

J. S. DUNCAN.
 ENVELOP FEEDING MECHANISM.
 APPLICATION FILED JULY 28, 1910.

1,063,338.

Patented June 3, 1918

2 SHEETS-SHEET 1.

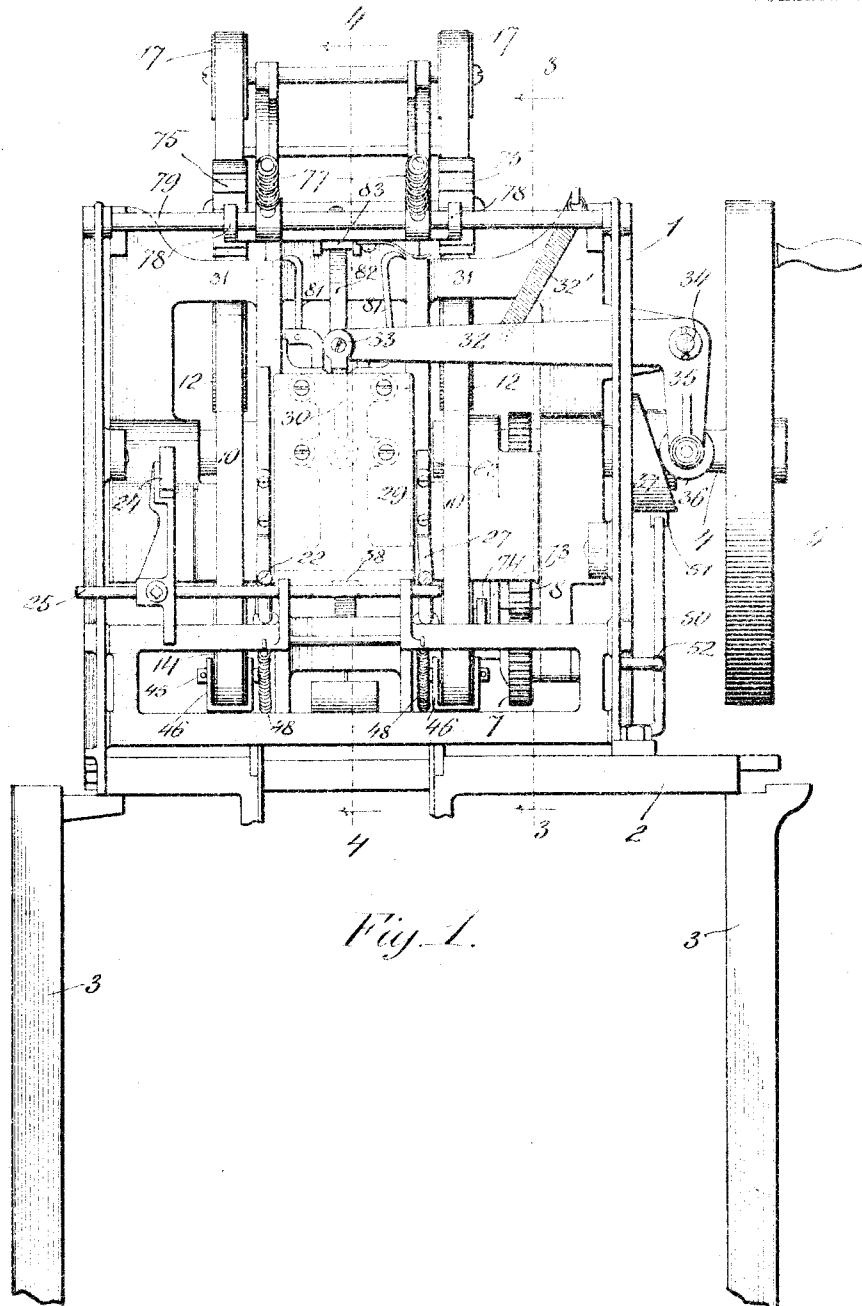


Fig. 1.

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6 SHEETS—SHEET 2.

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6 SHEETS—SHEET 3.

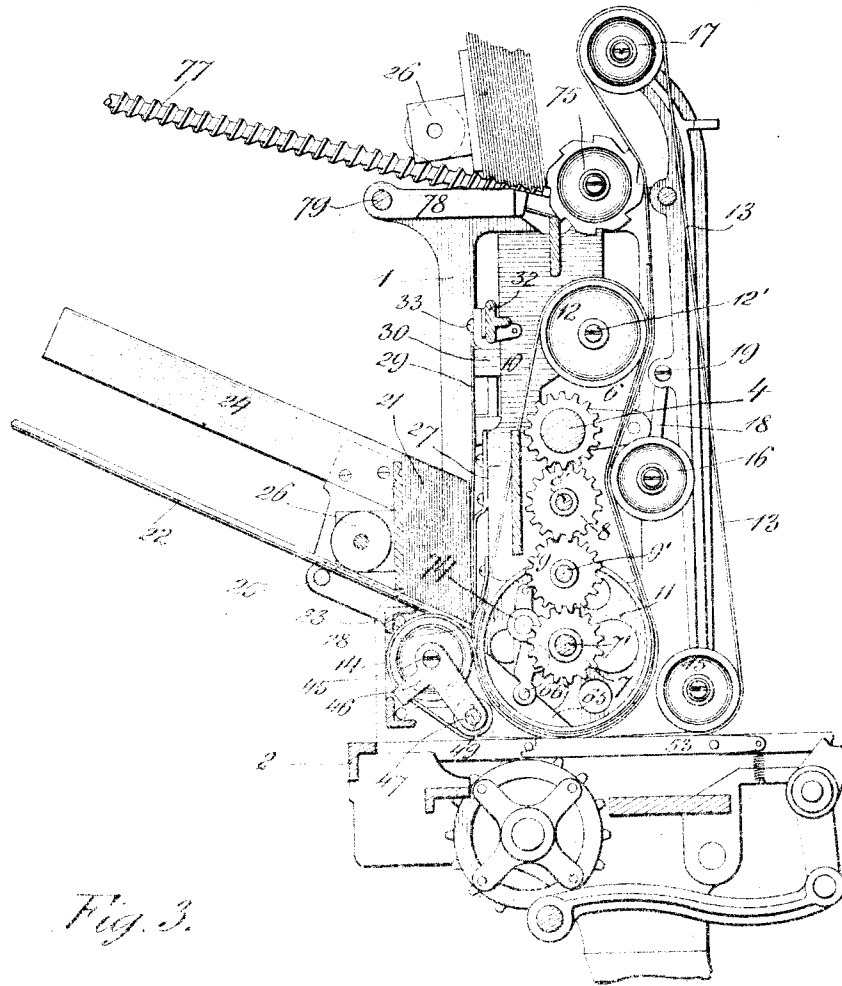


Fig. 3.

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6 SHEETS—SHEET 4.

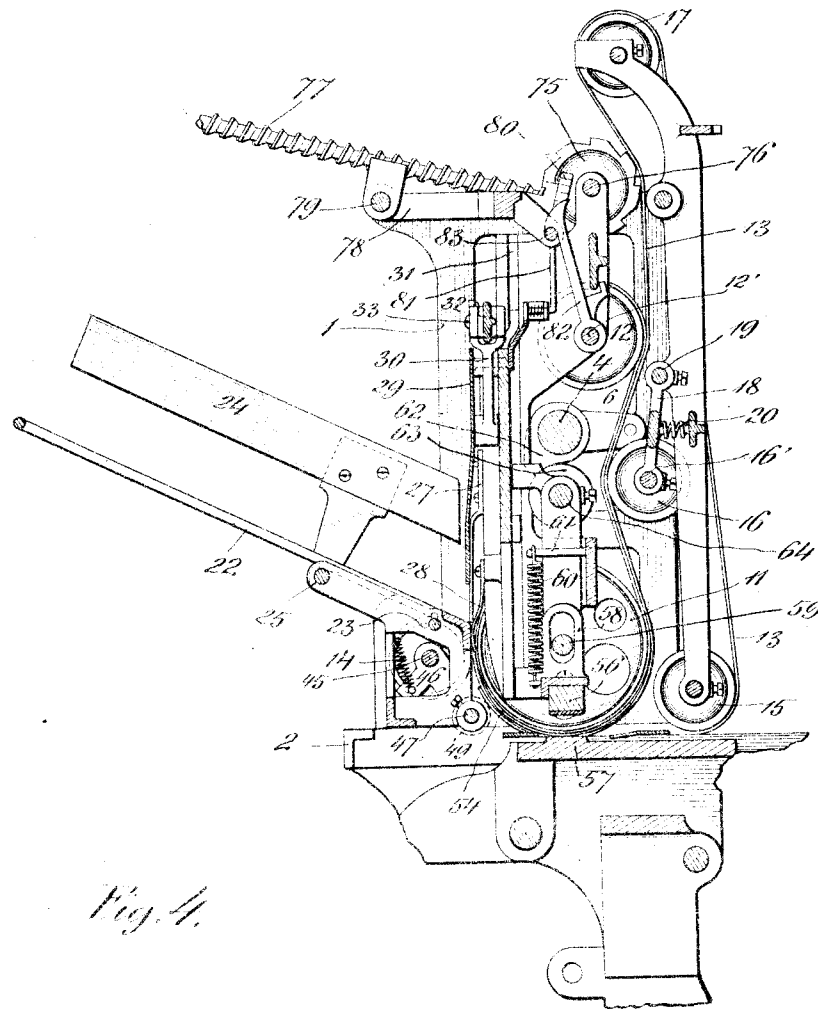


Fig. 4.

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6 SHEETS—SHEET 5.

Fig. 5.

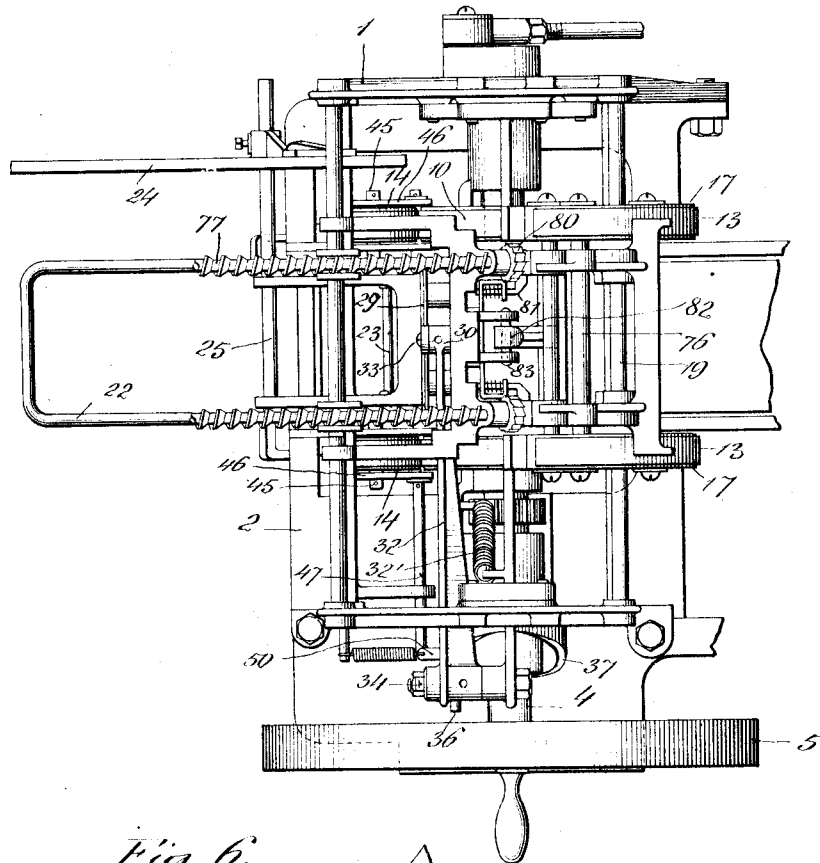
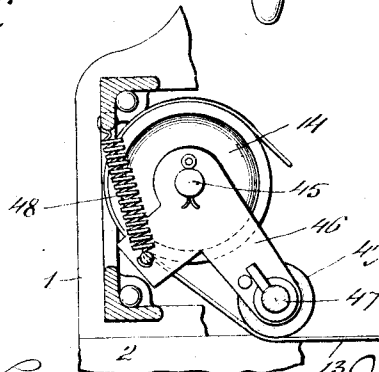


Fig. 6.



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6 SHEETS—SHEET 6.

Fig. 7.

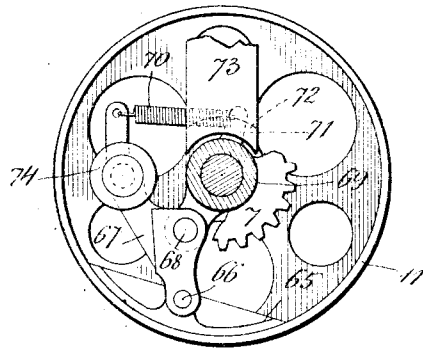


Fig. 8.

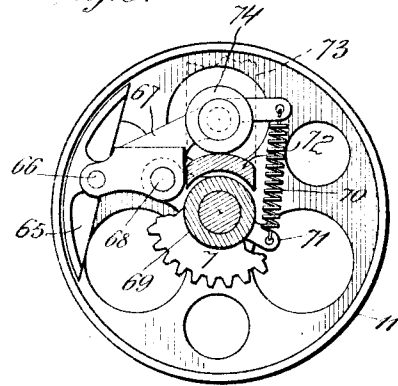


Fig. 9.

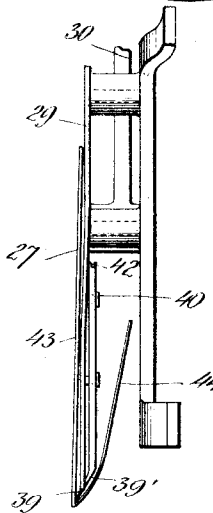
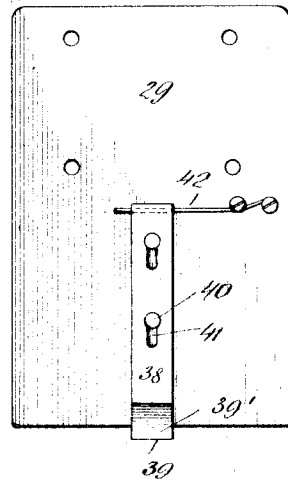
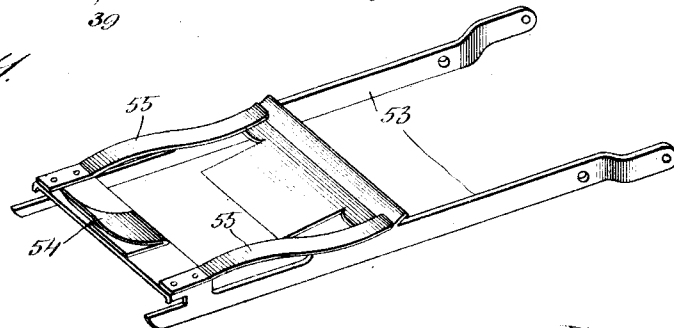


Fig. 10.

Fig. 11.



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UNITED STATES PATENT OFFICE.

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ENVELOP-FEEDING MECHANISM.

1,063,338.

Specification of Letters Patent.

Patented June 3, 1913.

Application filed July 28, 1910. Serial No. 574,412.

To all whom it may concern:

Be it known that I, JOSEPH S. DUNCAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Envelop-Feeding Mechanisms, of which the following is a specification.

This invention relates to improvements in that type of envelop feeding mechanism called "flap feed" machines in which the envelop is fed from a supply by means engaging the flap thereof to addressing or other printing mechanism.

The object of the invention is to provide a machine of simple and inexpensive construction for feeding envelopes rapidly and singly to a printing or other machine and for delivering the envelopes after being printed in a convenient position for removal.

The invention also has for its object to provide mechanism of this character which can be readily adapted to and embodied with a printing mechanism in one complete and compact machine which may be operated, and preferably is operated, by power applied through suitable means simultaneously to both mechanisms.

Further objects of the invention are to insure the feeding of the envelopes one at a time to printing position; to provide means for enabling the envelop to readily enter the feeding devices which carry it through the mechanism; to automatically stop the movement of the envelop so that the printing operation may be completed while the envelop is at rest; and to provide for the rapid feeding and delivery of the envelop.

While the invention is especially adapted for embodiment in a single machine with mechanism and devices for printing addresses on the envelopes, I have not considered it necessary to illustrate or describe such mechanism and devices, and in the drawings have simply shown the invention as it may be applied to an addressing machine.

Referring to the drawings Figure 1 is a front elevation of the invention, the side guide for the envelop being shown in section. Fig. 2 is a side elevation of the invention, showing the power shaft in section. Fig. 3 is a sectional view on the line 3-3 of Fig. 1. Fig. 4 is a sectional view

on the line 4-4 of Fig. 1. Fig. 5 is a top plan view. Fig. 6 is a detail sectional view showing the initial clamping rolls. Figs. 7 and 8 are detail sectional views of the devices which cause the feeding tapes to operate intermittently. Fig. 9 is a rear elevation of the feed plate. Fig. 10 is a detail view showing the feed plate engaged with an envelop. Fig. 11 is a detail view of the face plate.

The invention comprises a frame 1 of suitable configuration for supporting the other parts of the mechanism and this frame may be mounted on or embodied in a bed plate 2 and supported on legs 3, or other supports. A power shaft 4 is mounted in bearings in the frame and it carries a power wheel 5 which can be operated manually or by a power belt, as desired. A gear 6 on the power shaft 4 drives a gear 7 loosely mounted on the shaft 7' and clutched therewith, as hereafter described, through intermediate gears 8 and 9 mounted on shafts 8' and 9', respectively, the said shafts being all mounted in the frame in a suitable manner. Feed tapes 10 travel on feed rolls 11 rigidly mounted on the shaft 7' and on feed rolls 12 mounted on a shaft 12' supported in the frame. Tapes 13 are trained on rolls 14 in front of the rolls 11, rolls 15 behind rolls 11, rolls 16 arranged behind the tapes 10 and between the horizontal planes of the shafts of rolls 11 and 12, and rolls 17 located at the top of the mechanism. The tapes 13 are actuated by the tapes 10 with which they engage for a part of their travel, and the tapes 10 are driven from the power shaft through the gears heretofore described. The rolls 16 are mounted on a shaft 16' which is suspended in a swinging bracket 18 pivoted at 19 on the main frame, and a spring 20 interposed between the bracket and main frame projects the rolls 16 forwardly into engagement with the tapes to maintain the tapes at tension (Fig. 4).

The supply of envelopes 21 is arranged on a support 22 which is pivotally mounted in the frame on the rod 23 so that it can be swung up into a substantially vertical position out of the way when not in use. A side guide 24 is adjustably mounted on a rod 25 secured in the frame of the machine and the envelop supply is positioned in the mechanism by this side guide which can be adjusted for envelopes of different length.

The support 22 is adapted to rest in inclined operative position upon the rod 25 (Fig. 3) and a suitable follower 26 travels on the support behind the supply of envelopes and pushes the envelopes down the inclined support against the stop bars 27 and spring-holding fingers 28 (Fig. 3). The envelopes are arranged in the supply with the flaps forward and projecting upward so that a device may engage the flap of the first envelop and push the envelop down into position between the tapes. A feed plate 29 is mounted on a plate frame 30 which is arranged to slide vertically in guide-ways 31 in the main frame. A crank lever 32 is pivotally engaged at one end 33 with the plate frame 30 and is pivotally mounted at its angle on a stud shaft 34. The short arm 35 of this crank lever carries an anti-friction roll 36 which is held in engagement with a cam 37 rigidly mounted on the power shaft 4 by a spring 32' (Fig. 1). As the power shaft rotates the cam actuates the crank lever and imparts to the plate and its frame a vertical reciprocating movement which enables the plate to feed an envelop from the supply on each downward movement. Incorporated with the feed plate a device for insuring the engagement of the plate with the envelop by lifting the flap thereof to permit the plate to readily enter inside of the flap. This device comprises a spring actuated slide 38 having a forwardly and downwardly projecting and sharpened lower end 39. This end constitutes a separator for lifting the flap preliminary to the entrance of the lower edge of the feed plate and in order that the separator may act first upon the flap it projects forwardly through a recess 39' in the lower edge of the feed plate and downwardly in front of and below the face of said plate. The slide 38 is guided and limited in its vertical movement relative to the feed plate by pins 40 on the feed plate which engage slots 41 in the slide, and the slide is held normally in downward position, as shown in Fig. 9, by a spring 42 mounted on the back of the feed plate. On the downward movement of the feed plate the forwardly projecting end 39 of the slide first engages the top of the flap and lifts or spreads the flap away from the body of the envelop so that the feed plate may readily engage the flap at its juncture with the body of the envelop to feed the envelop away from the supply. The edge of the separator 39 is preferably sharpened to facilitate its action and the lower edge of the feed plate, while not necessarily blunt, is at least preferably not so sharp as the separator to avoid all liability of the feed plate cutting the envelop under the necessary pressure employed in feeding the envelop from the supply. To prevent the separator from cutting the envelop while it is being fed from the supply

I mount it yieldingly upon the feed plate so that it will yield to the pressure employed in feeding the envelop and thereby avoid mutilating the envelop.

The spring fingers 28 prevent the first envelop from slipping down out of its place in the supply until it is fed downward by the feed plate and then, in order that there may be no resistance to the movement of the plate and to enable the envelop to be fairly caught between the tapes I provide means for moving the clamping rolls 14 laterally to carry them away from the rolls 11 and thereby provide a wider or deeper throat or opening between the tapes 10 and 13 at said rolls to receive the envelop. To this end the rolls 14 are mounted on shafts 45, (Fig. 6), supported in brackets 46 which are rigidly mounted on the rock shaft 47. Springs 48 are attached to the brackets 46 and to the main frame to hold the rolls 14 in normal position, as shown in Fig. 3. The tapes 13 also travel on rolls 49 carried by the rock shaft 47. An arm 50 (Fig. 2) rigid with one end of the rock shaft 47 projects forward in the path of a cam 51 on the power shaft and located for convenience on the cam 37. The cam 51 is timed so that as the feed plate moves the envelop away from the supply the arm 50 will be engaged by said cam to rock the shaft and move the clamping rolls 14 laterally, as before described, to enable the envelop to enter between the rolls 14 and 11 whereupon, the cam 51 having passed the arm 50 the springs 48 will act upon the rolls 14 to move them toward the rolls 11 with a clamping action so that the tapes will engage and carry the envelop on through the mechanism. A spring 52 (Fig. 2) is connected to the main frame and the arm 50 to limit the rearward movement of said arm and rock shaft.

The face plate 53 (Fig. 11) is fastened on the bed of the machine to receive the envelop in printing position and it comprises a guide 54 which is located between the rolls 11 and curved in substantial correspondence therewith to insure the proper movement of the envelop at the initial stage of its feeding operation after leaving the supply. Spring fingers 55 are provided at the sides of the face plate on which the envelop rests while it is engaged by the platen 56 (Fig. 4) and pressed thereby against a printing device of suitable character on the bed at 57.

In the embodiment of the invention here selected for illustration the printing devices are fed one at a time to printing position beneath the platen which presses an envelop against each printing device as it comes to rest temporarily in printing position and the spring fingers are provided to insure the disengagement of the envelop from contact with the printing device as the platen

rises out of contact with the envelop to enable the tapes to carry the envelop on without interference. The platen is carried by a frame 58 which is arranged to slide vertically in the main frame and is guided in the guide-ways 31 (Fig. 4). This frame is also guided on a cross bar 59 in the main frame and it is pulled upward and normally held in elevated position by a spring 60 which is attached at one end to the platen frame and at its other end to a pin 61 rigid with the main frame. The platen frame is moved downward by cams 62 rigid on the power shaft 4 and arranged to engage rolls 63 on a shaft 64 mounted in the platen frame. The platen operating mechanism is timed with relation to the feeding mechanism so that the platen will be moved downward after an envelop has been registered in printing position thereunder and in the type of addressing machine which has been referred to as one with which the invention may be embodied, a printing device would also be registered at the same time below the envelop. In order that this registration of the envelop may be effected and the envelop brought to rest temporarily in position for the printing operation I provide means for stopping the movement of the tapes temporarily. This means comprises a friction shoe 65 (Figs. 7, 8) pivoted at 66 on one end of a lever 67 which is pivotally mounted at 68 on a sleeve 69 rigid with the hub of gear 7. A spring 70 attached at one end to the lever 67 and at its other end to an ear 71 on the sleeve 69 holds the shoe normally in engagement with the inner face of the rim of the adjacent tape roll 11. The gear 7 is loosely mounted on the shaft 77 and the rolls 11 are rigidly mounted thereon. Through the clutch mechanism just described the gear 7 is locked with the adjacent roll 11 to operate said rolls whereby the rolls 11 become the actuating feed rolls of the series for operating the tapes. A cam 72 is supported on a part 73 which may be fastened to the main frame or comprise a part thereof, as found most convenient, and the lever 67 carries a roll 74 to engage said cam. The parts are constructed and timed so that when the roll 74 engages the cam 72 the lever 67 will be rocked on its pivot to disengage the shoe 65 from the rim of roll 11 and thereupon the rolls 11 and all of the feeding mechanism come to rest. This operation is timed with relation to the other operations so that the feeding movement will be temporarily stopped during the printing operation. When the roll 74 passes over the cam 72 the spring 70 can throw the shoe 65 into engagement with the roll 11 and the feeding operation is resumed. After the envelops are printed they are fed forward from printing position by the tapes and carried up to a discharge table or

stacker mechanism which is located above the mechanism heretofore described and is arranged to receive and stack the envelops neatly in a pile above the feed table. This stacking mechanism comprises a pair of shouldered disks 75 mounted in the frame on a shaft 76 and operated by engagement with the tape 13. These disks receive the envelop from between the tapes 10 and 13 and discharge it with a quick throw on to the rods 77 which are mounted in a bracket 78 pivoted at 79 on the main frame. The rods 77 are provided with a thread of suitable character which will feed the envelops rearwardly from the disks 75 as the rods are turned, and the turning mechanism comprises ratchet wheels 80 on the forward ends of the rods arranged to be engaged by spring pawls 81 on the feed plate frame. The stacker or discharge table comprising the rods 77 is pivotally mounted on the main frame so that it can be folded closely against the frame when not in use, similar to the feed table 22, and to hold it in operative position, as shown in Fig. 4, I provide a pawl 82 to engage a bar 83 on the stacker bracket.

My invention is simple in construction and is adapted to be embodied with an addressing or other printing machine for printing addresses, or other matter, on envelops with great rapidity. While it is particularly adapted for envelops it may be used with other things having a fold similar to an envelop flap to be engaged by the feeding devices. The different parts of the mechanism are operated automatically so that the movement of the envelop is intermittent to the extent that it stops temporarily for the printing operation and the length of this stop may be regulated to accord with the operation of the printing mechanism.

What I claim and desire to secure by Letters Patent is:

1. In an envelop feeding mechanism, the combination of a feeding device adapted to engage the flap of an envelop, and a separator movably mounted on one face of the feeding device and projecting on the opposite face thereof.

2. In an envelop feeding mechanism, the combination of a feeding device adapted to engage the flap of an envelop, and a separator carried by the feeding device and movable relatively thereto to open the flap so that the device may engage therewith.

3. In an envelop feeding mechanism, the combination of a feeding device adapted to engage the flap of an envelop, and a separator yieldingly mounted on the feeding device and capable of movement in the direction of movement of the feeding device to open the flap so that the feeding device may engage therewith.

4. In an envelop feeding mechanism, the combination of a feeding device adapted to

engage the flap of an envelop, and a separator yieldingly mounted on the feeding device to open the flap so that the feeding device may engage therewith.

5 5. In an envelop feeding mechanism, the combination of a feeding device adapted to engage the flap of an envelop, and a separator yieldingly mounted on the back of the feeding device and projecting in front of
10 and below the feeding device to open the flap so that the feeding device may engage therewith.

6. In an envelop feeding mechanism, the combination of two pairs of feed rolls arranged one pair above the other, tapes
15 trained on said rolls, and tapes trained on a plurality of rolls and arranged to engage the first mentioned tapes throughout a portion of their travel, said latter rolls comprising a pair located in front of the lower
20 pair of the first mentioned rolls, and a pair located behind the lower pair of said first mentioned rolls, and a pair located above the plane of the upper pair of said first mentioned rolls, and means for feeding an envelop
25 to the tapes between the lower pair of the first mentioned rolls and the pair in front of said lower pair, whereby the envelop is fed downwardly and forwardly and then
30 upwardly to a discharge position above the initial feeding position.

7. In an envelop feeding mechanism the combination of a plurality of sets of tapes, rolls around which said tapes are trained,
35 the rolls being arranged to provide a throat between the tapes for the reception of envelops, means including a feeding device and a separator carried thereby for separating an envelop from a supply and delivering
40 said envelop to said throat between the

tapes, means for automatically moving a roll of one set away from an opposing roll of the other set to open the throat for the reception of the envelop delivered thereto, and automatic means for subsequently moving
45 said rolls into juxtaposition to close the throat and bring the tapes of both sets into engagement with opposite faces of the envelop whereby to feed said envelop along between the sets of tapes.

8. In an envelop feeding mechanism, the combination of a feeding device adapted to engage the flap of an envelop, a separator slidably mounted thereon, and means for
50 yieldingly holding said separator in operative position.

9. In an envelop feeding mechanism, the combination of a feeding device, a separator slidably mounted thereon, and means for
55 yieldingly projecting one end of the separator beyond the end of the feeding device to open the flap of an envelop so that the feeding device may engage therewith.

10. In an envelop feeding mechanism, the combination of a feeding device adapted to
60 engage the flap of an envelop, and a separator carried by said feeding device and movable conjointly therewith and also relatively thereto.

11. In an envelop feeding mechanism, the
70 combination of an envelop feeding device adapted to engage the flap of an envelop, and a separator mounted to move conjointly with said feeding device and also relatively thereto.

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