

(No Model.)

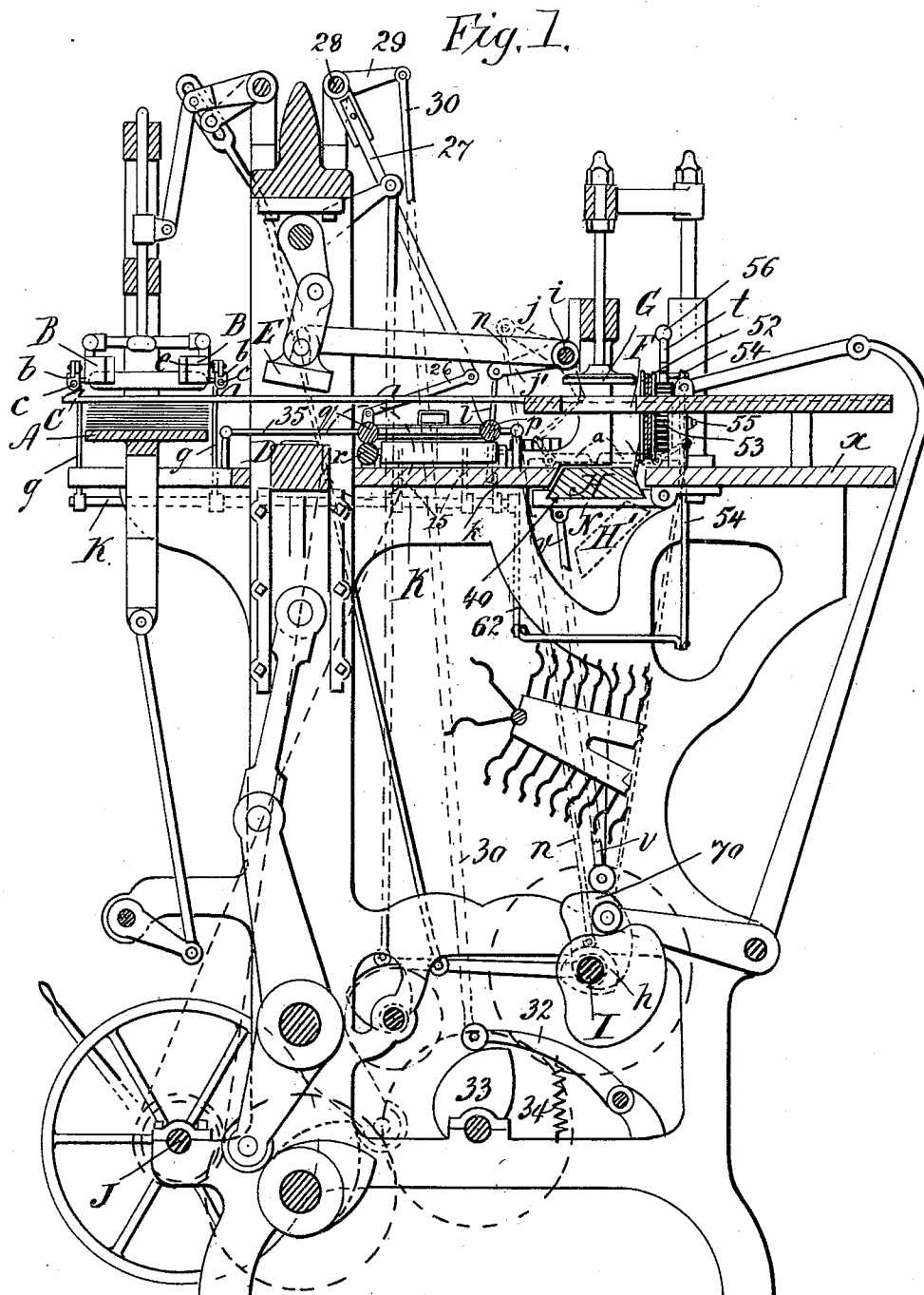
3 Sheets—Sheet 1.

J. BALL.

MACHINE FOR MAKING AND PRINTING ENVELOPES.

No. 463,981.

Patented Nov. 24, 1891.



Witnesses:

J. D. Garfield
W. B. Collins

Inventor,

James Ball.

by *Chapman & Co.*
Attorneys

J. BALL.

MACHINE FOR MAKING AND PRINTING ENVELOPES.

No. 463,981.

Patented Nov. 24, 1891.

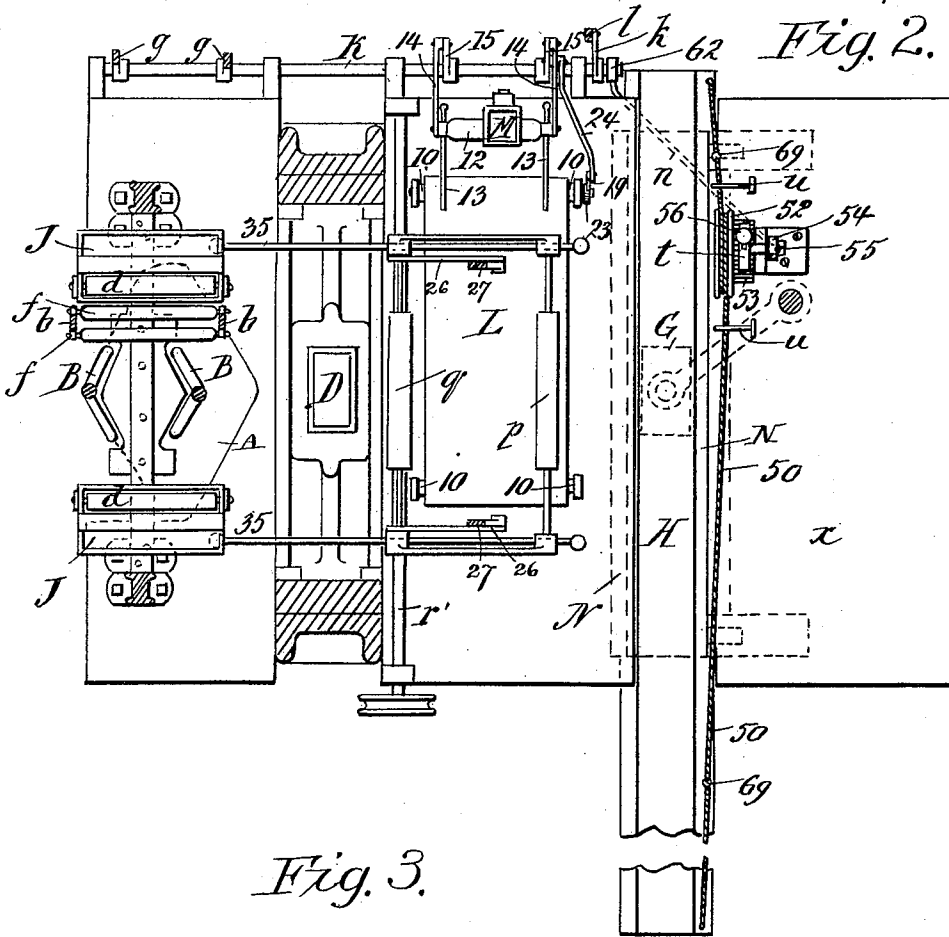
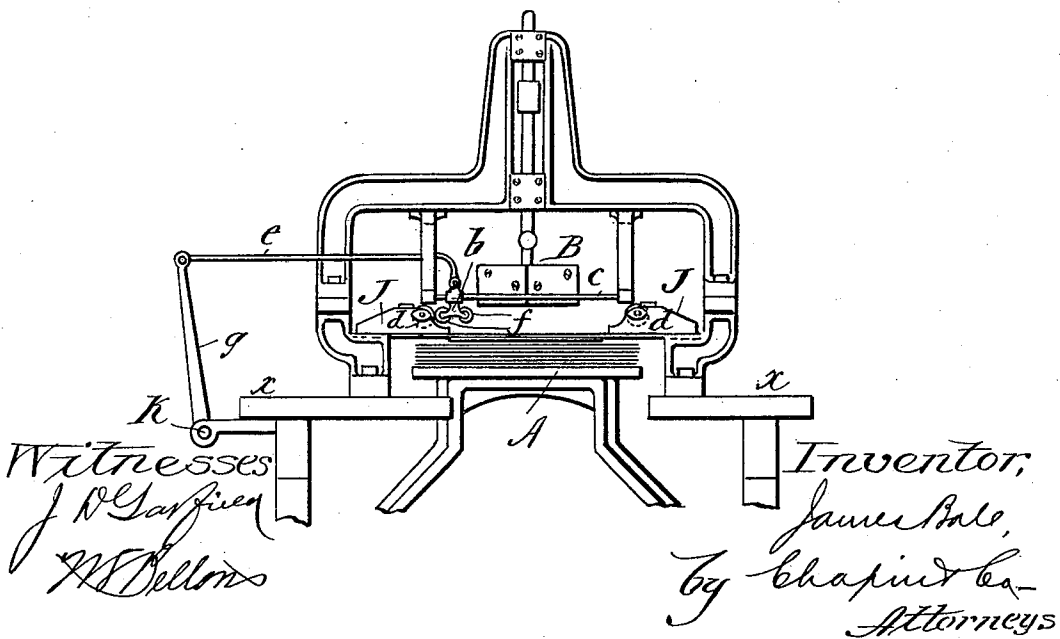


Fig. 3.



Witnesses
J. O. Garrison
W. D. Bellows

Inventor,
James Ball,
by Chapman & Co.
Attorneys

(No Model.)

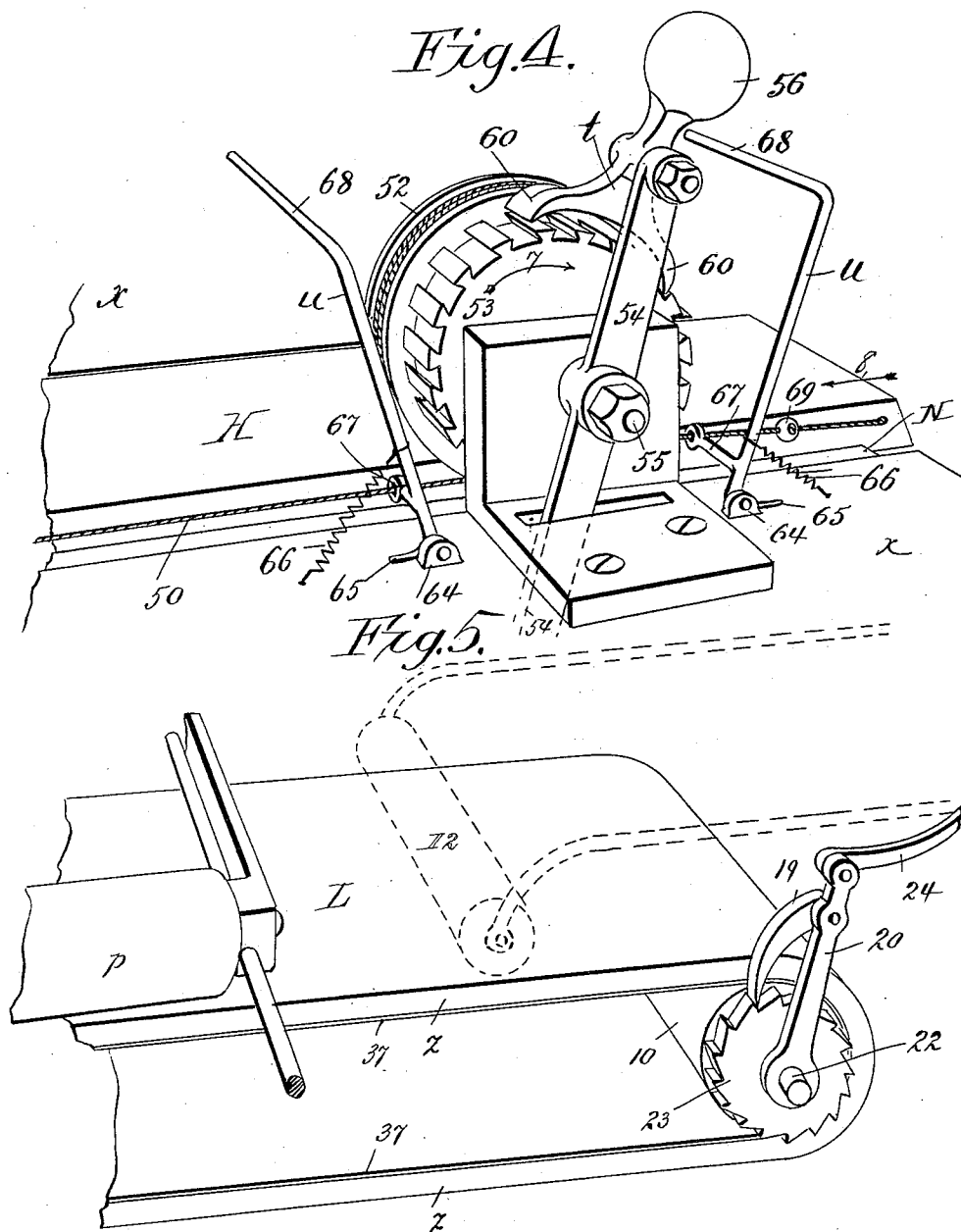
3 Sheets—Sheet 3.

J. BALL.

MACHINE FOR MAKING AND PRINTING ENVELOPES.

No. 463,981.

Patented Nov. 24, 1891.



Witnesses:

J. D. Garfield
H. B. Ballou

Inventor,

James Ball,
by Chapman & Co.
Attorneys

UNITED STATES PATENT OFFICE.

JAMES BALL, OF HOLYOKE, MASSACHUSETTS, ASSIGNOR TO THE HOLYOKE ENVELOPE COMPANY, OF SAME PLACE.

MACHINE FOR MAKING AND PRINTING ENVELOPES.

SPECIFICATION forming part of Letters Patent No. 463,981, dated November 24, 1891.

Application filed March 18, 1891. Serial No. 385,543. (No model.)

To all whom it may concern:

Be it known that I, JAMES BALL, a citizen of the United States, residing at Holyoke, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Machines for Making and Printing Envelopes, of which the following is a specification.

This invention in machines for making and printing envelopes particularly relates to improvements in the gumming mechanism for the gummer-pickers, in the ink-distributing devices for the type, and in the bed on which the printed and gummed envelope-blanks are to be folded and from which they are to be discharged.

The improvements in the gumming mechanism are to the end of securing one which insures the most effectual and even gumming of the pickers, so that the blank will consequently be evenly and effectually gummed.

The improvements in the mechanism for and constituting the folding-bed are to the end of providing such a bed on which the printed blanks are to be folded, that all liability of the faces of the envelopes becoming smooched with ink or defaced is avoided, and due to the improvements in the ink-distributing devices, the latter are rendered unusually advantageous for their efficient action; and to the ends as above indicated the invention consists in the construction and combination or arrangement of parts, all substantially as will hereinafter more fully appear, and be set forth in the claims.

Reference is to be had to the accompanying drawings, in which such illustrations of the present invention are given as, in connection with the following particular description, will readily disclose to persons skilled in the art the composition and operation of the mechanism of the present invention.

Figure 1 is a sectional elevation, taken from front to rear and about centrally, of a machine for making and printing envelopes. Fig. 2 is a horizontal section and plan view of the same. Fig. 3 is a front elevation of enough of the machine to include and illustrate the improvements in the gumming mechanism. Fig. 4 is a view in perspective on a larger scale, illustrating some of the mechanism coacting

with the movable folding bottom. Fig. 5 is a perspective view, also on a large scale, in illustration of parts of the inking mechanism.

Similar characters of reference indicate corresponding parts in all the views.

The envelope-machine will not be described, except as to the particular features of the present invention, further than to state that the blanks are supported and automatically elevated into the right relation to the gummer-pickers B on and by the table A. The blanks are then taken upon the conveyer C and carried to the action of the printing machinery, the type-bed being indicated at D and the platen at E, both being movable to and from each other by suitable mechanism, as is common or desirable. The blanks are successively farther rearwardly conveyed, after being printed, to the creasing-box F, being forced therethrough by the plunger G onto the novel folder-bed H, and then the flaps are folded down by the folder-wings, (slightly indicated in dotted lines in Fig. 1 at *a*), after which the bed is tilted to permit of the envelopes falling or being discharged into the drier-chain.

The novelty in the gumming mechanism consists, primarily and essentially, in the combination, with the gummer-picker having the usual reciprocatory movement, of a gum-box having a gum bearing or supplying surface or member located at one side of the line of the picker's movement, and a pair of rolls and a suitable carrier therefor for moving said rolls, so that both thereof will roll over the face of the picker-gummer, the one roll in advance of the other, and one of said rolls will be periodically moved to a bearing with the said gum bearing and supplying surface or member. Said gumming contrivance, however, preferably and furthermore embodies two gum-boxes, rolls of the said traversing pair of rolls alternately passing to receive by one or the other thereof gum from the one or the other of the two gum-boxes.

In the drawings, J J represent gum-boxes suitably mounted on the machine-frame at each side of the gummer and of any of the usual constructions, each employing therein a gum-roll, indicated by *d*.

f f represent two gum-distributing rolls

with their axes at right angles to their movement of traverse from the one gum-box to the other, said rolls being mounted with the upper portions of their peripheries in the same horizontal plane and coincident with the face of the gummer when the latter is in its uppermost position, on suitable bearing-supports *b*, which are mounted and guided on the runner-rods *c*, which latter are horizontally ranged at the front and to the rear of the gummer. The traversing motion of the said rolls is insured at each time that the gummers *B B* dwell momentarily in their uppermost position by having the link or connecting rods *e e* each attached by its one end to one of the roll-supports *b*, each of said connecting-rods by its other end being connected to an arm *g* on the rock-shaft *K*. The rock-shaft receives its rocking movement through means of connections and parts intervening between same and the cam *h* on the shaft *I*, (which shaft is suitably geared to the driving-shaft *J*,) which parts and connections consist in the intermediate rock-shaft *i*, having the two radial arms *j* and *j'*, the radial arms *k* on the rock-shaft *K*, the link *l* between arm *j'* and arm *k*, and the thrust-rod *n*, receiving a reciprocatory motion in a usual manner from the cam *h*, and having by its upper end a connection with the said arm *j*.

In the running of the machine, while the picker-gummers *B* are rising, the pair of gumming-rollers *ff* are at either the one side or the other of the gummers resting by the one of said rolls *f* which is then farthest from the gummers on the roll *d* of the gum-box, which is off at such side of the gummer. As is well known under the ordinary modes of gumming, as the blank raised by the gummer-picker is detached therefrom the surface of the gummer from which the blank has been forcibly stripped is left lumpy or hubbly, for as the blank is detached it draws a portion of the gum, which is not taken up by the blank, but remains on the gummer down from the face of the gummer to remain as an uneven surface onto which the next coating of gum is usually applied by the freshly-supplied roller. Now it will be seen that under the present improvements the one of the rolls *f* which next first passes over the face of the elevated gummer is the one which had last run over said face and imparted the gum thereupon, and therefore the said roll (running in advance of the one of the rolls *f* which had last rested on the gum-box roll and which is plentifully supplied with gum) smooths down the gum on the face of the gummer, so that the other and fully-gummed roll following closely behind spreads its gum upon a smooth and even gummer-face, so that consequently the flaps of the envelope will be correspondingly evenly and completely gummed.

I am aware that it has been proposed in the gumming of the gummer to pass a single roll from one gum-box with gum thereon past

and upon the gummer, and thence to the other gum-box to receive gum for supplying the gummer on the return movement of the roll over the face of the gummer. This method of gumming is devoid of the advantage arising from the "smoothing-down" roll, which is alternately constituted by the one or the other of said pairs of rolls when the pair is used as set forth under this invention. Another feature of practical advantage arising out of the said improved mechanism consists in the fact that each one of the rolls *f* contacts with but one of the gum-box rolls *d*. In practice where a single roll has a shuttle motion between the opposite gum-boxes, the effect, unless great care and intelligence was observed in adjusting the parts regulating the gum delivery, was that the reciprocating roll will receive an overplus of gum from one roll and would in fact deposit gum onto the roll into the other box, which latter instead of becoming depleted would in fact become excessively filled with gum at the expense of the opposite gum-box and also of the satisfactory gumming action upon the picker-gummer. Any such undesirable action is of course rendered impossible under the mode of procedure consequent upon the present provision and arrangement of the parts.

Describing now the improvements in the ink-distributing devices for the printing mechanism of the machine, *L* represents an endless apron, which is mounted horizontally upon the two shafts or rolls 10 10, which are ranged in parallelism behind the printing-bed *D* with their axes extending from front to rear of the machine, as will be understood on reference to Fig. 2, and so that as one of said rolls 10 is turned the said endless apron *L* will be moved to present different portions thereof back of and in line with the said type-bed.

M represents an ink well or supply located at one side of the machine, which is of an ordinary construction and is arranged above and in relation to the ink-carrying roll 12, so as to impart to said roll suitable portions of ink from time to time, as is demanded. The said roll 12 is supported and guided for a horizontal movement on horizontal runner-rods 13 13, and a back-and-forth movement is imparted to the said roll 12, so that it may, receiving ink from the ink-supply *M*, convey ink to and upon the endless apron and then return to its position under the ink-supply. Such back-and-forth movement of the roll 12 is secured through the connecting-rods 14 14, which are united with the radial arms 15 15 upon the rock-shaft *K*. *p* represents a distributing-roll, and *q* represents an ink-roll for the type-bed, and the said rolls *p* and *q* are united to move in unison, the one *p* across the upper surface of the endless apron onto the receiving-roller *r*, which receiving-roller is just in advance of the forward edge of the said endless apron and has a position under the roll *q* when said roll is in its normal posi-

tion, and the said roll *q* (as the roll *p* moves as just above described) moves forward upon and across the face of the type. The face of the type, when the type-bed is in its lowermost position, is in a plane which is coincident with the under surface of the said ink-ing-roll *q*. The ink-receiving roll *r* has its arbor *r'* extended to the side of the machine, as shown in Fig. 2, and is there provided with a pulley upon which to belt for the rotation of said roll from any shaft or rotatable part of the machine. The endless apron *L* is given a step-by-step movement by means of the pallet 19, which is pivotally mounted on the radial arm 20, that is loosely supported on the axial stud 22 of one of the rolls 10 with the ratchet-wheel 23, which is fixed upon the end of the said roll 10. A reciprocatory movement is imparted to the pallet-carrier 20 by the connection therewith of one end of a connecting-rod 24, which by its other end has an engagement with a radial arm 15 on rock-shaft *K*. The concurrent movements of the rolls *p* and *q* from rear to the front of the machine and return is secured through means of the connection with the arbor of the one or the other of said rolls, or with the rigid tie-pieces which unite them, of the link 26, which by its other end is pivoted to an arm 27, affixed to and radially extended from the rock-shaft 28. This rock-shaft has a radial arm 29 thereon, to which a connecting or thrust rod 30 is secured, the lower end of said rod being pivoted to a swinging lever-arm 32, pivoted on the frame and swung by the cam 33 in one direction, said arm 32 being swung in the other by the retracting-spring 34. The said rollers *p* and *q* are supported and horizontally guided upon the runner-rods 35, substantially as shown in the drawings, Figs. 1 and 2.

While the operation of the mechanism above described is undoubtedly apparent without further description or explanation, it will be briefly mentioned, however, that the roll 12 conveys ink from the ink well or supply *M* to and upon the endless apron *L*, above one of the rolls 10. The said endless apron has a step-by-step movement, so that the inked portion thereof has a suitable traverse and is brought in the line of the run of the distributing-roller *p*, which, in addition to effecting a complete and even distribution and spreading of the ink upon the endless apron, also conveys portions of the ink therefrom to and upon the receiving-roll *r*, and the roller *q* periodically carries the ink to and inks the type.

The endless apron *L* described is in itself a novelty of much utility, especially in a machine substantially such as the present one, and the said endless apron consists of a belt 37, of canvas or other textile material, or, in fact, any suitable flexible material, and a comparatively thick layer *z* of the ordinary printer's roll composition, which is placed evenly and uniformly upon the said belt 37, having an engagement therewith by the per-

meation of the interstices of the said belt material. This endless apron is very tough and elastic, unusually durable, and permits of the advantageous employment of an ink-receiving apron, where otherwise inconvenient expedients would necessarily have to be resorted to to accomplish the results here attained.

The bottom *H*, on which the gummed, printed, and creased envelopes are folded, consists of a long slab having an upper plane surface which is horizontally about coincident with the upper surface of the main table *x* of the machine, and said surface has a length which is a number of times as long as the length or width of the envelope to be folded thereon, the said slab being transversely supported upon the carrier *N*. The said carrier *N* is provided with a dovetailed way 40, in which the said slab *H* is free to move, and the movement of the said slab transversely of the machine is to be imparted so that at each envelope-forming operation of the machine a fresh surface on which to fold may be presented by any suitable mechanism, a form of mechanism for the purpose stated being shown in the drawings, and the same will now be described.

50 represents a cord or other form of flexible connection, which by its end portion is connected to the said slab at or near the end of the latter, the said cord by an intermediate portion thereof having one or more turns for a frictional engagement around the drum 52, which is mounted upon table *x* adjacent the said slab for rotation with its axis horizontally. The said friction-drum 52 has on one side thereof a ratchet 53, having double-faced teeth, substantially as shown in Fig. 4.

54 represents a lever intermediately pivoted, as at 55, carrying upon its upper arm the pivotally-hung double-toothed pallet *t*, which is provided with the extended and weighted arm 56. The tendency of the weight upon the pallet is to maintain the same, whether the lever-arm carrying same is tilted forward or back, so that when once swung to present one of the pallet-points 60 into engagement with one set of faces of the double-faced ratchet-wheel 53 continuously in such engagement, the opposite pallet-point being then of course swung out of engagement with the other set of faces of the said peculiarly-formed ratchet-wheel, the lever 54 receives its swinging motion through the connection with the lower end of the same of a radial arm 62, affixed on the before-mentioned rock-shaft *K*.

With particular reference to the perspective view, Fig. 4, it will be apparent that at each swinging movement of the lever 54 the ratchet 53 and drum 52 will be partially rotated in the direction of the arrow 7, and said drum having its axis immovable and cord 50 being under tension around the drum will insure the movement of the slab in the direction of the arrow 8, and this direction of feed

of the slab H will be continued under the running of the machine until the pallet *t* is reversed, so as to insure the working of the ratchet-wheel by the engagement of the other pallet-point. The reversal of the run of the slab, after it has been brought to present a portion thereof which is near its end to the folding position of the machine, is to be automatically effected, various contrivances for which purpose may be employed, and they are within the range of knowledge of skilled mechanics; but I have here illustrated one form of means for insuring the reverse movement of the slab, which will be now described.

At each side of the axis of the drum and ratchet 52 53 are provided levers *u u*, which by their bottoms are pivoted upon lugs 64 that are formed on or secured to the top of the table of the machine. Said levers are provided with limiting toe-pieces 65, so that each may be normally under the tension of the spring 66, which is applied thereto, held in the inclined position substantially as shown. Each of said levers *u* is provided with an eye-formed member 67, through which the portions of the said cords 50 which are extended from either side of the drum 52 loosely pass. The said levers *u* are formed at their extremities with extensions 68, which extend across the plane of swinging movement of the double-pointed pallet *t*. The cord 50 at its portions that are suitably near the ends of the slab H has the dogs or buttons 69. (See Figs. 2 and 4.) Now, noting Fig. 4, it will be seen that after the slab has been moved a short distance beyond the position in which it is shown, in the direction of the arrow 8, the right-hand dog or button 69 on the cord will come to an engagement with the member 67 of the lever *u*, which is at the right of the drum and ratchet. The said lever *u* will consequently be swung against the spring 66, insuring the tilting of the pallet, so that the same works by its other tooth, securing, without any change in the swinging movement of the pallet-carrying lever 54, a reversed rotation of the drum and ratchet-wheel, and consequently a reversed rectilinear movement of the slab H. At the completion of each envelope-folding operation the carrier N, and with it the said slab H, is swung downwardly, so that the slab occupies a position more or less nearly like the one indicated by H' in Fig. 1, and this swinging motion of the said carrier N and slab downwardly and also the return movement are secured through the thrust-rod *v*, which has a suitable engagement with the cam 70 on the rotary shaft I.

What I claim as my invention is—

1. In an envelope-machine, the combination, with a reciprocatory picker, of a pair of rolls and means for supporting, guiding, and moving same, whereby said rolls may move the one in advance of the other across the face of the raised picker, and a gum-supply with which the roll that is rearmost as said

pair proceeds to move across the face of the picker contacts, for the purpose set forth.

2. In an envelope-machine, the combination, with a reciprocatory picker, of a pair of rolls arranged, the one closely alongside of the other, and means for supporting, guiding, and moving same reciprocatorily in unison, whereby said rolls may both move, the one in advance of the other, across the face of the raised picker at each backward or forward movement thereof, and a pair of gum-supplying devices, one at each side of the picker, with each of which the one or the other of the rolls of said pair which is rearmost at the time said pair proceeds to move toward and across the face of the picker, respectively, contacts, for the purpose set forth.

3. In a machine for making and imprinting envelopes, the combination, with a type-bed, of an endless apron and supports therefor and means for imparting a motion to said apron, and a roll located intermediately of said apron and the type-bed, a roller running from said roll across the face of the type and returning to a contact with said roll, and another roll moving across the face of the said apron to contact with the said intermediate roll, and means for imparting to said rolls the said movements, for the purposes set forth.

4. In a machine for making and imprinting envelopes, the combination, with a type-bed, of an endless apron and means for supporting the same and for imparting a progressive movement thereto, a well or ink-supply, and a roll for taking ink therefrom and conveying same to the surface of said endless apron, and means for guiding and impelling the said roll, and rolls, and actuating mechanism therefor for distributing the ink upon the surface of the said endless apron and for receiving ink therefrom and inking the type-face, substantially as described.

5. In a machine for making and imprinting envelopes, the combination, with the type-bed, the rolls 10 10, and the endless apron mounted thereon, one of said rolls being provided with a ratchet-wheel and a pallet and carrier therefor, and means for imparting a swinging motion thereto, of the roller *r* between the type-bed and apron, the rolls *q* and *p*, arranged as described and united to move in unison, and the runner-rods 35 35, on which they are supported and guided, and means for moving said rolls *q* and *p* forward and back, substantially as and for the purpose described.

6. In an inking mechanism for a machine for making and imprinting envelopes, an ink-apron which consists of a belt of flexible material and a superposed layer of printer's roll composition, substantially as described.

7. In a machine for making and printing envelopes, the combination, with the type-bed, of a pair of separated rolls and an endless inking-apron supported on said rolls, which consists of a belt or endless band of

flexible material and a superposed layer of printer's roll composition, and rolls for distributing and spreading ink upon said apron and for conveying ink therefrom to the type, substantially as and for the purpose described.

8. In a machine for making envelopes, the combination, with the folders, of a slab mounted under the said folders and having a continuous and unbroken upper surface which is several times as long as the length or width of the envelope and movably supported and guided to present different portions of the top surface of said slab directly under the folders to constitute a fresh surface on which to fold, and means for imparting to said slab an intermittent forward movement and then an intermittent reverse movement, whereby different portions of the upper surface of the slab may be successively brought into operative relation with the folders, substantially as described, for the purpose set forth.

9. In an envelope-machine, the combination, with the folders, of a folding bed which consists of a slab supported under said folders and a carrier upon which the said slab is supported and guided for a movement coincident with the plane of its upper surface, said carrier being mounted to swing downwardly, and means for intermittently imparting the specified movement to the said slab, and a means for imparting the swinging movement to the said carrier, for the purposes set forth.

10. The combination, with the folding bed or slab and a support on which the same is movable, of a ratchet-wheel and a drum, a cord having an engagement with the said drum and also with said slab, and a pallet and means for supporting and imparting a swinging motion to said pallet, for the purposes set forth.

11. The combination, with the folding bed or slab and a support on which the same is movable, of a ratchet-wheel having double-faced teeth, and a drum, and cord connections between and connected to said drum and the end portions of said slab, and a double-toothed pallet and a carrier therefor, and means for imparting to said carrier a swinging movement, substantially as described.

12. The combination, with the folding bed or slab and a support on which the same is movable, of a drum and ratchet-wheel having the double-faced teeth, the cord connections between and connected to said drum and the end portions of the said slab and having the dogs or buttons 69, the double-pointed pallet having the weighted arm and the carrier therefor and means for swinging same, and the levers *u*, having extensions adapted to engage with and shift said pallet and located to be engaged by said dogs, substantially as and for the purposes set forth.

JAMES BALL.

Witnesses:

WM. S. BELLOWES,
G. M. CHAMBERLAIN.