move the sheet forward and turn the same acting upon one face of the sheet and said travelling member passing between said conveyors.

6. In an envelope machine, a sheet turning section comprising means to turn a sheet in its own plane, means holding the sheet above and below forming a passage way through which to pass a sheet to the turning means, an adjacent travelling member to carry a sheet through said way to the turning means, said turning means having a pair of conveyors and means for moving them at different forwarding speeds to simultaneously move the sheet forward and turn the same acting upon one face of the sheet and means movable transversely of the sheet on the opposite face thereof to hold the sheet in contact with the conveyors, the transverse position of said means varying the degree of turn given the sheets.

7. In an envelope machine, a sheet turning section comprising means to turn a sheet in its

down plane, means holding the sheet above and below forming passage ways through which to pass a sheet to and from the turning means, an adjacent conveying member to move a sheet through said ways to and from the turning means, said turning means comprising a pair of conveyors and means for moving them at different forwarding speeds to simultaneously move the sheet forward and turn the same acting upon one face of the sheet, and means to hold the sheet in forward and turning relation with the conveyors.

8. In an envelope machine, a sheet turning section adapted to receive partially folded sheets from the envelope machine and to pass them on for further operation after turning, means to hold the sheets folded as received from the envelope machine, means to turn the sheets in their own plane, means to forward sheets to the turning means, said turning means comprising a pair of conveyors and means for moving them at different forwarding speeds to simultaneously move the sheets forward and turn the same acting upon one face of the sheets and means movable transversely of the sheets on the opposite face thereof to hold the sheets in contact with the conveyors, the transverse position of said means varying the degree of turn given the sheets.

9. In an envelope machine, a sheet turning device adapted to receive partially folded sheets from the envelope machine and to pass them on for further operation after turning, means to hold the sheets folded as received from the envelope machine, means to turn the sheets in their own plane, means to forward sheets to the turning means, said turning means comprising a pair

of conveyors and means for moving them at different forwarding speeds to simultaneously move the sheets forward and turn the same acting upon one face of the sheets, and means to hold the sheets in forwarding and turning relation with the conveyors.

10. In an envelope machine, a sheet turning section comprising a pair conveyors and means for moving them at different forwarding speeds to simultaneously move a sheet forward and turn the same in its own plane acting upon one face of the sheet, means to feed the sheet thereto and to receive the sheet therefrom, squaring up means extending in the path of forward movement of the sheets and means to release said squaring up means and means movable transversely of the sheet on the opposite face thereof to hold the sheet in contact with both the conveyors, the transverse position of said means varying the degree of turn given the sheets.

11. In an envelope machine, a sheet turning device comprising a pair of rolls and means to rotate them to continuously forward and turn the sheet in its own plane, means to feed a sheet thereto and to receive a sheet therefrom, said rolls being in substantial alignment and having their axes parallel one with the other and with the plane of movement of the sheet, one roll having a forwarding speed greater than the other and means, movable laterally to determine the angle of turn, bearing on the sheet opposite said rolls, squaring up means extending in the path of forward movement of the sheets and means to release said squaring up means.

JOHN L. OBERENDER.