

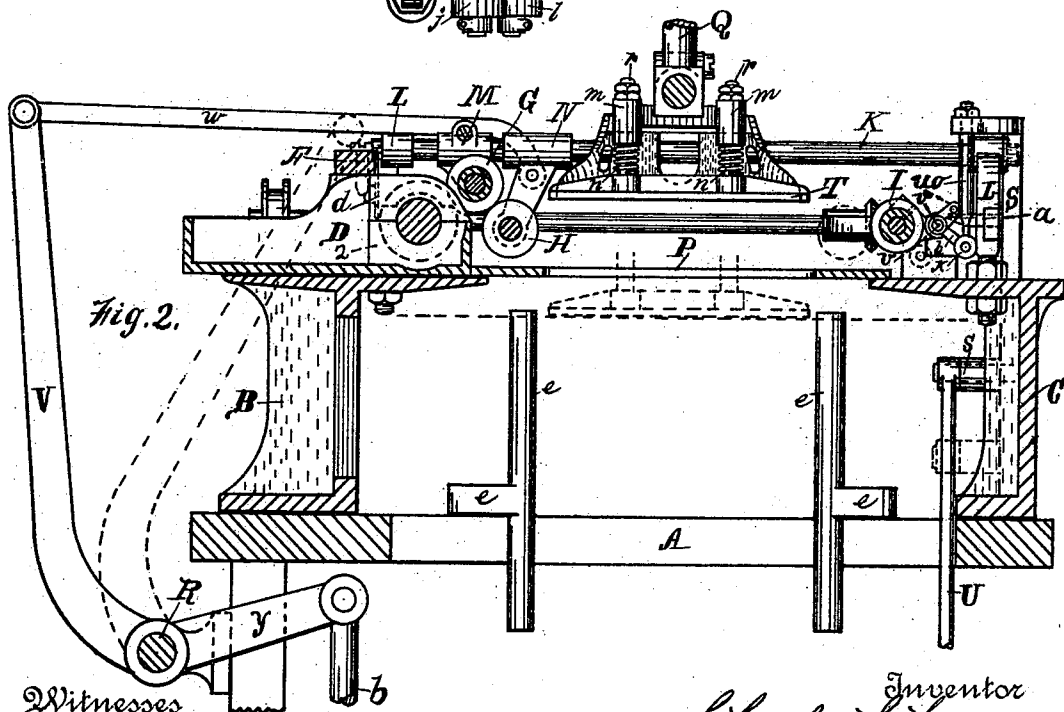
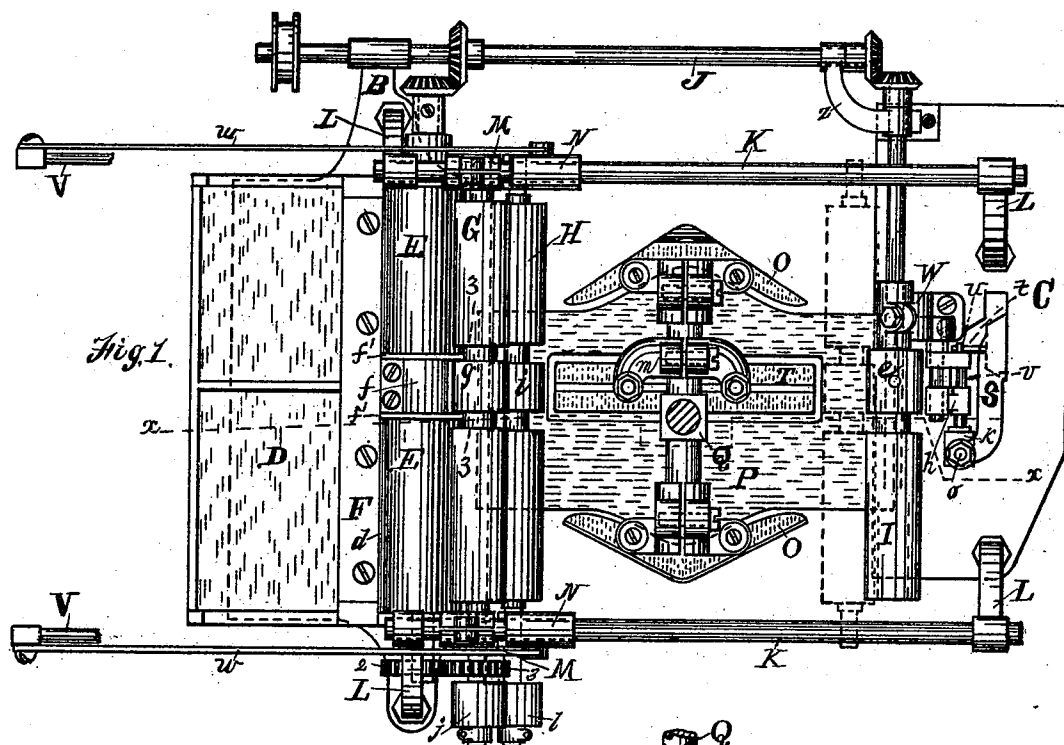
(No Model.)

3 Sheets—Sheet 1.

C. H. HEYWOOD.
ENVELOPE MACHINE.

No. 516,811.

Patented Mar. 20, 1894.



Witnesses
Robt. Ruddell
Geo. D. Dutton

Inventor
Charles Heywood

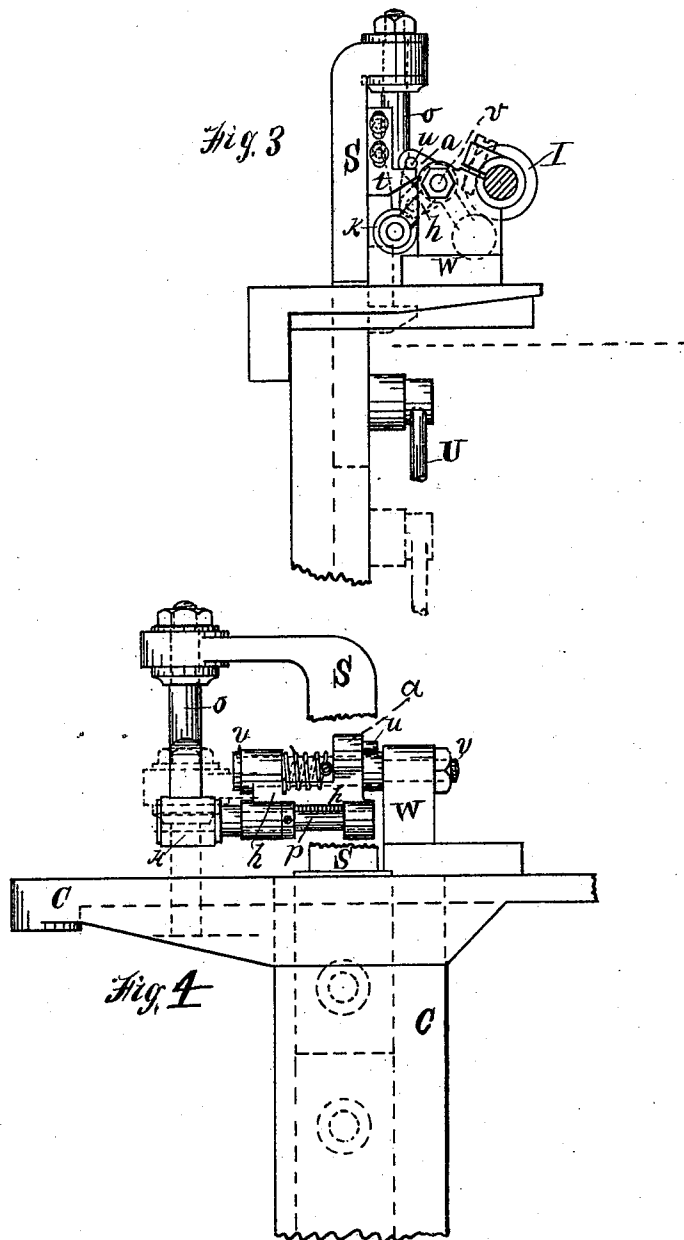
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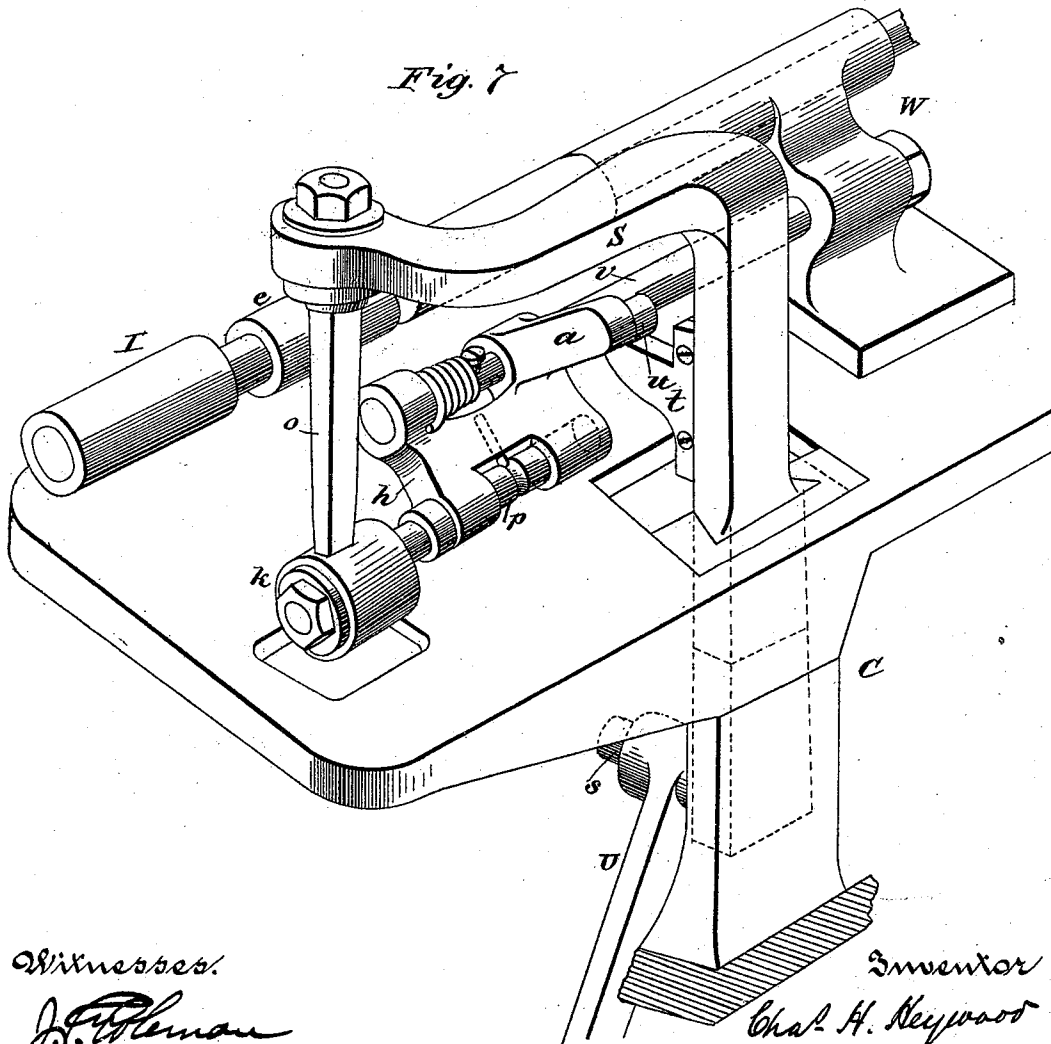
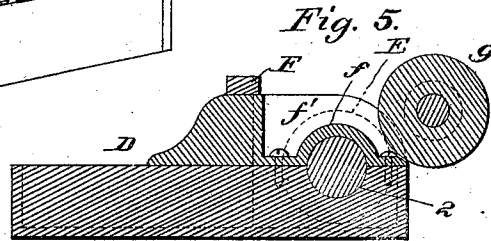
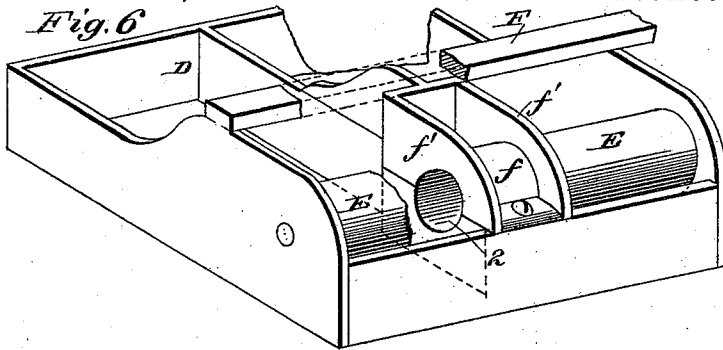
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Patented Mar. 20, 1894.



Witnesses:

J. F. Feltman
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Inventor
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UNITED STATES PATENT OFFICE.

CHARLES H. HEYWOOD, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO
THE NATIONAL ENVELOPE COMPANY, OF NEW JERSEY.

ENVELOPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 516,811, dated March 20, 1894.

Application filed February 16, 1892. Serial No. 421,759. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. HEYWOOD, a citizen of the United States of America, residing in Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Envelope-Machines, of which the following is a specification, reference being had to the accompanying drawings and letters and figures of reference marked thereon.

My invention relates more particularly to mechanism for applying gum to the gummers, and to the construction of the end flap gummer mechanism.

Heretofore difficulty has been experienced in the application of a uniform supply of gum to the face of the gummers, because of the fact that the roll employed for that purpose will at times slip and not revolve, thus removing the gum from the face of the gummers instead of applying it thereto, and unless considerable motion were given to the gummers it has been necessary to employ a very shallow gum reservoir, and heretofore a separate gum box has been employed to supply gum to the end flap gummer.

The objects of my invention are to provide a machine which shall be free from the aforementioned objections, and wherein the revolution of the gumming roll is rendered positive; wherein the vertical movement required of the gummers is reduced to the minimum, and wherein a deep reservoir or gum box may be employed, and to provide a construction wherein the end flap gummer shall receive its supply of gum from the same reservoir which is used to supply gum to the main gummers. And generally my object is to provide an improved construction wherein the objections heretofore existing are overcome; and to that end my invention consists in the construction herein set forth, whereby these objects are attained.

In the accompanying drawings in which like letters and figures of reference indicate like parts: Figure 1 is a plan view of so much of the mechanism as may be necessary to illustrate my invention. Fig. 2 is a side elevation of the same in section taken on line *x, x* of Fig.

1. Fig. 3 is an elevation on an enlarged scale of the end flap gummer mechanism as seen from the rear of the machine. Fig. 4 is a side elevation of the same on a like scale as seen from the right of Fig. 2. Fig. 5 is a detail central section of the bearing and cap of the gum-roll in the gum-box. Fig. 6 is a perspective of the gum-box with bearing for the gum-roll. Fig. 7 is a perspective of the end-gummer, its gumming-roll and connections.

In detail A indicates a plate fastened upon the frames which support the upper portion of the machine, B a stand for supporting the gum reservoir, C a stand to support the end flap gummer mechanism, D the main gum box or reservoir, E a metal gum roll located in the reservoir, F a bar arranged across the top of the reservoir, G an intermediate gum roll, H the gum applying roll, I a gum distributing roll for the end flap gummer, J shaft, K rods forming ways for the boxes in which the main gumming roll is mounted, L supports for said ways, M support for bearings of intermediate roll G, N sliding boxes supporting bearings for applying roll H, O main gummers, P take-off plate, Q gummer shaft, R rock shaft, S a frame in which the end flap gummer is mounted, T friction plate, U connecting rod for operating the frame S, V radial arms for giving motion to the boxes carrying the gum applying roll, W a stand or support for the mechanism which applies the gum to the face of the end flap gummer.

y indicates a radial arm, *b* a connecting rod, *d* plates or scrapers adjustably arranged adjacent to the gum roll E usually termed "doctors," *e* guide posts for the blanks, *f* a centrally arranged bearing forming a partition and cap, *g* and *j* friction surfaces on intermediate roll G, *h* a movable frame, *i* and *l* friction surfaces on roll H, *k* a roll for supplying gum to the end flap gummer, *m* a clamp or frame for supporting the rods upon which the friction plate is mounted, *n* springs, *o* end flap gummer, *p* shaft carrying the small gumming roll *k*, *r* rods on which the friction plate is mounted, *s* stud on frame S, *t* a lug on frame S and which moves frame *h*, *u* a pin projecting from radial arm *a* with which lug

t engages, *v* shaft on which the frame *h* is pivotally mounted, *w* connecting rods, and *y* radial arm.

The construction and operation are as follows:

The plate *A* is mounted upon the machine in proper position and the guides *e* are located as in the ordinary machine to hold the envelope blanks in position, the blanks being fed upwardly through the guides in any convenient manner. At one side upon the plate *A* the stand *B* is mounted, and upon this stand or support the gum box or reservoir *D* is secured in place. Upon the opposite side of the plate *A* a stand *C* is secured in position and upon the latter is mounted the end flap gumming mechanism. I mount an ordinary gum feeding roll *E* within the gum reservoir and at the front and back of the machine, mounted in suitable supports *L*, are the rods *K* which serve as ways upon which the boxes *N* travel. The boxes *N* are provided with depending parts having suitable bearings for supporting the shaft of the gum applying roll *H*. The gummings *O* are mounted upon a vertical reciprocating shaft *Q* in the ordinary manner, and in the usual location, and a take off plate *P* is arranged as heretofore. Between the gummings *O* I arrange a friction plate *T*, the same being mounted upon rods *r* which rods pass through openings in the frame or clamp *m*, the upper ends being provided with lock nuts, and these rods are free to move upwardly but cannot move downwardly beyond the limit allowed by the position of the nuts on their ends. Mounted upon the rods *r* and located between the friction plate and the lower face of the portion of the frame through which the rods pass, I arrange springs *n*, which serve normally to force the plate *T* downwardly to the extent permitted by the adjusting nuts.

The roll *H* which is mounted in the bearings carried by the sliding boxes *M*, and which serves to apply the gum to the face of the gummings *O*, is provided at an intermediate point with a portion *i*, which portion does not receive gum, but is kept dry at all times, and I prefer that this portion should be separated from the rest of the roll to prevent danger of the gum flowing upon it by the employment of annular recesses, and as the applying roll *H* is caused to traverse back and forth beneath the gummings the portion *i* being in contact with the lower face of the friction plate *T* is caused to revolve, thus revolving the remainder of the roll therewith, and thus insuring the uniform application of gum throughout the whole surface of the faces of the gummings, and overcoming the difficulty which has heretofore been experienced where the contact of the roll surface with the surface of the gummings has been relied upon to cause the gum applying roll to revolve, as with such contact alone, especially where the roll became heavily coated with thin gum, the roll would slide and scrape the face of the gum-

mers instead of revolving and applying gum thereto. As it is desired to have as little motion as possible in the operation of the machine, thus avoiding wear and increasing the possibility of speed, it is requisite that the gummings be required to traverse as short a distance as possible, and as it is necessary that the gummings move a sufficient distance to allow the gum supplying roll to pass beneath and in contact with them it is desired that the gum applying roll be lowered as far as possible, but it cannot be lowered in a machine of the ordinary construction below the center of the feed roll which is mounted in the gum reservoir, it being necessary that the applying roll be brought in contact with the feed roll to receive its supply of gum. Attempt has been made to overcome this difficulty by employing a very shallow reservoir. This is objectionable because of the fact that a sufficient supply of gum cannot be deposited therein, and if a supplementary apparatus be employed to feed gum to the reservoir it renders the machine more complicated and it has been found that in such construction the gum frequently overflows. To overcome these difficulties and to enable me at the same time to use a reservoir of sufficient depth I employ an intermediate roll *G*, the same being mounted in suitable hangers and arranged with its surface in contact with the feed roll *E*, and the intermediate roll in turn supplies the gum to the applying roll *H* whenever the surface of the two are in contact, and to insure the rotation of the supplying roll while in contact with the intermediate roll, the latter is provided with a friction surface *g*, which when in contact with the surface *i* upon the roll *H* will insure the revolution of the latter. To prevent the distribution of the gum to the rollers except to the portions required, the bearing 2 of the gum-roller *E* is provided with a cap *f*, formed with side-flanges *f'*, which engage in annular grooves 3, formed in the roller *G*, and thus prevent the flowing of gum to the friction surface *g*. I prefer also to provide the intermediate roll and applying roll with additional friction surfaces *j* and *l* located at the ends of these rolls, though these will not be necessary in all cases. A rod or plate *F* extends across the top of the gum reservoir, and projecting downwardly therefrom are the metal plates *d* usually termed "doctors," which prevent too much gum being taken up upon the surface of the feed roll *E*. By the arrangement of the rolls as described I am enabled to convey the gum from a deep reservoir to the intermediate roll and from thence to the applying roll and to maintain the applying roll in a greatly lowered position, thus lessening the motion required of the gummings and parts connected therewith while using a deep gum reservoir. Reciprocating motion is given to the sliding boxes *N* through the connecting rods *w*, one end of each of which is attached to one of the sliding boxes, the opposite ends being at-

tached to the radial arms V, which arms are mounted upon the rock shaft R. A radial arm *y* is mounted on the same rock shaft and a connecting rod *b* being pivotally attached thereto, is extended downward and receives motion from a cam mounted upon a rotatable shaft.

The construction and operation of the end flap gummer are more clearly shown in Figs. 3 and 4 wherein is shown the frame S mounted to move vertically upon the support or stand C and having mounted in the overhanging arm of said frame the end flap gummer *o*, the lower end of which receives the gum and applies it to the end flap of the envelope. Fixed upon the upper part of the stand C is a support W having a horizontally arranged shaft *v* mounted therein, and upon this shaft is mounted a frame *h* having bearings within which is mounted a rotatable shaft *p*. A spiral spring is arranged upon the shaft *v* one end being attached to the shaft and the opposite end to the frame *h*, the tendency of which spring is to normally maintain the frame in its lowered position as shown in dotted lines in Fig. 3 and mounted upon the frame *h* is a radial arm *a* having a pin *u* projecting from its face. A lug *t* is mounted upon the movable frame S in such position as to engage the pin *u* when the frame is moved upwardly, thus causing the frame *h* to rotate on the shaft *v* throwing the frame *h* forward to the position shown in full lines in the same figure, and carrying the roll *k* mounted on the end of the shaft *p* under the face or lower end of the flap gummer *o*, thus applying the gum to the end and as the frame S descends the end of the gummer is carried in contact with the envelope flap and at the same time the spiral spring operates to return the frame *h* to its normal position, thus bringing the roll *k* in contact with the roll I, from which the small roll *k* receives its supply of gum, and in turn the roll I receives its supply of gum from the supplying roll H in its forward stroke.

A friction surface *e* is provided and fixed upon the same shaft with the roll I and when the roll H is carried to the extreme length of its stroke as indicated in dotted lines in Fig. 1 the two friction surfaces *i* and *e* are brought in contact and thus the revolution of the roll H while in this position is insured. The shaft J is arranged to rotate the shafts which support the rolls E and I.

The frame S receives its motion through the operation of a connecting rod U pivotally connected to a stud *s* upon the frame S, the opposite end of which connecting rod receives motion through the operation of a cam or eccentric mounted upon a shaft in any convenient manner.

The office of the take-off plate P is well known to be that of separating the blanks from the face of the gummers in the upward stroke, and the object of mounting the friction plate upon movable supports is to insure it occupying the desired lowered position dur-

ing the time of the traverse of the gum applying roll across the face of the gummers, and to allow it to be retracted and in no way interfere with the operation of the gummers when they are carried downward and in contact with the blanks. Gears 2 and 3 insure the positive rotation of the intermediate roll.

It will be seen that in some machines the employment of the friction plate may be dispensed with and the friction surface upon the rolls still be employed for the purpose of causing them to rotate while in contact, and a very beneficial result thereby attained.

The roll I serves not only to supply gum to the roll carrying the gum to the end flap gummer, but it also serves to uniformly distribute the gum which may be upon the applying roll H while in contact with it, thus insuring the uniform application of the gum to the surface of one of the main gummers during the return as well as the forward traverse of the applying roll. The necessity for rendering the application of the gum to the face of one of the main gummers more uniformly than to the face of the other is seen in the fact that the one applies gum to the flap forming the lower portion of the envelope, or in other words the portion which is permanently sealed to the adjacent end flaps while the other main gummer applies the adhesive to the edge of the flap which remains to be sealed when the envelope is used, and while it is found that sufficient gum will be applied during either the forward or return traverse of the applying roll to cause the parts receiving gum to adhere if immediately brought into contact and subjected to the requisite pressure, yet at times hardly enough will be applied to render the adhesion of the parts uniform and certain as ordinarily moistened when the envelopes are being used, and if a portion of the unsealed flap be partly gummed, or in other words the unsealed flap be not uniformly gummed this fact lessens the commercial value of the goods, and to render the application of the gum to the unsealed flap uniform throughout I deem it advisable to make provision for distributing the gum upon the surface of the applying roll which performs this function at each interval before passing across the gummer face and one purpose, therefore, of the employment of the distributing roll I, as before stated, is to redistribute the gum upon one portion of the surface of the applying roll H prior to its return traverse, thus rendering the distribution upon this portion of the applying roll uniform without the employment of more than one gum reservoir. The roll I is preferably of metal and the applying roll H is of rubber or other suitable composition and as the roll I has a fresh supply of gum brought to it by the roll H at each alternate revolution of the machine the gum upon the roll I is always kept in a suitable condition to work properly, and if at any one revolution the roll H should deliver a surplus of gum to

the roll I and should at the next revolution be supplied with a less quantity of gum, then the surplus upon the roll I would be taken off by the roll H, and in this manner the supply of gum on both rolls would be equalized.

5 Having, therefore, described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination in a machine for gumming envelopes, of a gum-box a covered bearing, a feed-roll arranged to revolve therein with a part of the roll arranged within the bearing, an intermediate roll arranged to revolve in contact with the feed-roll and having a friction surface opposite that portion of the feed-roll in the covered bearing, a gum-applying roll provided with a friction surface to register with the friction-surface on the intermediate roll while the gumming-surfaces of the two rolls are in contact, substantially as shown and described.

2. The combination in a gumming-machine, of the gummers a friction plate secured to the gummer-frame between the gummers, a gum-applying roll provided with a central friction surface to bear on the friction plate, whereby the roll is rotated when traversing the gummers and friction plate and means to apply gum to the gum-applying roll, substantially as described.

3. In a machine for gumming envelopes, the combination of the gummers, a friction-plate located between the gummers, springs to press the plate down, means to adjust the plate and regulate the tension of the springs a gum-applying roll having a portion arranged to contact with the friction-plate and rotate the roll when passing back and forth under the gummers, a gum-box, and a gum-roll to supply gum to said supplying-roll, substantially as shown and described.

4. In a machine for gumming blanks, the combination, with the gum-box, a gum-roller in the gum-box, gummers, and gum-applying roll, of a distributing roll extending but partially the length of the gum-applying roll and placed upon the opposite side of the gummers from the gum-box and rotated by contact with the gum-applying roll of the machine, substantially as and for the purpose specified.

5. In a machine for gumming blanks, the combination of a gum-box, gummers, a feed-roll in the gum-box, a gum-applying roll an end flap gumming-roll, a roll I to receive gum from the gum-applying roll and deliver it to

the end-flap gumming roll, substantially as shown and described.

6. In a machine for gumming envelope blanks, an end-flap gummer composed of a pivotally supported frame, an arm on the frame provided with a pin, an end-flap gumming-roll journaled in the swinging-frame, a gummer for receiving and placing the gum upon the paper, and a vertically movable frame provided with a lug to engage the lug in the swinging frame, whereby the gumming roll is brought into contact with the gummer.

7. The combination in a gumming-machine, of a vertically movable frame S provided with a lug, a gummer *o* in the frame S, a swinging-frame *h* on a stationary support W, and provided with a pin to engage the lug on the frame S and swing the frame, a shaft *p* journaled in the frame *h*, a gumming-roll *k* on the shaft *h*, a spring to force the frame away from the gummer, and a roll to supply gum to the roller *k*, as specified.

8. In a machine for gumming envelope blanks the combination of vertically moving gummers, a deep gum reservoir, a feed roll arranged to revolve therein, an intermediate roll arranged in contact with the feed roll and revolving with its lowest part above the center of the feed roll and an applying roll arranged to be moved horizontally across the gummer faces in a plane below the axis of the intermediate roll and to be brought intermittently in contact therewith substantially as shown.

9. In a machine for gumming envelope blanks the combination with a vertically moving frame S having a gummer *o* and lug *t* fastened thereon, of a swinging frame *h* carrying a gummer roll and provided with an arm and pin in the path of the hook, to be engaged at every upward movement of the same, thereby swinging the gumming roll up into contact with the gummer face substantially as shown.

10. The gum-box, the gum-roller therein, the distributing-roller G formed with a central friction portion *g*, the gum-applying roll H having the central friction-portion *i*, the gummers and the roller I having the friction-portion *e*, arranged and combined as specified.

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Witnesses:

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