(No Model.) 3 Sheets—Sheet 1.

J. BALL.

ENVELOPE MACHINE.

No. 263,838. Patented Sept. 5, 1882.

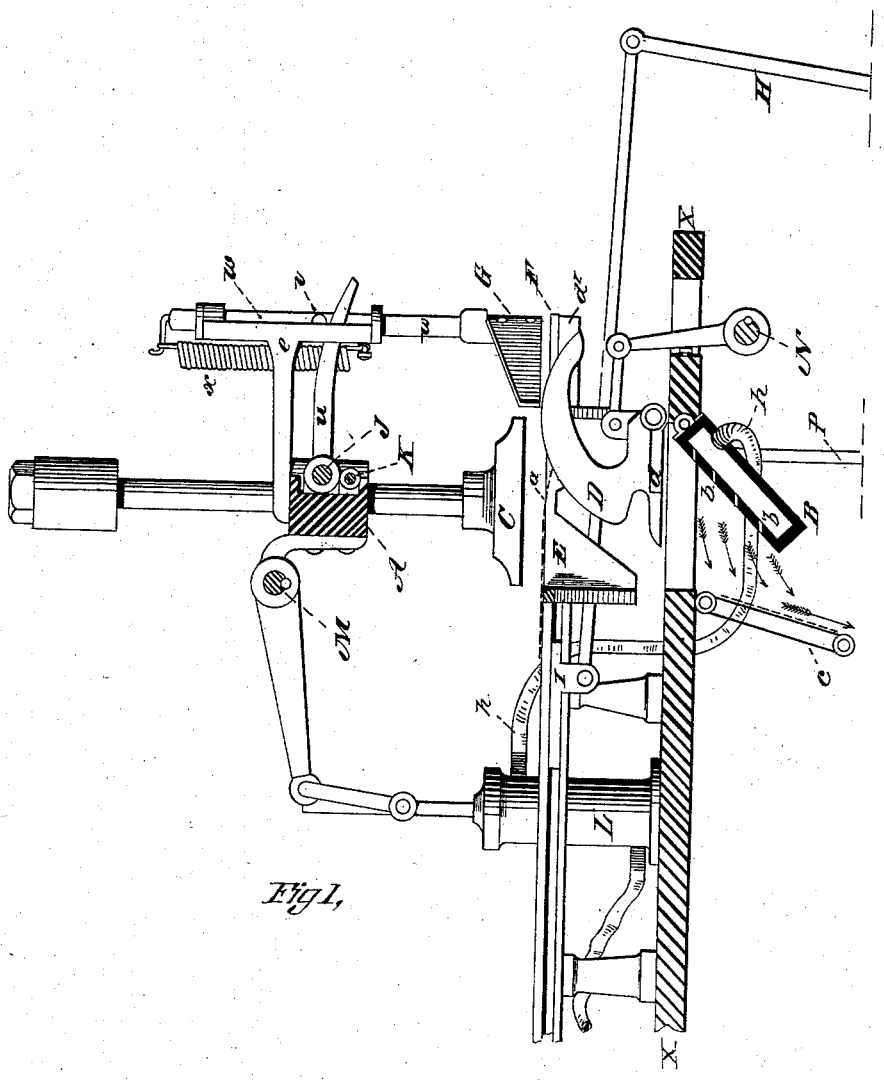

Fig 1,

Witnesses,
M. L. Buck
Wm. Hobapin.

Inventor;
James Ball,
by R. F. Hyde,
Atty;

(No. Model.)

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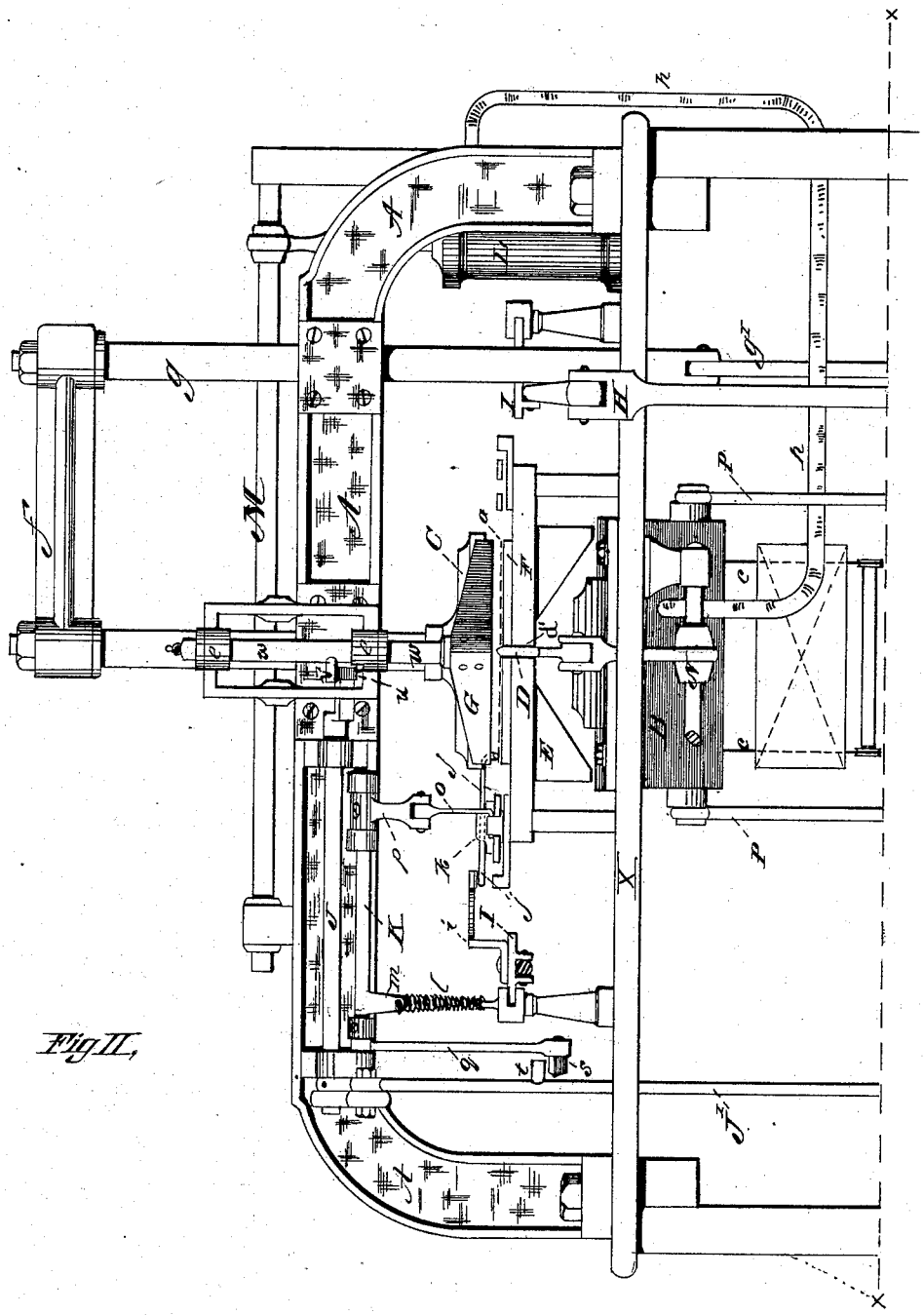

Fig. II.

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Wm. H. Chapin

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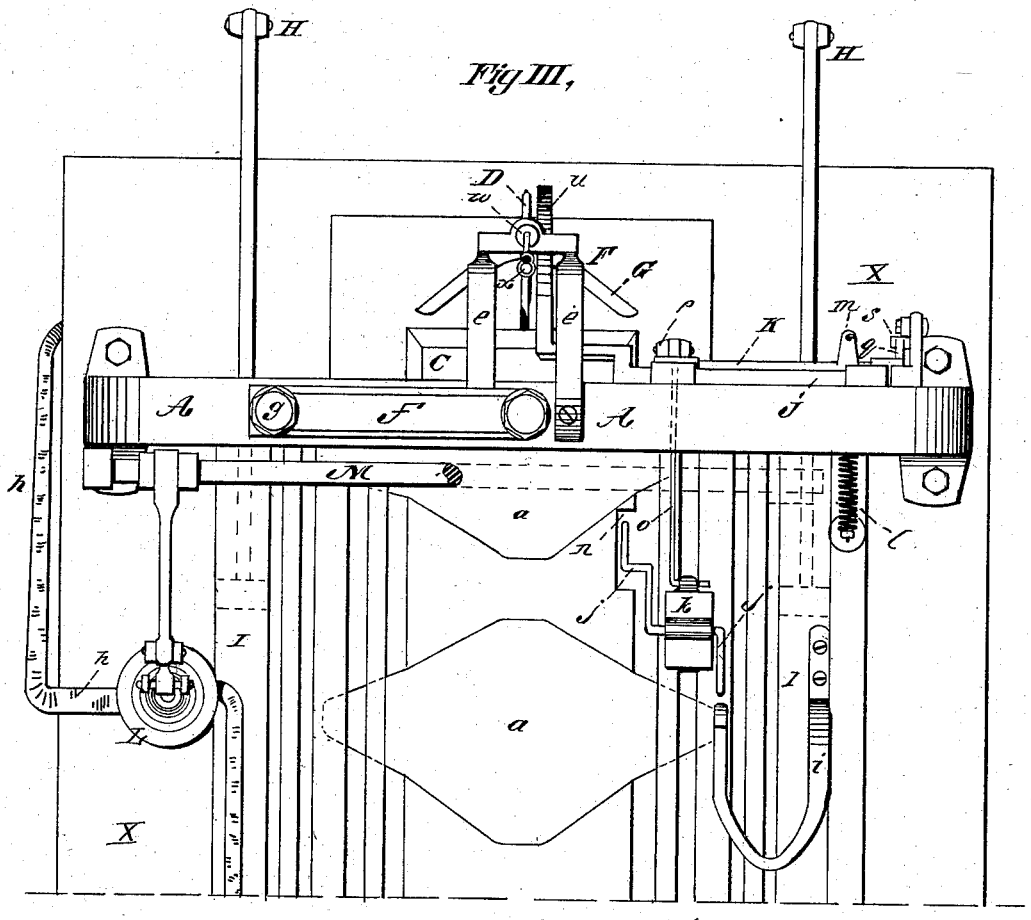
(No Model.) 3 Sheets—Sheet 3.

J. BALL.

ENVELOPE MACHINE.

No. 263,838. Patented Sept. 5, 1882.

Fig III,



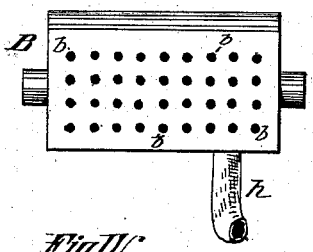


Fig IV,

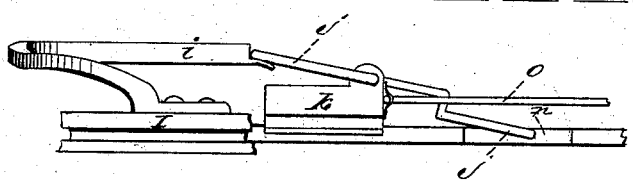


Fig V,

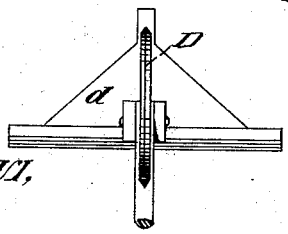


Fig VI,

Witnesses
M. C. Buck
Wm. H. Chapin

Inventor,
James Ball,
by R. F. Hyde,
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UNITED STATES PATENT OFFICE.

JAMES BALL, OF HOLYOKE, MASSACHUSETTS.

ENVELOPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 263,838, dated September 5, 1882.

Application filed May 2, 1882. (No model.)

To all whom it may concern:

Be it known that I, JAMES BALL, a citizen of the United States, residing at Holyoke, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Envelope-Machines, of which the following is a specification.

This invention relates to improvements in that class of envelope-machines in which the blanks previously cut and placed in position upon one end of the machine are gummed upon one flap and moved to the other end of the machine to be consecutively gummed upon another flap, folded, and delivered completed envelopes; and the first part of my improvements relates to mechanism having for its object the guiding of the moving blank to the exact position to be acted on by both the gummer and plunger and die for bending the flaps. The second part relates to the construction of the gummer bed-plate, and to automatic mechanism connected with the gummer and track over which the blanks pass to the gummer, whereby a level seat, always free from gum, is provided for the under side of the flap of the blank in process of being gummed; and the third part relates to pneumatic mechanism for automatically retaining and actively delivering the envelope from its bed beneath the folding-wings.

In the drawings, Figure I is a side elevation, in partial section, of so much of an envelope-machine as is necessary to assist in illustrating my invention. Fig. II is an end elevation of part of a machine containing my improvements. Fig. III is a partial plan view of a machine having my improvements; and Figs. IV, V, and VI are enlarged detail views of parts of the same.

As the application of my improvements to an envelope-machine involves no change in the well-known mechanism operating upon the blank until on its way to the "second gummer," nor to the operating cam-shaft with its cams, these parts are omitted in the drawings, and it will be understood that the connections shown to the movable parts convey the motion from the shaft and cams in ordinary use.

D is a guide secured to the hinged folding-wing *d*, and formed into an upper curved surface, as seen in profile, Fig. I. The guide is formed of a thin plate, to swing through a vertical opening, *d'*, in the gummer bed-plate F and wall of die E. The curved edge of guide D is formed to be always above the plane of the edges of the die E as it swings with the wing *d* upon its hinge. As shown in Fig. I, the guide D is about to commence its upward swing at the time when the blank *a*, fed by the slide I, has one flap over the hollow die E, and in position to be liable to catch against the edge of the die on its way to the gummer G were it not lifted; but the curved surface of the guide, moving at no less speed than the blank *a*, comes beneath the flap, and, extending above the edge of the die, bears all portions of the flap clear of the edge of the die, and, in swinging out through opening *d'* to leave the die clear for the plunger C, leaves the blank in proper position to be operated upon both by gummer and plunger.

In the drawings, N indicates the rock-shaft, operating folding-wing *d* and guide D.

The gummer G, having its stem *w* supported in bearings *e* from the beam A, is lifted by the movement of finger *u* beneath projection *v* on its stem *w*, and is lifted against spring *x*, arranged to connect stem *w* and part *e*, as seen in Fig. I. The finger *u* swings with rock-shaft J. The rock-shaft J, having bearings in the frame or beam A, is rocked by the arm J', which, having a yoke upon one end to rest upon a cam on the cam-shaft of the machine, is lifted by said cam and allowed to follow upon the cam in falling by gravity or by its weight, assisted by the spring-actuated gummer G. A gummer so constructed and operated is old, and heretofore the regular rise and fall of the gummer has had no reference to the presence or absence of the blank beneath it, so that to prevent the gummer from depositing gum upon its bed-plate in the absence of the blank it was necessary to cut a recess in the bed-plate, into which the gummer passed when no blank interposed, and said recess left practically no bearing beneath the gummer; but by mechanism as follows, for arresting the gummer before coming in contact with its bare bed, I am able to construct a bed to present a plane

surface conforming to the envelope-flap and bottom of the gummer, by means of which a perfect distribution of gum may be effected.

Resting upon ways above the bed, on which the blank moves, is the slide *k*, affording hinges for lever *j* and connection *o*. The lever *j* consists of two arms, one on each side of slide *k*, and turns freely in its hinge upon the slide. One arm is heavier, to cause its end to fall below the surface of the feed-bed through slot *n* therein. The connection *o* unites the slide *k*, through arm *p*, with shaft K, hung in bearings to the frame A. The shaft K is provided with an arm, *q*, having thereon the block *s*, and with an arm, *m*, connected by a spring, *l*, to the bed of the machine or suitable point of attachment therefrom, as shown in Figs. I and II.

Cam-rod J′ is provided with a pin, *t*, in position to rest upon block *s* when they are in the same vertical line.

Upon the feed-slide I is secured an arm, *i*, of configuration substantially as shown, to come in contact with the near end of lever *j* when said end shall lie in the plane of its movement. The ends of arm *i* and lever *j* are so relatively arranged that the depression of one end of lever *j* in slot *n* of the bed raises its other, to be caught by moving arm *i*. The lever *j* is made light enough to be swung up by the edge of the moving blank *a*.

In operation, the blank, as it moves to the die, passes under the end of lever *j*, to, by raising it at this end, depress the other below the arm *i*, and thus leave the position of slide *k* unaffected by the arm *i*, and to leave the gummer free to descend upon the blank beneath it. When, however, no blank fills the space belonging to it in the moving series, the longer arm of lever *j* is permitted to fall into slot *n* to raise the other, to be caught by the arm *i*, moving with the feed-slide I, as shown in Fig. V. The arm *i* carries the slide *k* with it, and through rod *o* and arm *p* rocks the shaft K to swing arm *g* thereon, to bring the block *s* beneath projection *t* on cam-lifting rod J′. The rod J′ is thus held from falling and the finger *u* from releasing the gummer, which is thus prevented from descending upon an empty bed-plate. With the reverse reciprocation of arm *i* the spring *l* rocks the shaft K to restore the slide *k* to its first position.

In Fig. II the dotted line *a* indicates the blank lifting one end of lever *j* to depress the other free of arm *i*.

It has heretofore been common to use a single-acting air-pump to deliver blanks, one at a time, from a pile at one end of the machine to be fed to the other. From a pump, L, operated for such purpose by a crank arm on shaft M is brought a tube, *h*, to connect with a hollow folding-bed, B, to communicate with its interior.

The face of the bed B fulfills the purpose, common to folding-beds of envelope-machines, of seating the blank under the folding-wings and of swinging down to let the envelope slide into the fingers of the drier or other mechanism for delivering it; but by forming a hollow bed, as shown in section, Fig. I, and perforating its face, as at *b*, Fig. IV, and connecting its interior with the double-acting pump L, as shown, pneumatic action is utilized to, by an exhaust when the bed is closed, firmly hold the blank in position on the bed under the operation of the folding-wings, and still further hold it as the bed swings down, until the reverse stroke of the pump, by a current of air behind the envelope, positively conveys it to suitable delivery mechanism.

Figs. I and II show endless moving cords *c c*, arranged as a carrier to catch the envelope blown from the bed B. The air-passages *b* are arranged at the proper angle to the face of the bed to cause the outward current of air to have the proper direction relative to the carrier-cord *c*, and for that purpose I prefer to make the face wall of the folder thick enough to give direction to said passages.

The tube *h* is provided with a flexible joint to permit the bed B to swing.

P P are connections for giving motion to the bed.

The plunger C is shown operated by arms *g g′* through cross-head *f*, and, as is also common, the feed-slide I is reciprocated by the crank-arms H.

X is the bed-plate of the machine.

Now, having described my invention, what I claim is—

1. In an envelope-machine, the combination, with die E, of the hinged guide D, having a curved edge arranged to move toward and extend above one edge of the die as the guide swings, substantially as and for the purpose set forth.

2. In an envelope-machine, the automatic mechanism, substantially as described, and brought into operation by the absence of the blank *a*, for arresting the descent of the gummer G, consisting of a lever, *j*, suspended above the bed of the machine in the track of the blank, and movable by gravity, to have one end intersect the surface, to thereby be brought into operative connection with the feed-slide I and be moved by it to, through intermediate mechanism, hold the gummer from its bed.

3. The combination of slide *k*, lever *j*, arm *i*, rod *o*, rock-shaft K, with arms *p*, *q*, and *m*, block *s*, and spring *l*, rock-shaft J, with finger *u* and stop *t* on rod J′, and gummer G, having stop *v* upon its stem, all arranged substantially as shown, and to operate for the purpose as set forth.

4. In an envelope-machine, the combination, with the gummer G and with mechanism, substantially as shown, for arresting its descent upon its bed, of the bed-plate F, formed to present a solid plane surface beneath the gummer, for the purpose as set forth.

5. In an envelope-machine, the combination of double-acting air-pump L, flexible connection *h*, and swinging hollow bed-plate B, provided with perforations *b*, all arranged substantially as shown and described, and operating to alternately positively hold the envelope to the face of the bed and actively deliver it therefrom.

6. The combination, with folding-bed B, constructed and operating as set forth, of the endless moving cords *c c*, arranged to catch and deliver the envelope blown from the folding-bed, substantially as shown and described.

JAMES BALL.

Witnesses:
R. F. HYDE,
M. C. BUCK.