

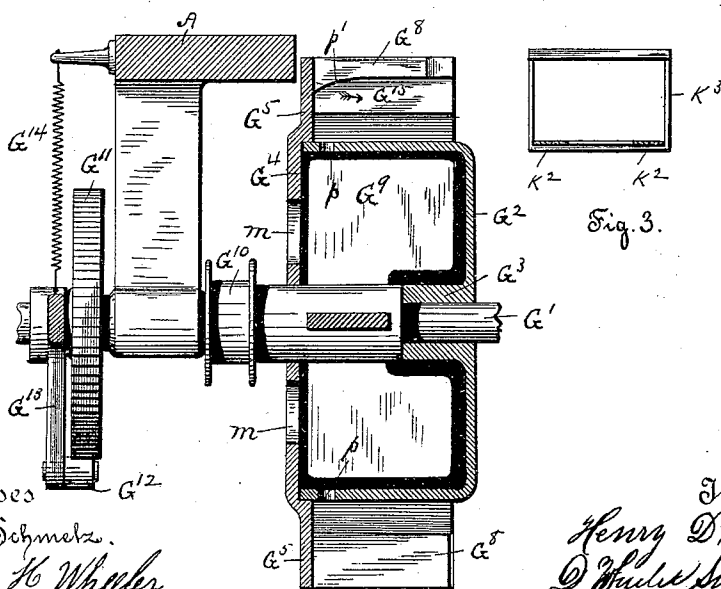
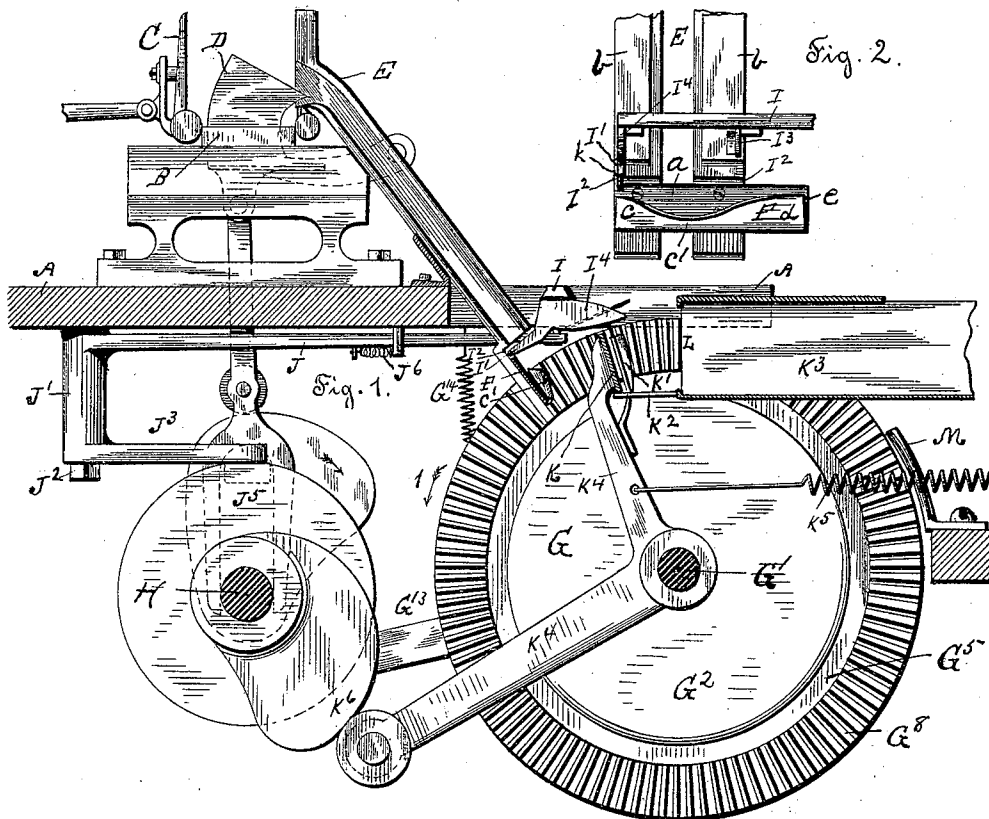
(No Model.)

2 Sheets—Sheet 1.

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

No. 466,122.

Patented Dec. 29, 1891.



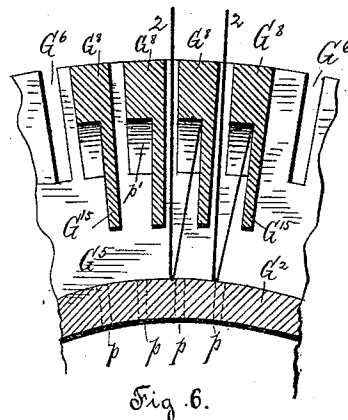
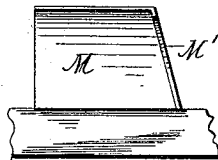
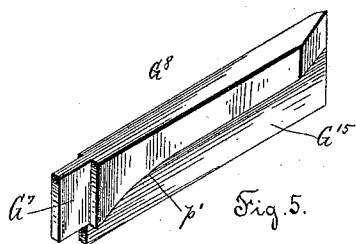
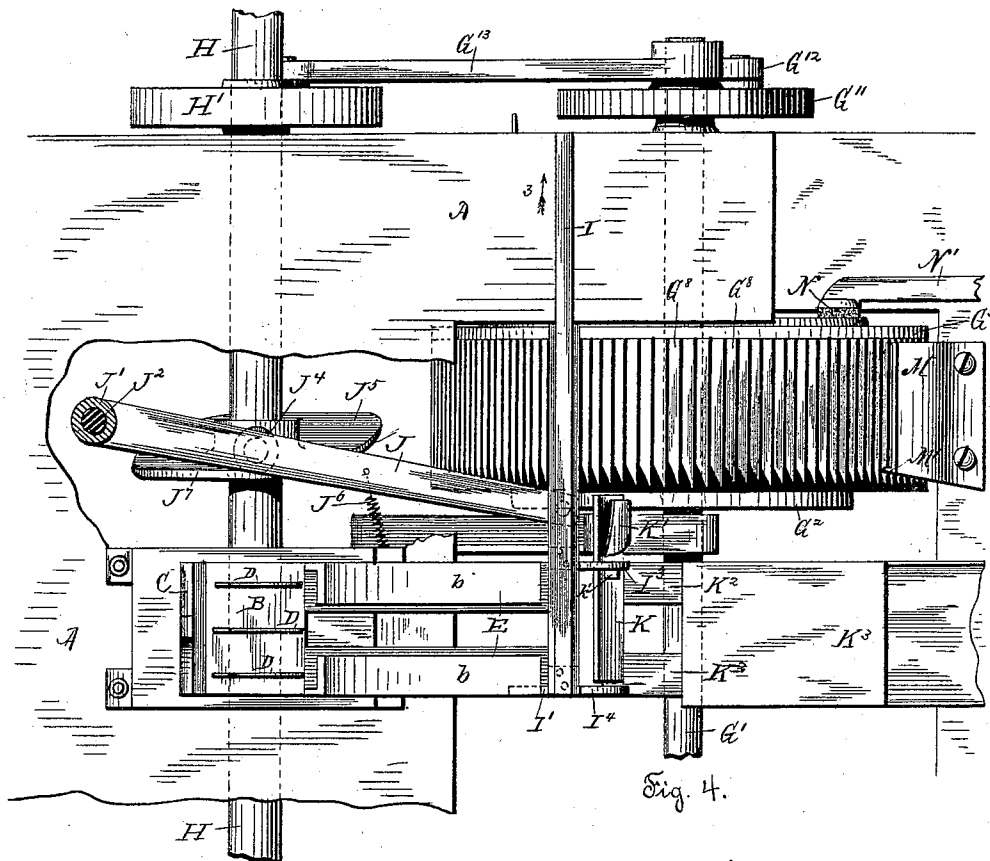
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

HENRY D. SWIFT AND DANIEL WHEELER SWIFT, OF WORCESTER, MASSACHUSETTS, ASSIGNORS OF ONE-HALF TO JAMES LOGAN AND JOHN S. BRIGHAM, OF SAME PLACE.

ENVELOPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 466,122, dated December 29, 1891.

Application filed August 15, 1887. Serial No. 246,935. (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, accompanied by drawings forming a part thereof and showing such portions of an envelope-machine as embody our invention.

Figure 1 of the drawings is a vertical sectional view of a portion of an envelope-machine representing that part known as the "drying mechanism," and showing the folding-table upon which the envelope is folded, a sectional view of the chute by which the envelope is conducted to the drier, a side view of the drier, a sectional view of the till in which the envelopes are bunched, and also the connected operating mechanism by which the envelopes are carried into the drier and from the drier into the till. Fig. 2 is a detached view of the pocket at the lower end of the chute. Fig. 3 is a vertical sectional view taken through the center of the drier. Fig. 4 is a top view of the parts shown in elevation in Fig. 1, a portion of the table being broken away to disclose the actuating-lever by which the envelopes are carried into and out of the drier. Fig. 5 is a perspective view of one of the drier-blades. Fig. 6 is a sectional view of a portion of the drier. Fig. 7 is a rear view of the guide-plate for determining the position of the envelopes in the drier, thereby securing the alignment of the envelopes with the mechanism by which they are withdrawn from the drier.

Similar letters and figures refer to like parts in the several figures.

Our invention relates to that part of an envelope-machine concerned in the operation of drying the gummed surface of the seal-flap, known as the "drying mechanism;" and it consists in the construction of the drier itself, in its arrangement relatively to the folding and bunching mechanisms, and also in the connected operating mechanism by which the envelopes are conducted from the folding mechanism to the drier and thence to the

bunching mechanism, as hereinafter set forth, and specified in the annexed claims.

In the accompanying drawings only such portions of an envelope-machine are shown as embody our present invention. The other parts—to wit, the mechanism for presenting the blanks to the machine, for gumming the blanks, for folding the blanks and removing the folded envelope from the folding table or bed to make room for the next succeeding blank, and for counting the finished envelopes—may be of any known construction, and their arrangement or method of operation is immaterial for the purposes of our present invention.

Referring to the drawings, A A denote a stationary platform, known in envelope-machines as the "table," and which is usually supported upon legs, (not shown in the drawings,) and upon which is placed the rectangular plate B, forming the folding-bed, upon which the envelope-blank is folded by folding-leaves, as is usual in machines of this class. One such folding-leaf employed to fold the back flap of the envelope is shown at C, Figs. 1 and 4, in which is also shown the three-bladed fork D, upon whose upper edges the envelope is raised from the folding-bed B and held with its seal-flap foremost in alignment with the inclined chute E, into which it is pushed by a short forward motion of the back-flap-folding leaf C and through which the folded envelope is conveyed to the drying mechanism. This portion of the machine as just described forms no part of our present invention, the same having been described and claimed in an application for Letters Patent of the United States filed by us on the 2d day of April, 1887, Serial No. 233,640. Neither do we confine ourselves to the device for delivering the envelope from the table B, as partially shown in the accompanying drawings, nor to any other special device for that purpose. At the lower end of the chute E we place a pocket F, formed of a strip of sheet metal attached to the lower end of the chute and bent in the form shown in Fig. 2 and in central sectional view in Fig. 1. The back *a* of the pocket forms a plane surface fastened to the two ways *b b*, forming the chute E,

while the front of the pocket is a warped surface. The end *c* approaches the back with a narrow slit between to sustain the envelope in position to be engaged by the mechanism for carrying it into the drier. The central section of the front is bent forward at *c'* to allow room for the seal-flap of the envelope to fall unimpeded into the pocket. The end *d* of the pocket, like the end *c*, approaches the back *a*, forming a narrow slit *e*, through which the envelope is pushed into the drier, as hereinafter described.

The drier *G* is attached to a shaft *G'*, journaled in bearings supported by the framework of the machine and parallel with the main driving-shaft *H*, and consists of the cylindrical drum *G²*, attached by its hub *G³* to the shaft *G'*. The removable side *G⁴* of the drum is extended beyond the cylinder, forming a flange *G⁵*, which is provided with a series of mortises *G⁶* to receive the tenons *G⁷* of the blades *G⁸*. Within the drum *G²* is a rotating fan-wheel *G⁹*, turning loosely on the shaft *G'* and driven through a flanged belt-pulley *G¹⁰*, placed on the hub of the fan, which extends through the side *G⁴*. The fan can be made in any of the well-known forms. In the drawings it is represented as comprising radial blades extending from the hub or hollow sleeve turning loosely upon the shaft *G'*. Two of these blades are shown in elevation and a third in cross-sectional view in Fig. 3. To the shaft *G'* is attached the ratchet-wheel *G¹¹*, which is driven by a pawl *G¹²*, carried on the bell-crank lever *G¹³*. The lever *G¹³* is oscillated by the cam *H'* on the main shaft and the spring *G¹⁴*, by which an intermittent rotary motion in the direction of the arrow 1, Fig. 1, is imparted to the drier, carrying the annular row of teeth or blades *G⁸* past the end of the pocket *F* and successively bringing each of the spaces between the blades in alignment with the pocket *F* and opposite the slit *e*, so the folded envelope lying in the pocket may be transferred by an endwise movement from the pocket into the drier, the envelope sliding on the seal-flap edge along the bottom of the pocket and upon the outer cylindrical surface of the drum *G²*, the envelopes occupying the position shown at 2 2, Fig. 6, with their seal-flaps resting against the flanges *G¹⁵*, which depend from the lower edge of the blades *G⁸*. As the drier rotates and the envelopes are brought below the axis of rotation they are held in the pockets or receptacles between the adjacent blades *G⁸* by means of the projecting shoulders *p'* engaging the seal-flaps and causing the envelopes to be retained in the pockets by their suspension by their seal-flaps resting on the surfaces *p'* of the blades *G⁸*.

Sliding in a groove in the table *A* or other suitable way is a bar *I*, having attached to its lower side the downwardly and rearwardly projecting finger *I'*, extending a short distance past the envelope as it lies in the pocket *F* and passing through the grooved way *I²* *I³*,

Fig. 2, in the two ways *b b* of the chute *E*. The sliding bar *I* has a reciprocating motion, actuated by the vibrating lever *J*, attached to a sleeve *J'*, which is pivoted on a stud *J²* in the table *A*. From the lower end of the sleeve *J'* an arm *J³* extends forward over the main shaft *H*, carrying a cam-roll *J⁴*, which is held against the side of the cam *J⁵* by a spring *J⁶*, attached to the lever *J* and the table *A* or other stationary portion of the machine. The action of the cam *J⁵* and spring *J⁶* serves to vibrate the lever *J* and connected bar *I*, timed to correspond with the action of the folding mechanism, so the bar *I* will be brought into the position shown in the accompanying drawings as an envelope is being delivered from the folding-bed *B* through the chute *E* into the pocket *F*. When the folded envelope has been deposited in the pocket *F*, the sliding bar *I* is moved in the direction of the arrow 3, Fig. 4, bringing the finger *I'* in contact with the end of the envelope and pushing the envelope along the pocket through the slit *e*, which serves to compress the seal-flap as near the body of the envelope as may be without causing the gummed surface to adhere and carrying the envelope into one of the spaces between the free ends of the blades *G⁸*. While the cam-roll *J⁴* is passing over the straight portion *J⁷* of the cam *J⁵* and the sliding bar is consequently at rest with the fingers *I³* *I⁴*, attached to said bar over the drier, a motion is imparted to the drier by means of the pawl-and-ratchet device, whereby the drier is moved the distance of one of the blades *G⁸*.

As the spaces between the blades *G⁸* become filled with envelopes, with their edges projecting radially beyond the blades *G⁸*, each intermittent forward motion of the drier the distance of one blade will carry the projecting edge of an envelope between the fingers *I³* *I⁴*, so that as the sliding bar *I* is moved back into the position shown in the drawings by means of the spring *J⁶* an envelope will be pushed endwise from the drier through the slit or open space between the pusher-blade *K* and the inclined plate *K'* onto the ways *K²* *K³*, upon which the envelope is carried into the box or till *K³* by means of the reciprocating motion of the pusher-blade *K*, which is attached to the lever or arm *K⁴*, pivoted on the shaft *G'* and actuated in its forward movement by a spring *K⁵* and in its reverse motion by the cam *K⁶* on the main shaft *H*. The device comprising the reciprocating bar *I*, with its pushing-fingers *I'* and *I³* and the retaining-finger *I⁴*, we term the "carrier;" and we do not confine ourselves to the special construction as shown and described. In carrying the envelope from the drier, as described, the envelope is pushed by the finger *I³*, while the finger *I⁴* prevents the envelope from being carried too far by its own momentum, causing all the envelopes to be left in the same position in front of the pusher-blade *K* and in front of the end *L* of the till *K³*. The plate *K'* is attached to the pusher-blade lever *K⁴*

and serves to prevent the envelope from falling forward, and also compresses the seal-flap toward the body of the envelope.

The finger I' is provided with a shoulder k, which is brought over the corner of the envelope as the finger I' comes in contact with the envelope, in order to prevent the end of the envelope from being lifted as it is moved into the drier. For a similar purpose the pushing-finger I³ is provided with a plate k', which extends over the top of the envelope as it is being pushed out of the drier.

In order to bring all the envelopes in the drier in alignment with the fingers I³ I⁴ as they are carried between them by the intermittent motion of the drier, we place a plate M in front of the drier, attached to a stationary part of the machine and having a flange M', held obliquely to the path of the envelopes as they are carried forward by the motion of the drier. The plate M is also placed eccentrically to the periphery of the drier, the free end of the plate being the nearest to the drier, so the projecting edges of the envelopes will be brought in contact with the plate M and pushed radially into the drier in case they project too far, and also carried into the drier or toward the flange G⁵, so they will be brought between the fingers I³ I⁴. The drier is held from turning during the reverse movement of the actuating-pawl G¹² by means of a friction-plate N, held on a lever N', suitably attached to the stationary portion of the machine, so the pressure of the friction-plate N may be varied, if desired. By means of the revolving fan-wheel G⁹ air is drawn through the openings m m in the side G⁴ and expelled through a series of radial holes p p, Fig. 3, there being preferably a hole for each of the fingers G³. The air as it passes through the radial holes p p strikes against the curved under surface p' of the fingers G⁸ and is thereby deflected over the gummed surface of the seal-flaps of the envelopes in the direction of the arrow, as seen in Fig. 3. As the drier rotates and the envelopes held therein are brought beneath or on the lower side of the drier they are retained in position between the fingers G⁸ by the edges of their seal-flaps being caught by the curved inner surfaces of the blades.

We deem the use of a revolving fan-wheel within the drier, as shown in the accompanying drawings, preferable in many cases; but we do not confine ourselves to its use, as the air in a compressed state can be brought into the interior chamber of the drier from an air-compressing device without the drier, and allowed to escape, as in the present case, through a series of radial holes p p.

We are aware that an inclined chute leading from the folding mechanism to the drying mechanism has been in use heretofore, through which the folded envelopes were conveyed directly into a drier, which was placed beneath the inclined chute. In our present improved drying mechanism the drier is at

one side of the chute, the chute and the till in which the envelopes are finally carried by the pusher being in the same vertical plane, while the envelopes are carried into and out of the drier by the reciprocating motion of a single carrying mechanism operating at right angles to the path of the envelopes from the folding mechanism to the till.

We are aware that a rotary drier has been before used in an envelope-machine; also, that such a drier has been used in which a current of air has been expelled from an annular chamber directly upon and across the gummed seal-flap. Such we do not herein claim; but

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

1. In an envelope-machine having mechanism, substantially as described, for folding and drying an envelope, the combination, with said folding and drying mechanism, of an inclined chute or way through which the folded envelope is delivered from the folding mechanism, and a pocket arranged to receive the envelope from said chute, said pocket being in alignment with an envelope-receptacle in the drying mechanism, substantially as described.

2. In an envelope-machine, the combination, with mechanism, substantially as described, for folding the envelope, of an inclined chute through which the folded envelope is delivered from the folding mechanism, a pocket arranged to receive the folded envelope from said chute, and a rotating drier with receptacles to receive the envelopes from said pocket, said rotating drier having an intermittent motion, whereby said envelope-receptacles are successively brought into alignment with said pocket, substantially as described.

3. In an envelope-machine, the combination, with folding and drying mechanisms, substantially as described, of an inclined chute leading from the folding mechanism, a pocket arranged to receive the folded envelope from said chute, and a reciprocating envelope-carrier by which the envelopes are carried from said pocket into the drying mechanism, substantially as described.

4. In an envelope-machine, the combination, with mechanism, substantially as described, for folding the envelope and an inclined chute leading from the folding mechanism, of a pocket to receive the envelope from said chute, said pocket being provided with a narrow opening at one end, through which the envelope is pushed and by which the seal-flap is carried in toward the body of the envelope, and means, substantially as described, by which the envelope is pushed through said opening, substantially as described.

5. In an envelope-machine, the combination, with a pocket or receptacle maintained in a fixed position and arranged to receive the folded envelope from the folding mechanism, of a reciprocating bar, and a finger attached

to said bar and arranged to be brought in contact with an envelope in said pocket by the reciprocating motion of said bar and push the envelope into the drying mechanism, substantially as described.

6. In an envelope-machine, the combination, with a pocket to receive the folded envelope from the folding mechanism and a drying mechanism, substantially as described, for drying the gummed surface of the seal-flap, of an envelope-carrier having a reciprocating motion and consisting of a sliding bar, fingers attached to said bar and arranged to engage the envelope at each reciprocating motion of the sliding bar, said fingers being provided with projecting shoulders, which project over the envelope and prevent it from being lifted as it is pushed by said fingers, substantially as described.

7. In an envelope-machine, the combination, with mechanism, substantially as described, for bunching the envelopes and embodying a reciprocating pusher-plate, and an envelope-carrier having a lateral reciprocating motion at right angles with the motion of said pusher-plate, of a plate inclined with reference to the surface of said pusher-plate, by which the envelope is conducted in front of the pusher-plate and its seal-flap carried toward the body of the envelope, substantially as described.

8. In an envelope-machine, the combination of a cylindrical rotating drier having a series of receptacles open at one side for receiving and holding the envelopes, with one side of the envelopes projecting radially beyond the drier, and an envelope-pusher blade for removing the envelopes through the open sides of the envelope-holding receptacles, said pusher-blade having a reciprocating motion parallel with the axis of the drier and arranged to engage the projecting portion of the envelope, substantially as described.

9. In an envelope-machine, the combination, with a rotating drier having a series of radial envelope-holding receptacles, of a guide-plate placed eccentrically with said rotating drier for the purpose of pushing the envelopes radially into said drier, as and for the purpose set forth.

10. In an envelope-machine, the combination, with a rotating drier having a series of radial envelope-holding receptacles, of a guide-plate for determining the position of the envelopes in said drier, said guide-plate being provided with a flange placed obliquely to the path of the envelopes held in said drier, substantially as described.

11. In the drying mechanism of an envelope-machine, the drier consisting of an interior air-chamber surrounded by a series of envelope-holding receptacles, forming an annular ring around said air-chamber, each of said envelope-receptacles being open at one side, so the envelopes may be carried into and delivered out of said receptacles by an endwise

sliding motion parallel with the axis of the drier, substantially as described.

12. In the drying mechanism of an envelope-machine, the drier consisting of a series of annular envelope-holding receptacles, an interior air-chamber for compressed air, said air-chamber having a series of radial holes corresponding with said envelope-receptacles, through which air is admitted to the envelope, substantially as described.

13. In the drying mechanism of an envelope-machine, the combination, in the drier, of an air-chamber for compressed air, said air-chamber having a series of air-passages to the envelope-receptacles, and a series of envelope-receptacles, said receptacles presenting opposing surfaces to said air-passages and at an angle thereto, whereby the air-current is deflected upon and over the gummed surface of the envelope, substantially as described.

14. In the drying mechanism of an envelope-machine, the drier consisting of an annular series of envelope-receptacles having a rotary motion about a common axis, each of said receptacles being provided with a projecting shoulder for engaging the edge of the seal-flap, whereby the envelopes are retained in said receptacles as they pass below the axis of rotation, substantially as described.

15. In the drying mechanism of an envelope-machine, the combination of a cylindrical drum inclosing a revolving fan-wheel and having a radially-projecting flange at one side, a series of fingers attached to said flange and extending over said drum parallel with the axis of the drum, forming envelope-holding receptacles open at one side, substantially as described.

16. In the drying mechanism of an envelope-machine, the combination of a cylindrical drum inclosing an interior air-chamber and having a radially-projecting flange at one side, a series of fingers attached to said flange and extending over said drum parallel with its axis, and flanges extending radially inward from said fingers, forming with said fingers and said drum a series of pockets for the seal-flaps of the envelopes, substantially as described.

17. In the drying mechanism of an envelope-machine, the combination of an interior air-chamber, an annular series of bars or fingers arranged around said air-chamber, between which the envelopes are placed, said air-chamber having a series of radial holes or air-passages placed beneath said bars or fingers, so the air-current will impinge upon said fingers and be deflected upon and over the gummed surface of the envelope, substantially as described.

18. In the drying mechanism of an envelope-machine, the combination, with a drier having a series of envelope-holding receptacles open at their side, of mechanism for removing the envelopes through the open side of said receptacles, said mechanism consist-

ing of a pair of fingers having a conjoint reciprocating motion through connected operating mechanism, one of said fingers moving behind the envelope, whereby it is pushed out of the envelope-holding receptacle, and the other finger moving in advance of the envelope, whereby its motion is limited, substantially as described.

19. In the drying mechanism of an envelope-machine, the combination of a rotating drier having a series of envelope-holding receptacles, an envelope-carrier having a reciprocating motion, by which the envelopes are carried into and removed out of said envelope-holding receptacles, a vibrating bar pivoted on the stationary part of the machine and connected with said reciprocating carrier, and an actuating-cam by which said bar is vibrated and the carrier moved back and

forth over said rotating drier and in a line parallel with the axis of said drier, substantially as described.

20. In an envelope-machine, the combination of a folding and a bunching mechanism, substantially as described, lying in the same vertical plane, a rotating drier placed at the side of and between said folding and bunching mechanisms, and a reciprocating envelope-carrier by which the envelopes are carried into said drier after leaving the folding mechanism and are removed from said drier into position to be acted upon by the bunching mechanism, substantially as described.

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