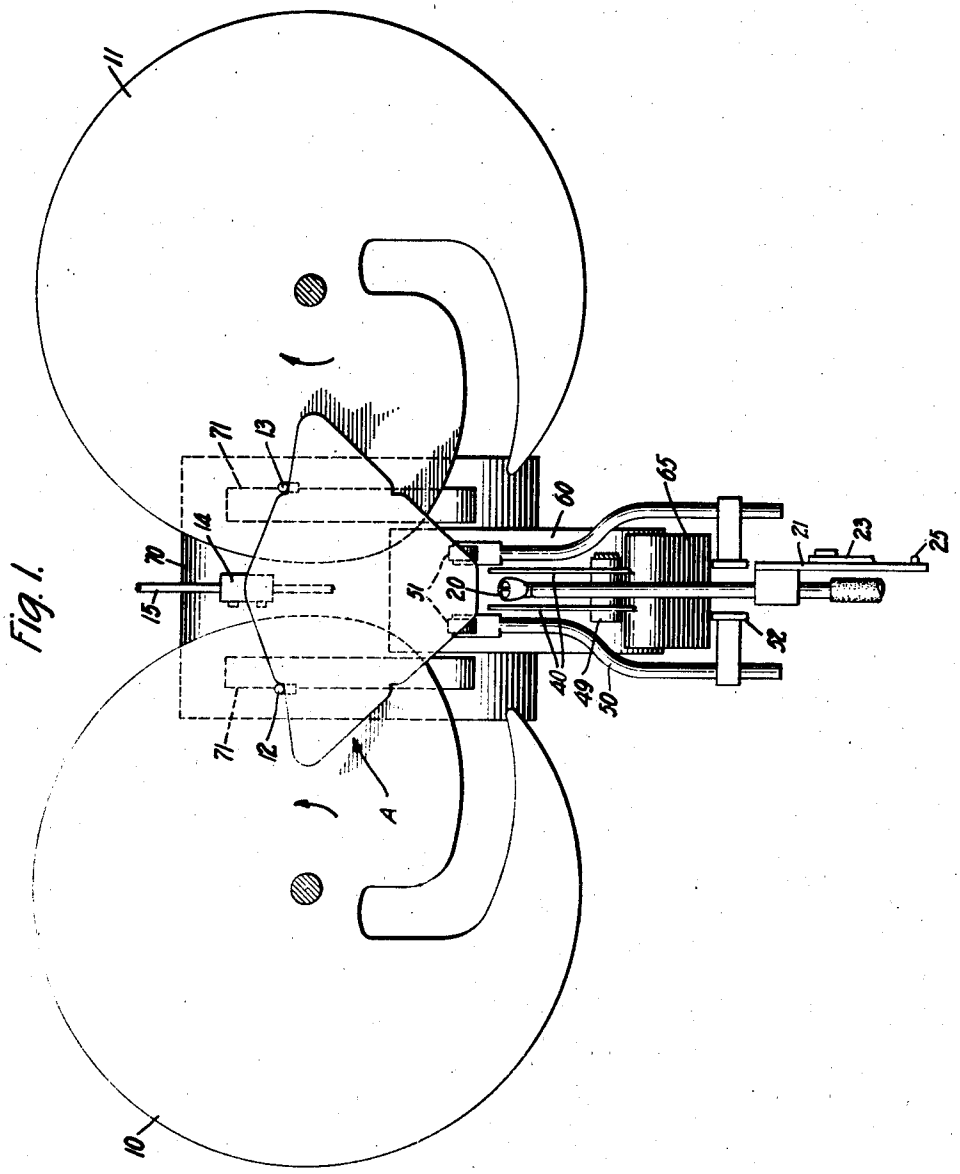
June 2, 1931. A. NOVICK 1,808,706

FEEDING MECHANISM FOR ENVELOPES AND THE LIKE

Filed Nov. 15, 1928 3 Sheets-Sheet 1

Fig. 1.



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Filed Nov. 15, 1928 3 Sheets-Sheet 2

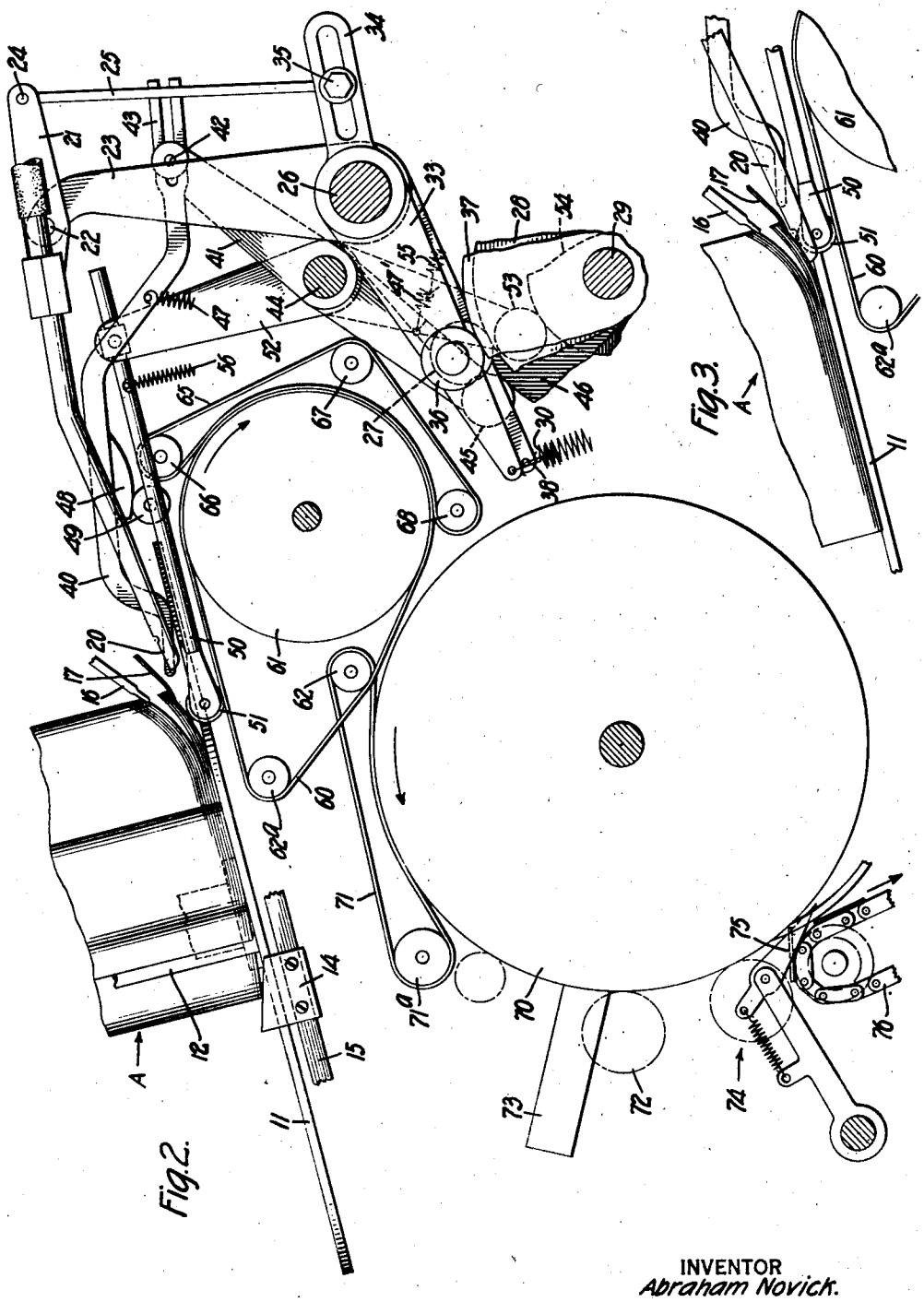


Fig. 2.

Fig. 3.

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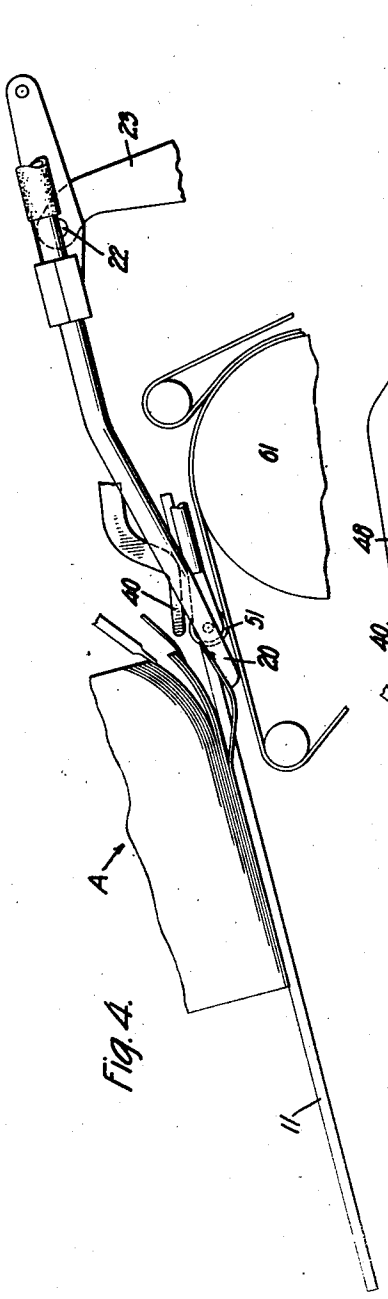


Fig. 4.

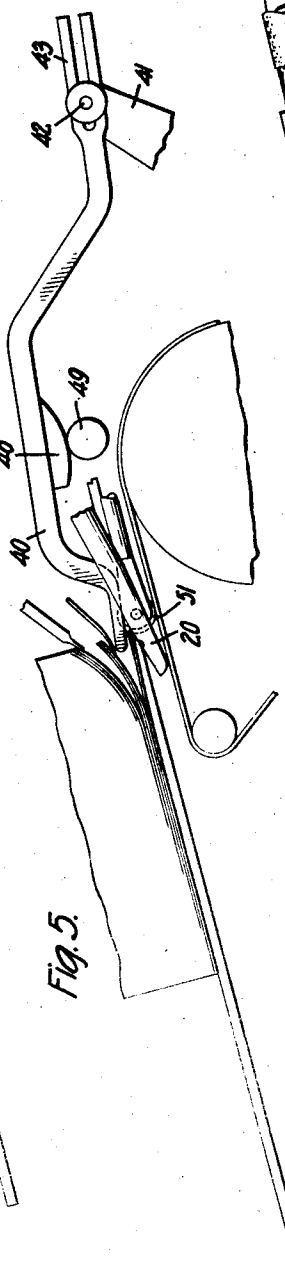


Fig. 5.

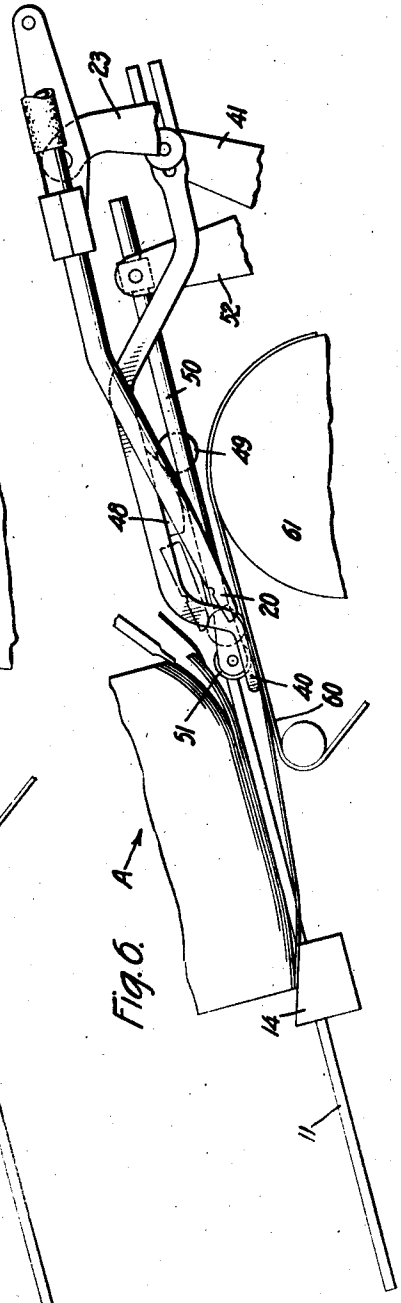


Fig. 6.

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Patented June 2, 1931 1,808,706

UNITED STATES PATENT OFFICE

ABRAHAM NOVICK, OF FLUSHING, NEW YORK, ASSIGNOR TO F. L. SMITHE MACHINE CO., INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

FEEDING MECHANISM FOR ENVELOPES AND THE LIKE

Application filed November 15, 1928. Serial No. 319,501.

The present invention relates to a device for feeding envelopes from a stack and is principally concerned with the provision of a device for feeding the blanks from the stack so as to form a continuous band in which only the sealing flaps are exposed. Although applicable as a top feeder, the invention is particularly adapted for feeding the blanks from the bottom of the stack. It is a principal object of the present invention to provide a device of the type mentioned which will feed the blanks rapidly and accurately, and furthermore will be easy to adjust for different sizes of envelopes. Further and more specific objects of the invention will be apparent as the description proceeds.

I have illustrated my invention in the accompanying drawings in which:

Figure 1 is a plan view of an illustrative embodiment;

Figure 2 is a view seen to the left of Figure 1, some parts being in section; and

Figures 3 to 6, inclusive, are somewhat diagrammatic views showing different stages in the operation of the improved device.

Briefly the operation of the illustrative device is as follows: The forward end of the bottom blank is moved away from the stack by the operation of a sucker member common in the art, this affording an opportunity for a pair of separator disks upon which the weight of the pile partly rests, to start the separation of the bottom blank. While this is taking place the sucker moves downward with the end of the blank for a short distance when the suction is cut off and a pair of presser members come into play and bring the end of the blank downward against a traveling conveyor. When this has occurred, traction between the blank and the conveyors is secured by means of a pair of rollers which move into place and press the blank thereupon, and since the separating disks have now accomplished their work, the withdrawal of the blank lengthwise of the stack is begun.

Referring now to the drawings in greater detail and by characters of reference, A denotes the stack which rests upon a pair of separating disks 10, 11. Part of the weight, however, is borne by depending toe members 12, 13 supported from above by means not shown, together with a member 14 of wedge shape which is adjustable along a rod 15 disposed beneath and intermediate the disks 10, 11. At this forward end the stack is supported by means of a pair of fingers, the upper of which, 16, sustains the forward end of the stack in a somewhat elevated position except for a small number of the blanks which, due to the increased curvature incident upon the removal of the blanks from the pile, drop below the first mentioned finger upon a second finger 17.

As above stated, the feeding of the blank is initiated by the action of a sucker, 20, which has a compound motion to and fro, as well as up and down, the mechanism for accomplishing these movements being as follows: Attached to the sucker rod is a lever 21 (see Figure 1) which is fulcrumed about two pivots including pivot 22 borne by a bellcrank 23 and a pivot 24 borne by a link 25. The bellcrank 23 is journaled for movement about a shaft 26 and adjacent its other end has a cam roller 27, in contact with a cam 28, secured to a shaft 29. Thus by means of the mechanism described, the sucker will receive by the operation of the cam 28 (and spring 30) a movement essentially to and fro. Link 25 is secured to a lever 33 having a slotted arm 34 in which it is adjustably held by means of a nut 35. The other end of the bellcrank bears a cam roller 36 which is urged in contact with its cam 37 by a spring 38, it being evident that operation of the cam 37 will give the sucker the desired up and down component of movement.

As above stated, the sucker having been moved down a short distance, the suction is cut off and the blank engaged by a pair of presser or transfer members 40, 40 which move the end of the blank against the conveyor members mentioned. Mechanism for operating said presser members is as follows: Each presser member is joined to a lever 41 by means of a pivot 42 which is held in adjusted position in a fork 43 at the ends of member 40. Lever 41 which is pivoted about a shaft 44 bears at its opposite end a

cam roller 45 which bears against a cam 46 due to the action of spring 47'. A further movement of each presser member 40 is obtained by means of cam surfaces 48 attached on the under surface thereof and bearing upon a roller 49 whose support is shown in Figure 1, the presser members 40 being held against the roller 49 by means of a spring 47. By means of the mechanism described, it will be seen that the presser members 40 have a compound motion which brings the blank engaged by said member from the upper position, as seen in Figure 4, to the lower position in Figure 6, and thence back to the position of Figure 4.

The presser members having conveyed the end of the blank against the conveyor belt (to be described), traction of the blank against said belt is accomplished as above mentioned by means of a pair of roller members which move across the end of the blank and press it against the belts. Mechanism for accomplishing this is as follows: Rod 50 carrying roller 51 is pivoted to a bellcrank 52, adjustably along the length of said rod, the other end of said bellcrank bearing a cam roller 53, which is urged against a cam 54 by a spring 55, rotation of cam 54 being effected to reciprocate the rod 50 back and forth, as will be apparent. Said roller 50 is maintained against the surface upon which it bears by means of a spring 56 attached to rod 50.

For the purpose of conveying away the blanks released from the stack, a system of conveyors is provided which in the embodiment shown includes a conveyor 60 disposed so as to receive the released portion of the blank by the action of the presser members 40, and also to receive the roller members 51 which bear against same. Conveyor 60 is carried around a large drum 61 and idler pulleys 62, 62*a*. Due to the action of the pair of roller members 51 cooperating with the belt 60, the blank held between them is conveyed from the bottom of the stack, the arrangement being such that when this action takes place the separator disks 10 and 11 will have completely severed the blank from the stack. It will be understood that the action of the feeding members described is such that a fresh blank will be presented to the conveyor 60 when the preceding blank has been conveyed a distance equal only to the desired width of the gum on the sealing flap whereby a band of overlapping blanks is produced. For the further transportation of the overlapping band of blanks formed, a conveyor 65 is provided which extends around a portion of the periphery of the drum 61 and above the conveyor 60 and passes over idler pulleys 66, 67, 68. In this manner the band of blanks is conveyed between bands 60 and 65 to a large drum 70, cooperating with which is a pair of guide conveyor bands 71, 71, which conveniently are arranged at either side of band 60 and utilize roll 62 in common with band 60. A roll 71*a* is also provided, around which bands 71 travel. Upon traversing the drum 70, the blanks are gummed by means of the gum box 73. After passing the gumming apparatus and also a guide roll 72 the blanks pass to a mechanism by means of which the blanks are individually gripped by means of grippers 75 carried by a chain 76. By means of this arrangement the gripped blanks are passed through a drying way and are delivered in timed relation to the operating cycle of the machine to mechanism which individualize, gum and fold the blanks into finished envelopes. The mechanism for inserting the blanks into the grippers 75 carried by chain 76, which mechanism is only partially indicated here, is described and claimed in my co-pending application, Serial No. 156,080, filed December 21, 1926.

Certain features of the invention described in the foregoing may be emphasized: First, it will be noted that by virtue of the arrangement of the conveyor band 60 directly under and substantially parallel with the sheets or blanks in the stack, a minimum of deflecting of the blanks is necessary. Secondly, it will be noted that the respective paths of the roller members 51 and the deflector members 48 extend within one another whereby the deflector members hold the blank against the conveyor until the roller members have moved over and upon the blank. It will be further noted that the roller members straddle the deflector members with the result that the latter engage the blank in advance of the roller members so that buckling of the blank by the rollers is prevented. If the positions of the deflector members and the roller members be imagined as reversed, it will be seen that it would be possible for the roller membrs to ride under the blank instead of upon it. Thirdly it will be seen that the sucker 20 and the deflector members 40 in effect move about a center or centers (pivots 22 and 24 in the case of the sucker and pivots 42 in connection with the deflector members) which are toward the remote end of said members whereby the total bodily movement of said members is reduced to a minimum. If the center of movement be imagined as under or within the stack for example, it will be seen that the total movement of said members particularly at the ends remote from the stack will be very much greater. By applicant's construction requiring a minimum of movement it is possible for the speed of the machine to attain a high value.

It will be evident that, in addition to providing a machine which satisfactorily accomplishes the feeding of blanks from a stack into an overlapping band, I have also provided means for readily adjusting the movement of the various feeding elements where-

by the machine is quickly and easily adjusted to take care of blanks of varying size.

Various changes may be made in the specific mechanism described without departing from the spirit of my invention, and certain parts thereof may be used without others.

I claim:

1. In a device for feeding envelope blanks in overlapped relation, in combination, a support for holding a stack of blanks, means for initiating the separation of the outside blank, a conveyor, means for bringing the separated portions of the blank against said conveyor comprising a pair of deflector members; means for constraining said separator portions against said conveyor comprising a pair of rollers having a to and fro movement, said deflector members being straddled by said roller members, the conveyor presenting a more or less flat surface and being more or less parallel to the plane of a blank in the stack.

2. In a device for feeding envelope blanks, in combination, a support for holding a stack of blanks, means for initiating the separation of an outside blank, a conveyor, means for bringing the separated portion of the blanks against said conveyors comprising deflector members, means for constraining such separated portion against said conveyor, the latter presenting a more or less flat surface and being more or less parallel to the plane of a blank in the stack.

3. In a device for feeding envelope blanks, in combination, a support for holding a stack of blanks, a sucker for initiating the separation of the outside blank, a conveyor for receiving the blanks released from the stack, a deflector member for bringing the separated portions of the blanks against said conveyor, said sucker and separator members being arranged so as to move about a center near the remote ends of said members, the conveyor presenting a more or less flat surface and being more or less parallel to the plane of a blank in the stack.

4. In a device for feeding envelope blanks in overlapped relation, in combination, a support for holding a stack of blanks, a travelling conveyor belt disposed below the bottom of said stack and a portion thereof travelling in a plane parallel to and spaced from the bottom of the stack, means for initiating the separation of the lowermost blank, means for completely separating said blank from the stack independently of the forward feed of the blank, means for bringing the forward portion of said blank against said conveyor, and means for holding same in contact with said conveyor, whereby said blank may take the motion of the conveyor, the operation of said elements being arranged in overlapping time relation.

5. In a device for feeding envelope blanks in overlapped relation, in combination, a support for holding a stack of blanks, a travelling conveyor belt disposed below the bottom of said stack presenting a more or less flat surface and being more or less parallel to the plane of a blank in the stack and spaced from the bottom of the stack, means for initiating the separation of the lowermost blank, means for bringing the forward portion of said blank against said conveyor, and means for holding same in contact with said conveyor, whereby said blank may take the motion of conveyor, the operation of said elements being arranged in overlapping time relation.

6. In a device for feeding envelope blanks in overlapped relation, in combination, a support for holding a stack of blanks, a travelling conveyor belt disposed below the bottom of said stack and a portion thereof travelling in a plane parallel to and spaced from the bottom of the stack, said portion being disposed in part below the forward portion of the stack and in part immediately in advance of said stack, means for initiating the separation of the lowermost blank, means for completely separating said blank from the stack independently of the forward feed of the blank, means for bringing the forward portion of said blank against said conveyor, and means for holding same in contact with said conveyor, whereby said blank may take the motion of the conveyor, the operation of said elements being arranged in overlapping time relation.

7. In a device for feeding envelope blanks in overlapped relation, in combination, a support for holding a stack of blanks, a travelling conveyor belt disposed in cooperating spaced relation thereto, means for separating the forward edge of the outside blank from the stack, a deflecting member having successive oscillatory and reciprocatory movements to be interposed between said separated forward edge and said stack and serving to deflect said separated portion against said conveyor, and a contact member for pressing said blank against said conveyor, and having a reciprocatory movement relative to said conveyor for permitting said blank to be deflected against said conveyor; said suction means, deflecting member, and contact member being operated in overlapping time relation.

8. In a device for feeding envelope blanks in overlapped relation, in combination, a support for holding a stack of blanks, a travelling conveyor belt disposed in cooperative spaced relation thereto, suction means for separating the forward edge of the outside blank from the stack, said suction means having successive oscillating and reciprocatory movements from an inoperative position to an operative position where it is in engagement with the forward edge of the blank and a similar return movement, a deflecting mem-

ber having similar combined oscillatory and reciprocatory movements to be interposed between said separated forward edge and said stack and serving to deflect said separated portion against said conveyor, and a contact member for pressing said blank against said conveyor, and having a reciprocatory movement relative to said conveyor for permitting said blank to be deflected against said conveyor; said suction means, deflecting member, and contact member being operated in overlapping time relation.

9. In a device for feeding envelope blanks in overlapped relation, in combination, a support for holding a stack of blanks, a travelling conveyor belt disposed below the bottom of said stack, suction means for separating the forward edge of the lowermost blank from the stack, said suction means having successive oscillating and reciprocatory movements from an inoperative position in advance of and below the forward edge of said stack to an operative position where it is in engagement with the forward edge of the lowermost blank and a similar return movement, a deflecting member having similar oscillatory and reciprocatory movements to be interposed between said separated forward edge and said stack and serving to deflect said separated portion against said conveyor, and a contact member for pressing said blank against said conveyor, and having a reciprocatory movement relative to said conveyor for permitting said blank to be deflected against said conveyor; said suction means, deflecting member, and contact member being operated in overlapping time relation.

10. In a device for feeding envelope blanks in overlapped relation, in combination, a support for holding a stack of blanks, a travelling conveyor belt disposed below the bottom of said stack, a portion thereof travelling in a plane substantially parallel to and spaced from the bottom of said stack, means for separating the forward edge of the lowermost blank from the stack, said means having successive oscillating and reciprocatory movements from an inoperative position in advance of and below the forward edge of said stack to an operative position where it is in engagement with the forward edge of the lowermost blank and a similar return movement, deflecting member having similar oscillatory and reciprocatory movements to be interposed between said separated forward edge and said stack and serving to deflect said separated portion against said conveyor, and a contact member for pressing said blank against said conveyor, and having a reciprocatory movement relative to said conveyor for permitting said blank to be deflected against said conveyor; said suction means, deflecting member, and contact member being operated in overlapping time relation.

11. In a device for feeding envelope blanks in overlapped relation, in combination, a support for holding a stack of blanks, a travelling conveyor belt disposed below the bottom of said stack, a portion thereof travelling in a plane substantially parallel to and spaced from the bottom of said stack, suction means for separating the forward edge of the lowermost blank from the stack, a deflecting member serving to deflect said separated portion against said conveyor, and having a reciprocatory movement relative to said conveyor for permitting said blank to be deflected against said conveyor; said suction means, deflecting member, and contact member being operated in overlapping time relation, and means independent of the above mentioned elements for completing the separation of the blank from the stack.

12. In a device for feeding envelope blanks in overlapped relation, in combination, a support for holding a stack of blanks, a travelling conveyor belt disposed below the bottom of said stack, a portion thereof travelling in a plane substantially parallel to and spaced from the bottom of said stack, said portion being disposed in part below the forward edge of the stack and in part immediately in advance of said forward edge presenting a more or less flat surface and being more or less parallel to the plane of a blank in the stack, suction means for separating the forward edge of the lowermost blank from the stack, a deflecting member serving to deflect said separated portion against said conveyor, and a contact member for pressing said blank against said conveyor, and having a reciprocatory movement relative to said conveyor for permitting said blank to be deflected against said conveyor; said suction means, deflecting member, and contact member being operated in overlapping time relation.

13. In a device for feeding envelope blanks in overlapped relation, in combination, a support for holding a stack of blanks, a travelling conveyor belt disposed below the bottom of said stack, a portion thereof travelling in a plane substantially parallel to and spaced from the bottom of said stack, suction means for separating the forward edge of the lowermost blank from the stack, said suction means having a combined oscillating and reciprocatory movement from an inoperative position to an operative position and a similar return movement, a deflecting member having a movement to interpose the same between said separated forward edge and said stack and serving to deflect said separated portion against said conveyor, a contact member for pressing said blank against said conveyor, and having a reciprocatory movement relative to said conveyor for permitting said

blank to be deflected against said conveyor; said suction means, deflecting member, and contact member being operated in overlapping time relation, and means independent of the above mentioned elements for completing the separation of said blank from the stack.

14. In a device for feeding envelope blanks in overlapped relation, in combination, a support for holding a stack of blanks, a travelling conveyor belt disposed below the bottom of said stack, a portion thereof travelling in a plane substantially parallel to and spaced from the bottom of said stack presenting a more or less flat surface and being more or less parallel to the plane of a blank in the stack, suction means for separating the forward edge of the lowermost blank from the stack, said suction means having a combined oscillating and reciprocatory movement from an inoperative position in advance of and below the forward edge of said stack to an operative position where it is in engagement with the forward edge of the lowermost blank and a similar return movement, a deflecting member having a movement to interpose the same between said separated forward edge and said stack and serving to deflect said separated portion against said conveyor, and a contact member for pressing said blank against said conveyor, and having a reciprocatory movement relative to said conveyor for permitting said blank to be deflected against said conveyor; said suction means, deflecting member, and contact member being operated in overlapping time relation.

15. In a device for feeding envelope blanks in overlapped relation, in combination, a support for holding a stack of blanks, a travelling conveyor belt disposed below the bottom of said stack, a portion thereof travelling in a plane substantially parallel to and spaced from the bottom of said stack presenting a more or less flat surface and being more or less parallel to the plane of a blank in the stack, suction means for separating the forward edge of the lowermost blank from the stack, said suction means having a combined oscillating and reciprocatory movement from an inoperative position in advance of and below the forward edge of said stack to an operative position where it is in engagement with the forward edge of the lowermost blank and a similar return movement, a deflecting member having a similar combined oscillatory and reciprocatory movement to be interposed between said separated forward edge and said stack and serving to deflect said separated portion against said conveyor, and a contact member for pressing said blank against said conveyor, and having a reciprocatory movement relative to said conveyor for permitting said blank to be deflected against said conveyor; said suction means, deflecting member, and contact member being operated in overlapping time relation.

16. In a device for feeding envelope blanks in overlapped relation, in combination, a support for holding a stack of blanks, a travelling conveyor belt disposed below the bottom of said stack, a portion thereof travelling in a plane substantially parallel to and spaced from the bottom of said stack presenting a more or less flat surface and being more or less parallel to the plane of a blank in the stack, said portion being disposed in part below the forward edge of the stack and in part immediately in advance of said forward edge, suction means for separating the forward edge of the lowermost blank from the stack, said suction means having a combined oscillating and reciprocatory movement from an inoperative position in advance of and below the forward edge of said stack to an operative position where it is in engagement with the forward edge of the lowermost blank and a similar return movement, a deflecting member having a similar combined oscillatory and reciprocatory movement to be interposed between said separated forward edge and said stack and serving to deflect said separated portion against said conveyor, and a contact member for pressing said blank against said conveyor, and having a reciprocatory movement relative to said conveyor for permitting said blank to be deflected against said conveyor; said suction means, deflecting member, and contact member being operated in overlapping time relation.

17. In a device for feeding envelope blanks in overlapped relation, in combination, a support for holding a stack of blanks, a travelling conveyor belt disposed below the bottom of said stack, a portion thereof travelling in a plane substantially parallel to and spaced from the bottom of said stack, said portion being disposed in part below the forward edge of the stack and in part immediately in advance of said forward edge, a pair of rotating separating disks disposed one on each side of the stack, the disks serving in part to support the stack and having a cut out portion forming a lip whereby every complete rotation of said disks serves to separate the lowermost blank from the stack, suction means for separating the forward edge of the lowermost blank from the stack, said suction means having a combined oscillating and reciprocatory movement from an inoperative position in advance of and below the forward edge of said stack to an operative position where it is in engagement with the forward edge of the lowermost blank and a similar return movement, a deflecting member having a similar combined oscillatory and reciprocatory movement to be interposed between said separated forward edge and said stack and serving to deflect said sepa-

rated portion against said conveyor, and a contact member for pressing said blank against said conveyor, and having a reciprocatory movement relative to said conveyor for permitting said blank to be deflected against said conveyor; said suction means, deflecting member, and contact member being operated in overlapping time relation, and their cycle of operation being completed within the time of one revolution of said disks.

18. In a machine for feeding envelope blanks in overlapped relation, the combination of a support for holding a stack of blanks, a travelling conveyor belt disposed below the bottom of said support and having a portion thereof travelling in a direction away from the leading edge of the stack in a plane parallel to and spaced from the said bottom, said portion being disposed in part below the leading edge of said stack and in part in advance of said leading edge presenting a more or less flat surface and being more or less parallel to the plane of a blank in the stack, and operating elements for separating the leading edge of the outside blank, for deflecting said edge into contact with said conveyor, and for pressing said blank against said conveyor, whereby said conveyor withdraws said blank in a direction away from the leading edge thereof and in a direction parallel to the plane of the bottom of the stack.

19. In a machine for feeding envelope blanks in overlapped relation, the combination of a support for holding a stack of blanks, a travelling conveyor belt disposed below the bottom of said support and having a portion thereof travelling in a direction away from the leading edge of the stack in a plane parallel to and spaced from the said bottom, said portion being disposed in part below the leading edge of said stack and in part in advance of said leading edge presenting a more or less flat surface and being more or less parallel to the plane of a blank in the stack, and operating elements for separating the leading edge of the outside blank, for deflecting said edge into contact with said conveyor, for pressing said blank against said conveyor, whereby said conveyor withdraws said blank in a direction away from the leading edge thereof and in a direction parallel to the plane of the bottom of the stack, said operating elements having paths of movement that lie substantially within the space defined by the plane of the conveyor and by the plane of the bottom blank.

In testimony whereof I have affixed my signature to this specification.

ABRAHAM NOVICK.

CERTIFICATE OF CORRECTION.

Patent No. 1,808,706. Granted June 2, 1931, to

ABRAHAM NOVICK.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, line 13, claim 1, for "portions" read portion, and line 16, same claim, for the syllable and word "rator portions" read rated portion; same page, lines 27 and 30, claim 2, for the word "portion" read portions; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 4th day of August, A. D. 1931.

Wm. A. Kinnan,
Acting Commissioner of Patents.

(Seal)