

April 15, 1958

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2,830,535

SEMI-AUTOMATIC ADDRESSING MACHINE

Filed Feb. 6, 1956

3 Sheets-Sheet 1

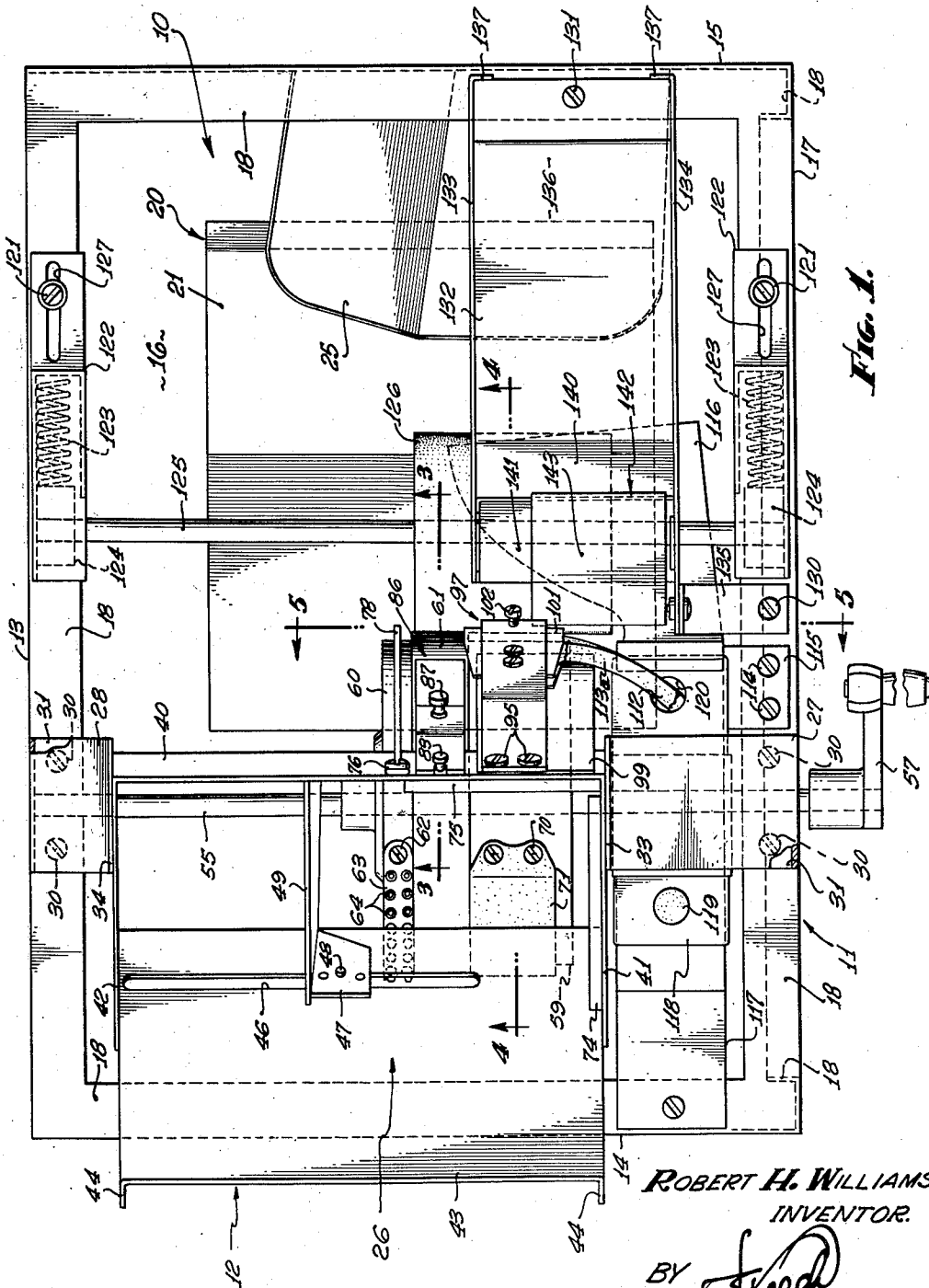


FIG. 1.

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3 Sheets-Sheet 2

Fig. 4.

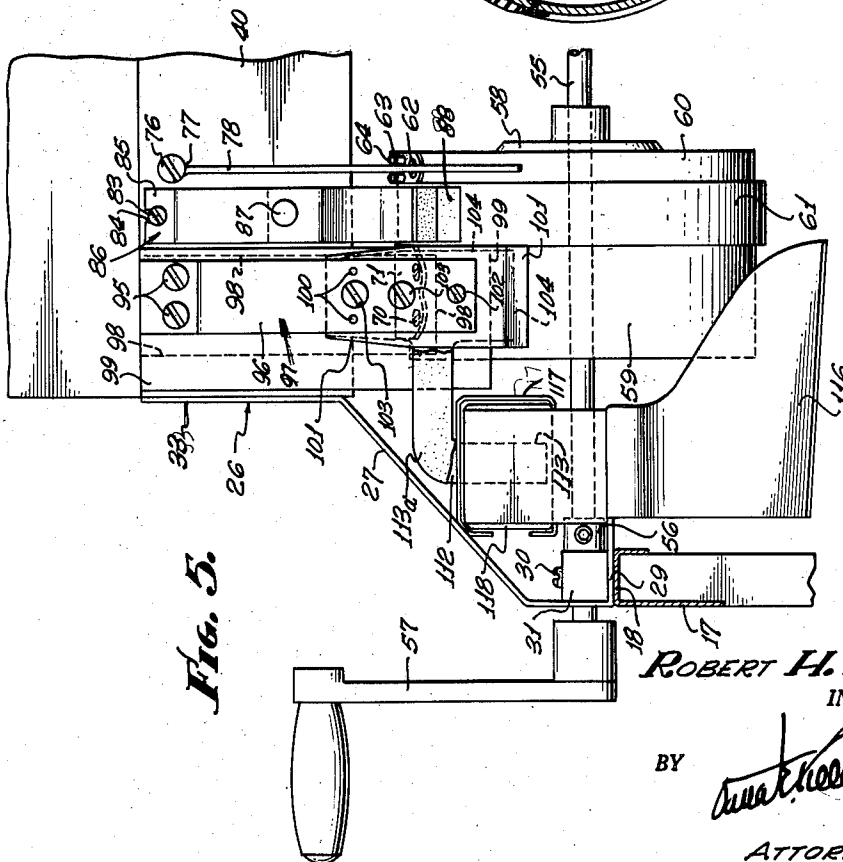
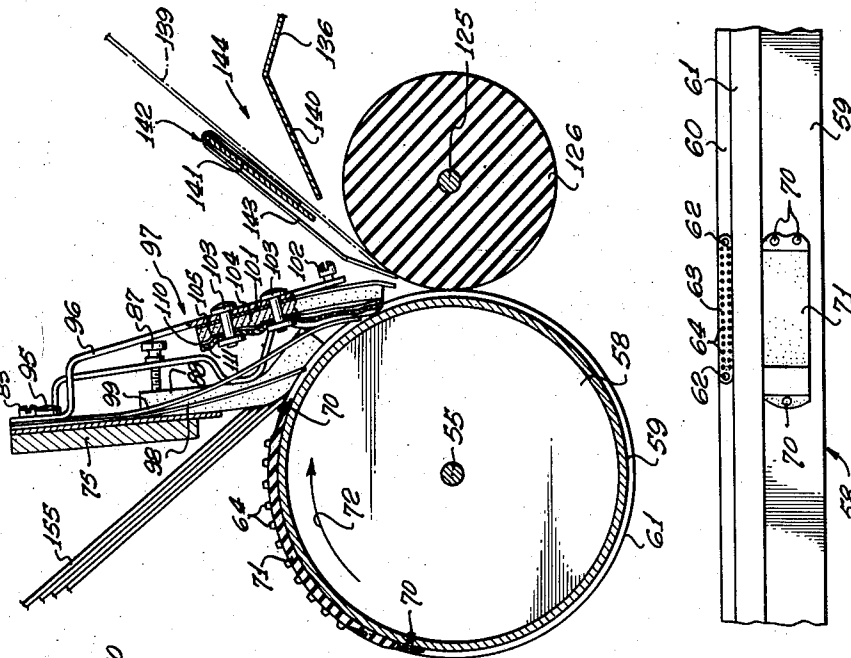


Fig. 5.

Fig. 6.

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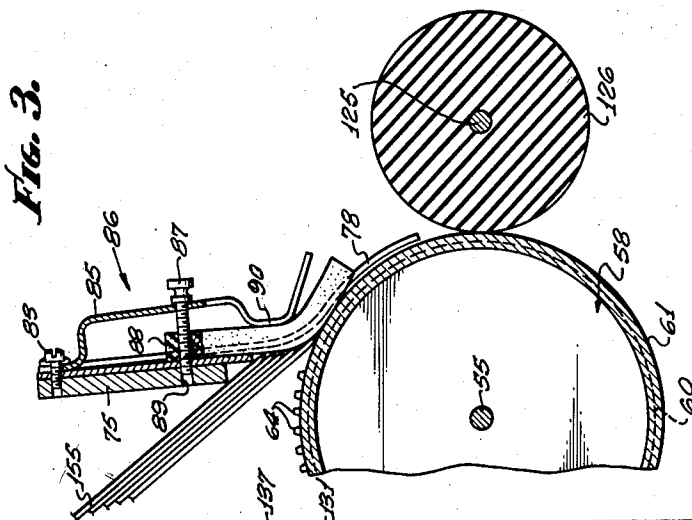
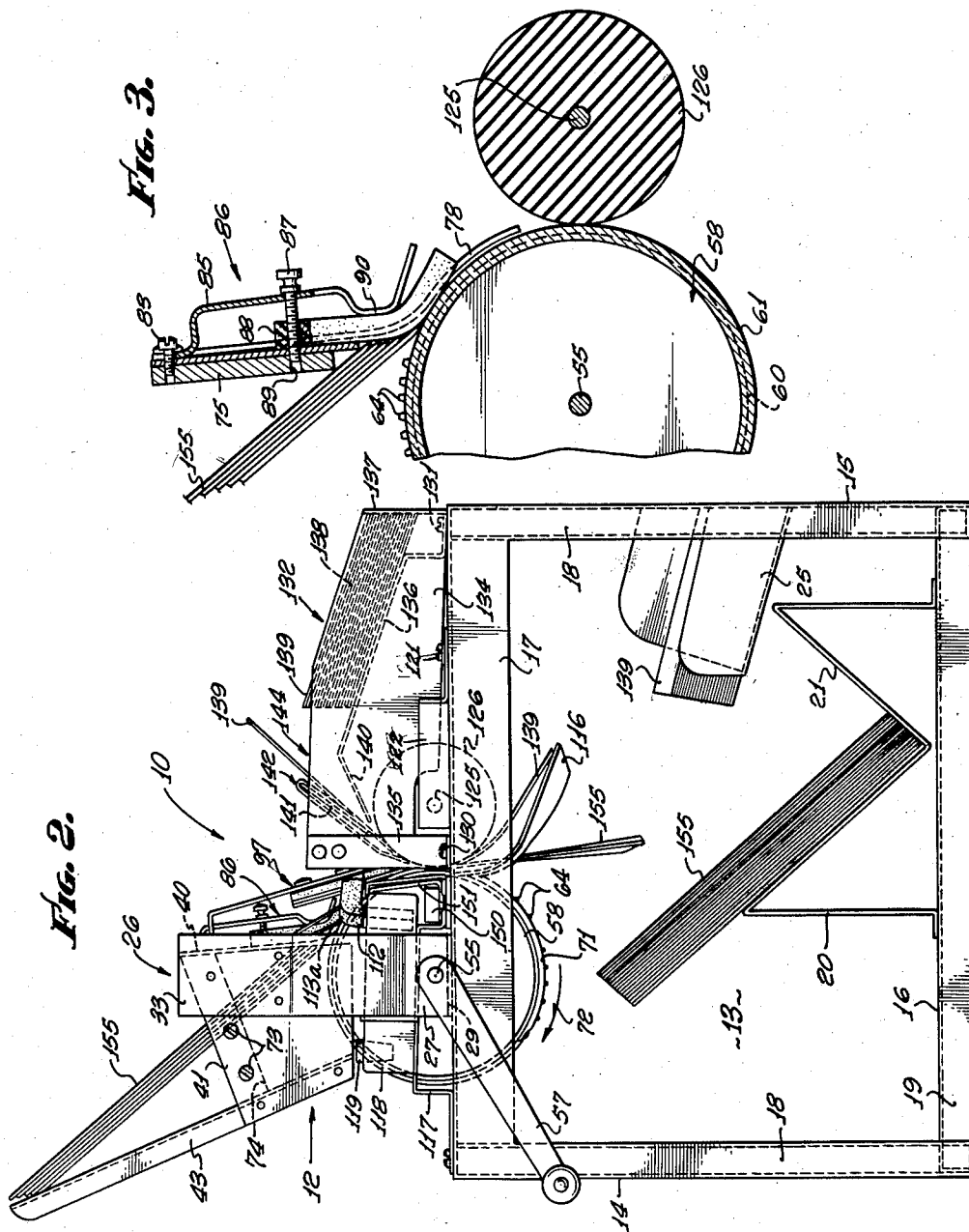
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SEMI-AUTOMATIC ADDRESSING MACHINE

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3 Sheets-Sheet 3



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2,830,535

## SEMI-AUTOMATIC ADDRESSING MACHINE

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Application February 6, 1956, Serial No. 563,583

5 Claims. (Cl. 101—132.5)

This invention relates to addressing machines and particularly to such machines wherein a master has a negative image formed thereon with suitable copying ink and the mailing piece to be printed upon is previously moistened with a quick-diffusing and quick-drying solvent and said master and said mailing piece then pressed together face-to-face to transfer the image on the master in positive form onto said mailing piece.

Addressing machines operating by this principle and having the master for each addressing operation formed on an individual card are well known in the art, but these machines are complex in structure and expensive to manufacture.

It was to meet the demand for an addressing machine of this type of simplified construction and, therefore, which can be sold at a relatively low price, that I conceived the machine disclosed in my co-pending application for U. S. Letters Patent, Serial No. 423,117, filed April 14, 1954. That machine was hand operated and both the envelopes and the address cards were fed automatically, and concurrently through the machine so as to print addresses from the address cards onto the envelopes. This machine has a high capacity, which is in excess of that required by many small business concerns whose needs could be met by a machine of substantially less capacity, and who naturally would like to purchase a machine at the lowest possible price which would be suitable for their purposes.

It is an object of the present invention to provide an addressing machine representing a simplification of the machine in said co-pending application and which operates semi-automatically with the envelopes being automatically fed from a hopper through the printing mechanism and the address cards being fed manually, which machine may be sold at a substantially lower price than its aforesaid preceding type and yet will handle a substantial volume of work.

It is another object of the invention to provide a semi-automatic addressing machine of simplified construction which may be inexpensively produced and sold at a relatively low price which will handle mailing pieces of a large variety of sizes and feed these automatically to the printing point of the machine and provide means for the accurate and rapid manual feeding of address cards in conjunction with the automatic feeding of said mailing pieces.

A further object of the invention is to provide an addressing machine having a simplified feed mechanism applying unbalanced forces to the envelope in feeding the same, and having means of making a correction for said unbalanced forces to deliver the envelopes to the printing point in true alignment with the address card.

The manner of accomplishing the foregoing objects as well as further objects and advantages will be made manifest in the following description taken in connection with the accompanying drawings in which:

Fig. 1 is a diagrammatic plan view of a preferred embodiment of the invention.

2

Fig. 2 is a front elevational view, at a reduced scale, of Fig. 1.

Fig. 3 is a fragmentary sectional detail view taken on the line 3—3 of Fig. 1, and illustrating the envelope separator.

Fig. 4 is a fragmentary sectional detail view taken on the line 4—4 of Fig. 1, and illustrating the envelope moistening device.

Fig. 5 is a fragmentary sectional detail view taken on the line 5—5 of Fig. 1, facing the front wall of the envelope hopper and showing the aforesaid separator and moistening device in elevation.

Fig. 6 is a development of the peripheral surface of the envelope feed roller, illustrating the disposition of the segmental envelope feed means thereon.

Referring specifically to the drawings, the invention is there disclosed as incorporated in a semi-automatic addressing machine 10. This machine includes a sheet-metal box 11 which provides a base for an addressing mechanism 12 which is mounted on top of the box 11 but is readily removable from the box for storage in the latter as when shipping the machine 10.

The box 11 is open at the top and front faces as shown in Figs. 1 and 2 and includes a back wall 13, end walls 14 and 15, a bottom 16 and a cross-beam 17 which unites the upper front corners of the end walls 14 and 15. The upper edges of back wall 13, end walls 14 and 15, and beam 17, and the front edges of end walls 14 and 15, are bent to form reinforcing edge channels 18.

The front edge of box bottom 16 is bent downwardly to form a reinforcing flange 19.

Formed of a single rectangular sheet of metal by bending the same along five parallel lines transversely of the sheet, is an addressed mailing piece receptacle 20 having a wide V-shaped bed 21. Secured as by spot-welding to end wall 15 is an address card receptacle 25 which is also V-shaped and inclined slightly rearwardly and upwardly from longitudinal parallelism with the box 10.

The addressing mechanism 12 includes a mailing piece hopper 26 supported by a pair of sheet-metal brackets 27 and 28, the latter having inturned feet 29 at their lower ends which rest on edge channels 18 of back wall 13 and cross-beam 17 and are secured to said channels by bolts 30 which also secure bearing blocks 31 to said channels. The brackets 27 and 28 extend upwardly and inwardly and have parallel upper portions 33 and 34.

The hopper 26 has a front wall 40 which is inclined slightly rearward from vertical and has side walls 41 and 42 bent rearwardly from the opposite ends thereof, the latter walls fitting flush against inner faces of the upper parallel portions 33 and 34 of brackets 27 and 28 and being riveted thereto. The hopper 26 has a more steeply rearwardly inclined rear wall 43, end edges 44 of which are bent rearwardly and are riveted to rear edge portions of hopper end walls 41 and 42. The hopper rear wall 43 has a horizontal slot 46 which accommodates a slide 47 having a clamp screw 48 and supporting an adjustable hopper partition 49, which is inclined towards the side wall 42 of the hopper and which may be fixed by manipulation of the screw 48 in any desired position lengthwise in the hopper 26 to accommodate mailing pieces of various widths. The reason for the inclination of the partition 49 will be made clear hereinafter.

Extending through a suitable aperture provided in brackets 27 and 28 and journalling in bearings 31 is a feed roller shaft 55. Fixed on the shaft 55 to limit end play thereof is a collar 56. A handle 57 is provided on the extending end of said shaft for rotating the same to cause the mechanism 12 to perform its addressing function. Fixed on the shaft 55 is a cast aluminum feed roller 58 having hard smooth peripheral surfaces 59 and 60, which are of uniform outside diameter, and a peripheral

3

band 61 which is disposed therebetween and which has a substantially larger radius than the surfaces 59 and 60, as shown in Figs. 1 and 5.

Fixed by screws 62 on the peripheral surface 60 of the roller 58 is a studded rubber strip 63. The studs 64 of strip 63 extend a substantial distance radially beyond the outer surface of smooth band 61 of the roller 58. Fixed by screws 70 on the peripheral surface 59 of the roller 58 is a segmental rubber envelope feeding and printing pad 71. The external radius of the pad 71 lies between that of the band 61 and the studs 64 of the strip 63. The reason for these distances will be made clear hereinafter. When the machine 10 is operating, the shaft 55 and roller 58 are rotated in a clockwise direction as indicated by the arrows 72 in Figs. 2 and 4. The leading ends of both the studded strip 63 and pad 71 are approximately abreast of each other. The strip 63 is shorter than the pad 71, however, so that the trailing end of the pad 71 extends about an inch past the trailing end of the strip 63, as shown in Figs. 4 and 6, and the latter portion of the pad 71 is preferably rendered slick by covering the same with a piece of polyester film coated with pressure adhesive.

Secured to an upper edge portion of the hopper side wall 41 by screws 73 and lying on the inside of said side wall is a mailing piece canting block 74. Secured to the inner face of hopper front wall 40 is a screw receiving block 75. Screwed into a tapped hole in the upper portion of the hopper front wall 40 and block 75 is a screw 76 which penetrates an eye 77 bent in the upper end of a spring wire guide 78, the latter extending downwardly from its point of attachment to said hopper wall by said screw with its lower portion bent to lie in a plane bisecting the two rows of studs 64 on the strip 63 and close to said studs, and substantially concentric with the roller 58. The function of the wire 78 will be pointed out in detail hereinafter.

Screwed into a tapped hole in the front hopper wall 40 and block 75 near the top edge of said wall is a screw 83 which is adapted to be received by a notch 84 in the upper end of a sheet-metal backing plate 85 of a mailing piece separator 86. Just below the screw 83, the plate 85 is bent outwardly and downwardly and is apertured to receive an adjusting screw 87 which also extends through a hole in the upper end of a rubber friction member 88 and is then screwed into a tapped hole 89 provided in hopper front wall 40 and block 75. Below the screw 87, the plate 85 is bent inwardly, downwardly and then outwardly, at a downwardly inclined angle, to form a pressure heel 90. The rubber friction member 88 constitutes one or more strips of relatively soft rubber which extends downwardly from the screw 87 and underneath the pressure plate heel 90, being pressed by said heel against the band 61 on feed roller 58. The pressure applied by the heel 90 against said friction member is readily adjustable by rotation of the screw 87. The separator 86 is superimposed directly over the smooth band 61 provided on roller 58 and rides at all times on this band except when a mailing piece is passing therebetween. The function of the separator 86 is to prevent the feeding of a mailing piece from the hopper 26 excepting when this mailing piece is engaged by the segmental studded strip 63 and the segmental feeding and printing pad 71, which engagement is just about to happen with the parts of the machine 10 positioned as shown in Figs. 3, 4 and 5.

Rigidly secured to an upper portion of the hopper front wall 40 and block 75 by screws 95 is a sheet-metal mounting arm 96 of a moistening device 97 (Figs. 4 and 5). The screws 95 also serve to secure to the wall 40, two spring plates 98 and 99 which are formed of very thin sheet spring metal. These plates are given a set, before assembly of the machine, as disclosed in Fig. 4, the purpose of which will be pointed out hereinafter.

Secured by rivets 100 to mounting arm 96 is a shield

4

101 which is preferably formed of the same material as the spring plates 98 and 99. The lower end of the shield 101 is bent slightly towards roller 58 and is adjustably flexed inwardly toward said roller by a screw 102 mounted in a tapped hole in the lower end portion of arm 96. Extending through suitable apertures in the arm 96 and shield 101 are a pair of bolts 103 which also extend through holes in a moistener pad 104 and are tightened up on this so as to unite this pad with the arm 96. The pad 104 includes a thick layer of felt 105, an intermediate layer 110 comprising a thin sheet of leather, and an inwardly exposed layer 111 which comprises a relatively thin sheet of felt, the lower end of which bears directly against each mailing piece passing through the addressing mechanism 12. The functions of the respective elements of the moistening pad 104 will be made clear hereinafter.

The thick felt layer 105 of the moistener pad 104 has formed integrally therewith, a feed wick 112 which extends horizontally from the moistener 97 and has a downward extension 113 at its outer end. The wick 112 is preferably enclosed in a polyester sleeve 113a to prevent excessive evaporation of solvent therefrom.

Fixed on the upper edge of cross-beam 17 by screws 114 (Fig. 1) is a bracket 115 from the right edge of which has bent downwardly therefrom an address card deflector plate 116 which is shaped and positioned as clearly shown in Figs. 1, 2 and 5, and the purpose of which will be made clear hereinafter. Supported at one end on the bracket 115 and at its opposite end on box end wall 14 is a sheet metal solvent reservoir support 117. Fitting within the support 117 is a plastic solvent reservoir 118, this having a filling aperture normally closed with a stopper 119 at one end, and an open aperture 120 at the other end, the latter being adjacent the moistener 97. The reservoir 118 is so positioned by its support 117 that the vertical arm 113 of wick 112 may be readily extended downwardly through hole 120 into the reservoir 118 as shown in Figs. 1 and 5. Thus a continual supply of solvent is transmitted through the wick 112 to the moistener 97 as long as the reservoir 118 contains solvent.

Mounted on the upper edge channel 18 of box back wall 13 and cross-beam 17 by screws 121 are housings 122 confining springs 123 and block bearings 124 in which opposite ends of a shaft 125 journal. Mounted on the shaft 125, so as to be pressed by springs 123 into contact with the feed rollers 58, is a printing roller 126 which is preferably made of soft rubber. The screws 121 pass through slots 127 in the housings 122 whereby the latter are adjustable lengthwise on the channels 18 supporting the same. As shown in Fig. 1, this adjustment is preferably effected so as to slightly cock the shaft 125 at the time no mailing piece is being fed through the mechanism 12. At this time, the roller 126 is pressed by the springs 123 exclusively into pressurable contact with the smooth band 61 of the feed roller 58.

Secured by screws 130 and 131 to the upper edge channels 18 of cross-beam 17 and box end wall 15 is an address card hand feed rest 132. This rest includes a pair of side walls 133 and 134, the latter having a bracket 135 which is secured to beam 17 by screw 130 and a floor 136 which is shaped as shown by dotted lines in Fig. 2, with one end of this connected by screw 131 to box end wall 15. The adjacent ends of side walls 133 and 134 have in-bent flanges 137 which are adapted to retain a stack 138 of address cards 139 resting on the floor 136 (Fig. 2). The opposite end portion 140 of the floor 136 slopes downwardly in the opposite direction over the roller 126 and terminates at a vertical plane located just beyond the vertical plane of the shaft 125. Disposed above the floor portion 140 and in converging relation therewith is a plate 141 opposite ends of which are united with the side walls 133 and 134. A relatively flat U-shaped spring clip 142 is adapted to be slipped over the plate 141 so as to mount the clip thereon. This clip, includes a pressure plate 143 which is disposed above the plate 141 and the

lower extremity of which is bent to extend towards and into contact with the rubber roller 126 and at a relatively small acute angle with the surface of the roller.

The floor portion 140 and the plate 141 and side walls 133 and 134 thus cooperate to form a hopper 144 for an individual address card 139. When such a card is inserted in said hopper (Fig. 4), the lower end thereof is pressed into frictional contact with the rubber roller 126 by the pressure plate 143 so that, immediately following said insertion, whenever rotation of roller 126 in an anti-clockwise direction commences, this card 139 will be drawn between the roller 126 and the plate 143 by the friction of the rubber roller against the card. In this manner, the card 139 will be fed downwardly from the position in which this is shown in broken lines in Fig. 4 so that it will pass between the feed roller 58 and the printing roller 126 and perform its function in an addressing operation.

To absorb solvent accidentally spilled from the reservoir 118, a block 150 of heavy felt is provided in the reservoir support 117, this felt having a wick 151 which extends up alongside the adjacent end of the reservoir 118 as clearly shown in Fig. 2. Thus solvent accidentally spilled from this end of the reservoir will be absorbed by the wick 151 and the felt block 150 to be evaporated into the air therefrom and prevent the dripping of the spilled solvent downwardly over the work.

#### Operation

To operate the machine 10, a group of mailing pieces, such as envelopes 155, is placed in the hopper 26 with the lower ends fanned as shown in the Figs. 2, 3 and 4. A stack of master address cards 139 is placed in the feed rest 132 provided therefor, as shown in Fig. 2, which makes these cards readily available for the operator to pick up the topmost card of the stack and place this in the hopper 144 for use in each addressing operation.

Assuming that the reservoir 118 contains a supply of solvent, the crank-handle 57 is now grasped by the operator and rotated clockwise in the direction of arrows 72 from the position in which it is shown in Figs. 3, 4 and 5 to engage the lowermost envelope 155 by the segmental pad 71 and studded strip 63. This envelope is thereby drawn downwardly beneath the rubber friction member 88 of the separator 86 and beneath the spring wire guide 78 and the spring plates 98 and 99, whereby this envelope is caused to continue downward in conformity with the contour of the roller 58. The turning of the handle is now halted with the envelope just short of being wiped against the lower extremity of the moistening pad 104.

With the handle thus halted, the operator inserts the top-most addressing card 139 in the card hopper 144, as shown in full lines in Fig. 2 and in broken lines in Fig. 4. The turning of the handle 57 is now immediately resumed which causes the lowermost feeding of the envelope 155 past the moistener 97, and the simultaneous feeding of this envelope and the card 139 in the hopper 144 downwardly between the rollers 58 and 126.

Each of the cards 139 contains an address negative applied thereto by carbon paper with spirit soluble transfer material and this address is located on that portion of the card which passes between the wall 133 and the pressure plate 143 so that this transfer material does not come under said pressure plate as the card is fed downwardly between the pressure plate and the roller 126. Thus the transfer material on the card 139 is not smeared by the pressure plate 143 but travels directly in to contact with the portion of the area on the envelope 155 which has just been wet with solvent by contact with the moistener pad 104 so that the pressure of the envelope and card between the rollers 58 and 126 dissolves a portion of said transfer material and transfers this to the envelope to form an address on the latter.

As shown in Fig. 2, the printing operation described is followed by the engagement of the lower end of the

card 139 involved therein with the deflector plate 116 which turns this card sharply to the right and directs it along a path causing it to drop into the address card receptacle 25. The envelope 155 continues straight downwardly from between the rollers 58 and 126 and drops into the mailing piece receptacle 20. It is to be noted that the addressed faces of the envelopes 155 are disposed upward when they are deposited in the receptacle 20. The address cards 139 are deposited in the receptacle 125 with the faces containing the transfer material disposed downwardly. The cards 139, however, are normally used also as filing cards and have the address, formed by the card when used in the addressing machine 10, typed in positive type on the opposite face of the card, and it is these opposite faces which are always disposed upwardly when the cards 139 are deposited in the receptacle 125.

The operator is thus able to observe, by looking downwardly through the open front of the box 14, as to how effectively the machine is operating in the addressing of envelopes 155.

It is to be noted, furthermore, that the cards 139 are deposited in the receptacle 25 in the same sequence that they are taken from the stack of these placed in the address card rest 132.

The sloping of the partition 49, and the introduction of the canting block 74 in the hopper 26, is for the purpose of giving a slight twist to the mailing pieces placed in the hopper 26 which counteracts the tendency of the two segmental means for feeding envelopes from this hopper to twist the envelope in the opposite direction when feeding it from the hopper. With the latter tendency counteracted the envelopes are fed downwardly in correct alignment with the cards 139 so that the address appears on each envelope in correct alignment with the longitudinal axis of the envelope. The tendency, for which correction is necessary, derives from the fact that the pad 71 exerts a substantially greater frictional drag on the envelope in the feeding operation than the studded strip 63. The resistance offered to the feeding of the envelopes by the separator 86 is thus disposed eccentrically relative to the total of the forces tending to feed the envelope. This produces the tendency to twist the envelope when feeding the same which is overcome by the laterally inclined partition 49 and the canting bar 74. It is preferable to correct this tendency rather than to try to feed the envelopes with balanced forces, as the combination of a flat pad 71 and a studded strip 63, as shown in the present machine, is found to be a thoroughly reliable means for feeding the envelopes and occupies less space and is less expensive to produce than a feeding means applying balanced forces in the envelope feeding operation.

The moistening device 97 employs the thick felt wick 112 and the thick felt layer 105 in the moistener element 104 which is integral with said wick, for delivering an adequate supply of solvent from the reservoir 118 to the moistening device 97. The intermediate leather layer 110 in the moistener pad 104 is closer grained than the felt and acts as a regulator for the transfer of solvent from the felt layer 105 to the envelope.

The exposed layer 111 of relatively thin felt is used to directly engage the envelope because of its superior wearing qualities, when exposed to friction, over that of the leather. The leather layer inhibits the flow of solvent from the felt layer 105 to the felt layer 111, thereby preventing excessive wetting of the envelope with solvent.

The spring plate 98 extends downwardly normally below the outer radius of the roller band 61 and thus yieldably engages each envelope 155 and holds the same pressed against the feeding and printing pad 71 during the feeding of that envelope.

The spring plate 99 prevents contact of the envelope with the moistener pad 104 until the envelope almost reaches the lower end of this pad. This permits advanc-

ing the envelope a substantial distance after starting the feed of the same, before inserting the address card 139 in the hopper 144, without starting the envelope to absorb solvent. Thus when the rotation of the handle 57 is resumed to consummate the addressing operation, the only solvent applied to the envelope is that uniform minimum amount which is necessary to effect the printing of a good address on the envelope.

The spring shield 101 with the adjusting screw 102 is provided on the moistener 97 for adjustment to compensate for the wearing away of the lower end of the moistener pad 104 by use. As the lower end of the pad becomes worn, it is shifted inwardly by screwing in on the screw 102 so as to retain the pad in proper relationship with the envelopes fed through the machine, whereby these are properly moistened with solvent.

The claims are:

1. In a semi-automatic printing machine, the combination of: a cylindrical roller participating in the combined functions of supporting, feeding, moistening and printing on a series of printing blanks such as envelopes, cards or the like; a hopper for confining a fanned stack of said blanks with the latter inclined from vertical with the upper end of said stack supported on the hopper and its lower end resting on and supported by said roller; a stationary flexible separator bearing against said roller just in advance of and engaged by the lower end of said stack of fanned blanks; segmental frictional feed means provided on the periphery of said roller and operated by rotation of the latter to sequentially engage said blanks, as each becomes the lowermost blank in said stack, to feed said blanks one at a time between said roller and said separator; moistening means mounted for engagement with each blank, as it is thus fed between said separator and said feed roller, for moistening said blank with a solvent; a printing roller mounted to bear against and being rotated by said feed roller in rolling relation with the latter so that each of said blanks passes between said feed and printing rollers following contact of said blank with said moistening device; yieldable means bearing against the periphery of said printing roller for positioning the lower end of a printing card having a negative image formed thereon in soluble transfer material with said card in frictional engagement with said printing roller when said card is lowered between said roller and said yieldable means; and frictional means extending around the periphery of said printing roller to cause the feeding of said printing card between said printing roller and said yieldable means to cause said card to pass between said printing roller and said feed roller whereby the operator may selectively feed said printing card in proper timed relation with the feeding of one of said blanks so that said blank and said printing card pass between said feed and printing rollers in face-to-face relation, with said rollers pressing said transfer material on said printing card against the moistened area on said blank and transferring a portion of said material onto said blank to form a positive imprint thereon of said negative image.

2. A combination as in claim 1 in which said printing roller has a periphery comprised entirely of rubber and in which said blank feed roller has a smooth, hard-surfaced peripheral band which extends to a greater radius than the balance of said feed roller, with the exception of said segmental feed means, the contact of said blank separator with said feed roller being confined to said band, said printing roller being driven by tangential contact with said band, excepting when said segmental feed means on said feed roller comes opposite said printing roller, said segmental feed means having an external radius substantially in excess of that of said smooth band so as to shift said printing roller out of contact with said band while said segmental feed means is travelling in contact with said printing roller.

3. A combination as in claim 2 in which said segmental blank feed means includes a relatively wide segmental flexible printing pad with a smooth cylindrical outer surface having a radius slightly in excess of that of said smooth hard band on said feed roller, said printing pad bearing the main burden of feeding blanks from said feed hopper and offering, while disposed between said feed roller and said printing roller, the sole contact therebetween.

4. A combination as in claim 3 in which said segmental frictional feed means also includes a segmental rubber strip with an externally studded surface which extends to a radius slightly greater than that of said pad, lies on the opposite side of said smooth hard band of said feed roller from said pad, and is disposed in offset relation to said printing roller; and yieldable guides positioned to be engaged by each blank just beyond the point where the latter is first frictionally engaged by said pad and said studded element to guide said blank into continued engagement with said pad and element and to cause said blank to conform to and follow the curvature of said feed roller as said blank is fed between the latter and said flexible separator.

5. A combination as in claim 1 in which the peripheral portion of said printing roller is formed of rubber; an individual card guiding hopper for guiding a printing card to bring the lower end into contact with the periphery of said printing roller and in a given overlapping but offset relation with said blanks, said yieldable card positioning means comprising a spring guide mounted on said individual card hopper and contacting said printing roller at a given point in substantial tangency therewith and positioned to form a stop for an address card inserted into said single card hopper with the lower end of said card engaging the peripheral frictional face of said printing roller to cause said card to be fed downwardly by said printing roller whenever said printing roller is rotated after said printing card is so fed, said spring guide bearing on a different portion of said printing card than the portion thereof containing transfer material.

No references cited.