

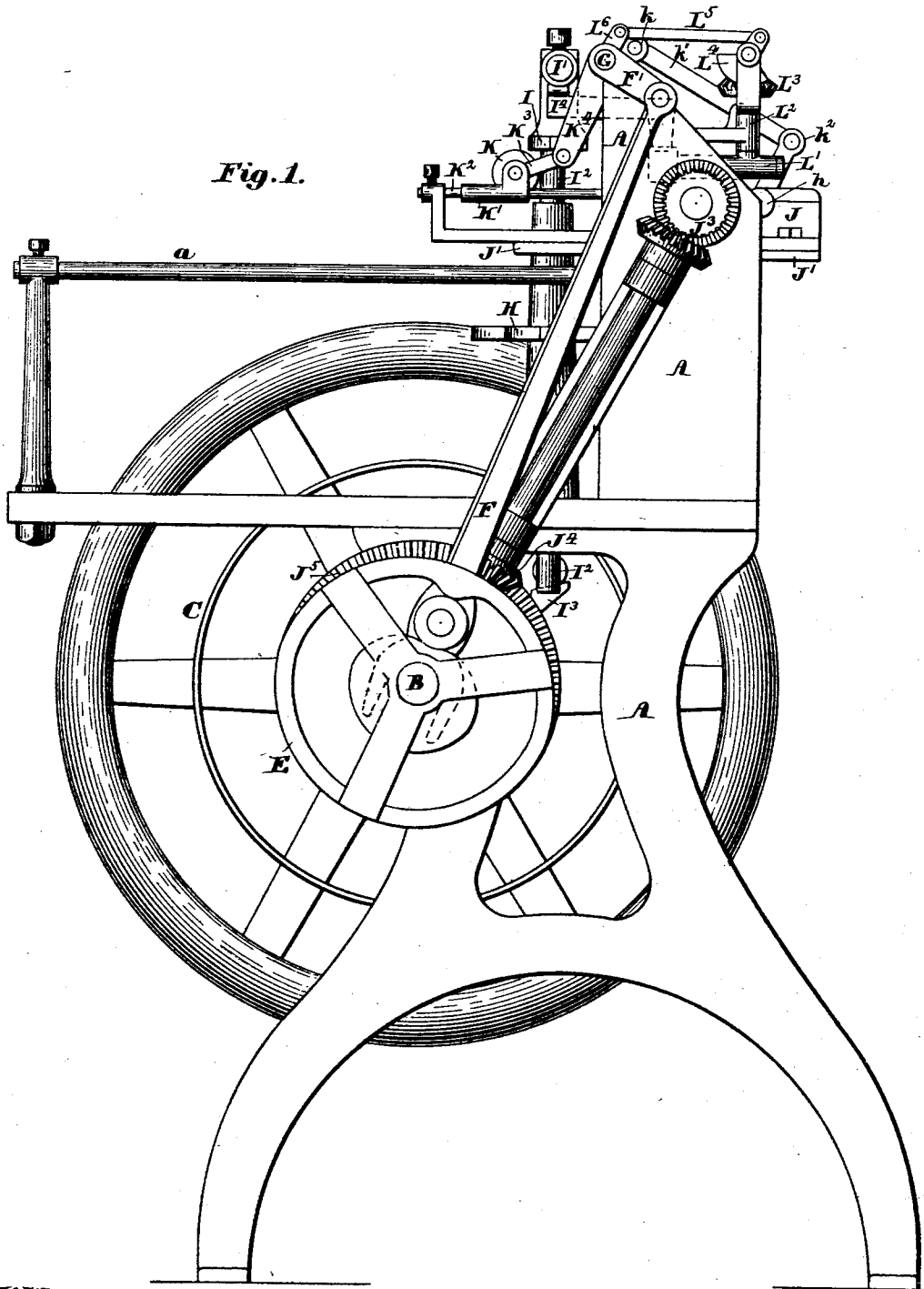
(No Model.)

2 Sheets—Sheet 1.

H. D. & D. W. SWIFT.
ENVELOPE MACHINE.

No. 520,147.

Patented May 22, 1894.



Witnesses:
Rufus B. Fowler,
Alfred C. Whiting.

Inventors:
Henry D. Swift
Daniel Wheeler Swift—

(No Model.)

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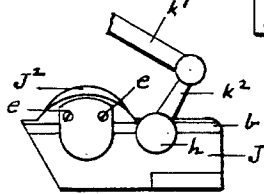
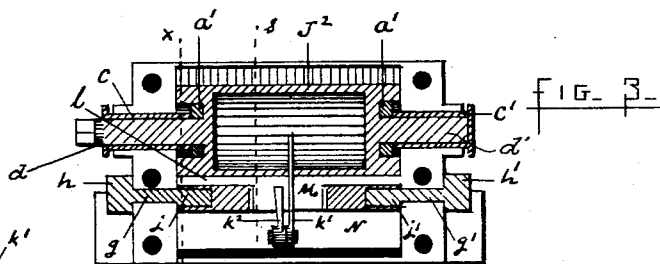
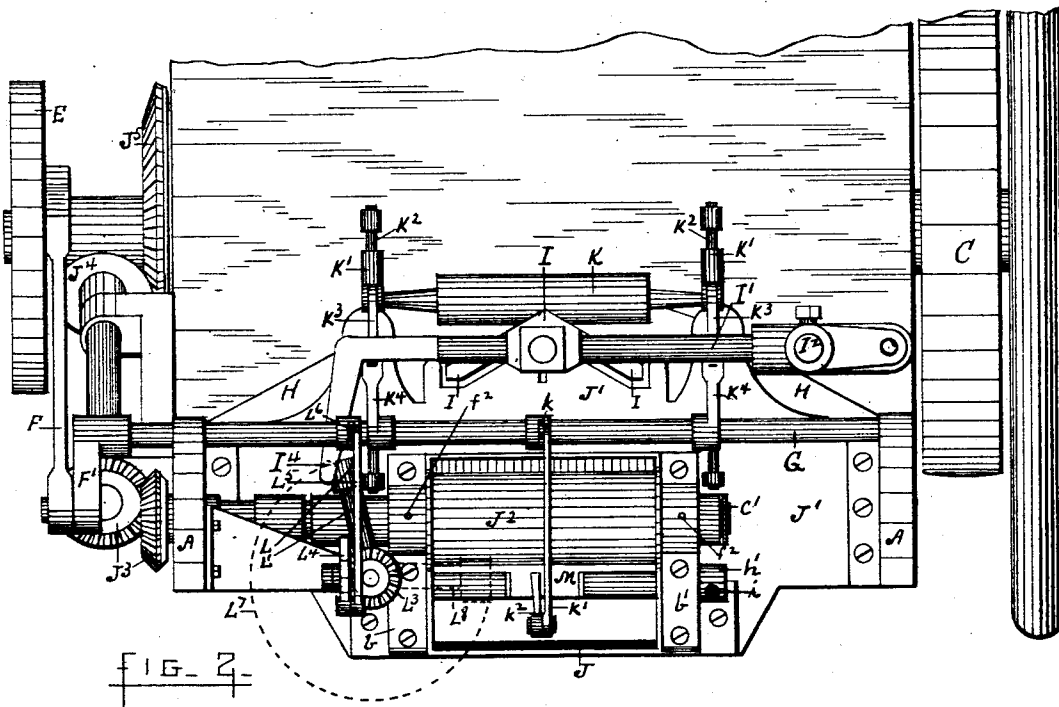


FIG. 4-

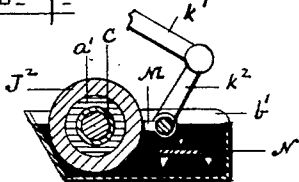


FIG. 5-

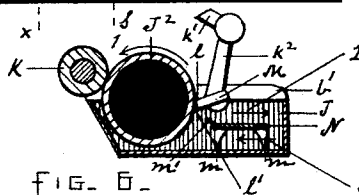


FIG. 6-

FIG. 7-

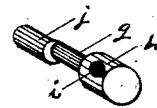


FIG. 8-

Witnesses.

John V. Bingham
Refus Bennett Fowler,

Inventors.

Henry D. Swift
D. Wheeler Swift

UNITED STATES PATENT OFFICE.

HENRY D. SWIFT AND DANIEL WHEELER SWIFT, OF WORCESTER, MASSACHUSETTS, ASSIGNORS, BY MESNE ASSIGNMENTS, TO THE LOGAN, SWIFT & BRIGHAM ENVELOPE COMPANY, OF SAME PLACE.

ENVELOPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 520,147, dated May 22, 1894.

Application filed December 2, 1885. Serial No. 184,455. (No model.)

To all whom it may concern:

Be it known that we, HENRY D. SWIFT and DANIEL WHEELER SWIFT, citizens of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Envelope-Machines, of which the following is a specification, containing a full, clear, and exact description of the same, accompanied by drawings representing those portions of an envelope-machine which embody our invention, and in which—

Figure 1 is a side elevation of an envelope machine with those operating parts employed in the operation of folding the envelope omitted. Fig. 2 is a plan view of the same. Fig. 3 is a plan view of the gum-box shown partly in section. Fig. 4 is an end view of the same. Fig. 5 is a sectional view of the gum box on line X X Fig. 3. Fig. 6 is a sectional view of the same on line S. S. Fig. 3. Fig. 7 is a detached view of the sleeve inclosing the journals of the gum box roll and Fig. 8 is a detached view of one of the eccentric pins on which the "doctor" oscillates.

Similar letters refer to similar parts in the several views.

Our invention relates to that portion of an envelope machine concerned in the operation of gumming and in the accompanying drawings only those parts of the machine are shown, and our invention consists in an auxiliary gumming roll for gumming the "side-flap" whereby we are enabled to employ gum of greater thickness than can be used with a sponge or other porous substance such as is commonly used for that purpose; and in devices for operating said auxiliary gumming roll so it can be used in connection with the main gum box and our invention also consists in certain improvements in the gum box as hereinafter described and specifically set forth in the claims, and which have for their objects, first to securely pack the journals of the gum box roll so as to more effectually prevent the escape of the gum; second to secure a uniform flow of gum freed from grit or dirt over the gum box roll; third to adjust the "doctor" so as to regulate the flow of gum,

and fourth to prevent the "coating over" of the gum by its continued exposure to the air.

A denotes the frame of the machine. B the central driving shaft, to which power is applied by means of the belt pulley C.

E is a cam on the shaft B imparting through a connecting rod F and arm F' an oscillating motion to the rock-shaft G journaled in bearings at the top of the frame.

H is a table upon which the pile of "blanks" are placed.

I is the "pick-up" carried by the rod I' which is attached to the vertically reciprocating spindle I² which rests upon a lever I³ vibrated by a cam on the main shaft and not shown in the drawings.

J is the gum box held on the table J' and containing the gum box roll J² having a continuous rotary motion imparted through the miter gears J³, gear J⁴ and the gear J⁵ on the main shaft B. A gumming roll K is journaled in bearings in the sleeves K' K' which are slid along the rods K² K² by links K³ and arms K⁴ which are attached to the rock-shaft G carrying the roll K back and forth from contact with the gum box roll J², as shown in Fig. 6, to the position shown in Figs. 1 and 2 passing beneath, and in contact with, the under surface of the "pick-up" I when at its highest elevation as seen in Fig. 1. A side "pick-up" I⁴ extends from the "pick-up" I in position to strike and gum the overlapping "side-flap" of the envelope and the side "pick-up" I⁴ is gummed, in our improved machine, by the auxiliary gumming roll L attached to a spindle rotating in a sleeve L' which is attached to a vertical spindle rotating in the bearing L² and having the beveled pinion L³ meshing with the geared sector L⁴ to which an oscillating motion is imparted through the connecting rod L⁵ attached to an arm L⁶ on the rock shaft G, giving a vibratory motion to the gumming roll L as indicated by the broken curved line L⁷, Fig. 2, and carrying the roll L from its position, as shown in Figs. 1 and 2, to the position in contact with the gum box roll J², as shown by broken lines L⁸ in Fig. 2. When the under surfaces of the "pick-ups" I and I⁴ have been gummed by

the contact of the gumming rolls K and L they are brought in contact with the upper blank of a pile of blanks held upon the table H; the "pick-up" I gumming the "back-flap" and the "pick-up" I⁴ the overlapping "side-flap." At the next upward motion of the "pick-ups" the adhesion of the upper blank causes it to be raised from the pile in suitable position to be taken and carried to the folding mechanism by a reciprocating carriage sliding on the bars *a* Fig. 1.

The action of the "pick-up" is well known it being common in machines of this class and inasmuch as our present invention relates only to those parts of the machine immediately concerned in gumming the "pick-ups," the mechanism by which they are actuated and the carriage by which the gummed blank is taken from the "pick-ups" and carried to the folding mechanism is entirely omitted from our drawings and specification. While the "pick-ups" have been carried downward in contact with the pile of "blanks" and returned again to the position shown in Figs. 1 and 2 the gumming rolls K and L are both in contact with, and rotated by, the friction of the continuously rotating gum box roll J² whose lower portion is immersed in the gum solution contained in the gum box J. The ends of the gum box roll J² are recessed and have annular disks *a' a'*, of leather or some semi-elastic material. Held in the sides of the gum box and secured by the caps *b b'* are sleeves *c c'* which inclose the journals *d d'* of the gum box roll J². The inner ends of the sleeves *c c'* are firmly pressed against the annular disks *a a'* by screws *e e* entering the caps *b b'* thereby packing the journals of the gum box roll J² and preventing the admission of the gum to the bearings. Sleeve *c'* is closed at its outer end and both sleeves have oil holes *f* Fig. 7 connected by a channel *f'* in the outer surface of the sleeve directly beneath the oil holes *f*² in the caps *b b'* Fig. 2. In the sides of the gum box J and held from turning by the caps *b b'* are pins *g g'* having the outer heads *h h'* with holes *i* to receive a pin or lever to enable the pins *g g'* to be turned when desired. The portion of the pin *j j'* inside of the gum box is eccentric to the portion *g g'* and forms the bearings for an oscillating blade or "doctor" M actuated by the "rock-shaft" G through an arm *k* and a connecting rod *k'* attached to an arm *k*² on the blade M. The edge *l* of the blade M, contiguous to the gum box roll J², is preferably made concentric with its axis of oscillation and may be carried toward or away from the gum box roll J² by the rotation of the eccentric bearings *j j'*, which are securely held in any desired position by the caps *b b'*, which inclose the portions *g g'* and form a gum tight joint; thereby regulating the flow of gum over the surface of the roll J². As the blade or "doctor" M is oscillated by the rock shaft G it will remain at rest and in the position shown in Fig. 6 during the period that the gumming

rolls K and L are in contact with, and taking gum from, the gum box roll J²; the edge *l* of the blade or "doctor" M then acting as a stationary "scraper" allowing a quantity of gum to follow the revolving surface of the roll J² around to the gumming rolls K and L, depending upon the distance between the edge *l* and the roll J². All coarser particles of dirt, grit, &c., being held back will accumulate in the angle *l'* between the edge *l* and the gum box roll J². Simultaneously with the motion of the gumming rolls K and L forward to gum the "pick-ups" the blade or "doctor" M is oscillated and brought into the position shown in Fig. 5; the curved surface at *l* moving past the surface of the roll J², and in the same direction with it, and carrying the accumulated dirt and grit past the blade M, allowing it to pass over the roll J² and become mixed again with the gum in the gum-box J. The roll J² rotates in the direction of the arrow 1, Fig. 6, the side passing out of the gum slightly raising the adjacent gum by its adhesion. We place a plate N supported on legs *m m* midway above the bottom of the gum box with a space at its front and rear edges between it and the roll J² and the front of the gum box. The gum raised by the rotation of the roll J² above the level of the gum in the box will flow out over the top of the plate N toward the front of the box J in the direction of the arrow 2 and passing down between the edge of the plate N and the front of the box, return toward the roll J² beneath the plate N in the direction of the arrow 3; thus producing a constant current of gum around the plate N and preventing the "coating over" of the gum by its continued contact with the air. We prefer to turn the edge *m'* of the plate N next the roll J² upward as increasing its efficiency in maintaining an active current of gum; but the essential feature of our invention consists in the use of a plate as hereinbefore described for the purpose of securing a movement of the gum in the gum box.

The construction and action of the blade or "doctor" M have been described as an oscillating blade whose edge *l* is concentric with its axis of oscillation; such a construction and operation are in many respects preferable as the intermittent, oscillatory motion is easily imparted and made synchronous with the movement of the gumming rolls toward and away from the roll J² by means of their common connection with the rock shaft G. The position of the "doctor" blade M, relatively to the roll J², is also very conveniently adjusted by means of the eccentric pins forming the bearings of the blade; but it should be observed that the distinguishing features of our improved "doctor" blade consists; first, in its action as a "scraper" over the surface of the gum box roll while the gumming rolls are in contact with it; and second, the motion of its edge *l* in the same direction as the contiguous side of the gum

box roll, when the gumming roll moves away from the gum box roll, allowing the dirt accumulated beneath the "doctor" blade to escape; and it will be readily seen that a vertical reciprocating motion of the "doctor" blade would accomplish the same purpose and clearly come within the scope of our invention.

The essential feature of this part of our invention consists in the employment of a blade whose edge is alternately brought near the gum box roll in order to check the flow of gum, during the period in which the gumming roll is in contact with and taking gum from the gum box roll, and removed during the period of non-contact of the gumming roll with the gum box roll, in order to allow any extraneous matter in the gum to pass the blade. Likewise it should be observed with reference to that portion of our invention relating to the gumming of the side "pick-up" I^4 that such gumming is necessary in what are known as "high cut" envelopes and has long been in use but such gumming has usually been accomplished by passing a box carrying a sponge, or other porous material, holding a solution of gum, beneath the side "pick-up," and bringing the saturated sponge in contact with the under side of the "pick-up;" but the exposure of the gum to the air soon causes it to thicken and renders necessary the frequent cleansing of the sponge and renewal of the gum. We employ, instead, an auxiliary gumming roll, and it will be readily seen that an auxiliary gum box may be used placed directly in front of the side "pick-up" or the main gum box may be lengthened and the auxiliary roll moved back and forth in a right line, similar to the gumming roll K, as described, but we prefer the construction shown and described herein as it enables us to accomplish the gumming of both the back and side flap without enlarging the gum box or employing an additional box.

A great variety of devices have been adopted to effect the proper gumming of the side flap; that of a sponge box herein referred to being the one in most general use, none, however, having to our knowledge employed an auxiliary gumming roll, working independently of that employed to gum the back flap.

We do not confine our invention to the specific construction and operation of the auxiliary roll.

What we do claim as our present invention, and desire to secure by Letters Patent, is—

1. In the gumming mechanism of an envelope machine, the combination with "pick-ups" arranged to gum separate portions of the envelope blank, a gum box containing a solution of gum, and a roll partially immersed in said solution of a series of separate and independent gumming rolls, each gumming roll receiving gum in common from said gum box roll and gumming a separate "pick-up" together with connected mechanism for actuating said gumming rolls in correspondence

with the movements of the "pick-ups," as described and for the purpose set forth.

2. In the gumming mechanism of an envelope machine, the combination with a pick-up for gumming the side flap of an envelope blank, of a vertical spindle, a radial arm attached to said spindle, a roll running loosely on the end of said radial arm, a gumming roll partially immersed in a gum solution, and connected operating mechanism, whereby said spindle is rocked back and forth carrying said roll, in an arc of a circle against said gumming roll, and over the face of said side flap pick up, substantially as described.

3. In the gumming mechanism of an envelope machine the combination of a gum box containing a solution of gum and having a revolving gum box roll immersed in the gum solution; a "pick-up" for gumming the "side-flap" of the envelope blank, a gumming roll for carrying gum to the "pick-up," said gumming roll being vibrated by an arm on a vertical spindle having a bevel gear and an oscillating sector meshing with said bevel gear, together with mechanism for actuating said oscillating sector, as described and for the purpose set forth.

4. The combination with the gum box J having a roll J^2 and the "pick-up" I^4 for gumming the "side-flap" of the envelope blank, of the gumming roll L sleeve L' attached to a vertical spindle with means for oscillating said spindle and vibrating the sleeve L' , as described and for the purpose set forth.

5. The combination with the gum-box of an envelope machine, of a gum-box roll provided with annular recesses in its ends and sleeves held by said gum-box and inclosing the journals of said gum-box roll, the ends of said sleeves entering said annular recesses, substantially as described.

6. The combination with the gum-box of an envelope machine, of a gum-box roll provided with annular recesses in its ends, annular semi-elastic washers held in said recesses and sleeves held by said gum-box and inclosing the journals of said gum-box roll, said sleeves having their inner ends held against said washers, substantially as described.

7. The combination with the gum box of an envelope machine, and with a gum box roll contained therein and partially immersed in the gum solution, and gumming rolls for taking gum from the gum box roll and carrying it to the "pick-ups," of a "doctor" consisting of a bar, or blade, held stationary a determinate distance from said gum box roll while the gumming rolls are in contact therewith, and moved so as to allow an increased flow of gum when the gumming rolls are moved away from the gum box roll, together with connected mechanism for actuating the same, as described and for the purpose set forth.

8. The combination with the gum box roll of an envelope machine, of a "doctor" consisting of an oscillating blade pivoted at its

ends to the sides of the gum box, one edge of said blade vibrating past the side of the gum box roll and having an alternating period of rest or "dwell" while the gum box roll is delivering gum to the gumming rolls, as described and for the purpose set forth.

9. The combination with the gum box roll of an envelope machine, of a "doctor" consisting of an oscillating blade rocking on pins firmly held in the sides of the gum box and entering the ends of said blade and actuating mechanism, substantially as described, attached to the oscillating blade between its ends, as described and for the purpose set forth.

10. The combination with the gum box roll of an envelope machine, of an oscillating blade or "doctor" rocking on pins held in the sides of the gum box said pins forming the bearings of said blade and held eccentrically in the sides of the gum box, whereby the distance between the gum box roll and the oscillating blade, or "doctor," may be varied to regulate the flow of gum to the gumming rolls, as described and for the purpose set forth.

11. The combination with the gum box roll of an envelope machine, and a gumming roll having a reciprocating motion to and from the gum box roll and a rocking shaft connected with and reciprocating said gumming roll, of an oscillating blade or "doctor" for regulating the flow of gum to the gumming roll, said oscillating blade being connected with, and actuated by, said rocking shaft, whereby a synchronous movement of the gumming roll and oscillating blade is secured, as described and for the purpose set forth.

12. The combination with the gum box roll J^2 , of an oscillating blade or "doctor" M, eccentric pins $j j'$, arm k^2 , connecting rod k' , and rock shaft G, all arranged and operating, as described and for the purpose set forth.

13. The combination with the gum box of an envelope machine having a revolving roll partially immersed in the gum solution contained in the gum box, of a plate, or partition, submerged in said gum and parallel with the bottom of the gum box with a space at each side of said plate allowing the gum to pass, and an oscillating blade placed over said plate or partition whereby the surplus gum is thrown back upon the upper side of said plate or partition all arranged, as described, whereby a current is maintained in the gum by the rotation of the gum box roll, as and for the purpose set forth.

14. The combination with the gum box of an envelope machine having a revolving roll partially immersed in the gum solution contained in the gum box, of a plate, or partition, submerged in said gum and parallel with the bottom of the gum box with a space at each side of said plate to allow the gum to pass; the edge of said plate next the gum box roll being turned up, and an oscillating blade placed over said turned up edge of the plate or partition as described and for the purpose set forth.

HENRY D. SWIFT.
D. WHEELER SWIFT.

Witnesses:

RUFUS B. FOWLER,
JOHN S. BRIGHAM.