

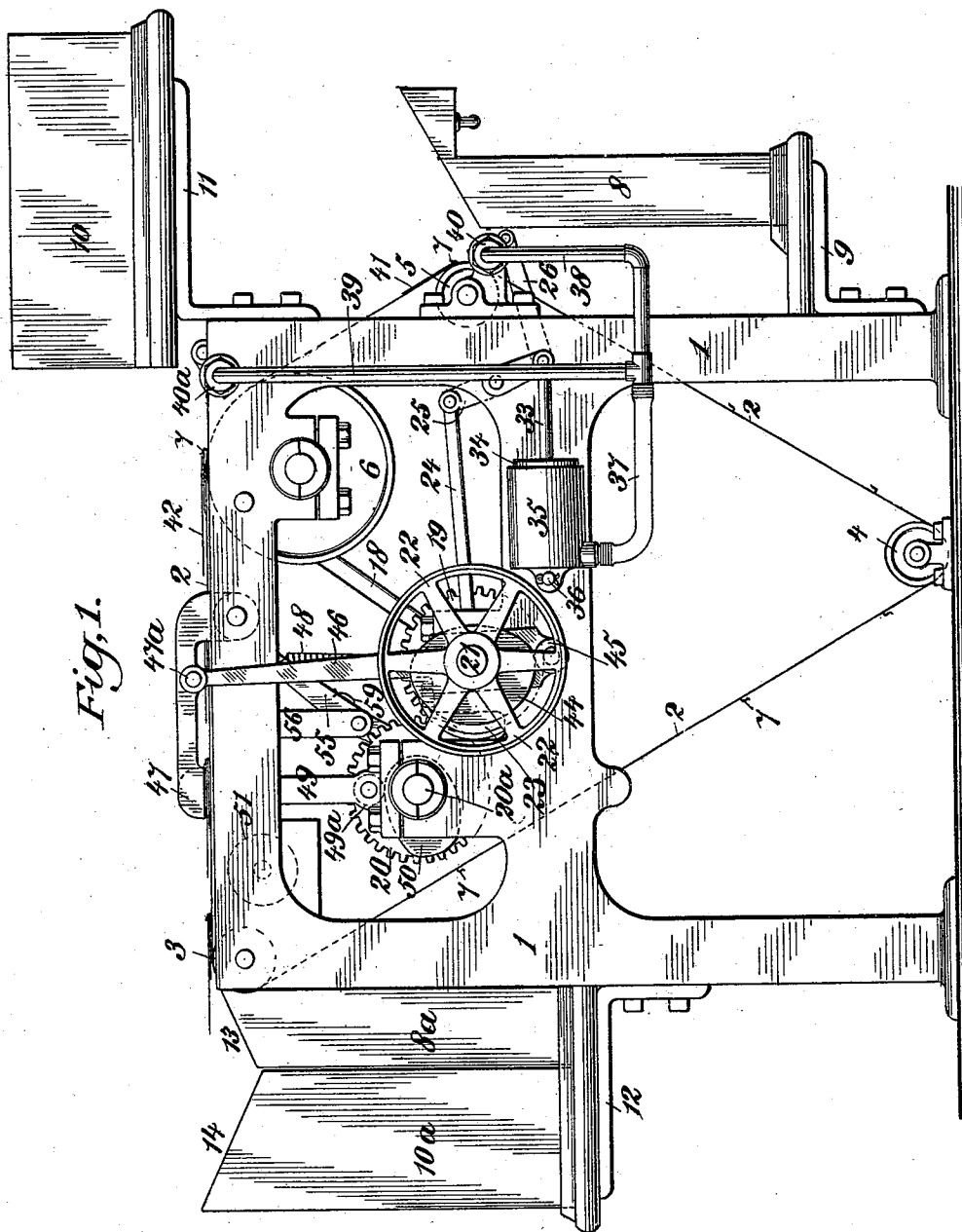
(No Model.)

5 Sheets—Sheet 1.

F. D. BELKNAP.
ADDRESSING MACHINE.

No. 551,751.

Patented Dec. 24, 1895.



Witnesses:-

B. H. Haymork
W. H. Tinsley

Inventor:

Frank D. Belknap
by A. Parker Smith
his Atty.

(No Model.)

5 Sheets—Sheet 2.

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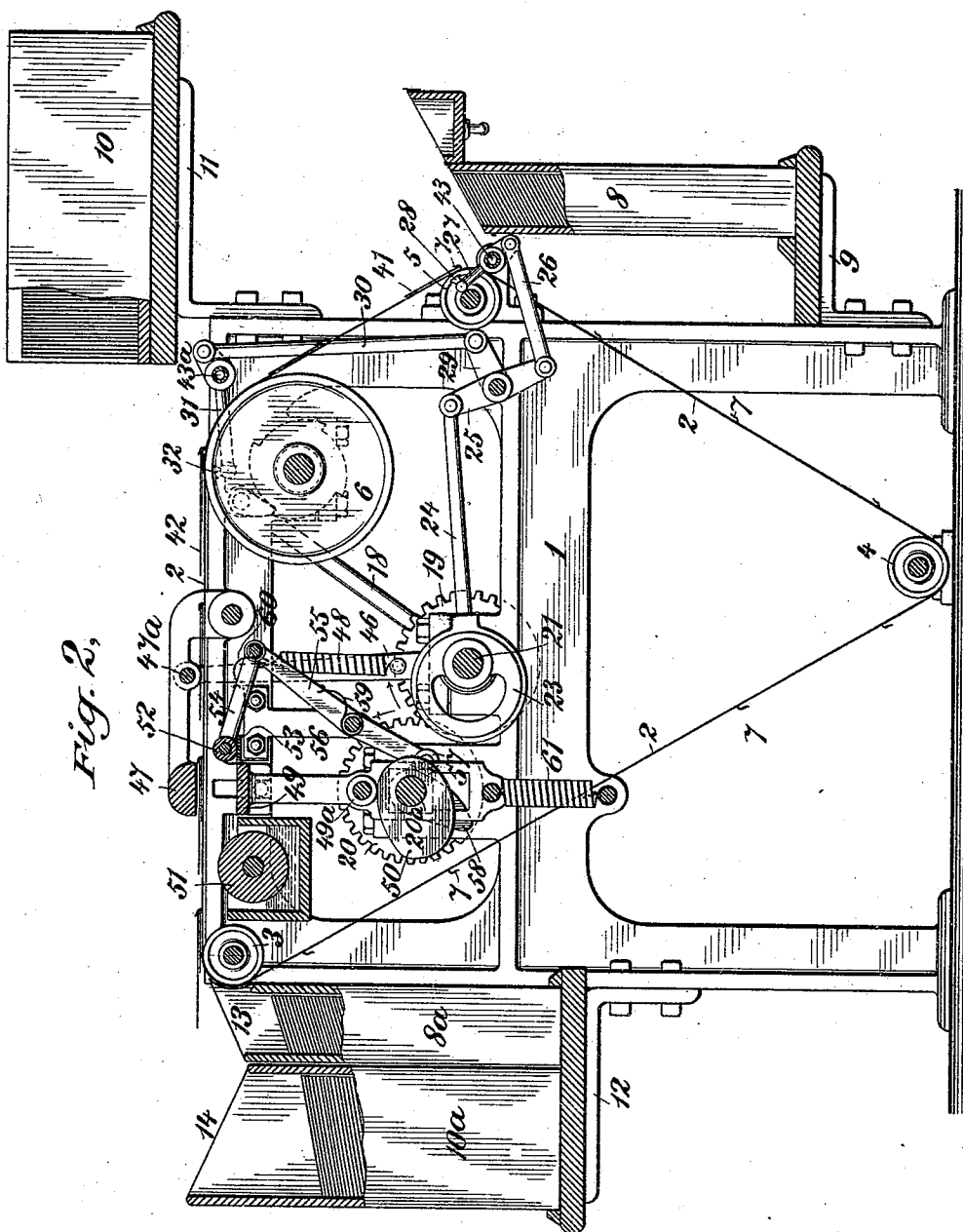


Fig. 2,

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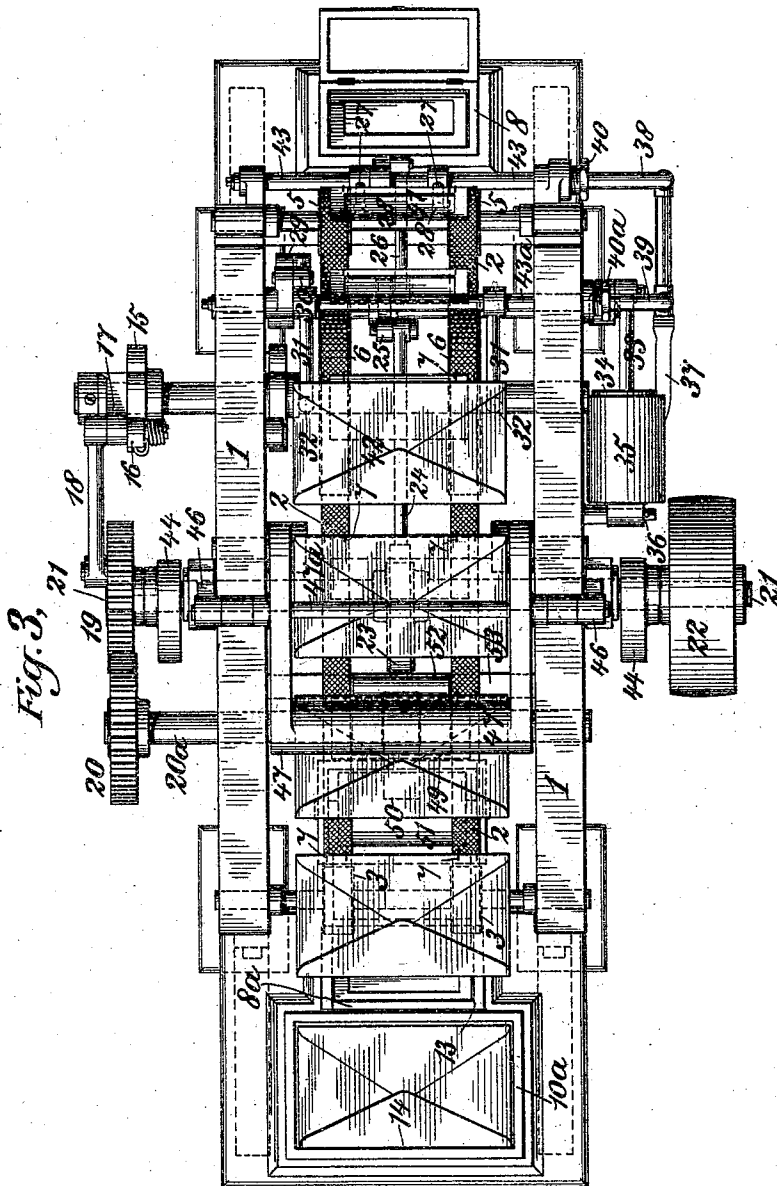
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5 Sheets—Sheet 3.

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5 Sheets—Sheet 4.

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Fig. 5.

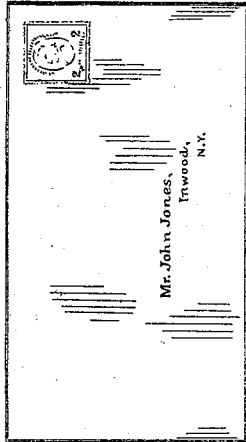


Fig. 6.

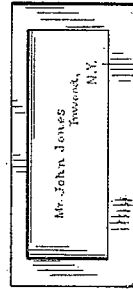
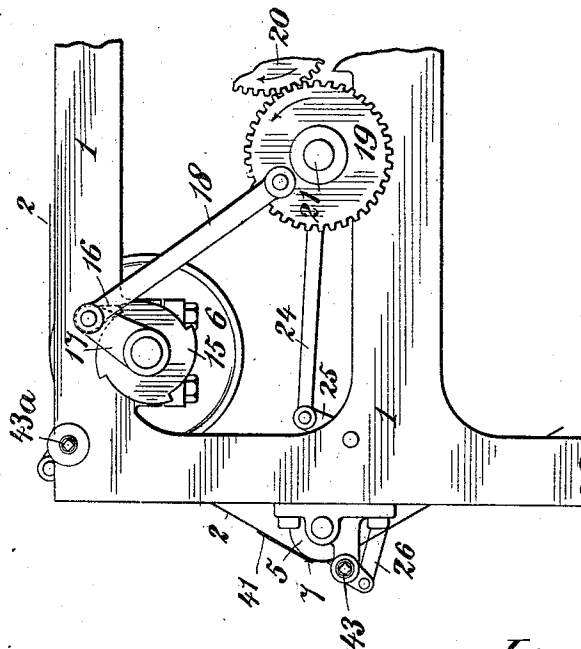


Fig. 4.



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(No Model.)

5 Sheets—Sheet 5.

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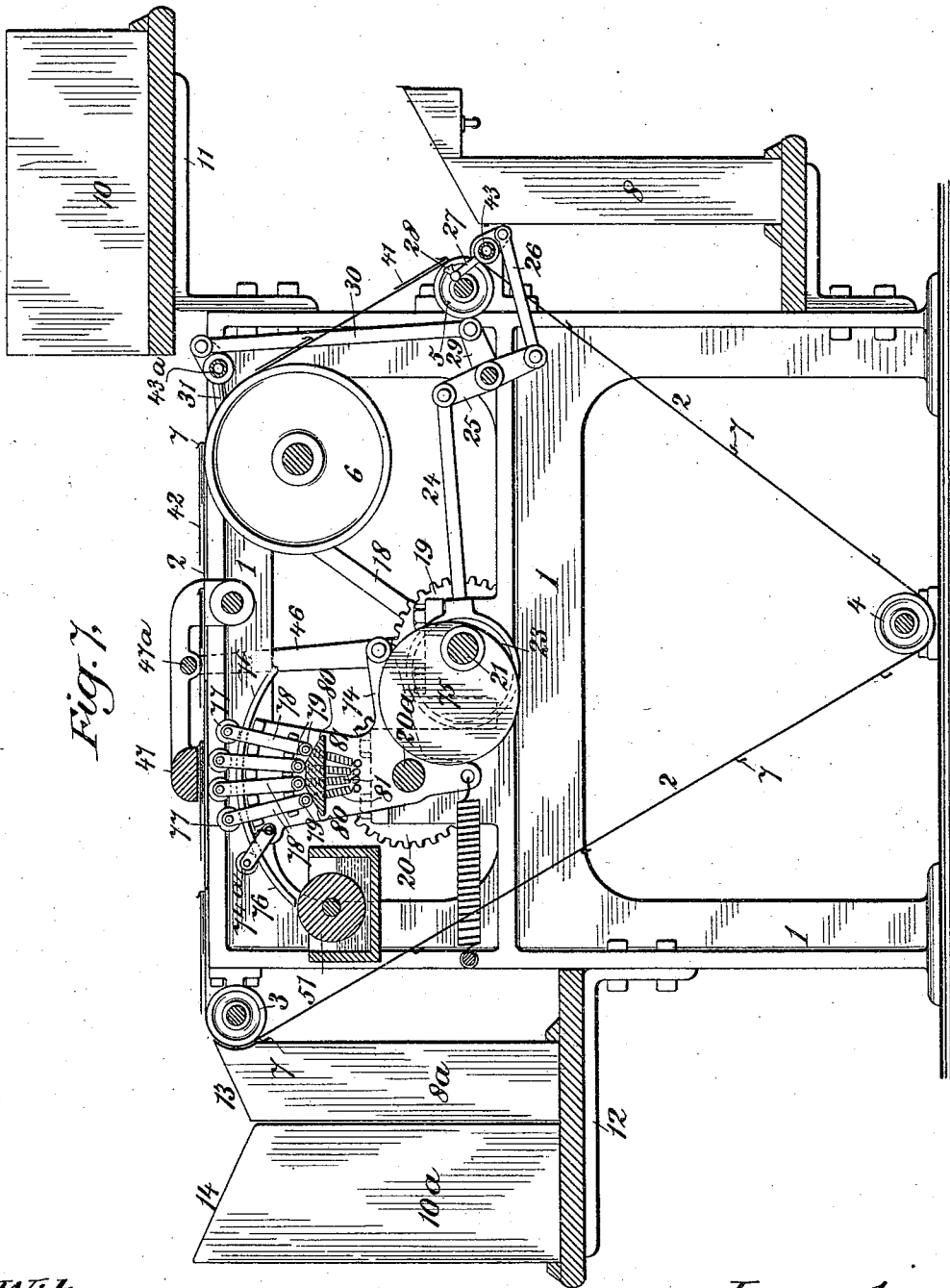


Fig. 7.

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UNITED STATES PATENT OFFICE.

FRANK D. BELKNAP, OF NEW YORK, N. Y.

ADDRESSING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 551,751, dated December 24, 1895.

Application filed August 2, 1894. Serial No. 519,264. (No model.)

To all whom it may concern:

Be it known that I, FRANK D. BELKNAP, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Addressing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to what are known as "addressing-machines"—that is, machines by which a number of envelopes, postal-cards, newspaper-wrappers, or other articles can be printed each with one name from a long list of such names and addresses and mailed accordingly. It is specifically designed to apply to that class of addressing-machines in which non-metallic stencils are used. These stencils have heretofore commonly been used in the shape of long rolls of parchment or similar suitable material upon which have been written the names and addresses by means of perforations through said parchment. As frequent corrections, additions and erasures are necessary in any such list, it has been a matter of great difficulty to make these changes on such a roll and still preserve the alphabetical order or other classification of the names. To overcome this difficulty I propose to substitute for the parchment-roll a set of small non-metallic perforated stencil-cards which can be packed in a magazine, like cards of a card-catalogue, and easily removed or added to.

My present invention consists of a simple machine specifically designed to use such card-stencils in the addressing of envelopes, &c., in combination with such stencil-cards, which thereby form a complete printing-machine.

The machine is illustrated in the accompanying five sheets of drawings, in which—

Figure 1 is a side view of the machine. Fig. 2 is a longitudinal section. Fig. 3 is a plan view with the envelope-magazine removed. Fig. 4 is a detailed view of the band-feed mechanism. Fig. 5 is a view of the addressed envelope. Fig. 6 is a view of the non-metallic perforated stencil-card. Fig. 7 is another

longitudinal section of the machine, showing a modified form of the printing mechanism.

Throughout the drawings like reference-figures refer to like parts.

1 represents the main frame of the machine.

2 is an endless feed-band which passes through the printing mechanism, carries to it the envelopes and card-stencil in position for printing, and afterward delivers them to suitable receptacles. This feed-band runs around pulleys 3, 4, and 5 and over the driving-drum 6. On the band at uniform distances are sets of hooks 7, which serve to hold the cards onto the band during a portion of its travel and also to properly space them. This endless feed-band may be solid and the printing done over its edges, or it may have openings cut in it through which the printing could be done; but preferably I make it double, composed of the two parts 2 and 2^a, as best shown in Fig. 3. The two parts then suffice to carry the cards and articles to be printed, while the printing and some of the other feed mechanism can operate between the two portions of the double band.

8 is a magazine of stencil-cards, having its cover thrown back and when in use placed upon the bracket 9.

10 is a magazine of envelopes, postal cards or other articles to be printed, resting on bracket 11. The stencil-cards and articles to be printed can be fed out slowly toward the mouths of their magazines by means of a spiral spring or other mechanism. (Not shown.)

8^a is a magazine for stencil-cards being charged or used as a collection-box. This, together with 10^a, a similar collection-box for the envelopes or printed articles, stand on the bracket 12, at the delivery end of the machine. The box for the smaller of the two sets of articles—that is, the stencil-cards and the envelopes—is placed next to the machine with its mouth just at the turning-point of the endless feed-band 2. At this point the band goes around roller 3 and changes from a horizontal to a downward direction of motion. The result is that the printed envelope and stencil-card are shot down over the mouth 13 of the collection-box 8^a, which mouth is inclined as shown. The stencil-card falls into

its collection-box while the larger envelope slides over its mouth and drops into that of its particular collection-box 10^a, the mouth of which, 14, is inclined in an opposite direction to prevent the envelope shooting beyond.

It is evident that an intermittent motion should be given to the endless feed-band equal in motion to the distance between any two adjacent sets of hooks 7. This is accomplished by means of the ratchet-wheel 15 and pawl 16, which together form a pawl-and-ratchet motion. The pawl is mounted on the link 17, and is given a reciprocating motion by the link 18, which is connected to the rotating gear-wheel 19, which is on the main driving-shaft 21. The ratchet-wheel 15 is of course keyed to the shaft of the driving-drum 6.

The main shaft 21 is driven by the belt-pulley 22. Keyed to the main shaft is the eccentric 23, which by means of the eccentric-rod 24 gives a reciprocating motion to the bell-crank 25. This bell-crank operates, through the link 26, the suction-arms 27, which are fitted up with the rubber suction-piece 28. I have shown two of these arms which are mounted on a tubular shaft 43. These arms move between the two parts of the double feed-band, as shown in Fig. 3.

29 is another branch of the bell-crank 25, which by means of the link 30 operates a similar set of suction-arms 31, provided with rubber suction-mouths 32, and mounted on hollow shaft 43^a. These two suction-arms operate outside of the feed-band 2, as shown in Fig. 3, and do not interfere with the stencil-card which is lying upon it at that point. The bell-crank 25, by means of the piston-rod 33 and piston 34, also operates the air-pump 35, which is pivoted to the main frame at 36.

37 is a flexible pipe which by means of the branch pipes 38 and 39 is connected with the hollow tubular shafts 43 and 43^a, respectively. The connection between the tubular shafts 43 and 43^a and the pipes 38 and 39 is rendered air-tight by means of the stuffing-boxes 40 and 40^a, as best shown in Figs. 1 and 3.

It is evident without further describing the operation of the machine at this point that the suction-mouth 28 picks up the topmost stencil-card 41 and lays it on the feed-band 2 before one of the sets of hooks 7, while the suction-mouth 32 will pick up the first envelope 42 in the magazine 10 and deposit it on said feed-band before another set of hooks and on top of the stencil-card already deposited there by previous operations of the machine.

It now remains to describe the printing mechanism.

44 is a cam on the main shaft which is full faced through one hundred and eighty degrees and partially cut away through the other one hundred and eighty degrees. This operates the cam-roller 45, which is on the slide connected to the link 46. There are two sets of these cams, slides and links, one on either side of the machine, and the links are pivoted to the cross-bar 47^a of the vibrat-

ing platen 47. This platen 47 I have shown pivoted to the main frame and vibrated by the mechanism last described, together with the springs 48, which hold the rollers 45 against the cams 44 and lift the platen 47 during one-half of the revolution of the main shaft. The gear 20, keyed on the shaft 20^a, meshes with the gear 19 on the main shaft and is driven thereby. The shaft 20 has the cam 50, which, by means of the cam-roller 49^a, gives the ink-platen 49 a vertical reciprocating motion.

51 is the roller of an ordinary ink-fount, and 52 is a small inking-roller, which normally rests on the shelf 53, which is close beside the platen 49 when in its lowermost position, and on the opposite side of it from the ink-fount. This inking-roller is mounted on the arm 54, pivoted to the lever 55, which is mounted on the strut 56, bolted to the main frame, as shown in Fig. 2. The lever 55 has a cam-roller 57 on its lower end which runs on the very quick cam 58, also mounted on the shaft 20^a. The spiral spring 59 serves to keep the lever 55 in such position that its cam-roller 57 is against the cam 58, and the inking-roller 52 is normally held over the shelf 53. The spring 60 serves to force the link 54 downward, so that said inking-roller 52 will not fly up from the shelf 53. The spring 61 pulls down the reciprocating platen 49, when it is not positively lifted by the action of the cam 50.

In the modification illustrated in Fig. 7 another inking apparatus is shown, in which the large bell-crank 74 is vibrated by the eccentric-cam 75. This bell-crank 74 carries a number of inking-rollers 77, which run from a curved inking-surface 76, which extends over to the ordinary form of ink-fount shown in the other drawings as well. These inking-rollers 77 are mounted in longitudinally-sliding links 78, whose inner ends are provided with cam-rollers 79 and springs 81. These cam-rollers run over a stationary cam-piece 80, which has a central horizontal portion and an inclined portion on either side.

74^a is a loose inking-roller which transmits the ink from the fount to the surface 76.

The operation of my improved machine is as follows: Motion being given to the main shaft 21 by the belt-pulley 22, the gear 19 is rotated and the ratchet-gear 16 vibrated so that the driving-drum 6 is given a quarter of a revolution during one-half of the revolution of the main shaft and allowed to stand at rest the other half. This gives the feed-band 2 an intermittent forward motion, which motion is equal to a quarter of the circumference of the driving-drum 6 or the distance between adjacent sets of hooks 7. This revolution of the main shaft by means of the eccentric 23 and connections causes the suction-arms 27 to be pressed down against the topmost stencil-card in the magazine 8, and at the moment such suction-arms start on their backward motion the piston 34 begins to move

out of the air-pump 35, and the suction thus created extending through the pipes 37 and 38 causes the stencil-card to adhere to the suction-mouth 28, and the continued upward motion of the arms 27 brings the said stencil-card against the feed-band 2 and holds it there for a second until said feed-band begins to move by the proper timing of the mechanism and one of the sets of hooks lifts the card 41 away from the suction-arms which had held it up to that moment. The second revolution of the driving-shaft has lifted the stencil-card 41 up to the horizontal portion of the feed-band 2, and during such second revolution the vibrations of the suction-arms 31 have, through the agency of the suction-mouth 32 and pipe 39 and pump 35, as before described, brought down an envelope from the magazine 10 and placed it over the stencil-card, as shown in Fig. 2. Just before the suction-mouth 32 lets go of the said envelope the envelope is wrenched away from it by the motion of the feed-band and hooks, as before described, and the envelope lying over the stencil-card is carried along toward the printing mechanism. In the arrangement of parts shown in the drawings two of the intermittent motions of the feed-band will carry the envelope and card we are following under the supporting-platen 47. The next rotation of the main shaft will bring the full portion of the cam 44 against the cam-roller 45 and drop down the supporting-platen 47 upon the envelope. The same motion of the shaft will, when this has been accomplished, have turned the gear-wheel 20 and the cam 50 far enough to drive up the reciprocating inking-platen 49. This will press against the stencil-card and envelope which are backed by the supporting-platen 47, and a portion of the ink being forced through the perforations of the stencil-card the name and address so perforated will be printed on the envelope. A complete revolution will have lifted the supporting-platen 47 and withdrawn the inking-platen 49. The next motion of the feed-band will carry the card and addressed envelope forward and discharge them. From the edge of the machine they will drop into their respective collection-boxes, as before described. When these boxes are full they can be removed and empty ones substituted.

The collection-box of stencil-cards when filled becomes a magazine, to be placed when needed upon bracket 9 and used to feed the machine again.

While the inking-platen 49 is at rest in its lowermost position, as it is during about one-half of the revolution of the cam 50, the quick motion of cam 58 vibrates the lever 55 and drives the inking-roller 52 over and onto the roller 51 of the ink-fount, and when the same is withdrawn on the passage of cam 58 it rolls across the platen 49 and freshly inks it.

The construction of the modification illustrated in Fig. 7 is in every way similar excepting that the ink in the fount is spread

over the curved surface 76 by the loose roller 77^a and from this surface 76 is picked up by the rollers 77, which are held down to it by the springs 81 during a major portion of each oscillation of the bell-crank 74. As the rollers 77 come under the stencil-card, which is held down by the envelope and supporting-platen back of it, said rollers 77 are raised by reason of the cam-rollers 79 running over the raised portion of the cam 80, and said rollers are run across the under face of the stencil-card and the ink is forced through its perforations onto the envelope as before.

Various changes could be made in the construction of this machine without departing from the spirit of my invention. As before indicated, the double feed-band 2 and 2^a could be replaced by a solid band with or without holes cut through it. It might be found possible to operate the machine with a stationary supporting-platen 47, the feed-band giving sufficient play to allow the inking-platen 49 to raise it and the card and envelope and force them against the stationary supporting-platen. The printing mechanism might be placed above the feed-band and the stencil placed on top of the envelope, which would simply necessitate a reversal of the positions of the stencil and envelope-magazines and collection-boxes. The arrangement of hollow shafts and suction-arms could be replaced by a solid construction with flexible rubber tube extending from the air-pump to the suction-mouth on the end of the arms. The eccentrics might be replaced by cranks, and cranks in turn by cams if necessary at various points, as is well understood by those skilled in mechanism. In the same way a kicker mechanism or a tape delivery of any of the kinds well known in printing-presses could be substituted for discharging the cards and envelopes after printing. A clawing-feed mechanism could be used to feed the stencil-cards onto the band feed.

Having therefore described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. In an addressing machine the combination of the printing mechanism, the double endless feed band which passes through said printing mechanism, the magazine of stencils, the magazine of articles to be addressed, and the automatic feeding mechanism operated in conjunction with the printing mechanism to lift the stencils and articles to be addressed from their magazines and place them one upon the other on the double feed band, substantially as described.

2. In an addressing machine the combination of the printing mechanism, the endless feed band which passes through said printing mechanism and has its delivery portion approximately horizontal, the two separate collection boxes for the stencils and articles to be addressed, located at the end of said horizontal portion, the box nearest the band having the smaller mouth of the two, and said mouth be-

ing inclined downwardly in the direction of delivery, whereby the smaller of the two sets of articles will drop into the first box and the other will slide over it into the second box and an automatic separation be thereby insured, substantially as described.

3. In an addressing machine the combination of the main frame, a swinging platen hinged to said frame, the main shaft, the link, cam and spring by which it is reciprocated, the ink fount at one side of the reciprocating platen, the resting shelf at the other side, the inking roll which normally rests on said shelf, the flexible arm supporting said ink roll, and the cam in connection therewith by which the inking roll is driven across the inking platen to the ink fount and back again while the platen is at rest in its lowermost position, substantially as described.

4. In an addressing machine the combination of the endless feed band, the magazines of stencil cards, and articles to be addressed, the vibrating suction arms, a train of mechanism extending from the driving shaft of the machine to the suction arms whereby they are alternately projected into the magazines and withdrawn behind the feed band, hooks at regularly spaced intervals along said band, an air pump operated by the before mentioned train of mechanism, and tubes from said air pump to said suction arms, whereby said arms are enabled to suck up the topmost article in each magazine and deposit it on the feed band and then return for the next article and so on, substantially as described.

5. In an addressing machine the combination of the printing mechanism, the double endless feed band, the magazine of stencil cards, the vibrating suction arms, operating between the two portions of the feed band to seize the topmost stencil card and deposit it on the band, the magazine of articles to be addressed, the second set of vibrating arms which operate outside of the feed band to pick

up the articles to be printed and deposit them one at a time on the feed band on top of the stencil cards, and the hooks on said feed band to space the articles deposited thereon, at equal distances apart, substantially as described.

6. In an addressing machine, the combination of the printing mechanism, the endless feed band having open spaces therein which passes through said printing mechanism the magazine of envelopes and the automatic feed mechanism which lifts the envelopes from the magazine and deposits them one by one on the feed band over the open spaces therein, together with a series of detached independent stencil cards, and mechanism for feeding them through the printing mechanism simultaneous with the envelopes, substantially as described.

7. In an addressing machine the combination of the endless feed band, having open spaces therein, the magazine of envelopes to be addressed, the vibrating suction arms, a train of mechanism extending from the driving shaft of the machine to the suction arms whereby they are alternately presented to the face of the magazine and withdrawn toward the feed band, an air pump operated by the above mentioned train of mechanism and tubes from said air pump to said suction arms whereby said arms are enabled to suck up the first envelope in the magazine and deposit it on the feed band over an open space therein, the series of independent stencil cards and mechanism for feeding said cards to the feed band at the same point as the articles to be addressed are deposited, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK D. BELKNAP.

Witnesses:

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