

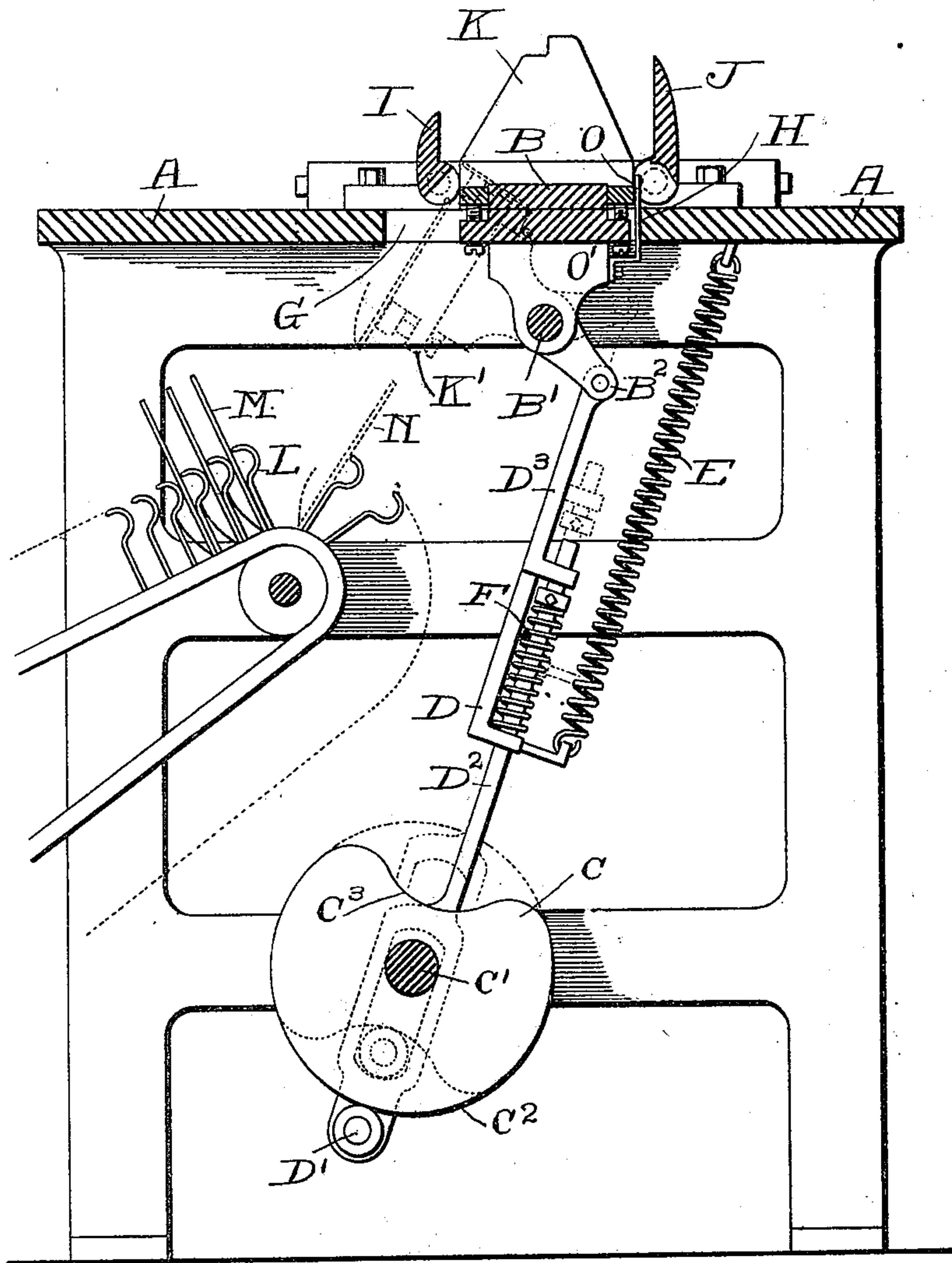
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W. S. METCALFE.
ENVELOP MACHINE.

(Application filed Mar. 1, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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ENVELOP-MACHINE.

SPECIFICATION forming part of Letters Patent No. 670,183, dated March 19, 1901.

Application filed March 1, 1899. Serial No. 707,315. (No model.)

To all whom it may concern.

Be it known that I, WILLIAM S. METCALFE, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in Envelop-Machines, of which the following is a specification, accompanied by drawings forming a part of the same.

The improvement has reference to the mechanism for delivering the folded envelopes from the folding-box.

The folding-box in an envelop-machine is formed by four folders, which surround a bottom piece or bed. The envelop-blank is forced by a plunger through a creaser-plate down onto the box-bed and the folders then act to turn over and press the flaps together. The envelop has been previously gummed, and thus the envelop is folded and secured together. After the envelop has been folded it is necessary to deliver the same from the box. The envelop is generally delivered into a drying mechanism, which carries the envelop for a certain time until thoroughly dried.

The parts before enumerated have to operate at high speed.

It has been a difficult problem to get the folded envelop out of the folding-box. Two ways have been previously used for doing this by moving the box-bed. The first has been to hinge the bottom of the box or box-bed on an axis in a plane to the rear of the back pressure-folder and to operate the bed or bottom by a cam, so that the bottom of the box will drop like a trap-door to allow the envelop to slide off without momentum. Difficulty has arisen with this form of machine, owing to the fact that there is no momentum imparted to the envelop to free the same from the bottom of the box, so that if the envelop happens to stick from loose gum or electricity or any other cause to the box-bed the delivery does not work. If the delivery does not work, the envelop will remain thereon and the next envelop-blank forced down thereon by the plunger will be spoiled and the machine quickly clogged and sometimes strained or broken. To overcome these difficulties, in some machines using this trap-door arrange-

ment fingers or other devices have been employed to positively knock the folded envelop off of the trap-door bed when the latter is in its inclined position; but such arrangements as these are complicated and are apt to mar the envelop. A second plan that has been used is to employ what is known as a "revolving" box-bed. This consists in making the bed-bottom with a plurality of box-beds or folding-surfaces and in imparting an intermittent partial rotation to this piece, so as to bring the various beds or bottoms alternately in operative position in the folding-box. This, while overcoming the difficulty of getting the envelop out of the box, involves a quick starting and accurate stopping of the piece which carries the plurality of box bottoms or beds, which necessarily has to be large and of considerable weight and necessarily has to have devices employed therewith to force the envelop off of each bed. I have overcome these difficulties and provided a simple, rapid, and efficient delivery mechanism by the following construction: I make the folding-box with one bed, as before, but I place the axis of the bed between the vertical planes of its front and back edges or of the front and back folders and preferably in the same vertical plane with the middle line of said bed. An arm is extended from said box, so that the entire structure forms a rocking lever, the top of which forms the folding-surface. This rocking lever is given a quick oscillation from a cam. The bed is provided with ears which engage the envelop, and the pressure-folder and preferably also the seal-folder are notched to allow the ears to operate. By this construction when the box-bed is oscillated the envelop will be given a throw and by the momentum thus imparted to it will be accurately and quickly delivered into the drier. By this simple arrangement a very rapid and efficient delivery is obtained.

The details of construction for using the invention are illustrated in the accompanying drawing, in which the figure is an elevation illustrating enough of the parts of an envelop-machine to show how my invention works.

Referring to the drawing and in detail, A denotes the table of the envelop-machine, which is provided with a suitable opening G.

B designates the folding-box bed, which may have the usual square frame or ring thereon, which may be adjusted so that the envelops may be folded to form what are known as "halves" or "quarters"—that is, half-thousands or quarter-thousands to a box. Extending down from the box-bed are lugs O', which are journaled or fitted on a shaft B', which is fixed in the frame of the machine. Extending from one of the lugs O' is an arm B². By this construction the box-bed and the arm B² substantially form a rocking lever, the face of which is the folding-surface.

The folding-box is formed by the usual folders, three of which are shown—namely, the front or seal-flap folder I, the pressure or back-flap folder J, and one of the two end-flap folders K. The folders act in turn in the ordinary way to fold the envelop on the bed.

The shaft B', which forms the axis of the folding-box bed, is arranged below the plane of the journals of the folders of the folding-box and within the vertical planes of two of the folders, as the seal-flap folder I and the back-flap folder J.

The arm B² is operatively connected to a cam C, secured on the rotating power-shaft C' of the machine by means of a two-part link D, carrying a roll D', bearing against the face of the cam C.

A spring E, attached at one end to the frame of the machine and at the other end to the link D, keeps the roll D' in engagement with the cam C and normally tends to throw the box-bed forward.

The cam C is made concentric for a greater portion of its face, so as to hold the box-bed in position in the folding-box, as shown in the drawing. The cam is also provided with an operative depression C³.

The link D consists of two parts, a part D², which comprises a rod and a yoke engaging the shaft C' and carrying the roll D', before referred to, and a part D³, which is connected to the arm B². The part D³ has two projections in which the rod of the part D² slides. A spring F is arranged on the rod between the lower projection and a collar secured on the rod D². By this arrangement the link is formed so as to have a spring-pressed motion or relief.

The box-bed B is provided with one or more (preferably two) ears O. Both the folders I and J are notched to receive the said ears. These notches are preferably formed or cut in the beads of the folders, which beads are used to crease the envelop during the folding operation.

A suitable drier is arranged in position to receive the envelops M as they are delivered. The form of drier that is preferred is what is known as a "chain-drier." This consists of a number of fingers, as L, which are arranged

on chains, which are drawn slowly around the usual pulleys, the space between the fingers forming envelop-receiving pockets. As the fingers turn at their upper position, as shown in the drawings, one of the pockets will open to receive the envelop.

The operation is as follows: After the envelop is properly folded on the box-bed B the folders will rise. The depression C³ of the cam then comes in operative position with the roll D'. This will allow the spring E to pull up on the link D and impart a quick oscillating movement to the box-bed. This oscillating or rocking movement will throw the box-bed so that its face will come into an inclined position, and the ears O, engaging the rear of the envelop, will throw the same with considerable momentum into the drier. This position of the box-bed is indicated in dotted lines K', and the position of the envelop just delivered is indicated by dotted lines N.

The spring-relief is provided in the link D, so that when the concentric portion of the cam returns the box-bed to its normal position to rest against the rear edge H of the opening G in the table, which thus forms a stop to limit the backward motion of the box-bed, the rod D² can have a slight additional downward movement on the spring F. This does away with accurate adjustment and causes the box-bed to rest on the back of the orifice G with a spring tension. In this way a device is provided which operates very rapidly and which delivers the envelops at great speed.

A further additional advantage is found by arranging the axis B' of the bed in the center line thereof, as this position, in connection with the relief provided by the spring F, will allow the bed to move forward slightly to center or adjust itself accurately to the pressure of the front and back folders during the folding operation.

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

1. In the folding-box of an envelop-machine, the combination of the box-bed journaled on an axis included within the planes of two of its opposite edges, perpendicular to the folding-surface thereof, and means for oscillating the bed on said axis, the forward motion acting to impart a momentum to the folded envelop to throw the same off of the folding-surface of the bed, and the backward motion acting to restore the bed to operative position in the folding-box, substantially as described.

2. In an envelop-machine, in combination with the folding mechanism, a folding-box bed mounted on the upper end of a rocking lever, the axis of said rocking lever being below the plane of the journals of the folding-box and within their vertical planes, and means whereby said lever is rocked, substantially as described.

3. In an envelop-machine, in combination with the folding mechanism, a folding-box bed mounted on the upper end of a rocking lever, and means whereby said lever is rocked, the axis of its oscillation being in the same vertical plane with the middle line of said bed, substantially as described.

4. In an envelop-machine, the folding mechanism above described consisting of a rocking lever and means whereby it is operated, said lever carrying on its upper end a folding-bed, upon one end of which are mounted ears, in combination with suitable folders, and means whereby they are oscillated, one or more of said folders being notched to receive said ears, substantially as described.

5. An envelop-folding box having an oscillating folding-bed, and provided with folders, said oscillating bed being supported on an axis lying in a vertical plane, passing through its longitudinal line, and being free to oscillate away from and toward its position in the folding-box about said axis, and having a spring-relief in its operating means, whereby it can move forward slightly to adjust itself to the pressure of the folders, substantially as described.

6. In an envelop-machine, an oscillating folding-bed, an axis lying in a vertical plane which passes through the middle longitudinal line of said bed on which the bed is supported and on which it is capable of oscillating, a fixed stop to limit the rocking motion of the bed as it is brought into its operative position, and means whereby said bed is oscillated on said axis, substantially as described.

7. In an envelop-machine, the combination of a folding-bed, an axis beneath the center of said bed on which the same is mounted, ears on said bed, a fixed stop, means for returning the said folding-bed against said stop, and means for imparting a quick rocking motion to said bed, whereby its surface is brought into an inclined plane, and a momentum is imparted to the envelop to deliver it from the inclined surface of the bed, substantially as described.

8. In an envelop-machine, the combination of an oscillating folding-bed, having its axis beneath the center of the bed, whereby the surface of the bed is substantially tangential

to its arc of oscillation, a fixed stop by which the movement of the bed is limited in one direction, and an actuating-cam operatively connected with said bed by intermediate mechanism comprising a two-part link and a spring applied between the parts of said link, whereby a yielding pressure is applied to said bed to hold it in operative position against said fixed stop, substantially as described.

9. In an envelop-machine, the combination of a folding-bed capable of oscillating about an axis beneath and in the vertical plane of the center of said bed, an actuating-cam and connections by which said bed is brought into its operative position for folding an envelop, a spring applied to rock said bed and carry its face into an inclined position, and a depression in said cam, whereby said spring is allowed to impart a movement to said bed to give a momentum to the folded envelop as it is delivered from the folding-bed, substantially as described.

10. In the folding-box of an envelop-machine, the combination of the box-bed, lugs projecting down therefrom, a fixed shaft arranged below the bed between the vertical planes of two of its opposite edges on which said ears are journaled, and means for oscillating the bed on said shaft, substantially as described.

11. In the folding-box of an envelop-machine, the combination of a movable box-bed, a cam, a connection from said cam to oscillate the bed, and a spring-controlled relief in said connection, substantially as described.

12. In the folding-box of an envelop-machine, the combination of a movable box-bed, a cam, a connection from the cam to the box-bed made of two parts fitting into each other, a spring arranged between these two parts, a roll on said connection bearing on the cam, and a spring arranged between the connection and the frame of the machine, substantially as described.

Dated this 27th day of February, 1899.

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Witnesses:

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