

A. A. RHEUTAN.

Envelope Machines.

No. 133,800.

Patented Dec. 10, 1872.

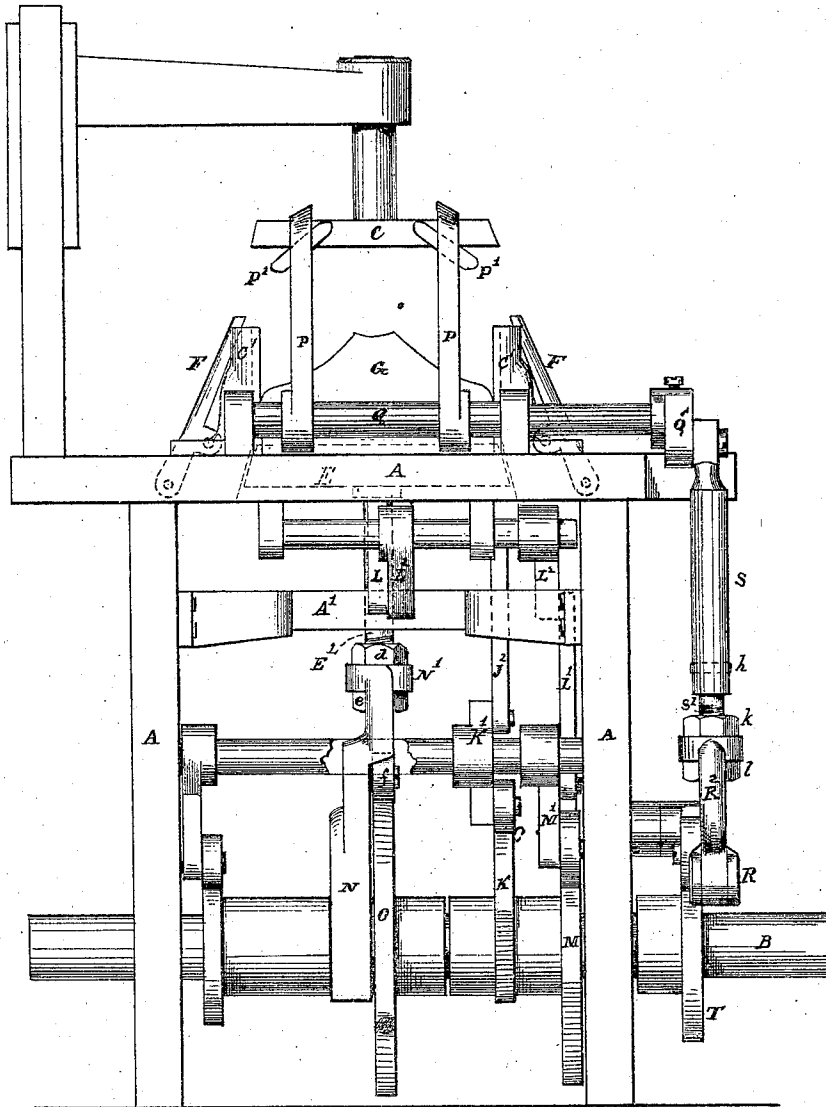


Fig. 1

Witnesses

Thos. C. Dodge
Chas. W. Burleigh

Inventor

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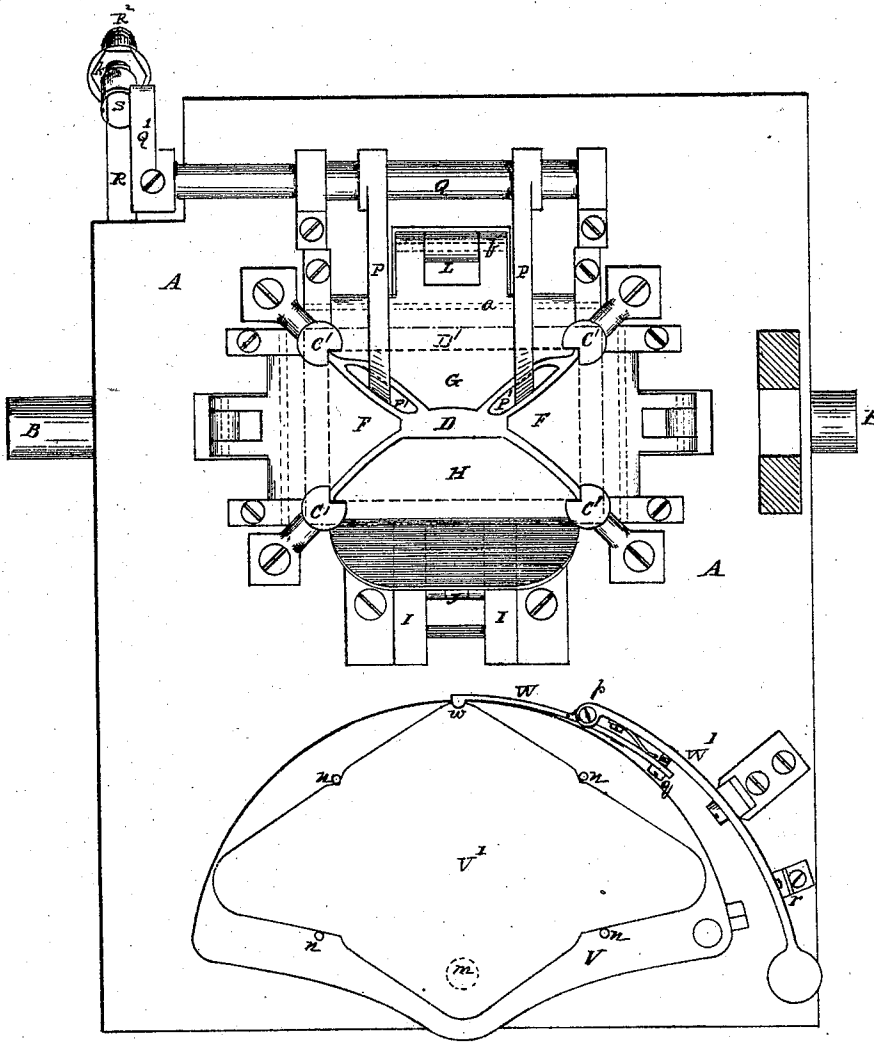


FIG. 2

Witnesses

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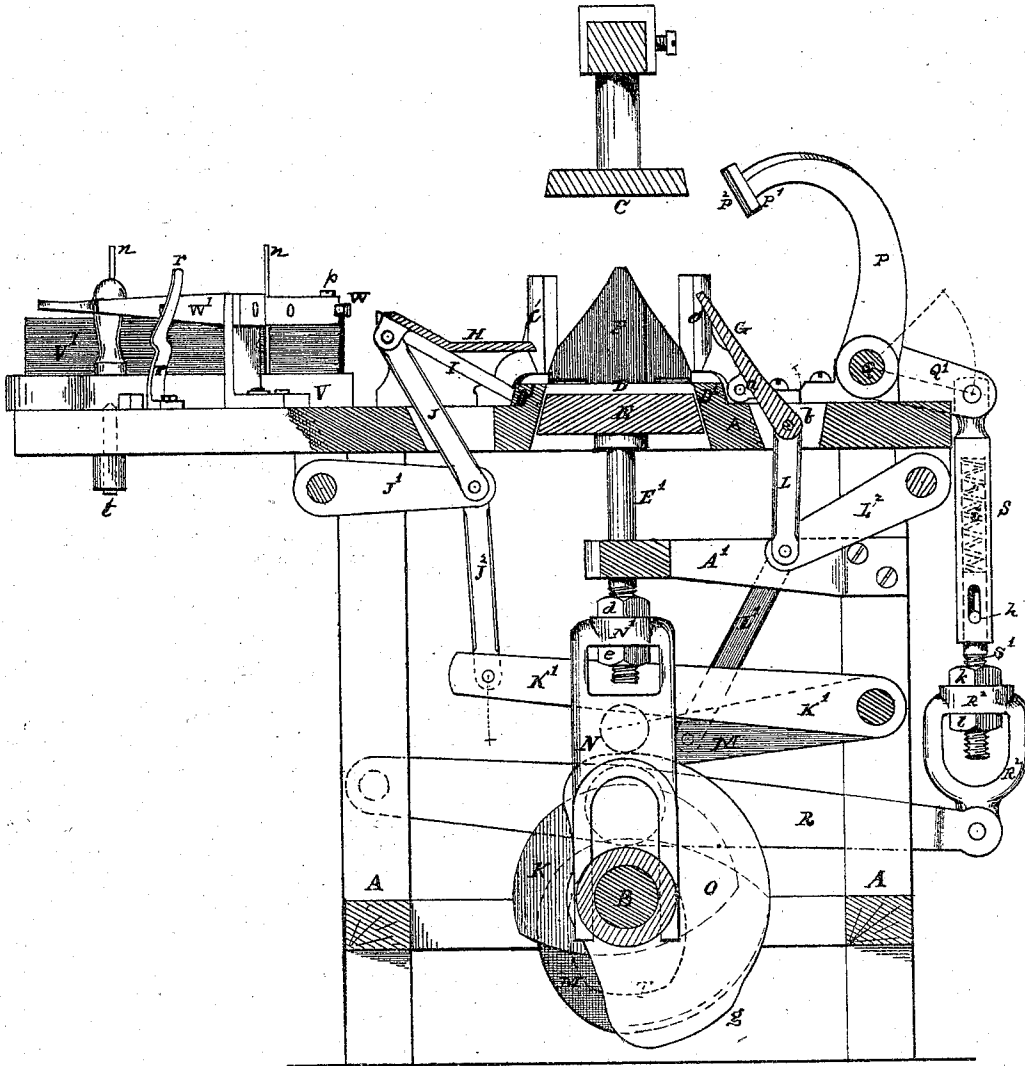


Fig. 3

Witnesses
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UNITED STATES PATENT OFFICE.

ABRAM A. RHEUTAN, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN ENVELOPE-MACHINES.

Specification forming part of Letters Patent No. 133,800, dated December 10, 1872.

To all whom it may concern:

Be it known that I, ABRAM A. RHEUTAN, of the city and county of Worcester and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Envelope-Machines; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing which forms a part of this specification, and in which—

Figure 1 represents a rear view of such parts of an envelope-machine as are necessary to illustrate my invention. Fig. 2 represents a plan view of the same; and Fig. 3 represents a vertical section through the folding mechanism, the blank-supporting plate being shown in side elevation.

This invention consists in certain improvements in mechanism for folding envelopes, whereby the folding-machine is rendered more perfect in its action so that better work can be produced, while the adjustment of the various parts of the mechanism to the requirements of the work can be more readily and accurately accomplished, as hereinafter described. My invention also consists in certain improvements in the devices for separating the blanks, the same being an improvement on the weight-separator for which Letters Patent were granted to me February 4, 1868.

In the drawing, the parts marked A represent the supporting frame or table, which may be made in any suitable form. B indicates the operating-shaft, which may be revolved by any suitable arrangement of belts or gears. C indicates the upper platen or plunger, by means of which the envelope-blanks are pressed down between the guides C¹ into the folding-box D, said platen C being operated up and down in the ordinary manner by means of suitable mechanism, which is not shown in the drawing. E indicates the lower platen or folding-bed, which works up into the lower side of the folding-box D, and upon which the envelopes are folded. F F G H indicate the folding-flaps, which fold down the edges of the blanks.

The folding-box D is made with a flange or rim, D', around it, which flange projects above the level of the table A in the manner shown, and the folders or flaps are arranged to move

down and fold in the edges of the blank, after its center has been pressed into the folding-box by the platen C, in the proper order—viz., first, the two ends F F, then the rear or bottom G, and last the front or top holder H. The front flap H, which folds over the top of the envelope, is made to slide upon inclined ways, I, while the others, F F G, are arranged to swing. The flap H is connected by a rod, J, to one of a pair of swinging arms, J¹, which work together, and the other arm is joined by a rod, J², to the actuating-lever K', which lever is moved by a suitable cam, K, upon the operating-shaft B, and the upward and downward motion of the lever K', as it rests upon the revolving cam K, is transmitted through the rods J J² and arms J¹ to slide the flaps H backward and forward along the inclined ways I. The rear end b of the flap or folder G is connected in a similar manner by the rods L L¹ and arms L² to the actuating-lever M', which works on a suitable cam, M, whereby said flap is swung up and down with the proper motion and at the proper time. The side flaps F F are also fitted with proper actuating mechanism worked by suitable cams on the operating-shaft B. The mechanism for operating the side flaps may be constructed similar to that for operating the flap G; or, if preferred, it may be constructed in any other suitable form, provided the proper movement is imparted to the flaps. The flaps F, F, and G are fulcrumed at the outside of the flange D' at a, the hinges being arranged at some distance forward of a plane coincident with the face of the flap, so that when the flaps are moved or swung down upon the blanks their faces will have a forward or advancing movement in order to carry or roll the edges of the blanks toward the center of the folding-box, thus avoiding the liability of breaking down or wrinkling the edges of the blanks when folding very thin paper. The hinges a are placed in relation to the top of the folding-box rim D' in such a manner that the flaps will move or swing down squarely upon the top of said flange D' with their faces in a horizontal plane coincident with the top surface of the flange or rim, whereby the flaps are all brought to a position even with each other, where they form a top to the folding-box during the time the mechanism is press-

ing or gaging the edges of the envelope. The arrangement of the hinges *a* in front of the face-line of the flaps and at the back of the folding-box rim also enables me to operate the flaps with smaller cams than usual, from the fact that the flaps thus hinged swing within angles of a less number of degrees when moving from their horizontal position up to a sufficient height to clear the descending upper platen than do those heretofore in use; consequently the movement of their rear arms *b*, to which the operating-rods are connected, are shorter, thus requiring smaller cams to produce their movement and a less expense of power for their operation. The lower platen or folding-bed *E* is supported at the end of a vertical rod, *E'*, which rod works through a suitable guide-bearing, *A'*, on an arm of the supporting-frame *A*. The lower end of the rod *E'* passes through the socket or head *N'* of a forked piece, *N*, in the manner shown, and is secured therein by means of two nuts, *d* and *e*, screwed onto the end of said rod—one above and one below the head *N'*. The forks of the piece *N* are arranged at each side of the shaft *B*, and serve as guides to keep the piece in position, while a cam, *O*, is arranged upon the operating-shaft *B*, by means of which the piece *N* and lower platen *E* are moved up and down. A small roll or wheel, *f*, may be introduced between the cam *O* and piece *N* to reduce the friction between the parts. The cam *O* is made of such form that the platen *E* will be moved up into the folding-box *D* to the position indicated in Fig. 3. The envelope-blank is then pressed down into the folding-box by the upper platen *C*, and the flaps *F F G H* are folded down upon the top of the envelope and level with the top of the rim *D'*, as above described; and the flaps are there held firmly in position while the swell *g* on the cam *O* raises the under platen *E*, which presses the envelope upward against the flaps and gives to its edges the proper gage or thickness.

It will be observed that by means of the socketed piece *N N'* and nuts *d, e* the height to which the under platen is raised can be very easily and quickly adjusted so as to adapt the machine to various thicknesses of paper or to fold the envelopes more or less close at the edges.

The double movement of the platen *E* for gaging the thickness of the envelopes may be effected by other mechanism than the cam *O* when it is used upon envelope-machines of a different construction from that shown, the mechanism being arranged to conform to the requirements of the machine, and to produce the desired result in the most advantageous manner.

P P indicate a pair of presser-fingers furnished at their ends with pads or pressers *P¹*, of the proper size and form to fit over that portion of the envelope to which is applied the gum that attaches the bottom fold to the

side folds. The fingers *P* are, in this instance, attached to a rocking-shaft, *Q*, arranged across the rear part of the frame *A*, and which shaft is rocked forward to bring the pressers *P¹* down upon the envelope, and to press the gummed edges of the bottom fold firmly down upon the side folds, and thus cause their surfaces to adhere strongly to each other. The shaft *Q* is then rocked back to carry the fingers *P* and pressers *P¹* out of the way of the upper platen *C* as it descends. The face of the pads or pressers *P¹* are covered with elastic cushions, *P²*, which may be made of rubber or other similar materials or with metallic springs. These elastic cushions allow the pressers to fit closely down upon the envelope and press the gummed surfaces throughout the entire area of the pad, even though the metallic portion of the pressers should not descend squarely upon the level folding-bed or upon the envelope supported thereon, as might be the case when the platen or folding-bed was adjusted very low.

By this construction of the pressers any slight inequality in the thickness of the paper is prevented from interfering with the correct action of the pressing mechanism. If desired, the faces of the pressers may be made with a smooth metallic surface, in which case more care would be required in their adjustment than when provided with cushions.

For some classes of work, such as express and safety envelopes, it may be desirable to have the sealed portions of the envelope embossed or stamped with depressions, in which case the faces of the pressers would be made with serrations, points, or figures to be impressed into the paper.

The pressers *P¹* are not brought into contact with the gummed portions of the envelope until after the folders have bent down the edges of the blank and the lower platen *E* has performed its second operation or moved up to gage the thickness of the envelope; but immediately after the platen *E* has gaged the thickness the pressers are brought to work to press the gummed edges firmly upon the side folds, as above described. In this manner any air that may be inclosed within the envelope when the platen *E* rises to gage the thickness is allowed to escape before the adhesive parts are pressed together, thus obviating the liability of bursting out the envelope, forming double edges, or wrinkling the paper. To the end of the rocking shaft *Q* an arm, *Q'*, is attached, and the end of said arm is joined to the end of an actuating-lever, *R*, by means of a spring-rod, *S*, the said parts being operated by a cam, *T*, on the shaft *B*. The upper portion of the rod *S* is formed hollow, and the lower part *S'* is inserted within the upper part and secured by a pin, *h*, which passes through a slot in the outer portion, as shown. A spring, *i*, is arranged within the upper hollow portion, which presses upon the end of the part *S'* and tends to keep the rod extended as far as possible. The end

of the part S' is made adjustable in the socketed connecting-link R² by means of the two nuts, *k* and *l*, arranged as shown. By this construction and arrangement of devices the parts can be very nicely adjusted, so that the pads P¹ will press down the gummed edges with the desired degree of force, and as the pads P¹ strike upon the envelope and are resisted by the under platen E beneath it, the parts are relieved from any undue strain by the compression of the spring *i* and the shortening of the rod S, by the part S' being pressed up into the upper portion thereof. The fingers P are held in position with the pads P¹ pressing upon the envelope and the rod S shortened by the compression of the spring *i*, as above described, while the lower platen E descends, and, as said platen E is withdrawn from the folding-box, the resistance being removed from below the pressers P¹ allows the spring *i* to expand and rock the shaft Q forward, so that the fingers P will press the finished envelope down out of the folding-box, thus insuring the discharge of the finished envelope before another blank is pressed into the folding-box. This method of discharging the envelopes enables me to operate the machine successfully at a very high rate of speed. The downward movement of the fingers P for discharging the envelopes may also be attained by making the cam T with an additional swell to raise the actuating-lever R at the proper moment, in which case the spring connecting-rod S could be dispensed with and a stiff rod used in its stead. By arranging the forward folder H to slide on the inclined ways I while the rear folder G is made to swing, their operating-cams are brought upon opposite sides of the shaft B, so that one has an upward movement while the other has a downward movement, thus balancing each other upon the shaft and equalizing the power required for their operation. Another advantage of the sliding flap is that its operating-arms rise up close to the table, when the folders open and the lower platen E descends, thus allowing ample space for the discharge of the finished envelopes and for the operation of any mechanism for carrying the envelopes away from beneath the machine.

If desired, any or all of the folders can be made to slide in a manner similar to the folder H.

It will be observed that the flap or folder G is so made as to allow space for the gum-pressers P¹, while it has a sufficient width to fold over the edge of the blank along the entire side of the folding-box. The plate V, for supporting the pile of envelope-blanks V', is made in the form shown, and is pivoted to the table A, as indicated at *m*, so that it can be revolved to the front when it is desired to replenish the stock of blanks thereon. The blanks V' are retained in position by pins *n* in the ordinary manner, and are taken from the pile by the gummers and carried forward to the folding-box by mechanism constructed substantially

in the ordinary manner, and which mechanism is not in the present instance shown. The separator or device for preventing more than a single blank at a time from being raised from the pile V' I make with an adjustable end, W, which is fulcrumed to the part W', as shown at *p*, and a set-screw, *q*, is arranged in its inner end, by means of which the outer end can be adjusted so that the lip *w* will rest, to a greater or less extent, over the edge of the blanks, thus enabling my present envelope-blank separating device (which is an improvement on the weighted separating device patented to me on the 4th of February, 1868) to be conveniently and easily adapted to the different qualities or thicknesses of paper, or to any variation in the size of the blanks. When it is desired to move the plate V the separator can be raised from the blanks by pressing down its outer end and catching it upon the spring *r*. The plate V is retained in position by a conical-pointed spring-bolt, *t*, which presses into a depression in the under side of said plate in the ordinary manner.

The parts of the machine which are not herein shown and described may be constructed in any suitable form and be operated in any suitable manner.

Having described my improvements in envelope-machines, what I claim therein as new and of my invention, and desire to secure by Letters Patent, is—

1. The combination, with the folding mechanism in an envelope-machine, of a presser or pressers, operating independently of the folding-flaps, to press upon the gummed or adhering portion of the envelope, for the purposes stated.

2. The combination, with the presser-pads P¹, of rubber cushions or other yielding faces, as and for the purposes stated.

3. The combination, with the folding-flaps F F G H and platen or folding-bed E, of the presser-fingers P P¹, rock-shaft Q, actuating cam-lever R, and yielding connecting-rod S, substantially as and for the purposes set forth.

4. The combination, with the presser-fingers P, rock-shaft Q, and actuating cam-lever R, of the adjustable connecting devices S S' R² *k l*, substantially as and for the purposes set forth.

5. The combination, with the under platen or folding-bed in an envelope-machine, of presser-fingers and mechanism for imparting to said fingers an additional downward motion when the platen or folding bed descends for forcing the envelope from the folding-box, substantially as set forth.

6. The combination, with the folding-flaps in an envelope-machine, of an under platen and its operating-cam, substantially as described, whereby the platen has a double movement imparted to it for first receiving and supporting the blank while it is being folded and then rising to gage the thickness of the envelope, substantially as set forth.

7. The combination, with the folding mech-

anism in an envelope-machine, of a back flap having its front edge cut away or reduced for exposing the gummed surface of the envelope to the action of presser fingers or pads, substantially as and for the purposes set forth.

8. The combination, in an envelope-machine, of one or more sliding folders or flaps, H, substantially as and for the purpose set forth.

9. The combination, with the separator-lever, of the adjustable end arm W and set-screw *q*, substantially as and for the purpose set forth.

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Witnesses:

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