

No. 819,763.

PATENTED MAY 8, 1906.

M. P. KENNA.  
ENVELOP PRINTING MACHINE.

APPLICATION FILED JAN. 31, 1905.

3 SHEETS—SHEET 1.

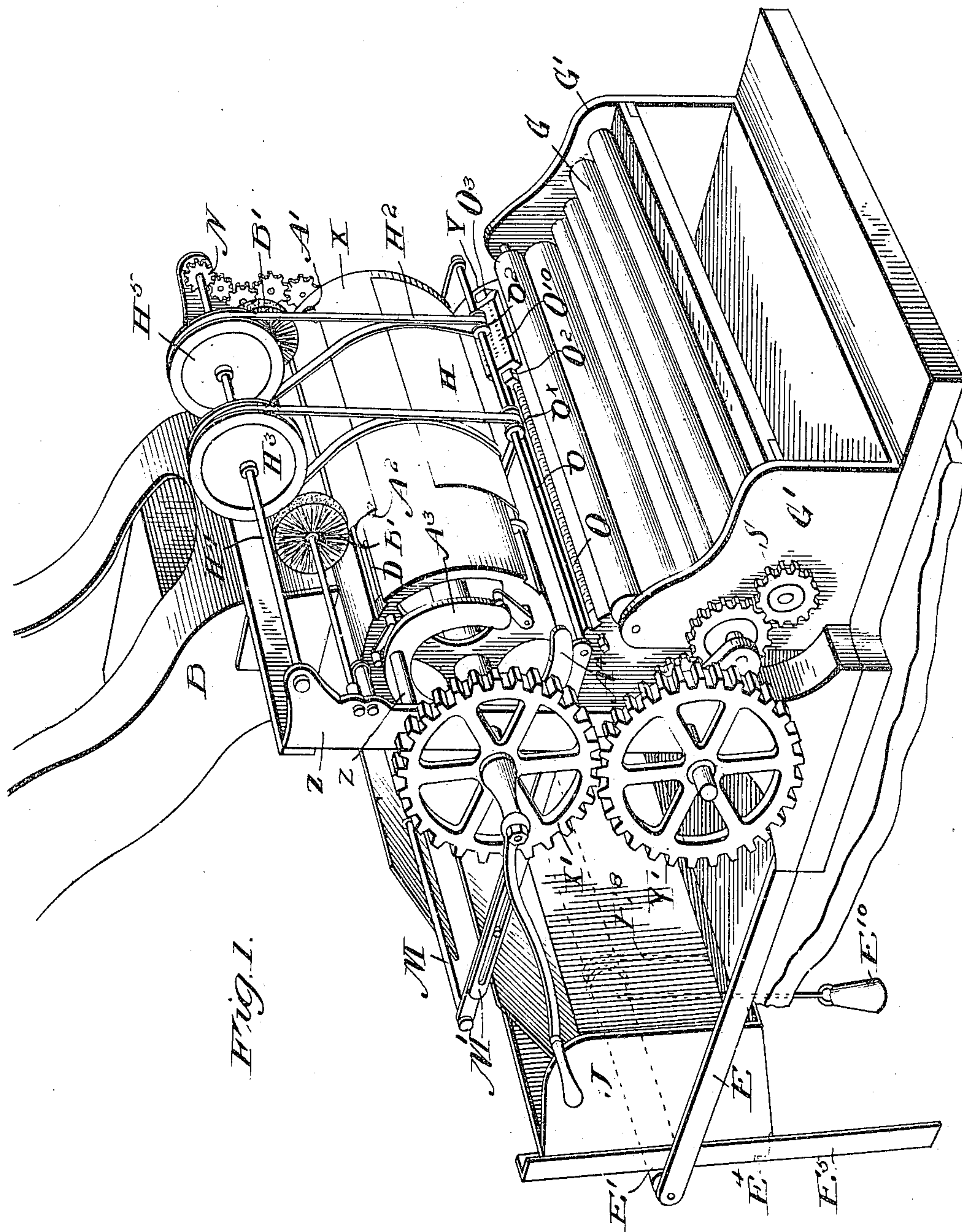


Fig. 1.

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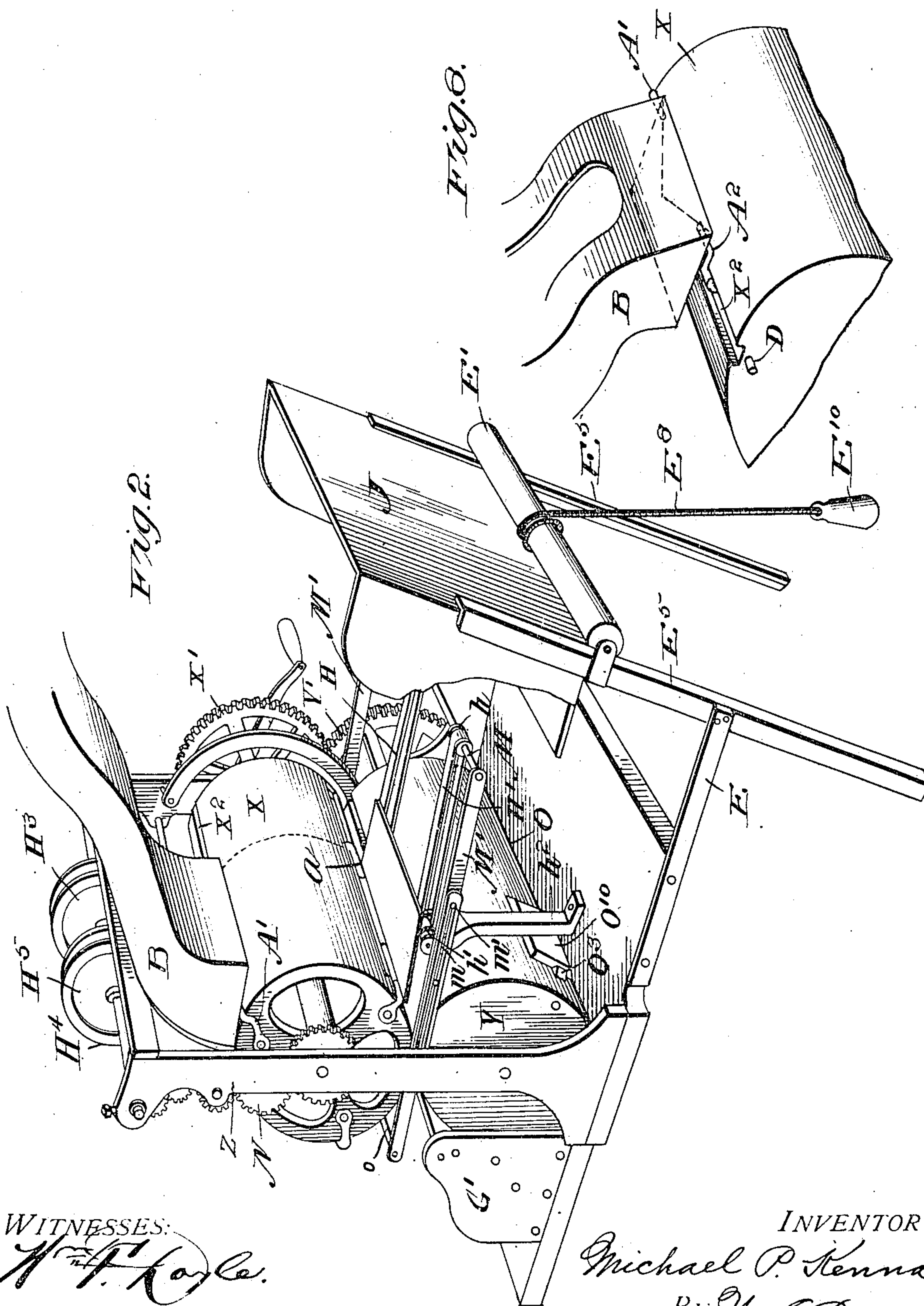
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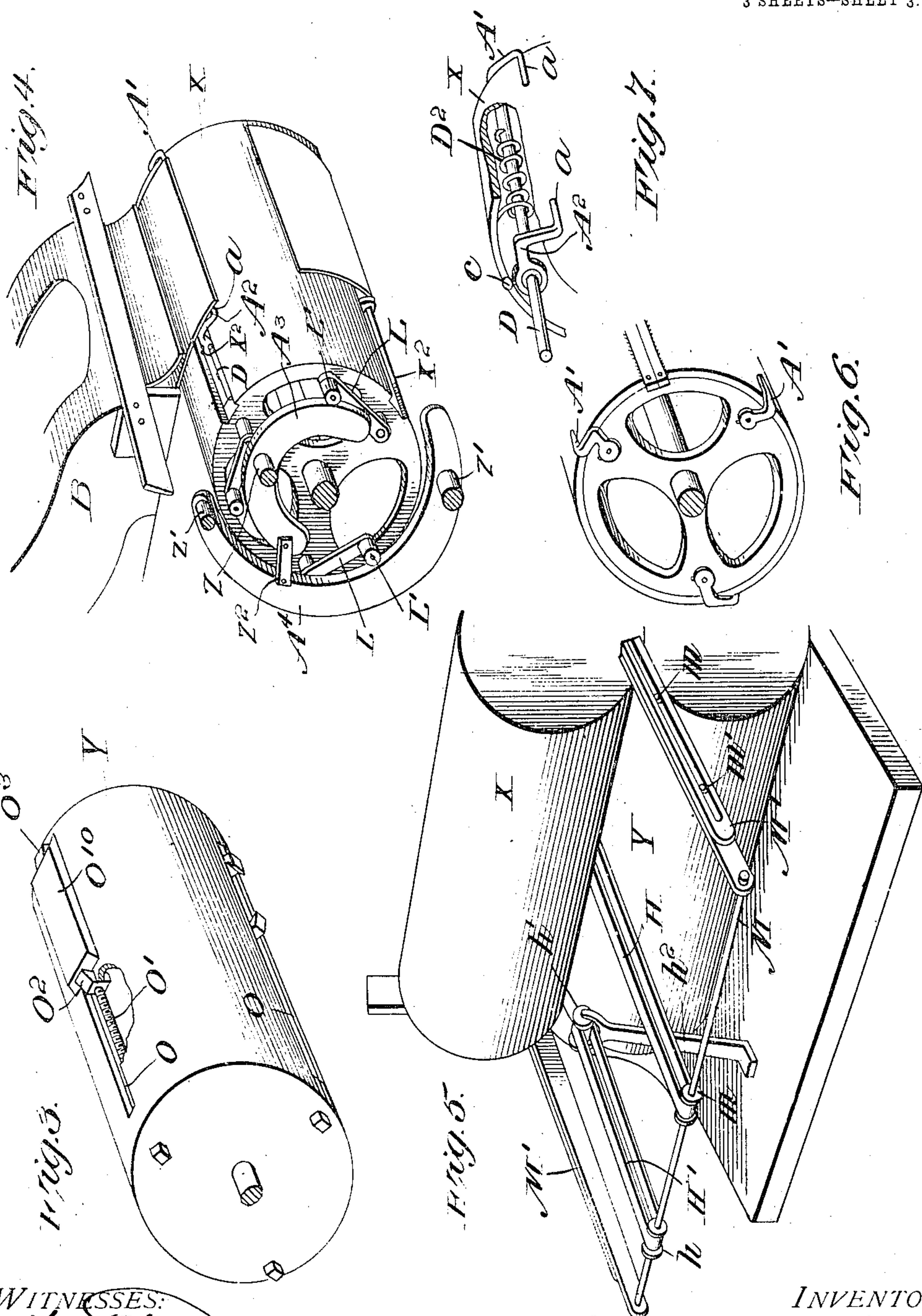
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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

MICHAEL P. KENNA, OF DUBUQUE, IOWA.

## ENVELOP-PRINTING MACHINE.

No. 819,763.

Specification of Letters Patent.

Patented May 8, 1906.

Application filed January 31, 1905. Serial No. 243,486.

*To all whom it may concern:*

Be it known that I, MICHAEL P. KENNA, a citizen of the United States, residing at Dubuque, in the county of Dubuque and State of Iowa, have invented certain new and useful Improvements in Envelop-Printing Machines, of which the following is a specification.

My invention relates to envelop-printing machines, and has for its object, among others, to provide a machine adapted for printing advertising matter, return-corners, or other desired matter upon the face of an envelop in a rapid and efficient manner; and a further object is to provide a machine of the described character which is of comparatively simple construction and with the various objects in view.

The invention consists in the novel construction, arrangement, and combination of parts, as hereinafter fully described, illustrated in the drawings, and pointed out in the appended claims.

In the drawings, Figure 1 is a perspective view of a machine constructed in accordance with my invention. Fig. 2 is a perspective view looking from the opposite side of the machine. Fig. 3 is a detail view, partly broken away, of the lower printing-roller. Fig. 4 is a detail view of the upper printing-roller, part of the envelop-receptacle, and contiguous details. Fig. 5 is a perspective view of the printing-rollers and delivery-tapes for the printed envelops. Fig. 6 is a perspective view showing one end of the upper printing-roller and part of the devices for engaging and feeding the envelops successively around to the printing-point. Fig. 7 is a perspective view showing a portion of the upper roller and one set of the envelop-engaging means. Fig. 8 is a perspective view showing a portion of the upper roller and lower end of the envelop-receptacle and showing in dotted lines an envelop in the position in which it is engaged by the clips or nippers.

My invention embodies improvements in certain of the features disclosed in two co-pending applications, one filed on November 23, 1903, Serial No. 182,381, and the other filed on August 23, 1904, Serial No. 221,852, these improvements being directed to the means for engaging the envelops and withdrawing same from their receptacle and feeding them to the printing-point, the means for securing the electrotype, stereotype, rubber, or other printing plates to the lower printing-

roller, the tapes or belts for delivering the printed envelops to a receptacle, and other features, all combining to produce a machine which will be improved in its general construction and whose general efficiency is also improved.

X and Y indicate the superposed printing rollers or cylinders rotatably mounted in the frame Z of the machine and adapted to be operated in a manner similar to the printing-cylinders seen in my aforesaid application, Serial No. 182,381, and by means substantially like the means disclosed in the last-mentioned application, and which means need not, therefore, be specifically described herein.

B indicates the envelop-receptacle, adapted to contain the envelops and feed the same into a position to be engaged by the feeding-spurs, and B' indicates the rotatable brushes adapted to sweep back or retain the pile of envelops after each lowermost one has been withdrawn, all in a manner similar to that described in my said application Serial No. 182,381.

The means for feeding the envelops successively from the receptacle B comprises three sets of devices and arranged at equidistant points around the upper cylinder, and each set comprises a rod or shaft D, the ends of which are journaled in and project somewhat beyond the heads of the said cylinder, and fingers or spurs A' A<sup>2</sup>, the finger A' being integral with or fixedly secured to one end of a rod D, while the finger A<sup>2</sup> is adjustably mounted upon the rod, so as to be adjusted toward or from the finger A'. The finger A<sup>2</sup> is loose upon the rod and is adapted to be secured in adjusted position upon the rod by means of set-screw c. The fingers are bent, as shown, so that each has a portion a, which lies parallel with the circumferential surface of the cylinder and said portions a of each set extending inward toward each other sufficiently far to engage with the open flap of the lowermost envelop in the receptacle B.

By making one of the fingers of each set adjustable upon its supporting-rod each pair of fingers will be adapted to properly engage with envelops of varying lengths. For permitting the finger to be adjusted upon the rod the cylinder is provided with a slot x<sup>2</sup>, the finger A<sup>2</sup> extending through said slot. The rods D are rigidly secured to arms L, respectively, which arms carry each at its outer end a roller L', and each of the rods D carries a



coiled spring  $D^2$ , which encircles the rod, one end of the spring being secured to the rod, while the opposite end is bent outwardly and bears against the inner surface of the cylinder.

The function of each spring  $D^2$  is to turn the rod or shaft  $D$  into a position with the fingers  $A' A^2$  in a closed position—that is, in a position clamping the flap of an envelop between them and the surface of the cylinder, the said envelop having previously been engaged by the fingers as they passed beneath the receptacle  $B$ .

In connection with the coiled springs I employ additional means to insure the clamping down of the fingers upon the flaps of the envelops in the event that there should be any irregularity in the action of the coiled springs, said additional means cooperating with the said springs for the described purpose, and I also employ means for causing the fingers to release the envelops after the latter have in turn passed the printing-point, and these various means comprise a cam-shaped piece  $A^3$ , secured by posts  $z$  to the frame  $Z$  of the machine, said cam being of a length to extend substantially half a circle or about one-half around the head of the upper cylinder.  $A^4$  is a second cam-shaped piece also secured to the frame  $Z$  by posts  $z'$ . A link or connecting-piece  $z^2$  connects the two cams, as shown. The cam  $A^4$  is of greater length than the cam  $A^3$  and is substantially semicircular, the position of the two cams relatively to each other and to the cylinder  $X$  being substantially as shown in Fig. 5.

In practice at least a portion of the inner edge of the cam  $A^4$  should be a trifle nearer the central axis or shaft of the upper cylinder than the outer edge of the shorter cam for a purpose presently apparent.

The location of the cams relatively to each other is such that during the rotation of the cylinder  $X$  each roller will ride upon the outer curved edge of the cam  $A^3$  and in conjunction with the coiled spring swing its arm  $L$  to cause rod  $D$  to partially turn and cause the fingers to close down upon the flap engaged by the fingers. The action of the cam  $A^3$  upon each of the rollers begins just after the fingers have entered within the open flap of the lowermost envelop, and the fingers are under the positive action of the cam  $A^3$  kept closed upon the flap until the envelop has been printed, and then the roller clears the edge of the cam  $A^3$  and next rides against the inner edge of the longer cam, and as the said inner edge, or at least a portion thereof, is nearer the central axis or shaft of the upper cylinder than the outer edge of the shorter cam the roller will be forced inwardly toward the said central axis by said inner edge of cam  $A^4$  sufficiently to rock the rod  $D$  reversely, and thus raise the fingers away from the flap of the printed envelop, thus permit-

ting the latter to fall upon the delivery-tapes presently to be described.

It will be noted that the freeing of the envelop will occur just after the same has been printed.

The roller will remain in contact with the inner edge of cam  $A^4$  until the fingers (which are now in an open position) have engaged with the open flap of the lowermost envelop in receptacle  $B$ , and by this time the roller has reached a point where it will again ride upon the outer edge of the cam  $A^3$  and be operated to cause the fingers to clamp down upon the flap of the envelop just previously engaged by the fingers.

$H$  is an endless tape which passes around a pulley  $H^3$ , mounted on a shaft  $H^4$ , journaled in the frame  $Z$ , and which tape partially encompasses the cylinder  $X$  and also passes around a pulley  $o^x$  on shaft  $o$  and a pulley  $m$  on a shaft  $M$ .

$H^2$  indicates a second endless tape which passes around a pulley  $H^5$  on shaft  $H^4$ , partially encompasses the cylinder  $X$ , and also passes around the pulley  $o^2$  on the shaft  $o$ . The two tapes  $H H^2$  cooperate to clamp the envelops closely around the cylinder as they are fed to the printing-point and prevent the bulging or springing outward of the envelop while being printed.

After the envelop has been printed the tape  $H$ , assisted by the endless tape  $H'$ , delivers the same to a receptacle  $J$  at the rear of the machine. The tape  $H'$  runs over pulleys  $h h'$ , mounted, respectively, on the shaft  $M$  and at the upper end of a standard  $h^2$ , carried by the base of the machine-frame.

The shaft  $M$  is supported by arms  $M'$ , each of which is made in sections adjustable lengthwise by means of a slot-and-pin connection, as seen at  $m m'$ , whereby to adapt the delivery devices to the varying sizes of envelops.

The endless tapes  $H H' H^2$  are operated by means of suitable gearing, as indicated at  $N$ , interposed between the shaft  $H^4$  and the shaft of the upper cylinder.

For the purpose of attaching the electrotype, stereotype, or other printing plate to the lower cylinder  $Y$ , I construct the latter with three slots  $O$ , extending transversely of the cylinder and nearly the entire length thereof. The slots are at equidistant points around the cylinder.

Extending from end to end of the cylinder  $Y$  within the latter and at points directly under the slots are three rods  $O'$ , each rod being threaded for at least a portion of its length. Upon the threaded portion of each rod is mounted a jaw  $O^2$ , which is adapted for free adjustment within the slot of the cylinder and the said jaw extending slightly above the surface of the cylinder. A second jaw  $O^3$ , similar to that  $O^2$  and rigidly mounted, cooperates with the jaw  $O^2$  to clamp a printing-



plate O<sup>10</sup> and hold it securely in position, as seen plainly in Fig. 3.

For the purpose of turning the rods O in one direction or the other to cause the movable jaw to be adjusted toward or from the jaw O<sup>8</sup> to thereby clamp a printing-plate or release the same each rod is extended at one end through the head of the cylinder and is squared at that end, whereby a wrench may be applied thereto to turn the rod.

The adjustability of one of the jaws provides also for clamping printing-plates of varying lengths.

The printing-plates are beveled at the ends, and the engaging ends of the jaws are angularly bent, so as to engage the beveled ends of the plates, all as seen plainly in Fig. 3. The printing-plates of course are curved to conform to the curvature of the cylinder.

The devices for receiving the printed envelopes comprise horizontally-arranged arms secured at one end to the base of the machine and extending rearwardly, and supported in the rear ends of the arms is a roller E', around which passes a rope E<sup>8</sup>, from one end of which is suspended a weight E<sup>10</sup>, which counterbalances a sheet-metal receptacle J. The base of the receptacle rests in an angular bar E<sup>4</sup>, to which the other end of the rope is attached and which is adapted for vertically-sliding movement within standards E<sup>5</sup>, secured to the arms E. The receptacle J is in a position to adapt it to receive the printed envelopes discharged by the delivery-belts, and as the receptacle becomes filled with the envelopes it will descend to about on a line with the roller E', when the receptacle may be lifted out and emptied of its contents, another empty receptacle in the meanwhile being placed in position upon the bar E<sup>4</sup>.

The inking device for supplying ink to the printing-plates comprises a series of ink-rollers G, supported by standards or cheek-pieces G', secured to the base of the machine, these rollers being rotated by suitable gearing, as S, from the shaft of the lower printing-cylinder.

The rollers G are arranged in a position to adapt them to supply ink to the printing-plates during the rotation of the cylinder Y.

The machine may be operated by hand or by power. I have shown the shafts of cylinders X Y as being provided with intermeshing gear-wheels X' Y', the former being provided with a crank for operating the machine by hand.

What I claim, and desire to secure by Letters Patent, is—

1. In a machine of the character described, the combination with an envelop-receptacle and an impression-cylinder arranged in operative relation to the discharge end of said receptacle, of means for engaging the flap of the lowermost envelop contained within the receptacle, withdrawing it from the latter

and feeding it around to the printing-point comprising a rock-shaft carried by the cylinder, spurs or fingers carried by said shaft, one of said fingers being adjustably mounted upon the shaft to adapt it to be adjusted toward and from the other finger, and means for rocking the shaft at a predetermined period during the rotation of the cylinder to cause the fingers to clamp down upon the flap of an envelop previously engaged by the fingers.

2. In a machine of the character described, the combination with an envelop-receptacle and an impression-cylinder arranged in operative relation to the discharge end of said receptacle, of means for engaging the flap of the lowermost envelop contained within the receptacle, withdrawing it from the latter and feeding it around to the printing-point comprising a rock-shaft carried by the cylinder, spurs or fingers carried by said shaft, one of said fingers being adjustably mounted upon the shaft to adapt it to be adjusted toward and from the other finger, and means for rocking the shaft at a predetermined period during the rotation of the cylinder to cause the fingers to clamp down upon the flap of an envelop previously engaged by the fingers, and means for rocking the shaft reversely to cause the fingers to release the flap, as described.

3. In a machine of the character described, the combination with an envelop-receptacle, and an impression-cylinder arranged in operative relation to the discharge end of said receptacle, of means for engaging the flap of the lowermost envelop contained in the receptacle, withdrawing it from the latter and feeding it around to the printing-point comprising a rock-shaft arranged within the cylinder and rotatably mounted in the heads thereof, spurs or fingers carried by the shaft, one of said fingers being adjustably mounted upon the shaft to adapt it to be adjusted toward and from the other finger, and means for rocking the shaft at a predetermined period during the rotation of the cylinder to cause the fingers to clamp down upon the flaps of an envelop previously engaged by the fingers, comprising a coiled spring mounted upon the shaft within the cylinder operating to rock the shaft to cause the fingers to clamp down upon said flap, as described.

4. In a machine of the character described, the combination with an envelop-receptacle, and an impression-cylinder arranged in operative relation to the discharge end of the receptacle, of means for engaging the flap of the lowermost envelop contained in the receptacle, withdrawing it from the latter and feeding it around to the printing-point comprising a rock-shaft carried within the cylinder and rotatably mounted in the heads thereof, one end of the shaft extending beyond a head of the cylinder, a spur or finger



mounted upon said extended end of the shaft, a second spur or finger adjustably mounted upon the shaft within the cylinder and projecting through a transverse slot in the latter, and means for rocking the shaft at a predetermined period during the rotation of the cylinder to cause the fingers to clamp down upon the flap of an envelop previously engaged by the fingers.

5. In a machine of the character described, the combination with an envelop-receptacle and an impression-cylinder arranged in operative relation to the discharge end of the receptacle, of means for engaging the flap of the lowermost envelop contained within the receptacle, withdrawing it from the latter and feeding it around to the printing-point comprising a rock-shaft carried by the cylinder, spurs or fingers carried by the shaft, an arm secured to one end of the shaft, a roller on said arm, and a cam mounted independently of the cylinder and in a position to cause the roller to ride upon the edge of the cam and be operated thereby to cause the shaft to rock at a predetermined period during the rotation of the cylinder to cause the fingers to clamp down upon the flap of an envelop previously engaged by the fingers.

6. In a machine of the character described, the combination with a supporting-frame, an envelop-receptacle and an impression-cylinder arranged in operative relation to, the discharge end of the receptacle, of a shaft  $H^1$  mounted in the frame, pulleys on said shaft, a shaft  $o$  mounted in the frame, pulleys on the latter shaft, a shaft  $M$ , supporting-arms for the last-named shaft, a standard carried by the base of the frame, a roller on said standard, and endless tapes  $H$ ,  $H^2$ ,  $H'$  running over the various pulleys in the manner described.

7. In a machine of the character described, the combination with a supporting-frame, an envelop-receptacle and an impression-cylinder arranged in operative relation to the discharge end of the receptacle, of a shaft  $H^1$  mounted in the frame, pulleys on said shaft, a shaft  $o$  mounted in the frame, pulleys on the latter shaft, a shaft  $M$ , supporting-arms for the last-named shaft, said arms being adjustable in length, a standard carried by the base of the frame, a roller on said standard, and endless tapes  $H$ ,  $H^2$ ,  $H'$  running over the various pulleys in the manner described.

8. In a machine of the character described, the combination with an envelop-receptacle and an impression-cylinder arranged in operative relation to the discharge end of said receptacle, of means for engaging the flap of the lowermost envelop contained within the receptacle, withdrawing it from the latter and feeding it around to the printing-point comprising a rock-shaft arranged within the cylinder and extending lengthwise thereof and having a bearing in the ends of the cyl-

inder, spurs or fingers carried by said shaft, one of said spurs projecting through a longitudinal slot in the cylinder, and means for rocking the shaft at a predetermined period during the rotation of the cylinder to cause the fingers to clamp down upon the flap of an envelop previously engaged by the fingers.

9. In a machine of the character described, the combination with an envelop-receptacle and an impression-cylinder arranged in operative relation to the discharge end of said receptacle, of means for engaging the flap of the lowermost envelop contained within the receptacle, withdrawing it from the latter and feeding it around to the printing-point comprising a rock-shaft arranged within the cylinder and extending lengthwise thereof and having a bearing in the ends of the cylinder, spurs or fingers carried by said shaft, one of said spurs projecting through a longitudinal slot in the cylinder and the other spur being mounted upon a projecting end of the shaft exteriorly of the cylinder, and means for rocking the shaft at a predetermined period during the rotation of the cylinder to cause the fingers to clamp down upon the flap of an envelop previously engaged by the fingers.

10. In a machine of the character described, the combination with an envelop-receptacle and an impression-cylinder arranged in operative relation to the discharge end of the receptacle, of means for engaging the flap of the lowermost envelop contained within the receptacle, withdrawing it from the latter and feeding it around to the printing-point comprising a rock-shaft carried by the cylinder, spurs or fingers carried by the shaft, an arm secured to one end of the shaft, a roller on said arm, a spring arranged to exert its stress upon the shaft in the manner set forth, and a cam mounted independently of the cylinder and in a position to cause the roller to ride upon the edge of the cam and be operated thereby to cause the shaft to rock at a predetermined period during the rotation of the cylinder to cause the fingers to clamp down upon the flap of an envelop previously engaged by the fingers.

11. In a machine of the character described, the combination with an envelop-receptacle and an impression-cylinder arranged in operative relation to the discharge end of the receptacle, of means for engaging the flap of the lowermost envelop contained within the receptacle, withdrawing it from the latter and feeding it around to the printing-point comprising a rock-shaft carried by the cylinder, spurs or fingers carried by the shaft, an arm secured to one end of the shaft, a roller on said arm, a cam mounted independently of the cylinder and in a position to cause the roller to ride upon the edge of the cam and be operated thereby to cause the shaft to rock at a predetermined period dur-



ing the rotation of the cylinder to cause the fingers to clamp down upon the flap of an envelop previously engaged by the fingers, and a second cam also mounted independently of the cylinder and operating upon the roller at a predetermined period to effect the reverse turning of the shaft and cause the fingers to release the flap of the envelop after the latter has been printed.

10 12. In a machine of the character described, the combination with a supporting-frame, printing devices carried thereby, and delivery-belts for the printed envelops, of a device for receiving the printed envelops  
15 from the delivery-belts comprising stand-

ards secured to rearwardly-extending arms of the frame, a roller rotatably mounted in said arms, a bar slidably mounted within the standards, a receptacle removably supported on said bar, a rope secured at one end to the bar and passing around the roller and a counterweight secured to the opposite end of the rope, as described.

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

MICHAEL P. KENNA.

Witnesses:

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ALEX. SIMPLOT.