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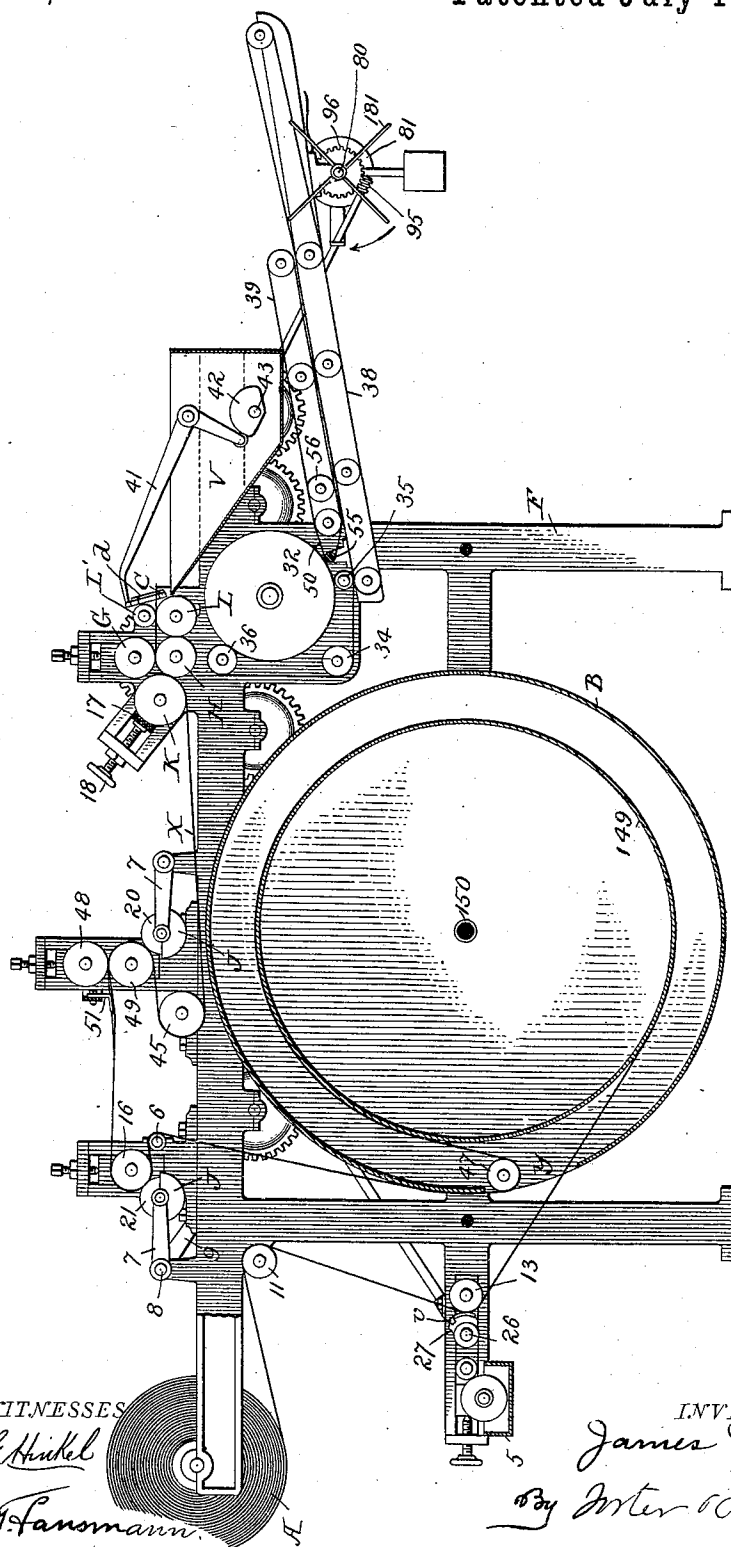
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J. WEST.
ENVELOPE MAKING MACHINE.

No. 479,042.

Patented July 19, 1892.

Fig. 1.



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(No Model.)

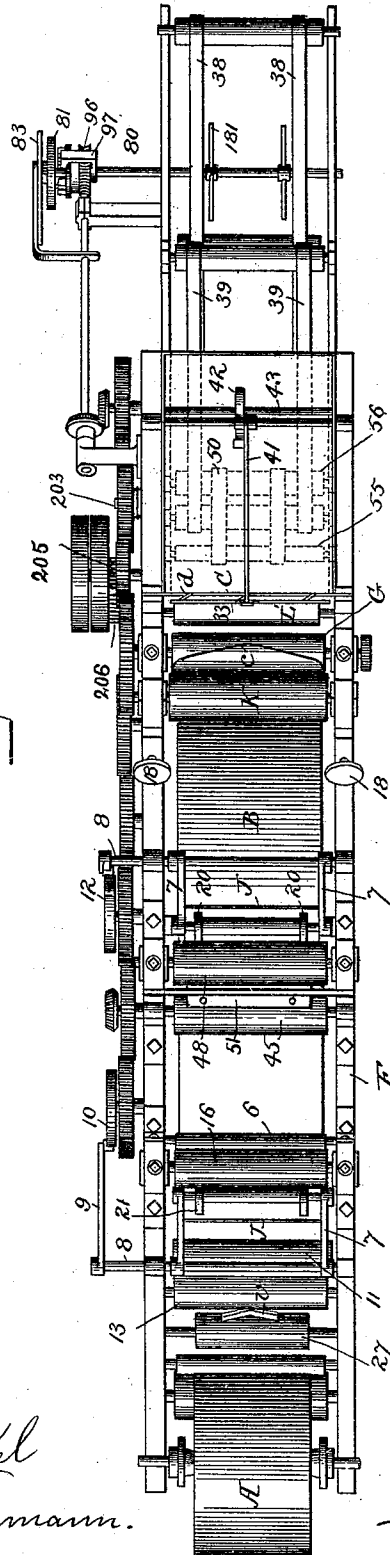
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Fig. 2.



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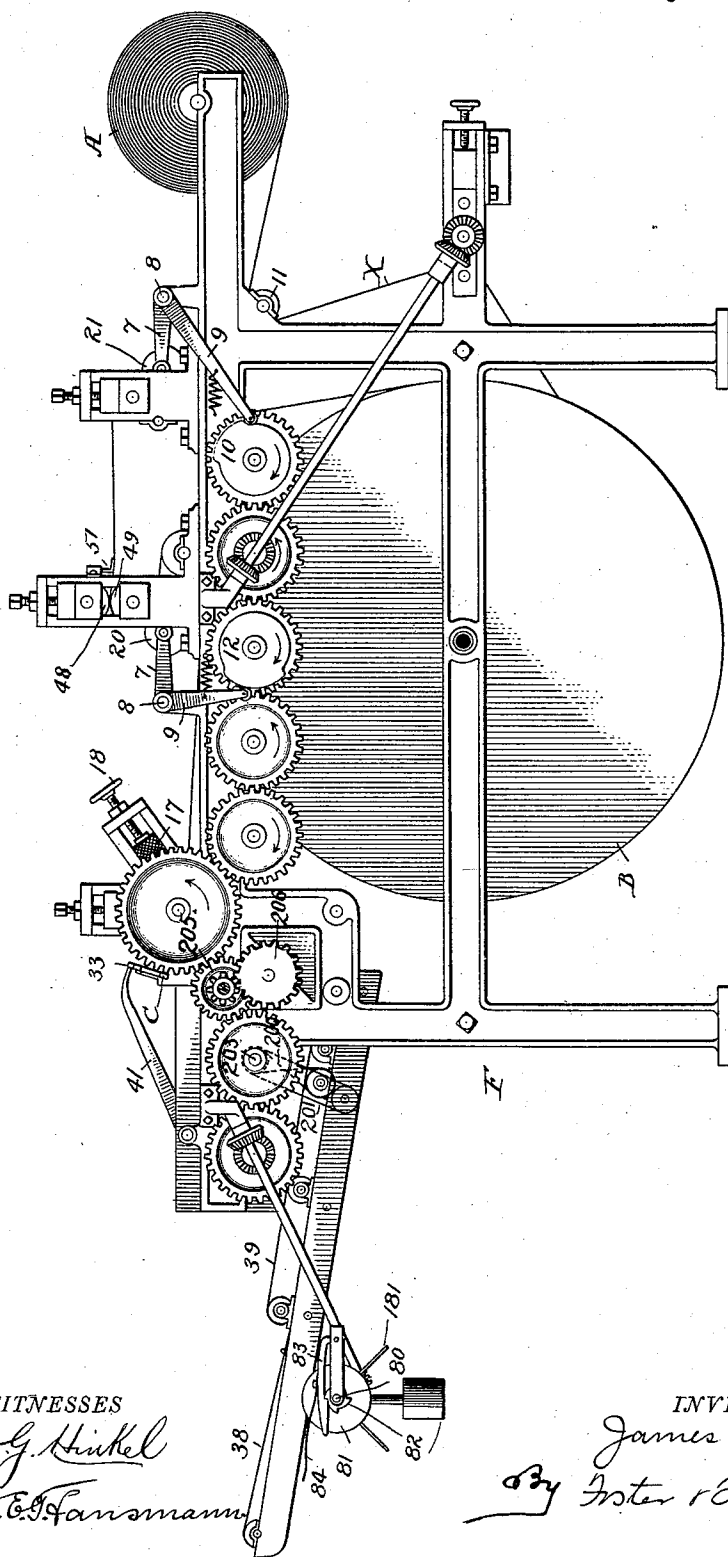
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Fig. 3.



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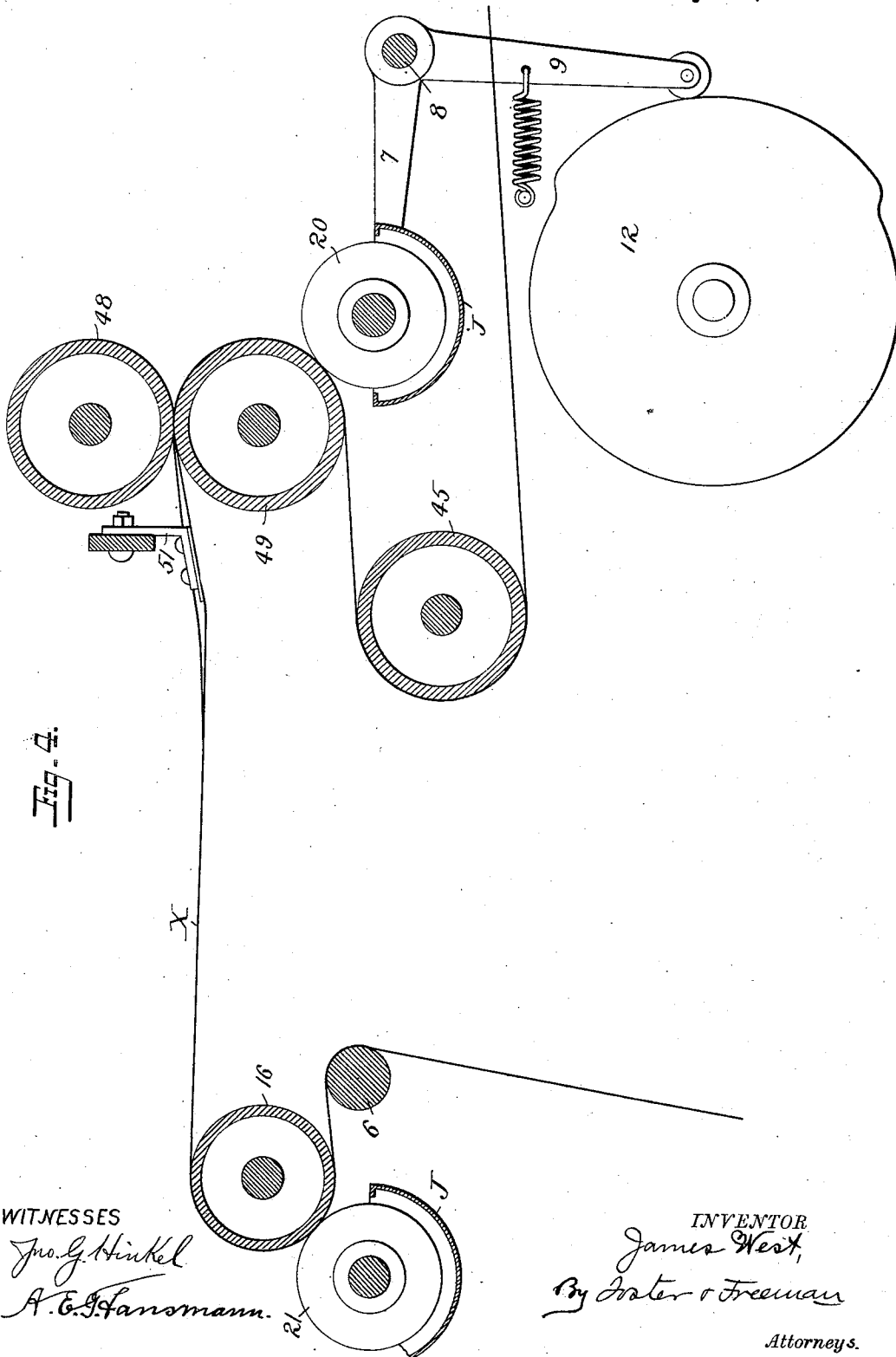
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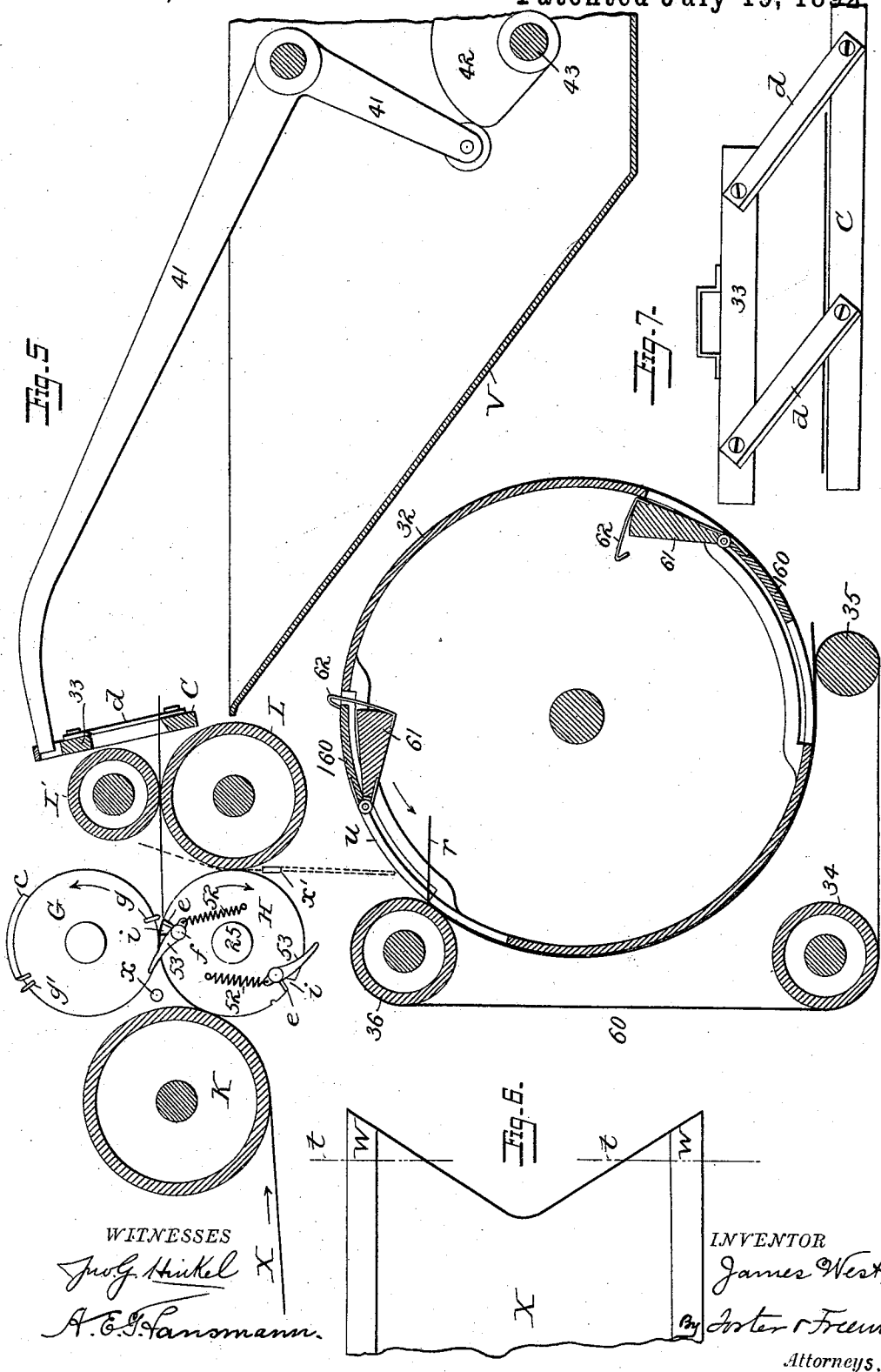
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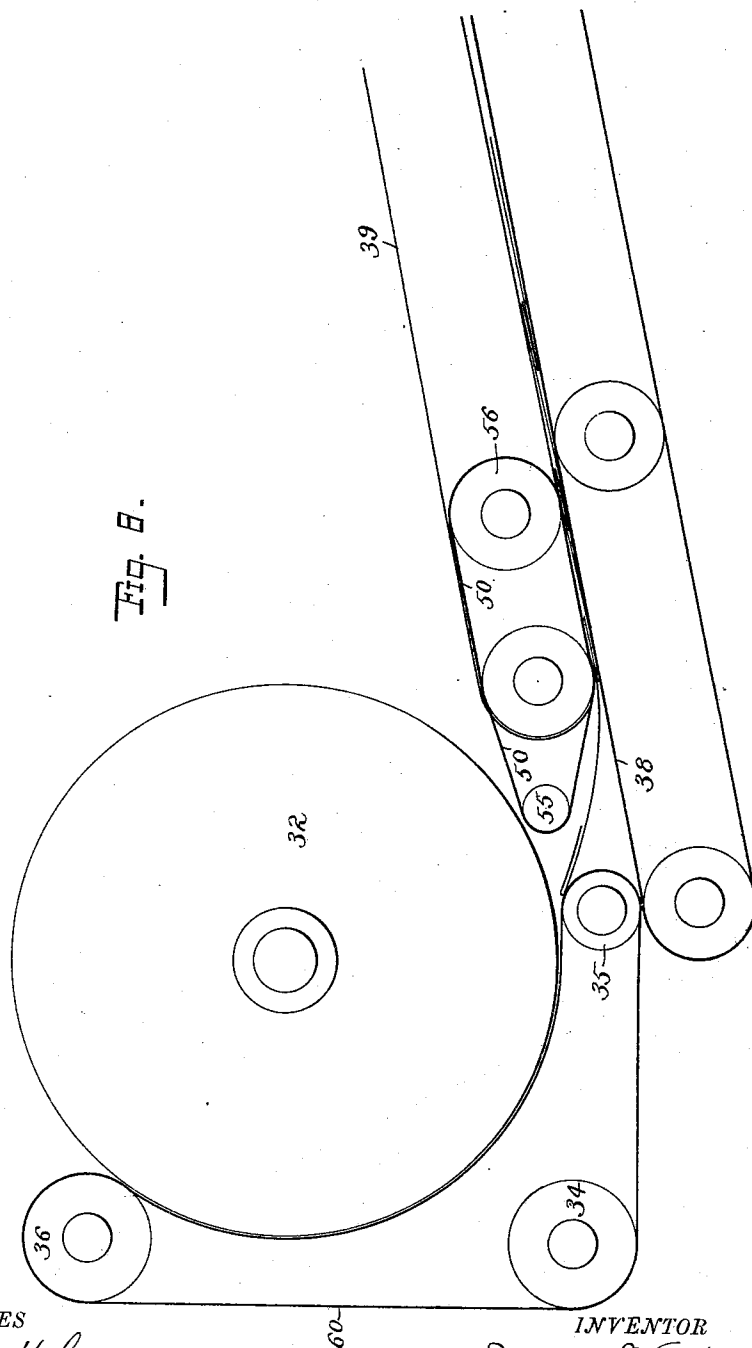
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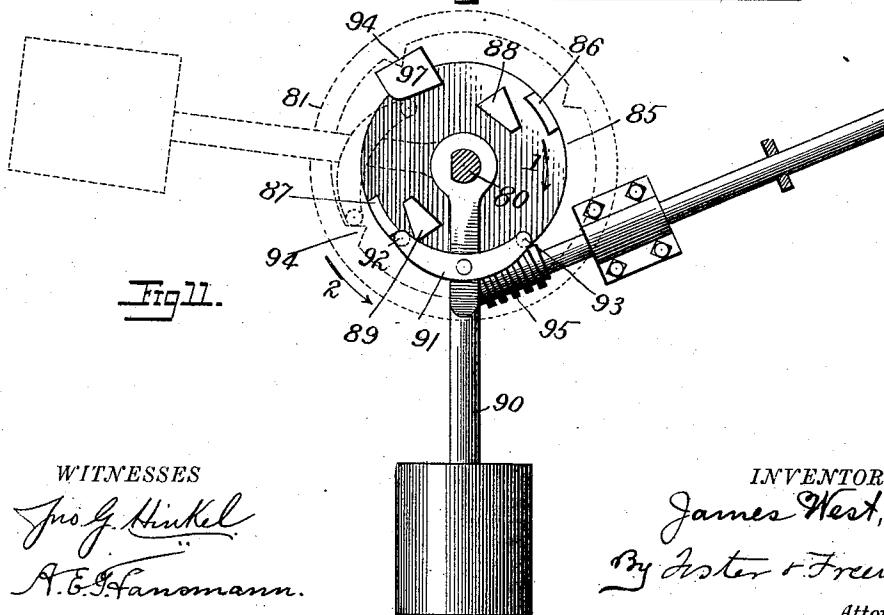
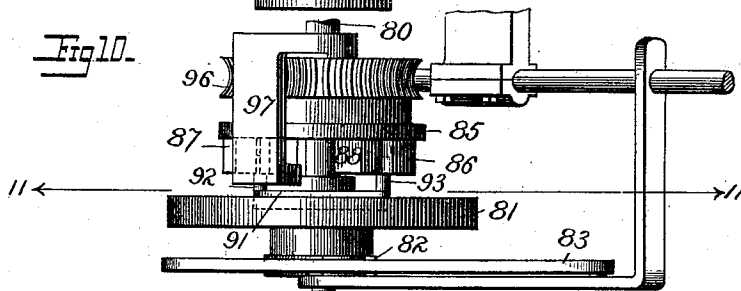
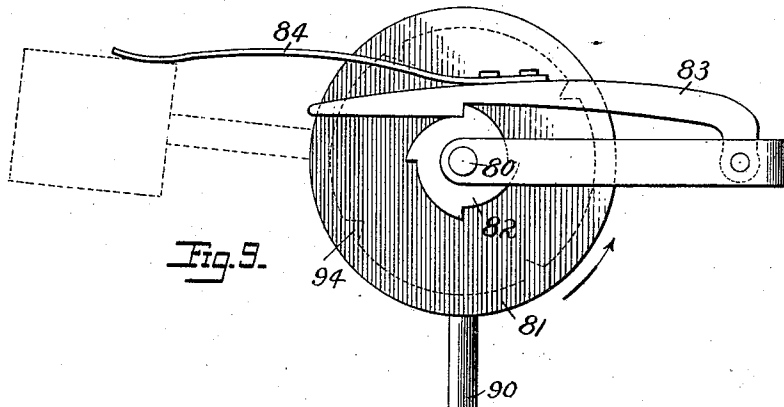
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UNITED STATES PATENT OFFICE.

JAMES WEST, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO SAMUEL
CUPPLES, OF SAME PLACE.

ENVELOPE-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 479,042, dated July 19, 1892.

Application filed November 5, 1890. Serial No. 370,397. (No model.)

To all whom it may concern:

Be it known that I, JAMES WEST, a citizen of the United States, residing at St. Louis, Missouri, have invented certain new and useful Improvements in Envelope-Making Machines, of which the following is a specification.

My invention relates to that class of envelope-making machines in which the envelopes are formed from a continuous strip which is carried through the machine, folded, pasted, and cut to form the envelopes; and my invention consists in certain details of construction whereby to facilitate the operations of the machine and secure a more perfect product.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of an envelope-machine embodying my improvements. Fig. 2 is a plan view. Fig. 3 is a side elevation. Fig. 4 is an enlarged sectional view illustrating the arrangement of the pasting and side-folding devices. Fig. 5 is an enlarged sectional view illustrating the creasing, shearing, cutting, and flap-folding devices. Fig. 6 is a plan view showing the form of the end of the strip. Fig. 7 is a face view of the shearing devices. Fig. 8 is an enlarged detached view showing a portion of the carrying-bands. Fig. 9 is a side view of parts of the separating or connecting devices. Fig. 10 is a plan of the parts shown in Fig. 9. Fig. 11 is an elevation on the line 11 11, Fig. 10.

The paper to be made into envelopes, in many respects as shown in my Letters Patent No. 442,839, dated December 16, 1890, is conducted through the machine in the form of a strip of proper width and is carried opposite a gumming-roll 27, having upon it a type *v* of such a shape as to correspond to the form of the layer of gum that is required to seal the flap of the envelope. This layer of gum is preferably deposited upon the sheet in position to be upon the back of the completed envelope, this method being preferable, so that by moistening the uncoated edge of the flap the envelope may be sealed by bringing the flap against the coated back. After passing opposite the gumming-roller the strip passes through a suitable drying-chamber in a casing B, whereby the gum is dried, after which it passes opposite pasting-disks 21, whereby the paste is applied in lines

at the edges at intervals, after which the strip passes beneath a folding-blade 51, by which the edges of the strip are turned upward, and then beneath a roller 48, by which the turned-in edges are folded flat against the body, thence around a roller 49 and opposite pasting-disks 20, by means of which lines of paste are deposited at intervals upon the inturned folded edges, and thence between creasing, folding, and cutting rollers G H, whereby the strip is folded crosswise and carried with its folded edge between the roller H and an opposite roller L until the knife *c* of the roller G cuts the strip transversely, forming the edge of the flap. These general operations are such as have heretofore been effected in the manufacture of envelopes and need not be further described; but the particular mechanisms whereby they are effected will be now more specifically set forth.

The operating parts of the machine that effect the operations above described and the additional novel devices required to complete the manufacture of the envelope are all supported by a frame F of suitable construction, and the various rolls and shafts are supported by suitable bearings on the frame, as will be readily understood. The strip passes from the paper-roll A around a guide-roll 11 to the roll 13 opposite the gumming-roll 27, which receives its gum through intermediate rolls from a suitable trough 5. The heater B is in the form of a casing having a side opening *y* for the passage of the strip to a revolving drum 49 within the casing, which drum receives steam through a central opening 150, and is maintained in a heated state thereby. The strip after passing around the drum and under a guide-roll 47 passes out of the casing upward to a guide-roller 6 and between the pasting-disks 21 and a supporting-roll 16. The pasting-disks 21 revolve in a trough J, and in order to secure the application of the paste in lines of determined lengths I vibrate the support of the pasting-disks, so as to bring them at definite intervals against and carry them from the strip. By this means I could vary the length of the lines of paste, as desired, without having to employ pasting-type of definite sizes, altering them from time to time in accordance with changes in the depths of the envelopes. One means of sup-

porting and operating the paste-disks is shown, and consists in supporting the trough, its disk, and shaft upon arms 7 of a rock-shaft 8, having an arm 9, which is kept by a spring 5 against a revolving cam 10, which acts to rock the shaft at the proper intervals. In like manner the second pair of pasting-disks 20 is supported and vibrated by means of a cam 12. The strip X of paper is pressed against the creasing-roll H by means of a friction-roll K, which is forced against the roll H by means of a spring 17, adjusted to any desired degree of pressure by set-screws 18, Fig. 1. The roller H carries two creaser devices, one for creasing the strip to form the bottom fold and the other for creasing the strip at the point where the flap is folded, and the roll G carries the creaser-blades g g' , the parts being shown in position, Fig. 5, in which blade g has forced the paper into a recess i in the roll H and left it gripped between a blade e and one edge of the opening in the roll. The blade e is carried by a rock-shaft f , having an arm 53, to which a spring 52 is connected to swing the blade e against the side of the recess. When the paper is to be folded into the recess by one of the creaser-blades, the arm 53 strikes the stop a , which carries the blade e away from the side of the recess, permitting the entrance of the blade g with the strip doubled thereon, after which the arm 53 passes from the stop and the spring 52 draws the blade e against the fold of the paper left in the recess, so that as the roller H continues to revolve in the direction of its arrow the folded strip is carried downward between the rollers H and L until the arm 53 strikes a second stop a' , when the strip is released. Prior to the passage of the blade g upon the paper strip the forward end of the latter has passed horizontally between the roller L and a second roller L' and over a cutter-bar C. As the end of the paper strip from which the preceding envelope-blank has been cut has an angular recess in it, as shown in Fig. 6, and as the envelope is to be made with the back higher than the edge of the flap it is necessary to cut off the corners W W, Fig. 6, and this is done by means of cutters d , that co-operate with the cutter-bar C to shear off the said ends on the lines t t .

As shown in Fig. 7, there are two shearing knives or blades d , each jointed at the lower end to the shearing-bar C and at the upper end to a cross-bar 33, which is operated vertically by a crank-lever 41 upon a rock-shaft actuated by a cam 42 on a rotating shaft 43. The triangular pieces thus sheared from the ends of the strip constitute the only waste that occurs in the manufacture of the envelope and are received in a box V, preventing them from adhering to any portion of the gummed strip. After the strip has been partially folded and carried down between the rollers H and L the next blade g' , co-operating with the other blade g , creases the strip transversely, after which the cutter c severs

it, forming the edge of the flap. The folded blank passes down between the rolls H and L, as shown in dotted lines, Fig. 5, and the lower edge is caught between a revolving hollow cylinder 32 and bands 60, supported by rolls 34 35 36 and bearing against the cylinder, the bands and cylinder constituting a carrier for carrying the blanks downward. As thus supported that portion of the blank which forms the flap is at the rear end of the traveling blank, so that the latter cannot be folded down onto the body by passing between rolls, as would be the case if the flap were at the forward end of blank. I therefore provide a folder for folding down the flap as follows: The cylinder 32 is driven by gears 205 and 206 (see Fig. 3) and has at one side (or at both sides, as shown when duplex in its action) a transverse opening u , so that the flap portion r of the envelope-blank projects inward, as shown in Fig. 5. In suitable guides slides peripherally a plate 160, which extends across the opening u and which carries a folding-bar 61, hinged to one edge of the plate and supported by a spring-hook 62, which projects upward and engages the top of the frame. As the plate 160 and its folding-bar are brought to the upper position shown in Fig. 5, they will be above the flap of the blank last received between the cylinder and bands, and as the revolution of the cylinder further continues the plate and its bar will slide downward in the direction of the arrow, and when the hook 62 makes contact with the roller 36 it will be pushed away from the plate 160 to release the bar, which will then swing out toward the inner face of the cylinder, folding the flap down upon the body of the envelope. The bands 60 are driven by contact with the cylinder 32. As the envelope passes from the roller 35, it passes from the control of the bands 60 and onto carrying-bands 38 between the latter and shorter bands 39, supported by an upper set of rollers. In order to prevent the flap from rising as the envelope passes from the roller 35 onto the lower bands 38 and 39, I provide supplemental bands 50, passing round rollers 55 56 and extending inward so, as to hold the flaps in place. The bands 38 are driven to travel at a less speed than the bands 60 by any suitable means, such as the belts 200 and 201, Fig. 3, which connect the driving-pulleys of the bands with a pulley upon a shaft 203 of the gear-train, so that the envelopes are deposited upon the bands 38, each so as to overlap partially the preceding envelope.

In order to count out any desired number of envelopes for a pack or bundle, I make use of one or more blades, which at proper intervals rise and make contact with the adjacent rear edge of one of the envelopes and then move outward, carrying said envelope and all that are forward of its position rapidly forward, bringing them together upon the bands in one pile or collection. Various means may be employed for imparting the required move-

ments to such a blade or blades. For instance, a cross-shaft 80 below the frame supporting the bands carries cross-blades 181, and a quarter-revolution is imparted to said shaft at proper intervals, whereby one of the blades is brought against the adjacent envelope and pushes it and all that is forward of it together in a pile for collection, as before described. Various means may be employed for imparting to said blade or blades the proper movements at the desired intervals. Thus to the shaft 80 on one side of the frame is secured a disk 81 and a ratchet 82, having four shoulders for engaging a pivoted pawl 83, from which extends a spring-blade 84. Upon the shaft 80 turns a disk 85, having upon it two lugs 86 87 and cams 88 89, and between the disk 85 and the disk 81 is hung to the shaft a weighted arm 90, provided with a centrally-pivoted dog 91, having projections 92 93 at its opposite ends. The disk 81 is provided with an internal flange having four equidistant lugs 94. The disk 85 is driven continuously at a slow speed in any suitable way—as, for instance, by a worm 95 and worm-gear 96 in the direction of its arrow 1, Fig. 11. When one of the lugs or projections 86 strikes the projection 93 on the dog 91, the weighted arm 90 will be carried with the disk 81 until the opposite projection 92 strikes a fixed stop or cam 97, when the dog 91 will be tilted so as to bring the lug 93 above one of the projections 94, as shown in dotted lines, Fig. 11. As the lug 93 passes from contact with the lug 86 or 87 and to the lug 94, the weighted arm will have struck the blade and lifted the pawl 83, and the weighted arm will then descend by its own weight and the dog 91 will turn the disk 81 a quarter-revolution in the direction of the arrow 2, Fig. 11. As the arm 90 swings to its vertical position, the lug 92 will strike the side of the adjacent cam 88 or 89, and the pawl 91 will be thereby swung to its central position with the lug 93 in position to be struck by the succeeding lug 86 or 87.

Without limiting myself to the precise construction and arrangement of parts shown, I claim—

1. The combination, with the rolls for creasing and folding the strip and the cutter for severing the blanks from the web, of a transverse cutter for severing the corners of the strip, substantially as set forth.
2. The combination, with the transverse cutting devices and the feed-rolls, of the cutter-bar C, blades *d*, arranged to shear with the bar C, and means for moving said blades periodically, substantially as described.
3. The combination, with the creasing, folding, and cutting device arranged to deliver the blanks downward with the flaps uppermost, of a carrier for carrying the folded blanks forward and a folder constructed to turn down the flaps, substantially as described.
4. The combination, with the folding and cutting rolls, of a cylinder recessed to receive

the flap of the envelope and carrying a folding-bar, with means for bringing the latter against the flap to fold it down against the body of the envelope, substantially as set forth.

5. The combination, with the cylinder 32, of the sliding and hinged folding-bar 61 and side guides wherein it can slide peripherally upon the cylinder, arranged substantially as set forth.

6. The combination, with the cylinder, of the plate 160, sliding peripherally in guides upon the cylinder, the folding-bar 61, hinged thereto, and the detent for temporarily holding the bar in one position, substantially as described.

7. The combination of the cylinder 32, supporting one or more hinged folding-bars and recessed to receive the flaps of the envelopes and traveling bands arranged to hold the body of the envelopes against the cylinder, substantially as specified.

8. The combination, with the devices for feeding the envelopes and finishing them by folding down the flaps, of traveling conducting-bands and means for driving them at a speed slower than that at which the envelopes pass from the said devices, and mechanism for separating the envelopes into bundles, substantially as described.

9. The combination, with the traveling bands 28, of one or more revolving blades 181 and means for carrying them at intervals forward against the envelopes, substantially as described.

10. The combination, with the traveling bands, of a shaft carrying cross-blades and means for imparting an intermittent revolution to the shaft, substantially as set forth.

11. The combination, with the shaft and its carrying-blades, of a disk provided with projections, a weighted arm carrying a pawl, and means, substantially as described, for raising and lowering the arm and for carrying said pawl to and from said projection, substantially as set forth.

12. The combination, with the shaft 80 and its blades, of a disk 81, having projections 94, a rotating disk 85, having projections 86, a weighted arm provided with a pivoted dog, and a fixed stop for making contact with said dog, substantially as set forth.

13. The combination, with the disks 81 and 85, their projections, and weighted arm and dog, of cams 88 89, substantially as set forth.

14. The combination, with the disk 81, weighted arm, and operating appliances, of a ratchet 81 82 and pawl 83, extended to make contact with a part of the weighted arm, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES WEST.

Witnesses:

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J. B. CUNIE.