

No. 725,479.

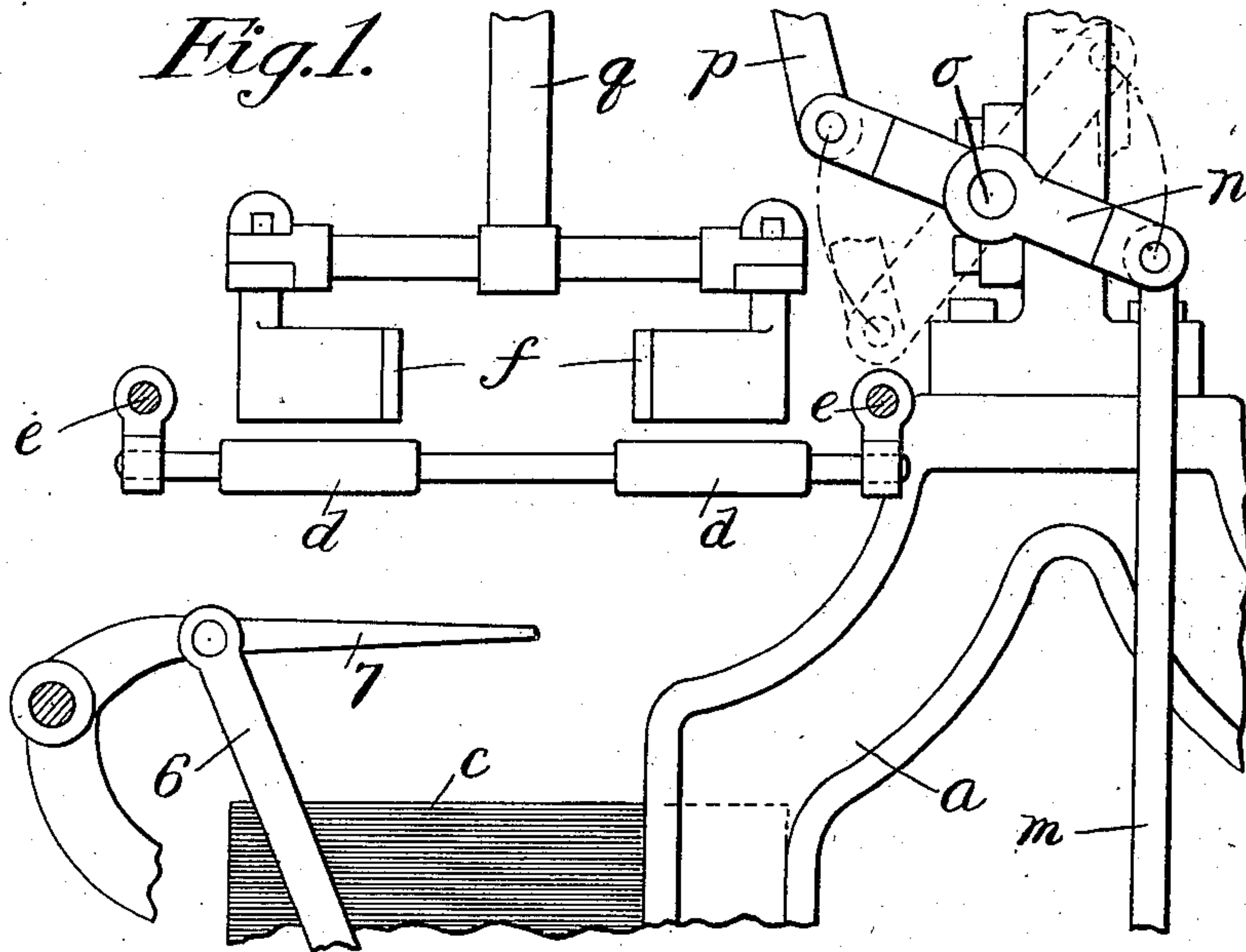
PATENTED APR. 14, 1903.

F. B. POWERS.  
ENVELOP MACHINE.

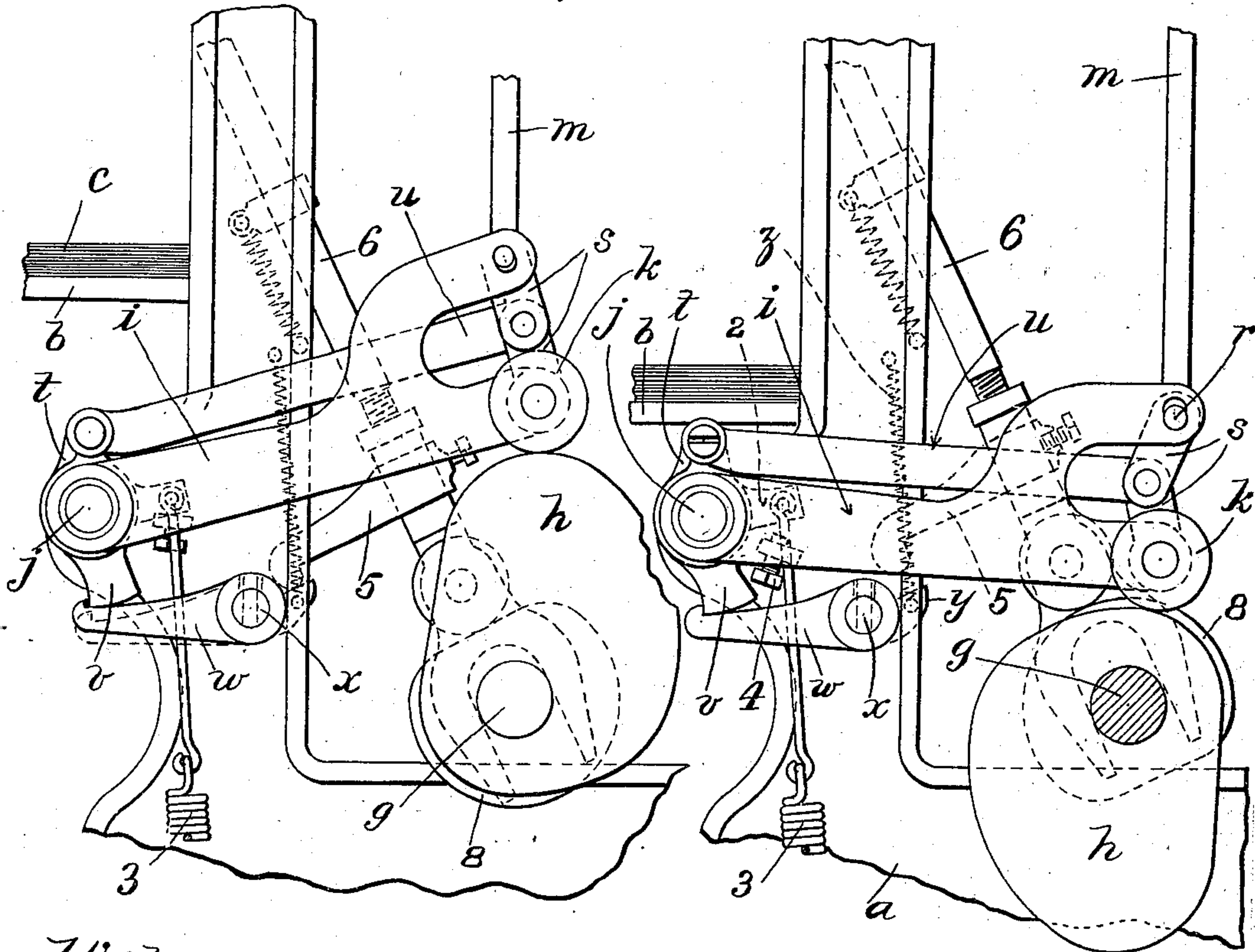
APPLICATION FILED FEB. 11, 1903.

NO MODEL.

*Fig. 1.*



*Fig. 2.*



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# UNITED STATES PATENT OFFICE.

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## ENVELOP-MACHINE.

SPECIFICATION forming part of Letters Patent No. 725,479, dated April 14, 1903.

Application filed February 11, 1903. Serial No. 142,947. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK B. POWERS, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Envelop-Machines, of which the following is a specification.

This invention relates to envelop-machines; and the object thereof is to improve the construction of that part of the mechanism which comprises the pickers and their operating means, whereby the application of gum to the envelop-blanks by the operation of the picker may be much more uniform than is possible with machines constructed as at present; and this invention consists in the provision of means whereby when the picker does not operate to pick up a blank it receives no additional supply of gum until such time as it resumes its operative movement on the pile of blanks.

As is well known, the picker on an envelop-machine has a vertical reciprocatory movement toward and from a pile of envelop-blanks, the under side of the picker being gummed and in its contact with the blank applies the gum to the two outside flaps of the latter, one of which is folded and gummed to the end flaps, the gum on the other or seal flap being dried. Generally the gum is applied to the pickers by gum-rolls, which roll over the face of the picker when the latter is at its highest point, where it has a dwell. The blank-table feeds upward to maintain a constant level of the upper surface of the pile of blanks, and when it becomes necessary to renew the supply of the latter the blank-table is lowered and the blanks placed on it, and the table is then elevated to a position to again bring the top of the pile within reach of the picker. During this operation of supplying more blanks to the machine the picker has been moving as usual and the gum-rolls have been traversing the face of the picker and at every movement of the rolls applying gum thereto.

If the picker were permitted to resume its operation on the regular stock of blanks, it would apply to some of them an excess of gum, which would be pressed out from under the folded side of the envelop and might

cause the latter to stick in the folding-box, or, if this did not occur, the heavily-gummed seal-flap might stick in the drying-chain. Supposing that neither of these things happens and the heavily-gummed envelops pass through the machine, when they come to be printed the excess of gum forms a hard ridge running from each lower corner of the envelop to the center and often crushes or breaks down the face of the type. In ordinary practice, therefore, when the pile of blanks is renewed it is customary to place on top of the new blanks a number of blanks of a different color, the envelops made from these blanks being thrown out when the product of the machine is packed. As it usually requires from one to two dozen picker movements to clean off the extra gum applied to the pickers, the product of the machine is not only curtailed to this extent, but the cleaning of the picker is also frequently rendered necessary, because the gum will build up on the edges of the latter, thus broadening its face in spots and rendering its subsequent operations imperfect, not only because it applies gum unevenly, but because the lumps of gum harden and become detached from the picker and adhere to the blank, and these also cause great damage to the type in subsequent printing operations.

My improvements overcome all of the above-named inconveniences and curtailment of product; and the invention consists, essentially, of means to automatically lift the picker out of the path of movement of the gum-rolls whenever the blank-carrying table is lowered to receive a new supply. The upfeed of the table is governed by the well-known ratchet-feed movement operated by means of a finger with which the top of the pile of blanks comes in contact at each movement of the picker devices and connected with the said ratchet devices by a rod having constant vertical reciprocating movements, whereby if the finger drops below a certain point mechanism is actuated whereby the next vertical movement of the rod effects the raising of the table more or less.

In the drawings forming part of this application, Figure 1 is a side elevation of such portions of an envelop-machine as are necessary to show the application of this invention



thereto. Fig. 2 is a similar view of portions of the same mechanism, showing the parts in a different position.

Referring to the drawings, *a* indicates the frame of the machine; *b*, the blank-table, (means for elevating it having been omitted, as they are well known;) *c*, the pile of blanks; *d*, the gum-rolls, carried in suitable hangers on rods *e*, on which these hangers have a reciprocatory sliding movement toward and from the observer, the rolls running over other rolls at the end of their traverse motion, located in gum-boxes, as is customary in these machines, the gum-boxes not being shown in the drawings.

*f* indicates the picker, which is reciprocally actuated from a cam-shaft *g*, supported on the frame, on which shaft is a cam *h*, whose revolutions will swing the fork-arm *i* in a vertical plane through the arc of a circle of which the shaft *j* is the center, said arm being provided with the usual cam-roller *k* to bear on the cam. This fork-arm *i* is shown in its lowermost position in Fig. 1 and in its most elevated position in Fig. 2.

From the end of the upper arm of the fork-arm *i* a connecting-rod *m* extends to one end of a lever *n*, pivotally supported on the shaft *o*. From the opposite end of this lever *n* another connecting-arm *p* extends upwardly to a point over the picker *f* and is there connected to a post *q* on the picker, whereby the upward movement of the connecting-rod *m* imparted thereto by the revolution of the cam *h* will impart downward movement to the picker, and vice versa. The connecting-arm *p* and post *q* are broken off and do not show the point of connection between them.

It will be observed that the connecting-rod *m* may have a slight vertical movement relative to the fork-arm *i*, because of the vertical play of the pin *r* in its bearing in said arm. Between said pin *r* and the axis of the cam-roller *k* are two links *s*, which when they are in the normal position (shown in Fig. 2) will permit the connecting-rod *m* to assume its uppermost position relative to the arm *i*; but when these links are drawn out, as in Fig. 1, they will impart to the rod *m* a slight movement downwardly in addition the motion imparted by the cam *h*.

Supported on the shaft *j* is a freely-swinging yoke *t*, and between the united ends of the links *s* and the upper end of this yoke *t* is a rigid arm *u*, pivotally connected to the yoke and the links. The lower end *v* of the yoke is of such shape as will permit it to be engaged by one end of a hook *w*, pivotally supported on the frame at *x*, and to the opposite end *y* of this hook is attached a spring *z*, whereby normally the hook *w* will be prevented from engaging with the lower end of said yoke. On the yoke *t* there is a projection 2, which extends toward the cam-shaft, to which a spring 3 is applied, (whose power is superior to that of the spring *z*,) and a suitable adjustable stop 4 is located in the

arm *i* under said projection 2 on the yoke to limit the swinging movement of the latter. Normally the spring 3 operates to draw the projection 2 on the yoke down to its abutment, thus moving the arm *u* endwise toward the links *s* to straighten them.

It will be observed that by reason of the location of the arm *u* above the axis on which the arm *i* swings and because of the tension of the spring 3, which tends to move the said arm *u* in a direction which will straighten the links *s*, the normal operation of the picker will (if the swinging movement of the yoke *t* is not interfered with) be that imparted thereto when the links *s* are straight—that is, the condition in such a case would be the same as though the rod *m* extended in one piece to the axis of the roll *k*. Therefore, the arm *i* being moved by the cam *h* in the manner described, as it swings upward or downward, the arm *u* is held stationary as far as endwise movement is concerned, the projection 2 resting on its stop 4. When the links are in the position shown in Fig. 2, they are preferably just past a position of alinement whereby the links become toggled. From this point the two arms *i* and *u* will move as one against the tension of the spring 3, the yoke *t* swinging on the shaft *j*. When the parts are in this position, the picker *f* will not rise above the plane of the upper surface of the gum-rolls *d*, and in its downward movement it will come in contact with the top of the pile of blanks *c* and pick up one in the usual manner.

From the foregoing description it is obvious that during the normal movements of the arm *i* the links will always be in a straightened position, and the upward movement of this arm will coincide with the downward movement of the picker and the downward movement of the arm with the upward movement of the picker. Therefore the downward movement of the picker will always terminate in the same plane. Now by breaking the toggle relations of the links *s* when the arm *i* moves downward (the picker then moving upward) the connection between the arm and the picker is shortened, but the throw of the arm remains uniform. Therefore the said downward movement of the arm *i*, with the links in the position shown in Fig. 1, will result in an upward movement of the picker in excess of its downward movement, and this excess of upward movement is imparted thereto practically by shortening the connection between the cam and the lever *n*, and it results in raising the picker to a plane located above the upper surface of the gum-rolls *d*, whereby the latter will pass back and forth out of contact with the under surface of the picker, the latter being practically at rest during this movement, while the roll *k* is passing over the concentric portion of the cam *h*, on which it is just entering, in the position of the parts shown in Fig. 1. Normally, however, the links *s* are not permitted to break on the downward movement



of the arm *i*, for the reason that the spring 3, maintaining a constant tension on the yoke *t*, tends to hold the arm *u* in the position shown in Fig. 2 during the entire upward or downward movements of said arm *i*. It is therefore clear that if when the arm *i* is in the position shown in Fig. 2 means be provided to hold the yoke stationary when the arm *i* swings downward, then owing to the eccentricity of the axes of said arm *i* and the arm *u* said downward movement of the arm *i* will cause the toggle relation of the links *s* to be broken, as shown in Fig. 1.

The means provided herein for holding the yoke *t* stationary consist in the hook *w*, before described, whose end *y* when the paper-table is lowered will be struck by the finger 5, secured to the rod 6, the upper end of which has pivotal connection with a finger 7, which rod and finger form part of the well-known ratchet-operating device whereby the blank-carrying table may be raised as may be necessary to maintain the top of the pile of blanks in the same plane.

The lower end of the rod 6 is forked, as shown, and straddles the cam-shaft *v*, which acts as a guide therefor, and on which shaft a cam 8 is located, which imparts vertical reciprocatory movements to the rod 6, a cam-roll on said rod bearing on the edge of the cam 8, and the movements imparted to the rod 6 are such as to bring the end of the finger 7 down into contact with the top of the blanks *c*.

When during the operation of this machine the blank-table is lowered to renew the supply of blanks, the rod 6 in its downward movement (which is always contrary to the upward movement of the arm *i*) will cause the finger 5 thereon to come in contact with the end *y* of the hook *w*, the latter thus being thrown upward into engagement with the lower end *v* of the yoke *t*, which at that moment will be in position to be engaged by the hook and from which it cannot be disengaged except by the failure of the finger 7 to reach its lowest position (which it is prevented from reaching) by the raising of the table to bring the top of the blanks to normal level again.

Therefore notwithstanding the fact that the finger 5 moves upward out of contact with the end of the hook the engagement between it and the yoke is maintained, because the tension of the spring 3 is superior to that of the spring *z*, and therefore when the arm *i* again swings downwardly it will start with the links in the position shown in Fig. 2, and at the end of its movement the toggle of the links will be broken, as shown in Fig. 1; but the engagement of the hook *w* with the yoke will remain unbroken until such time as the finger 5 in its descent fails to strike the end *y* of the hook at the moment the arm *i* starts to swing downwardly. It is thus apparent that if there arrives a time during the operation of this machine in which the pile of

blanks gets so low as to need renewal the blank-table may be run down to receive a supply of blanks, the mechanism operating while the table is depressed to cause the picker on its upstroke to be raised above the level of the upper surface of the gum-rolls, and when the new blanks are in position on the table the latter may then be raised to bring the top of the pile of blanks to the normal level, whereupon the oscillating finger 7 (which has been swinging as usual during this operation) will strike the top of the blanks, and the finger 5 will then fail to strike the hook *w*, and therefore the toggle relation of the links *s* will not be broken on the downward swing of the arm *i*, which will result in limiting the rising movement of the picker to the plane of the upper surface of the gum-rolls, but, conversely, as soon as the table is lowered the picker will rise upon every upstroke thereof above the plane of the gum-rolls, and therefore during its dwell at the limit of its upward stroke the gum-rolls will pass beneath it without touching it. It is thus seen that the devices are purely automatic in their action and the picker is fully protected against an accumulation of gum applied thereto when the machine is inoperative by reason of the dropping of the blank-table.

The mechanism described herein while particularly applicable to envelop-machines may be applied to printing-machines substantially in the manner described and shown, the gum-rolls representing the ink-rolls and the picker representing the platen for the type, and such minor changes as would be required to adapt the construction to this use would clearly come within the scope of the invention. Furthermore, it would clearly fall within the scope of the invention to adapt the mechanism to operate in the reverse order from that described herein and by means of the toggle connection shown to cause the support on which the gum-rolls slide to drop below their normal plane of movement to prevent at the proper time the application of gum to the picker. In that case the picker would, as in the machines now constructed, have a constantly uniform movement toward and from the blank.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A picker for envelop-machines, and means to impart movements thereto toward and from the blank, gumming devices arranged to apply gum to said picker, a support for blanks, and means to render the gumming devices inoperative when the blank-support is out of position.

2. The combination with the blank-support of an envelop-machine, of a picker, and means to impart to the latter normally uniform reciprocating movements toward and from the support, together with devices actuated by



the movement of the support to increase the normal movement of the picker in one direction.

3. A picker for envelop-machines, a cam to  
5 impart reciprocating movements thereto, suitable connections between the cam and the picker, and means operating with said connections whereby the normal movement of the picker may be temporarily varied.

10 4. In an envelop-machine, a picker, a cam for operating it, a forked arm adapted to be oscillated by the cam, connections between said arm and the picker comprising a rod having a loose pivotal engagement with one fork  
15 of said arm, whereby said rod may move independently of the arm more or less, a pair of links between the other fork of the arm and said rod, means to normally maintain the links in substantial alinement with said rod  
20 during the swinging movements of the arm, and means to throw the links out of line with

the rod to vary the degree of movement of the picker at the proper time.

5. The combination with the blank-support of an envelop-machine, of a picker, and means 25 to impart to the latter normally uniform movements toward and from a blank, together with devices actuated by the movement of said blank-support, to increase the normal movement of the picker in one direction. 30

6. In combination, a picker, and a gumming device located in an operative relation thereto, a support for envelop-blanks or the like, and means operable when the blank-support is out of position, to render the relation of the 35 picker and gumming device an inoperative one.

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