

(No Model.)

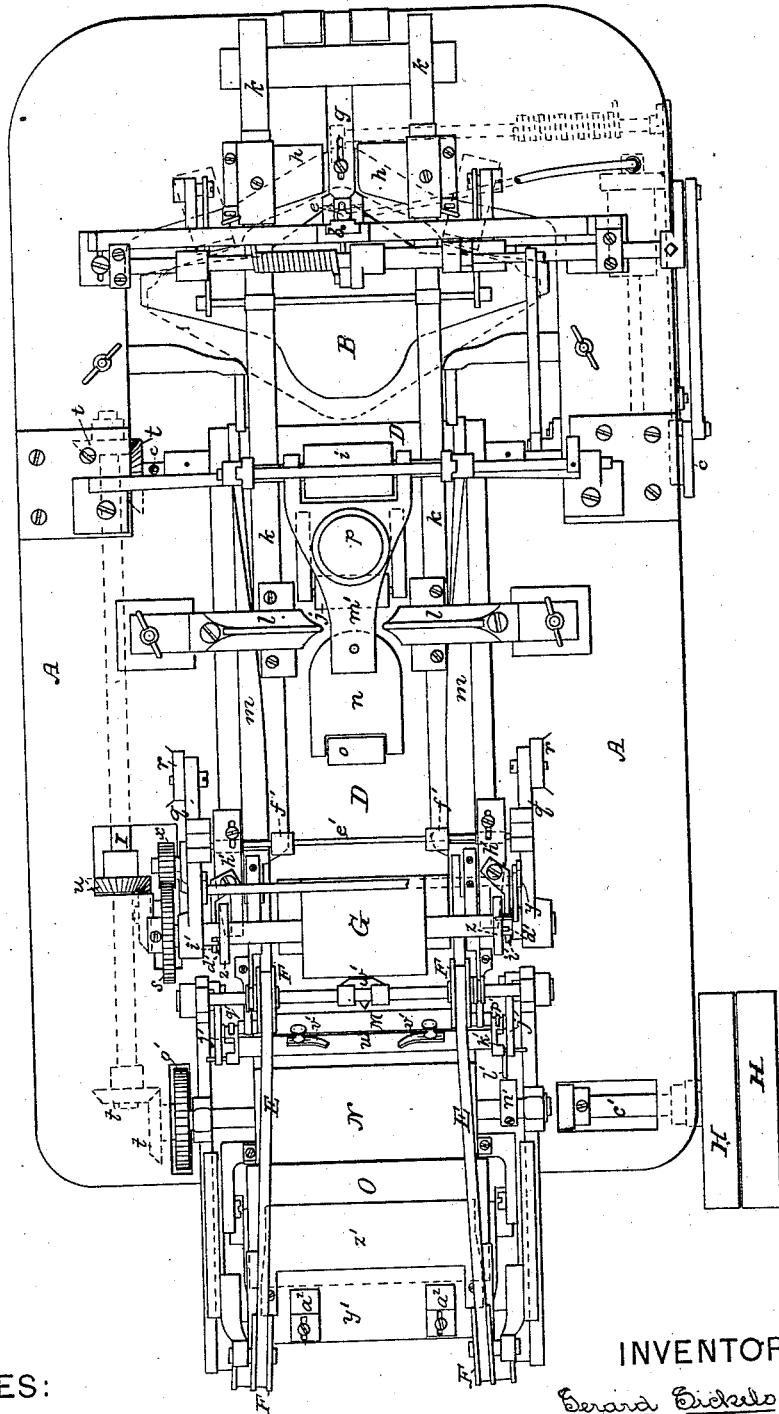
6 Sheets—Sheet 1

G. SICKELS, Jr.
ENVELOPE MACHINE.

No. 307,079.

Patented Oct. 21, 1884.

FIG. 1.



WITNESSES:

E. B. Bolton

Geo. H. Fraser

INVENTOR:

Gerard Sickels Jr.

By his Attorneys,

Burke, Fraser & Connors

(No Model.)

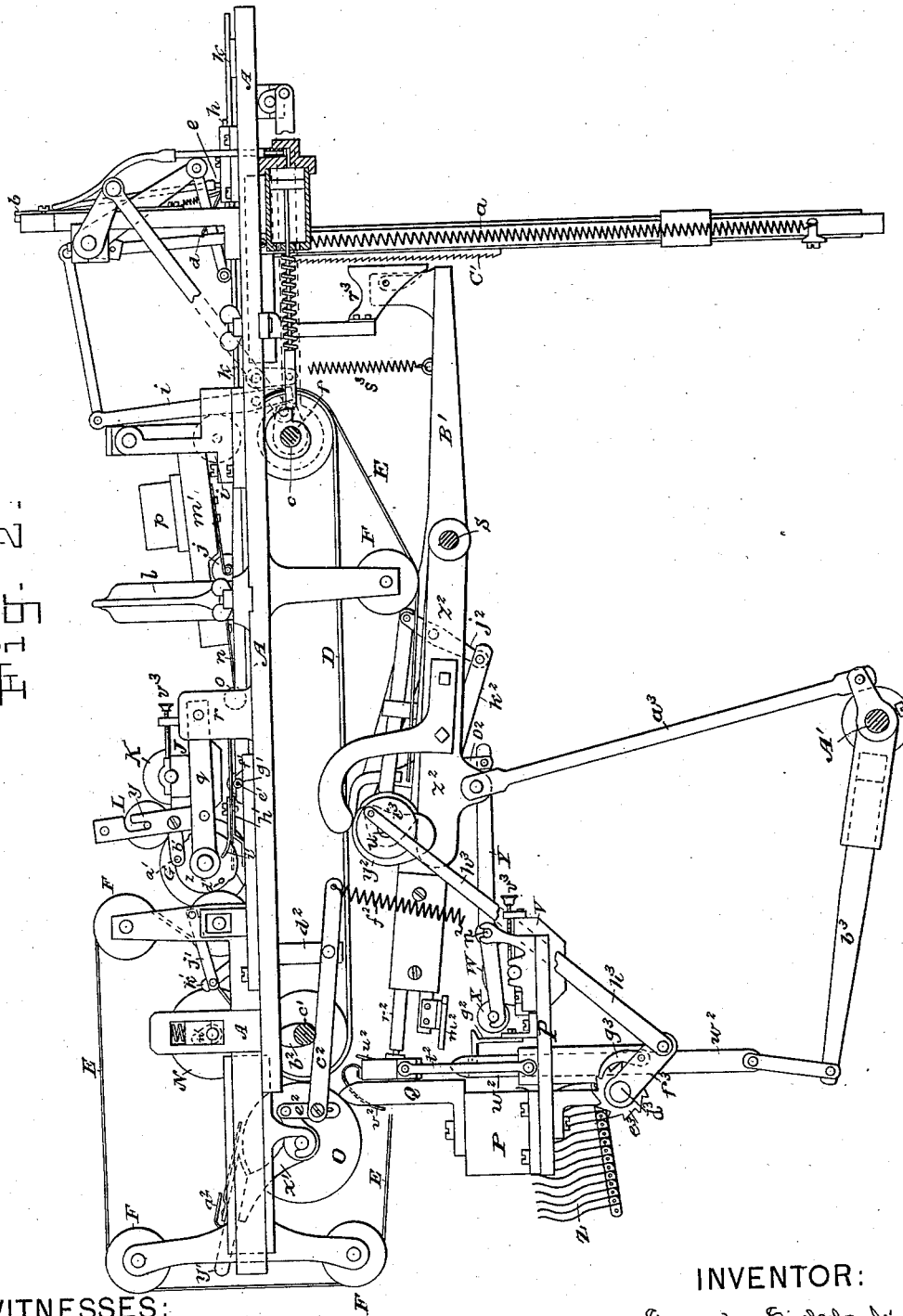
6 Sheets—Sheet 2.

G. SICKELS, Jr.
ENVELOPE MACHINE.

No. 307,079.

Patented Oct. 21, 1884.

Fig. 2.



WITNESSES:

E. B. Bolton
Geo. H. Spaser

INVENTOR:

Gerard Sickels Jr.

By his Attorneys,

Burke, Faser & Hornum

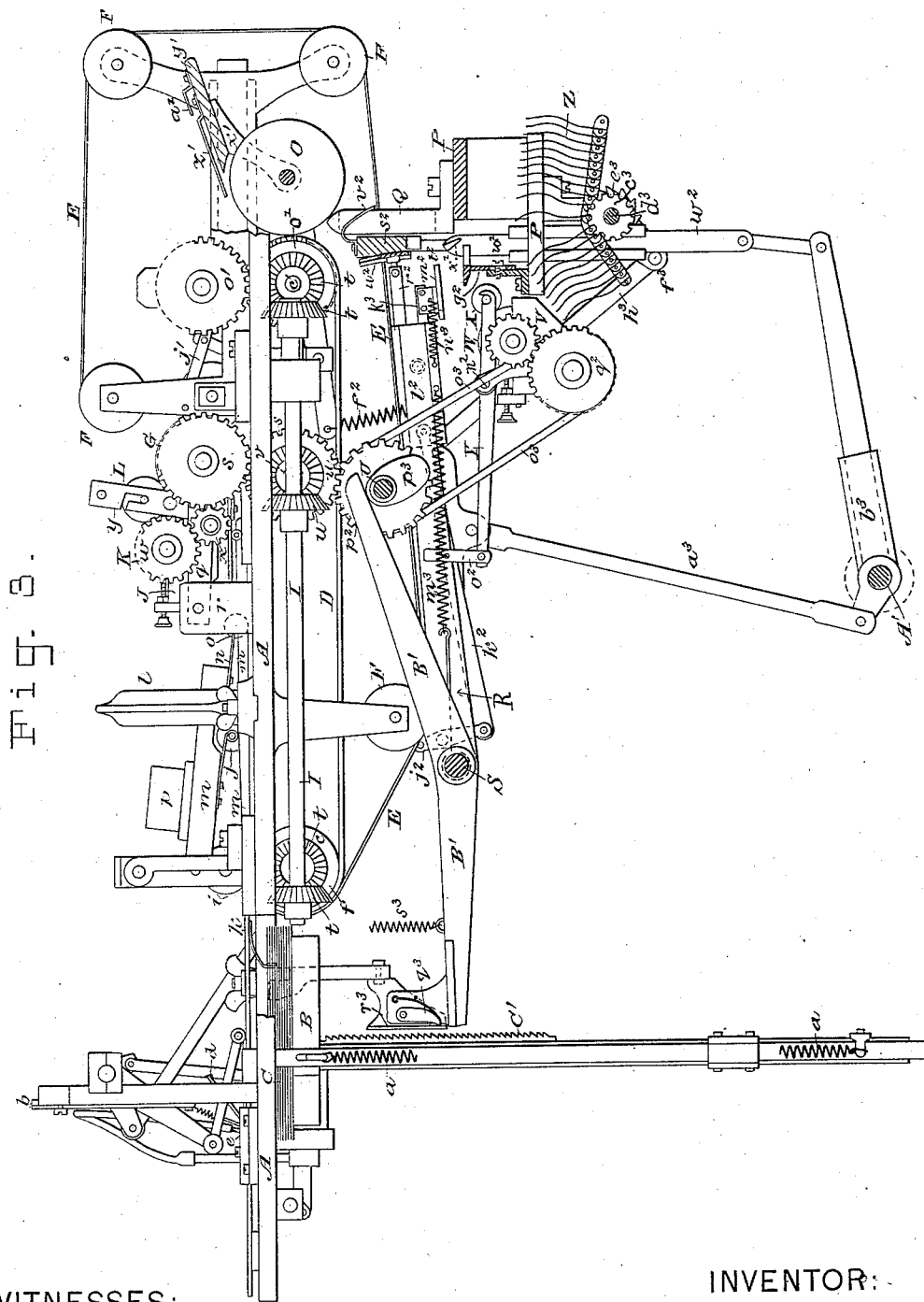
(No Model.)

6 Sheets—Sheet 3.

G. SICKELS, Jr.
ENVELOPE MACHINE.

No. 307,079.

Patented Oct. 21, 1884.



WITNESSES:

E. B. Bolton

Geo. H. Fraser.

INVENTOR:

Gerard Sickels

By his Attorneys,

Bank, Fraser & Company

(No Model.)

6 Sheets—Sheet 4.

G. SICKELS, Jr.
ENVELOPE MACHINE.

No. 307,079.

Patented Oct. 21, 1884.

Fig. 4.

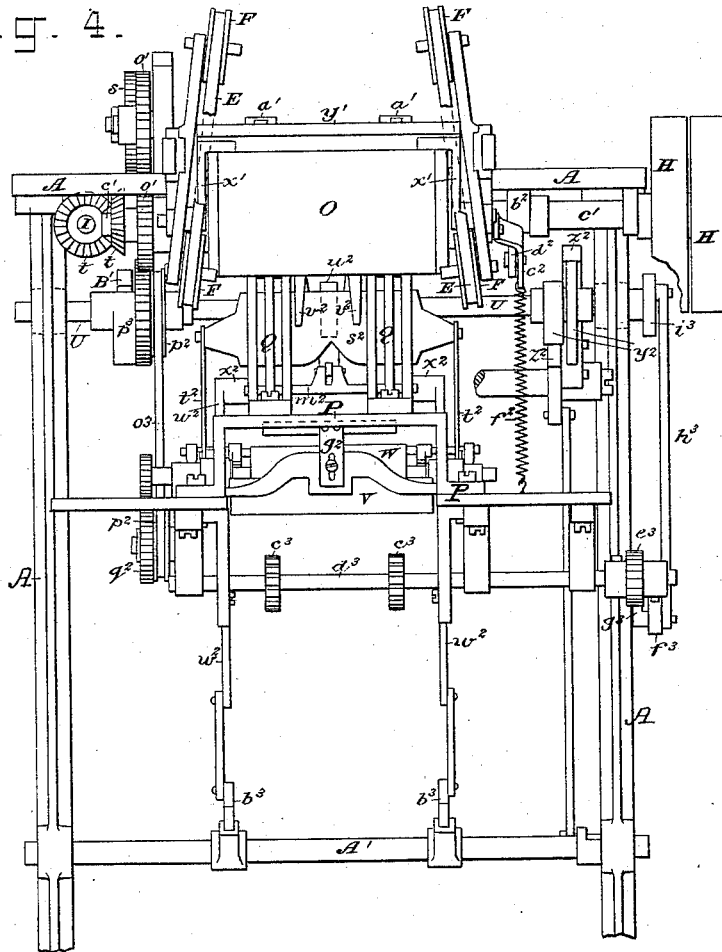


Fig. 5.

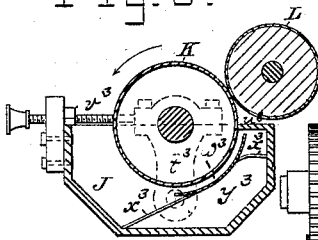
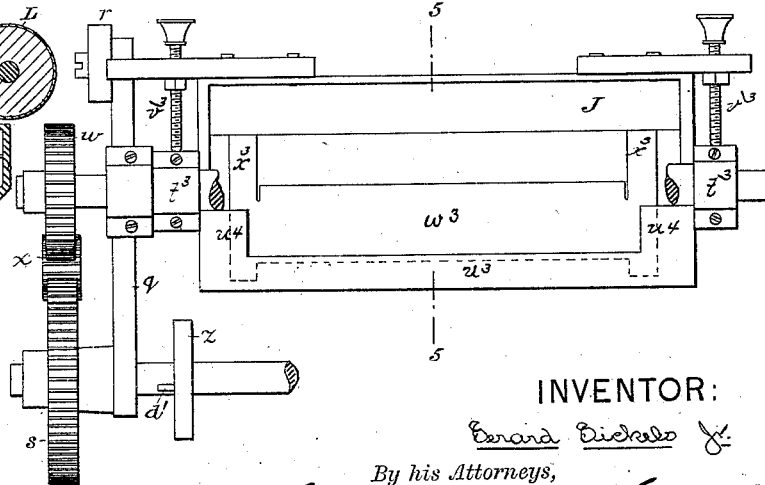


Fig. 6.



WITNESSES:

E. B. Bolton
Geo. H. Graser.

INVENTOR:

Garard Sickels Jr.

By his Attorneys,

Burke, Frank & Co.

(No Model.)

6 Sheets—Sheet 5.

G. SICKELS, Jr.

ENVELOPE MACHINE.

No. 307,079.

Patented Oct. 21, 1884.

Fig. 7.

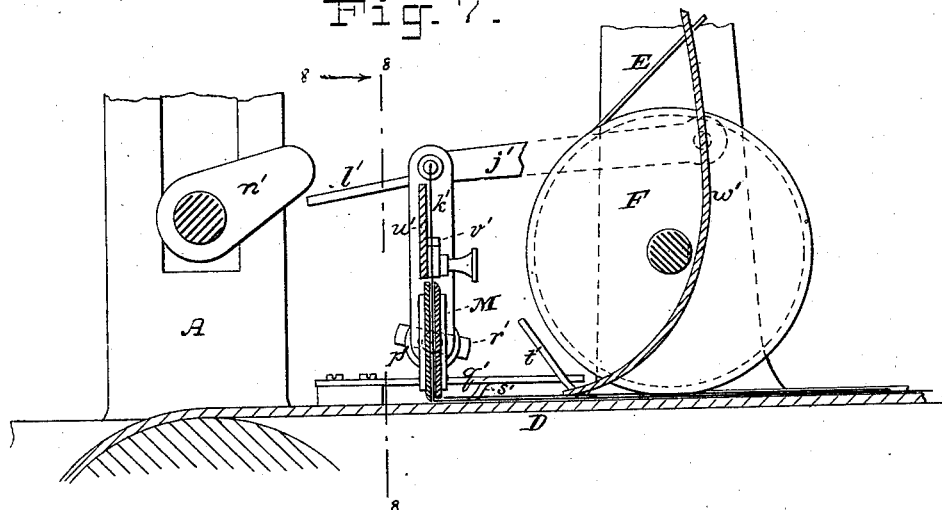


Fig. 8.

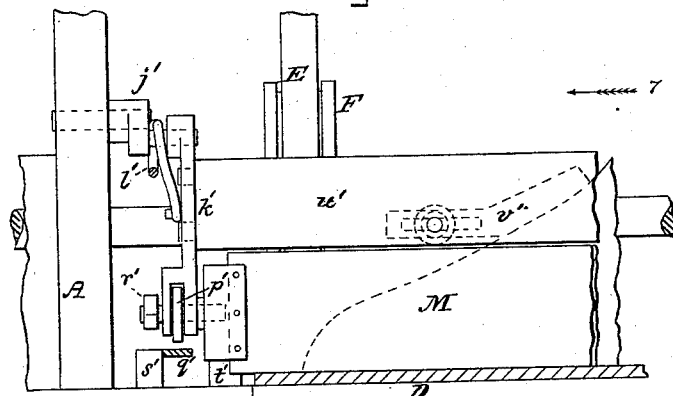
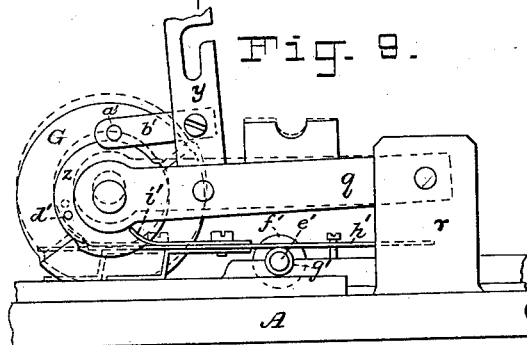


Fig. 9.



WITNESSES:

E. B. Bolton

Geo. H. Spauld.

INVENTOR:

Gerard Sickels Jr.

By his Attorneys,

Burke, Fraser & Bennett

(No Model.)

6 Sheets—Sheet 6.

G. SICKELS, Jr.
ENVELOPE MACHINE.

No. 307,079.

Patented Oct. 21, 1884.

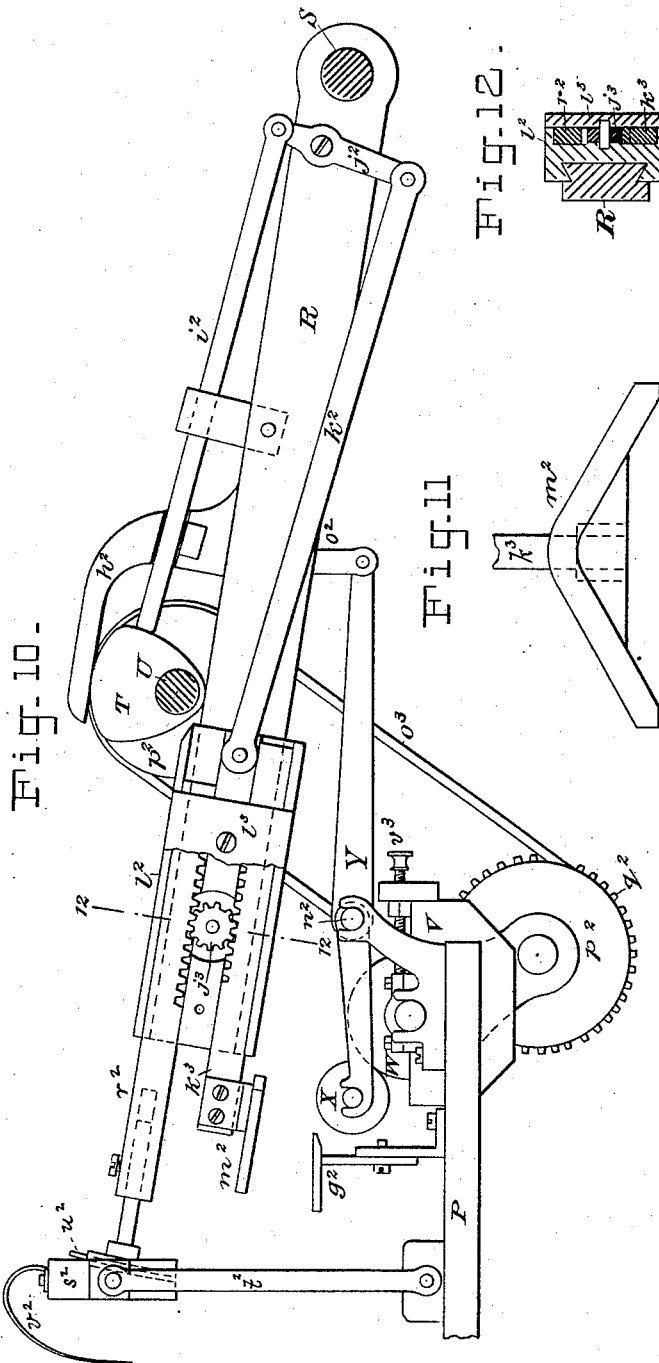


Fig. 12.

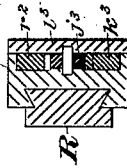


Fig. 11.

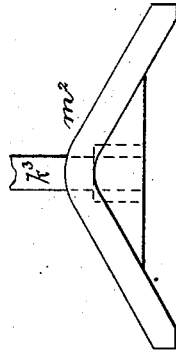
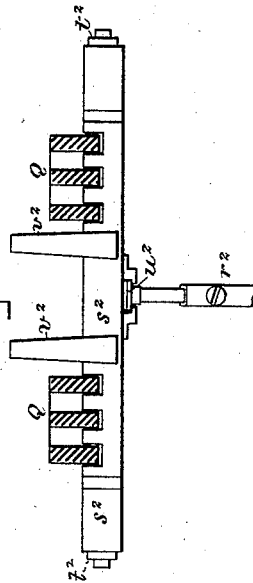


Fig. 13.



WITNESSES:

E. K. Holton
Geo. H. Fraser,

INVENTOR:

Gerard Sickels Jr.
By his Attorneys,
Burke, Inger & Connors

UNITED STATES PATENT OFFICE.

GERARD SICKELS, JR., OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF
TO ABEL T. HOWARD, OF SAME PLACE.

ENVELOPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 307,079, dated October 21, 1884.

Application filed June 6, 1883. (No model.)

To all whom it may concern:

Be it known that I, GERARD SICKELS, JR., a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Machines for Making Envelopes and Similar Receptacles, of which the following is a specification.

My invention relates to improvements in that class of machines which are employed for making envelopes, bags, or receptacles of paper and similar materials, this machine being especially designed to fold, gum, or paste, and apply gum to the sealing-flap of paper blanks, to form complete envelopes ready for use. In my patent, No. 271,282, of January 30, 1883, I show and describe a machine of this character, and my present application embodies in the main certain improvements on that machine.

The principal features of the present machine wherein lie the improvements over the machine described in my before-mentioned patent are as follows: a device or mechanism whereby the main gumming-roller is lifted and prevented from touching the endless carrying-belt when there are no envelopes passing; this prevents the gumming of the carrier belt or apron and the consequent soiling of the envelopes in case of the failure of the feeder to operate, as it may occasionally, and thus a gap be left in the succession of blanks passing through the machine; an improved construction of fountain for the gum or paste, which will be fully hereinafter set forth; certain improvements in the tumbler-operating mechanism, whereby the tumbler is caused to positively assume its proper position for receiving the bottom flap of the envelope; a novel mechanism for applying gum to the sealing-flap of the envelope before it leaves the machine, whereby the envelopes are rendered self-sealing, and a novel device embodied in said mechanism for preventing the gumming mechanism from performing its functions unless there is an envelope presented to be operated upon; a novel device or mechanism for lowering the blank-platform immediately after the removal of the topmost blank, whereby such blanks as may have become disarranged by the removal of the topmost blank may be straightened and properly placed by the guides which embrace the blanks on four

sides; also, in certain minor improvements, which will be hereinafter fully described.

In the drawings, which serve to illustrate my invention, Figure 1 is a plan of the machine, with the intermediate gum-fountain removed to better show the parts below. Fig. 2 is an elevation of the left side of the machine. Fig. 3 is an elevation of the right side of the same. Fig. 4 is an elevation of the rear end of the machine. The remaining figures are detached detail views on a larger scale. Fig. 5 is a cross-section of the gum-fountain and rollers, taken on the line 5 5 in Fig. 6. Fig. 6 is a plan of the gum-fountain with the rollers removed. Fig. 7 is an enlarged view of the tumbler for folding the bottom flap, taken from the direction indicated by arrow 7 in Fig. 8; and Fig. 8 is a sectional elevation of same, taken on line 8 8, Fig. 7, looking in the direction of the arrow 8. Fig. 9 is a side view of the mechanism for lifting the gumming-rollers, drawn to a larger scale. Fig. 10 is a side elevation of the mechanism for gumming the sealing-flap enlarged. Fig. 11 is a plan of the flap-gummer; Fig. 12, a cross-section on line 12 12 in Fig. 10; and Fig. 13 is a plan of the grid and clamping block, which will be fully hereinafter described.

I will only briefly describe herein the mechanism that corresponds substantially in construction and operation with that shown in my before-mentioned patent.

The operative mechanism is mounted on a suitable table or frame, A, and takes the envelope-blank at the front end to the right in Fig. 1 and carries it through to the other end, performing all the necessary operations on it in transit, including the gumming of the sealing-flap and delivery into the carrier, which latter may be of the ordinary kind used on other envelope-machines.

B is the platform, upon which is placed the pile of envelope-blanks C. This platform is upheld normally by the springs *a a*, which feed up the platform as fast as the blanks are taken one by one off the top by the pneumatic separator. The topmost blank is separated from the pile or individualized by means of the following described mechanism. Over the blank and near its front angle is the presser-foot *b*, arranged to play in fixed vertical guides or keepers and to be pressed down upon the blank by means of toggle-links actuated at the proper

moment by a cam on a shaft, *c*, arranged transversely of and under the bed of the machine through a lever and connecting-rod. As the foot is depressed the toggle-link drives forward a rod, *d*, and depresses the sucker or nozzle *e*, which is hinged to the presser-foot and upheld normally by a spring. The nozzle is connected by a tube with the cylinder of the air-exhausting device, which is actuated by a cam, *f*, on the shaft *c*. The cams which actuate the presser-foot and sucker and air-exhaust are set to act in unison, so that when the former are pressed down upon the blank the exhaust acts and causes the topmost blank to adhere for an instant to the sucker by atmospheric pressure. The nozzle now lifts, and, turning on its hinge, bends or deflects the corner of the blank upward. At this instant the separating-finger *g* springs forward under the corner of the uplifted blank, so as to hold down the pile of blanks when the presser-foot lifts. This finger is actuated by means of cranks and rods through the medium of the cam which actuates the exhaust. When the presser-foot has risen, carrying with it the sucker and the topmost blank, the blank is borne forward by a carrier, *h*, arranged to reciprocate in guides by means of cranks and arms, which connect it with an actuating-cam on the shaft *c*. As the blank is carried forward its rear edge or angle passes under a bearing-roller, *i*, which roller *i* drops upon the blank at the proper moment and presses it upon the broad endless carrying-belt *D*, which passes over drums on the shafts *c* and *c'*. This belt or apron *D* carries the blank through the devices for folding the end flaps, which consist of the folding-blades *k*, attached to "gooseneck" supports *l*, the folders *m*, and narrow folding-belts *E E*, which pass over suitable idler-sheaves, *F F*.

So far as above described the operative mechanism is in substance the same as that shown in my before-mentioned patent; and I have not, therefore, deemed it necessary to describe it more particularly. I will say, however, that the means for depressing the presser-foot and suction-nozzle, for actuating the carrier *h*, for actuating the air-exhausting device, (shown in section in Fig. 2,) for actuating the separating-finger, and for imparting a vertical movement to the roller *i* consists of cams mounted on the shafts *c*. These do not differ materially from the means for operating the same parts in my said patent, and I make no claim to them nor to the parts they actuate in this application.

I will now proceed to describe the remaining parts of the machine wherein the novel features lie. Mounted on the frame *m'*, which connects the rollers *i* and *j*, is a plate, *n*, pivoted on a vertical axis to said frame *m'*, and bearing a roller, *o*, which rests on belt *D*. This roller *o* serves to keep the blank straight as it is being folded in its travel. A weight, *p*, keeps the rollers *j* and *o* pressed firmly down upon the carrying-belt.

I will now describe the intermediate gumming or pasting device, which is so arranged that the gumming-roller is raised, normally, so as not to touch the carrying-belt *D*, but is lowered through the medium of the advancing blank, so as to properly gum the same.

Referring particularly to Figs. 1 and 9, *G* is the main or intermediate gumming-roll, which has an impression-surface of the proper form—usually that of an extended *V*—for laying the gum to secure the bottom flap of the envelope to the end flaps. This roller is mounted in the ends of arms *q*, pivoted in posts *r* on the bed of the machine. This roller is driven from the main driving-shaft through toothed wheels *s s*. The roller *G* is in itself the same as that shown in my former application.

I will now digress in order to describe the driving-gear and mechanism of the machine.

H represents the tight and loose driving-pulleys. These are mounted on the shaft *c'*, which serves as the main driving-shaft. This shaft and the shaft *c* bear the drums or rollers, over which passes the main carrying-belt or apron *D*.

I is a shaft arranged at right angles to the shafts *c c'*, along one side of the frame *A* and under the bed of the machine. This shaft is driven from the shaft *c'* and drives shaft *c* by means of miter-gears *t t*.

On a stud, *v*, fixed in the side of the frame, is mounted rotatively a miter-gear, *u*, which meshes with a miter-gear, *u*, on the shaft *I*; and to the miter-gear *u* on the stud *v* is fixed a toothed gear-wheel, *s*, which meshes with a like toothed wheel, *s*, on the prolonged axis of the gumming-roller *G*, as above mentioned. Thus it will be seen that all the operative parts are positively connected by means of shafts and toothed gears, and the difficulties incident to slipping of belts are avoided. This is very important in machines of this character, where each moving part must be timed and all the operations synchronized. In my machine only the main carrier-belt *D* and the folding-belts *E*, which have no tendency to slip, are employed in connection with parts which require to be synchronized.

J is the gum-fountain, which is mounted in the arms *q* through the medium of the axis of the fountain-roller *K*. This roller bears on its prolonged axis a toothed wheel, *w*, and is driven from the toothed wheel *s* on the gum-roller *G* through an intermediate wheel, *x*, as shown in Fig. 3.

L is the roller which receives the gum from the fountain-roller *K* and applies it to the gumming-roller *G*. This roller *L*, which may be made of the same composition as printing-rollers, is mounted rotatively in swinging arms *y*, pivoted to the arms *q*, which carry the gumming-roll.

On the axis of the gumming-roll *G* is a cam, *z*, which as it revolves takes under a pin, *a'*, on a branch, *b'*, from one of the arms *y*. This imparts a swinging motion to the roller *L*, and

causes it to remain a part of the time in contact with the fountain-roll to receive gum and a part of the time in contact with the gumming-roll, which it supplies with gum. The arms which bear the roller L stand slightly inclined, so that the roller is caused to leave the fountain-roller by gravity when the cam ceases to act on it; but if it is inclined to stick to the roller K, a light spring may be arranged to keep it pressed normally against roller G.

As the fountain with its roller simply rests in its bearings in the arms *q* and the roller L in its bearings in arms *y*, these parts may be readily removed for cleaning and replenishing the fountain.

I will describe hereinafter the peculiar construction of the fountain.

In order to insure the gumming of the partially-folded blank by the roller G, and at the same time prevent it from applying gum to the carrier-belt D in cases where a blank is missed, I provide means whereby the gumming-roller is lifted by its own movement and held up until a blank approaches and lets it down low enough to deliver its gum.

Referring now particularly to Fig. 9, the cam *z* on the axis of the gumming-roll is shown provided with a raised surface extending about half-way around its periphery, and also a pin, *d'*, which projects from its side.

Across the machine, over the belt D, extends a slender shaft, *e'*, rotatively and loosely mounted in bearings on the table, and provided with a roller or rollers, *f'*, under which the blank must pass on its way to the gumming-roll.

On the shaft *e'* is a sleeve, *g'*, of rubber or other frictional material, and on this rests a slide, *h'*, provided with an upwardly-curved or hooked part, *i'*, arranged in the path of the pin *d'* in the cam *z*, while the slide itself is in the same plane as the cam *z*. Suppose the slide to be moved forward at starting, as the cam revolves pin *d'* engages the curved part *i'*, draws back the slide under the cam, and the higher part of the cam (which corresponds to the gumming-surface of roller G) impinges on the slide and raises the roller so that its gumming-surface is out of contact with carrier-belt D. This status will be maintained as long as no blanks pass through the machine; but when a blank approaches it passes under rollers *f'*, and by turning shaft *e'* runs the slide *h'* forward so that the gumming-roller may fall on and properly gum the blank. If after this blank passes there is, from any cause, an intermission in the succession of blanks, the same operation as I have before described will prevent the gumming of the carrier-belt D. This is very important, as the gumming of the carrier-belt will inevitably soil and destroy a number of blanks, and will sometimes cause trouble by sticking the blanks fast to the parts of the machine.

I have described but one cam, *z*, slide *h'*, &c.; but I provide the roller G, by preference, with a cam, *z*, at each end, and provide two

slides, *h'*, in order that the gumming-roller may be lifted equally at both ends. This is the more important as the lift is very slight, and the looseness of the bearings might prevent it from being lifted evenly if only one cam was employed. The lift is so slight as not to interfere with the proper engagement of the driving gear-wheels *s*, and the roller G will be revolving continuously, having a slight vertical reciprocating movement when no envelopes are passing. When envelopes are passing regularly, the roller simply revolves in its lowest position.

I will now describe the improvements in the tumbler for folding over the bottom flap of the envelope, premising that the tumbler itself in its general features and functions closely resembles that described in my aforesaid patent, and will therefore not require particular description here.

Referring particularly to Figs. 7 and 8, *j' j'* are arms pivoted to posts on the frame or bed of the machine, and to the free ends of these are coupled links *k' k'*, in the free or pendent ends of which the axes of the tumbler M find a bearing. In Figs. 7 and 8 the tumbler is shown as standing on edge in its vertical position and just on the point of being turned by the advancing blank. On one of the links *k'* is an arm, *l'*, which is preferably elastic, and which is arranged in the plane of a cam, *n'*, on the prolonged axis of a pressure-roller, N, which is driven by means of toothed wheels *o'*, one on the driving-shaft *e'* and the other on the axis of said bearing-roller. This cam is so set that after the tumbler has been tilted over or inverted by the movement of the blank, which movement presses the now horizontal tumbler back toward the roller N, and after the blank has been nipped by said roller, the said cam *n'* will strike the arm *l'* and swing or drive the tumbler forward to the proper position for receiving the flap of the next succeeding envelope. On the journals or axes of the tumbler are mounted bearing-rollers *p'*, which bear and roll upon tracks *q'* on the main frame when the tumbler is moved forward.

To assure the tumbler taking its proper position when moved forward by the cam *n'*, I may provide blocks *r'*, secured to the ends of its axles, as shown, and arrange these blocks to engage fixed cam-faces *s'* at the proper moment. This device may, however, be omitted. I also prefer to fix on the main frame an inclined guide or stop, *t'*, up to which the tumbler is brought in its forward movement. These last-named devices are mainly precautionary and are intended to insure uniformly perfect work.

On the plate or bar *u'*, which connects the links *k'*, are secured the adjustable stops *v'*, against which the envelope-flaps abut. This is shown in my aforesaid patent, as is also the pendent plate *w'*, which serves to keep the flap of the envelope pressed gently down upon the apron D, so that it may properly enter between the plates of the tumbler. When the bottom

flap has been folded, the envelope passes on under the pressure-roller N, which presses the bottom flap down upon the gummed surface of the envelope and causes it to adhere thereto.

5 The body of the envelope now passes under the swinging folder for folding down the sealing-flap. This folder is constructed and operated in the same manner as that described in my aforesaid patent, and is best illustrated
10 herein in Figs. 1, 2, and 3.

O is a bearing-roller mounted in the main frame, and mounted loosely on the axes of this roller are two arms, x' , which are connected by a plate, y' . On this plate are mounted the folding-plate z' and stops a^2 , against
15 which the envelope abuts while its flap is being folded. The envelope passes up under the folding-plate while the latter is standing in the position shown in Fig. 3. As soon as it
20 strikes the stops a^2 the folding-plate is given a motion forward, swinging on the axis of the roller O, and the front edge of the plate breaks the paper on the line of the fold and forces the envelope down between the roller O and the
25 apron D, where it breaks over the rear bearing roller or drum. In Fig. 3 the rear end of the machine has been broken away to illustrate this mechanism for folding the sealing-flap and the flap-gumming mechanism below.

30 The mechanism for oscillating the folding-plate comprises a cam, b^2 , on the main shaft c' , which is arranged to act upon a lever, c^2 , pivoted to the main frame at d^2 , and adjustably connected at its one end to a short branch
35 arm on one of the arms x' by a link, e^2 . As the cam rotates the folding-plate is swung forward through the medium of the lever c^2 , link e^2 , and arm x' . When the cam passes by, the folding-plate is retracted by means of a spring,
40 f^2 , one end of which is connected to the short end of lever c^2 , and the other to the main frame.

I will now describe the sealing-flap-gumming device with especial reference to Figs.
45 2, 3, 4, 10, 11, 12, and 13, premising that in 2 and 3 the sides of the main frame or table, which provide supports and bearings for the mechanism below the table, have been omitted in order to avoid obscuring the mechanism by inert parts. As before stated, the envelope now finished, except the application of
50 gum to its sealing-flap, passes down vertically between the roller O and the rear end of the carrying-belt D on its way to the mechanism for applying the gum to its sealing-flap and for delivering it into the endless carrier. As the various elements of these mechanisms act in
55 alternate order, and yet so nearly simultaneously, upon the envelope, to avoid confusion I will first describe the mechanisms in succession, and then describe their operation.

P is a platform or bed-piece fixed to the rear of the machine-frame, and on this are mounted a pair of grids or slotted frames, Q
65 Q. (Best seen in Fig. 4.) I have shown these grids made separately and mounted at a little distance apart on the platform P; but they

might be made in one, and I will refer to them, for simplicity, as one. The vertical front face of this grid is in a line with the front of roller O, so that when the envelope is discharged
70 downward it passes down along the front face of the grid Q. The flap-rest g^2 , upon which the envelope-flap rests when it is being gummed, is mounted adjustably on the platform P, or on
75 the frame of the machine, as preferred, and stands a little in front of the grid Q—that is to say, when the envelope-body rests with its face against the grid its sealing-flap, which is turned in that direction, is capable of being
80 turned down, so as to rest on the flap-rest, standing then at about a right angle to the body.

I will now describe the flap-gumming device, omitting for the present all reference to
85 the means whereby it is controlled so as to be made operative by the envelope itself.

R is a swinging bar hung at one end on a rod, S, which extends across and has bearings in the sides of the main frame.
90

T is a cam on a cross-shaft, U, mounted in the main frame and driven through the medium of miter and spur gears from the shaft I. This cam T rotates within a recess in the bar R, which is shown as formed by means of a
95 curved piece, h^2 , which takes over the cam. When the cam rotates, the bar R receives a vertical swinging motion on the rod S. A cam-rod, i^2 , has a bearing on the bar R, and its free end rests against the cam T, while its
100 other end is coupled to a lever, j^2 , pivoted to the bar R. The other end of said lever j^2 is coupled to one end of a connecting-rod, k^2 , the other end of which rod is coupled to a socket piece or block, l^2 , arranged to slide on the bar R, as indicated in the cross-section, Fig. 12.
105 When the cam T is rotated, the bar R is moved up and down, and the socket-piece l^2 , which bears the flap-gummer m^2 , is caused to reciprocate on the bar, being retracted by a spring, n^2 , Fig. 3. This compound motion causes the flap-gummer to descend on the sealing-flap of the envelope as it rests on the flap-rest g^2 and then draw off from the same with a wiping
110 movement, whereby the gum is applied smoothly, as it should be. The gum is supplied to the flap-gummer from a gum-fountain constructed like that referred to as the intermediate gummer.

V is the fountain, and W the fountain-roller. The intermediate gumming-roller, X, is mounted in the ends of a lever-frame, Y, pivoted at n^2 , and having its longer arm coupled to the bar R by means of a link, o^2 . This arrangement is such that when the flap-gummer
125 descends the roller X ascends to the level of the path of the gummer, and when the latter draws back it wipes over the roller X and receives the gum for the next operation. When the gummer is elevated, the roller X is in
130 contact with the fountain-roller W. The fountain-roller is driven (or may be) from the shaft U through the medium of a belt, p^2 , and pulleys or sheaves q^2 . (See Fig. 3.) The sliding

socket-piece ℓ^2 also bears an arm, r^2 , which is coupled to a block, s^2 , that is pivoted to two uprights, ℓ^2 , pivoted at their lower ends to the platform P. This block s^2 has a swinging motion toward and from the grids Q, imparted to it by the bar R, and to permit the block to swing in its arc without the necessity of following all of the movements of the arm r^2 , the said arm is coupled to the block by means of a cross-head plate, w^2 , which plays in grooves or keepers in the block in a well-known way. The block s^2 (which is shown in plan in connection with the grid Q in Fig. 13) has vertical grooves formed in its face, as shown, which, when the block is moved up to the grid and no envelope is interposed, engage the bars of the grid, as represented. The block is also provided with very light curved springs v^2 , preferably two. The function of these will be described hereinafter.

I will now describe the mechanism for drawing down and depositing the envelope in the carrier Z, premising that this carrier is or may be of the usual kind employed on envelope-machines.

Referring most particularly to Figs. 2, 3, and 4, w^2 w^2 are two slides precisely alike, arranged to play vertically in keepers in the frame of the machine at the ends of the platform P. The envelope, while receiving the gum, rests between these slides, its ends being adjacent thereto. On their upper ends these slides are provided with obliquely-arranged hook-like projections x^2 . (See Fig. 3.) The slides w^2 have a halting or intermittent reciprocating motion imparted to them by suitable mechanism, which will be hereinafter described.

I will now describe the operation of the various mechanisms which serve to gum the sealing-flap of the envelope and deliver it into the carrier Z.

While the envelope is being fed downward between the roller O and the belt D, and before it is freed from these parts, the slides w^2 are moved upward to their highest point, the oblique hooks x^2 on their ends wiping over the sloped corners of the sealing-flap and taking a position between said flaps and the body of the envelope. To accomplish this the paths of said hooks are arranged a little in front of the face of the grid Q. At this moment, and before the envelope is released by roller O, the block s^2 is so far advanced that when the envelope is free to fall the sealing-flap, which stands out at a slight angle from the body, is caught against the springs v^2 and the envelope prevented from dropping down into the carrier. The slides w^2 , however, immediately descend from their highest point, and the hooks x^2 engage the interior angle formed by the junction of the sealing-flap with the envelope-body and draw the envelope down until the lower edge of the envelope-body is just above the level of the flap-rest, when they stop for an instant. The sealing-flap is now below the level of block s^2 , and this block, which has

been advancing, impinges against the envelope and presses it firmly against the grid Q, the light springs v^2 being compressed flat between the envelope-body and block s^2 . The slides w^2 are now caused to descend a little farther, just sufficient to cause the oblique hooks x^2 to turn out the sealing-flap to a right angle and lay it on the flap-rest. This effect is produced by the body of the envelope being held tightly by the block s^2 , while the flap is free. The parts just described now stand still for a moment, while the flap-gummer descends onto the flap and draws off with a wiping motion imparted to it by its actuating-cam. After the gum has been applied to the flap the block s^2 draws back, leaving the envelope to be retained in its position only by the gentle pressure of the springs v^2 , and as soon as the block so releases it the envelope is drawn down into the carrier Z by a final downward movement of the slides w^2 . The block s^2 has a simple reciprocating movement, resting for an instant at each extremity of its stroke; but the slides w^2 have one long upward movement from their lowest to their highest portions and an intermittent downward movement, as before explained.

The mechanism for actuating the slides w^2 comprises a double cam, y^2 , on the shaft U, which acts to impart a swinging vertical movement to an arm, z^2 . This arm is mounted to swing on the cross-rod S. From the arm z^2 a connecting-rod, a^2 , extends down and is coupled to a crank on a rock-shaft, A^2 , mounted low down in the sides of the main frame. On this shaft are fixed arms b^2 , which are coupled by links to the slides w^2 . I have shown the cam y^2 as double, one part to raise the arm z^2 and the other to depress it; but one cam might be constructed to accomplish the same result, or a spring might be employed to depress the arm. The carrier Z is fed along by a ratchet device. The chain of the carrier takes over sprocket-wheels c^2 , mounted on a shaft, d^2 , on the end of which is a ratchet, e^2 . An arm, f^2 , loosely mounted on the shaft d^2 , bears a pawl, g^2 , which engages the ratchet, and a connecting-rod, h^2 , couples this arm with a crank, i^2 , on the shaft U.

Referring to Figs. 3, 10, 12, and 13, I will now describe the mechanism whereby the flap-gummer m^2 is rendered practically inoperative for the time being should the succession of envelopes be broken, whereby the application of gum to the flap-rest is avoided. The sliding socket-piece ℓ^2 is recessed to receive a toothed wheel or pinion, j^2 , which is rotatively mounted therein, and the toothed bar k^2 bearing the block s^2 , and the toothed bar l^2 bearing the flap-gummer m^2 . The teeth on these bars mesh with the teeth on opposite sides of the pinion j^2 , as shown in Fig. 10, where the cap-plate ℓ^2 of the socket-piece is broken away to show the construction. This construction is such that when the bar r^2 is pressed back into the socket-piece the bar k^2 will be protruded, and vice versa.

Referring now to Fig. 3, w^3 is a spring, connected at one end to the socket-piece l^2 , and at the other end to the bar k^3 , bearing the gummer. This spring keeps the said bar drawn normally into the socket-piece to its fullest extent, and while in this position it will not in its movement reach far enough to deposit gum on the rest g^2 . At the same time the bar r^2 protrudes to its fullest extent, and if nothing is interposed the ribs on the block s^2 will pass between the bars of the grid Q when the cam advances the socket-piece l^2 ; but when an envelope is interposed between the block s^2 and the grid Q, the forward movement of the socket-piece will, owing to the resistance offered by the envelope, cause the bar r^2 to rotate the pinion and protrude the bar k^3 far enough for the gummer m^2 to reach and gum the flap of the envelope. Thus the gummer is prevented from acting when there is no flap on the rest by reason of the ribs on the block s^2 meeting with no resistance to their extreme forward movement.

I will now describe the device for intermittently lowering the blank-platform B, which is best illustrated in Figs. 2 and 3.

When the carrier h has taken the topmost blank, it is desirable that the platform shall be lowered, so as to insure the proper arrangement and adjustment of the blanks on the platform by bringing them down against the lateral guides. It is also necessary to provide for actuating the platform, no matter at what level it may stand at the time.

B' is a lever pivoted on the rod S, one end of which is arranged over a cam, p^2 , on the shaft U, which lifts the end of said lever at every revolution. The other end of the lever is provided with a plate which bears a spring-pawl, q^2 , which engages a ratchet, C' , on the frame of the blank-platform B.

Mounted on some fixed part of the frame A is a shield, r^2 , which draws the pawl out of engagement with the ratchet when the lever and pawl are lifted by the retracting-spring s^2 , as shown in Figs. 2 and 3.

The mechanism operates as follows—that is to say, when the topmost blank is taken by the carrier h , the cam p^2 lifts the rear end of lever B' , and of course depresses the front or pawl end of the lever. The pawl moves from behind the shield r^2 , and its tip immediately engages the rack C' at some point, and depresses the blank-platform. When the cam passes the lever, the retracting-spring s^2 immediately raises the pawl end of the lever until the pawl is drawn up behind the shield and disengaged from the rack. The springs a are then permitted to elevate the platform B to its normal position. No matter how many blanks, or how few, there may be on the platform, the pawl q^2 will always be in a position to engage some tooth of the ratchet C' , which must be long enough and so placed on the platform-frame as to insure such engagement. This feature is precautionary, and insures the rearrangement of the blanks on the platform

should they become disarranged in the removal of the top one. This is effected by the lateral guides around the blanks and platform, which serve to readjust the blanks as the pile is drawn down between said guides. When the platform is elevated, the topmost blanks are necessarily above the tops of the guides, and these blanks are liable to be displaced, and before the next blank is removed it is very desirable that the top blank should be presented properly to the presser-foot, suction-nozzle, and other parts. The function of the guides is to effect this.

I will now describe the construction of the gum or paste fountain with especial reference to Figs. 5 and 6, premising that the fountain J here shown is or may be precisely the same as the fountain V for supplying gum to the sealing-flap.

The fountain-roller K is mounted rotatively in lugs t^2 , which lugs are pivoted to the ends of the fountain J low down, as clearly indicated by the dotted lines in Fig. 5, and extending lengthwise along the top of the fountain is a scraping-plate, w^2 , which may serve as a partial cover to the fountain. The ends w^1 of this plate extend along the ends of and embrace the roller tightly. The roller K turns in the direction of the arrow, Fig. 5, and the gum or adhesive liquid in the fountain J, in which the roller turns, is scraped off the roller to some extent by the plate w^2 , leaving only a thin film on the roller. The thickness of this film of gum is regulated by screws v^2 , which have bearings in nuts fixed on the fountain, and the ends of which screws impinge against the lugs t^2 and press the roller up to the plate w^2 with all the force necessary. I find, however, that there is a tendency in the gum, owing to its viscid nature, to be carried up by the roller to the point where the latter passes the plate w^2 , and to accumulate under plate w^2 in that angle of the fountain, being too viscid to flow back upon itself, and this accumulation causes the gum to ooze out at the crevices, especially at the ends of the roller, thus making bad work. To obviate this I provide a channel for a return current by the following means—that is to say, I provide the fountain with a concave plate, w^2 , provided with branches x^2 to brace and support it in its place just under the fountain-roller. The current in the liquid gum caused by the revolving roller carries the gum up through the channel between the roller and plate w^2 , and the surplus overflows into the space y^2 under the plate, where it joins with the liquid mass in the fountain. This circulatory current prevents the accumulation of the liquid gum at the point before mentioned. I find that this device also mitigates the foaming produced by rapid rotation of the roller through bubbles or particles of air getting mixed with the gum. The plate w^2 is simply set into the fountain and remains unattached. It may be readily removed for cleaning both it and the fountain by simply lifting it out.

I wish it understood that I do not herein claim those parts of this machine which I have before stated to be shown in my aforesaid patent, and which I have carefully distinguished from the novel features herein set forth.

I have herein shown, and also shown in my former application, a sucker-nozzle and an air-exhausting device for lifting the topmost envelope-blank from the pile; but I do not wish to confine myself to this device. I may employ other means for lifting the blank—as, for example, the application of an adhesive material.

I wish it also understood that I do not limit myself to the exact arrangement of mechanical devices herein shown for accomplishing the results desired, as these may be varied somewhat without departing materially from my invention.

Having thus described my invention, I claim—

1. In an envelope-machine wherein the envelope-blank is arranged to be carried under the gumming-roller to receive its gum, a mechanism constructed substantially as described, and arranged to be actuated by the passing blank, whereby the impression-surface of the gumming-roller, which is normally upheld, is permitted to apply its gum to the blank, as and for the purposes set forth.

2. In an envelope-machine wherein the envelope-blank is arranged to be carried under the gumming-roller by an endless apron to receive its gum, a mechanism for normally upholding the impression-surface of the gumming-roller, but which mechanism is controlled by the passing blank, which permits said roller to properly gum said blank, said mechanism comprising a rotating gumming-roller having a cam on its axis, a slide arranged in the plane of said cam and provided with a hook or projection to engage a pin in the side of said cam, a shaft arranged in bearings over the carrying-belt and provided with fixed wheels or rollers arranged over the path of the blank, and the ends of the said shaft projecting under the slide and provided with friction-sleeves whereby when the blank passes under the fixed rollers the slide is drawn back by the revolving shaft and the gumming-roller allowed to operate, substantially as set forth.

3. The combination, with the tumbler M and the frame in which it is hung, of the arm l' , cam n' , and guide-stop t' , all arranged to operate substantially as set forth.

4. The combination, to form a mechanism for applying gum to the sealing-flap of an envelope, of the carrying-belt D and roller O, arranged to deliver the envelope, the flap-rest and frame Q, the swinging bar R and its actuating-cam, the sliding socket-piece l' , and the mechanism for giving it a reciprocating motion on the bar R, the springs v^2 for holding the envelope, and the flap-gummer m^2 , both connected with the piece l' , the gum-fountain

and its roller, the roller X and its frame Y, coupled to the bar R, the slides w^2 , provided with hooks x^2 , and the cam y^2 and intermediate mechanism for imparting to the slides w^2 a reciprocating motion, substantially as set forth.

5. As a means for preventing the gumming of the flap-rest when there is an intermission in the succession of envelopes to the mechanism for gumming the sealing-flap, the flap-gummer arranged to be normally retracted by a spring and to be protruded by the interposition of an envelope between the grid or frame Q and the block s^2 , substantially as set forth.

6. The combination, with the bar R and its actuating-cam, of the cam-rod i^2 , lever j^2 , rod k^2 , sliding socket-piece l' , spring m^3 , pinion j^3 , tooth-bars r^2 and k^3 , spring n^3 , pivoted block s^2 , provided with springs v^2 and mounted and attached to bar r^2 substantially as shown, a flap-gummer, m^2 , a rest, g^2 , a grid or frame, Q, and a suitable gumming mechanism, substantially as described, for applying gum to the gummer m^2 , all arranged to operate substantially as set forth.

7. In a machine for making envelopes and similar receptacles, a gum or paste fountain provided with means, substantially as described, for creating a return current of the viscid liquid, said means comprising a plate arranged under the fountain-roller and between it and the bottom of the fountain, as set forth.

8. The combination, with the fountain J and its roller, of the concave plate w^3 , provided with branches x^3 to sustain it in its position in the fountain, but permit it to be readily removed for cleaning, substantially as set forth.

9. The combination, with the fountain J, provided with the plate w^3 , arranged to embrace the ends of the fountain-roller, of the said fountain-roller mounted in the pivoted lugs l' , the screws v^3 , and the plate w^3 , all constructed and arranged to operate substantially as set forth.

10. The means for intermittently lowering the blank-platform B, comprising a ratchet on the frame of said platform, a spring-pawl mounted on a vertical lever and arranged to engage the said rack when the pawl is depressed, a shield arranged to disengage the pawl from the ratchet when the said pawl is raised, and mechanism for imparting a vertical reciprocating motion to the pawl-lever, all constructed, combined, and arranged substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

GERARD SICKELS, JR.

Witnesses:

HENRY CONNETT,
ARTHUR C. FRASER.