3 Sheets—Sheet 1.

H. D. & D. W. SWIFT.

ENVELOPE-MACHINE.

No. 185,798. Patented Dec. 26, 1876.

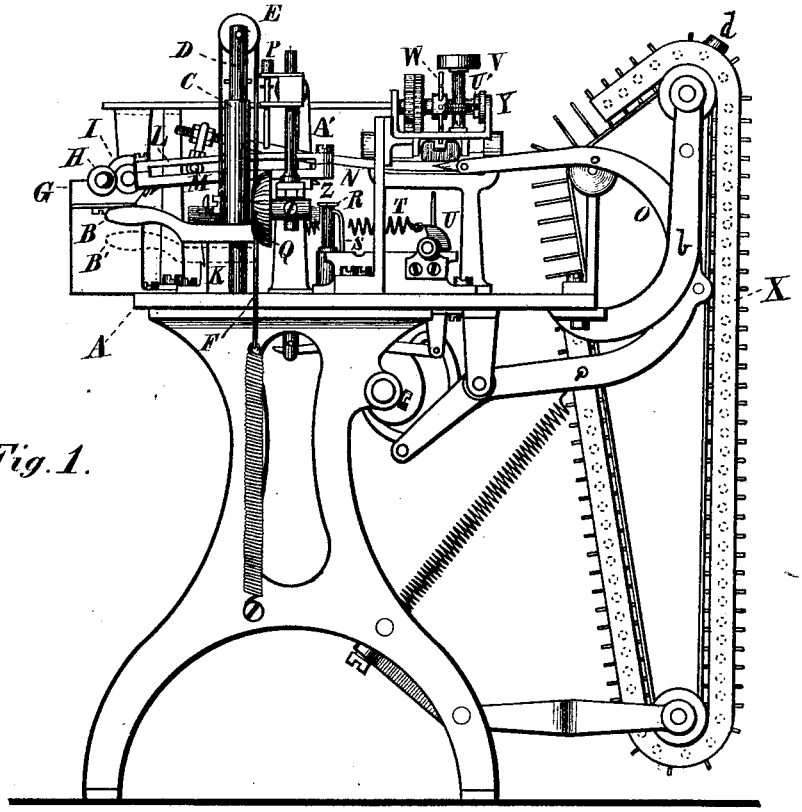

Fig. 1.

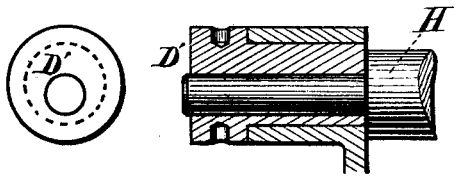

Fig. 2.

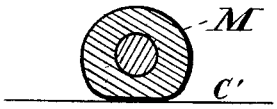

Fig. 3.

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H. D. & D. W. SWIFT.

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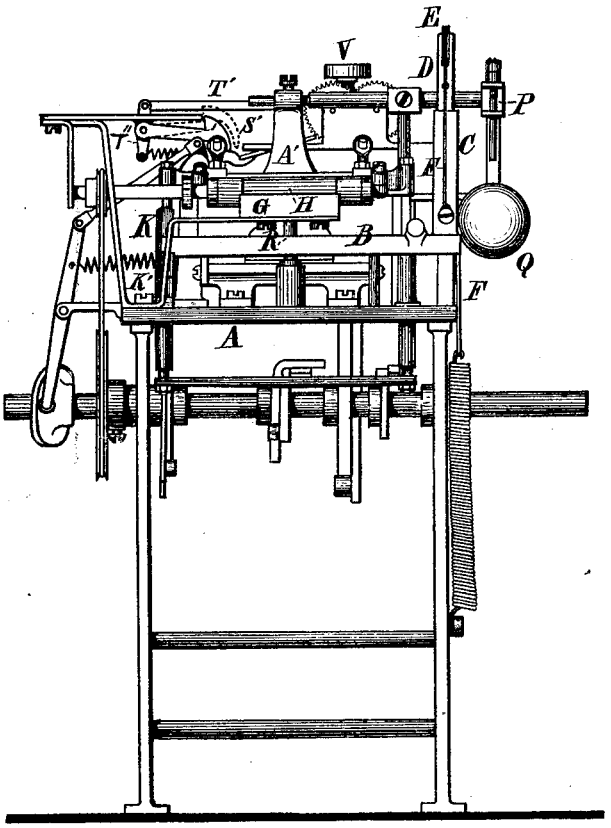
Fig. 4.



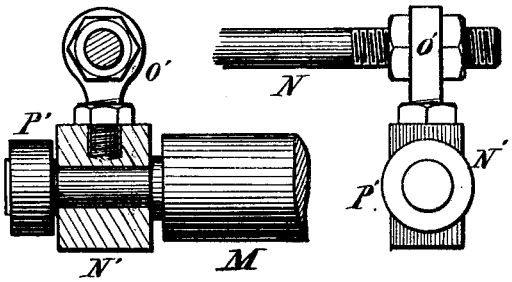


Fig. 5.

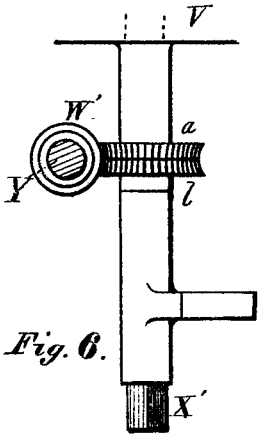


Fig. 6.

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ENVELOPE-MACHINE.

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Fig. 7.

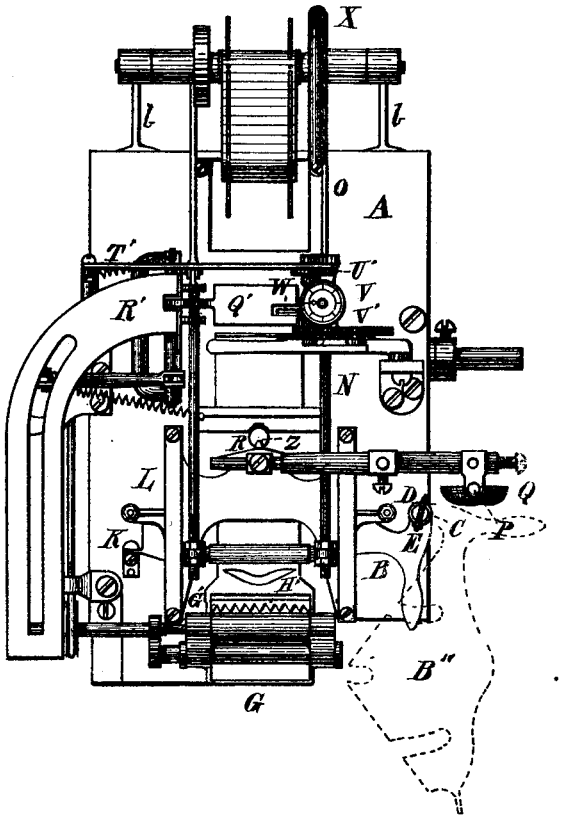
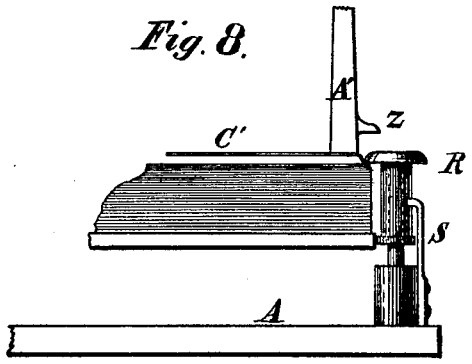


Fig. 8.



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UNITED STATES PATENT OFFICE.

HENRY D. SWIFT AND DANIEL WHEELER SWIFT, OF WORCESTER, MASS., ASSIGNORS TO G. HENRY WHITCOMB & CO., OF SAME PLACE.

IMPROVEMENT IN ENVELOPE-MACHINES.

Specification forming part of Letters Patent No. **185,798**, dated December 26, 1876; application filed August 26, 1876.

To all whom it may concern:

Be it known that we, HENRY D. SWIFT and DANIEL WHEELER SWIFT, both of the city and county of Worcester, State of Massachusetts, have invented certain Improvements in Envelope-Machines, of which the following is a specification:

Our invention relates to that class of envelope-machines that feed themselves from a pile of blanks cut in the proper form, applying the sealing-gum, folding, drying, and delivering the finished envelopes ready for banding.

They (our improvements) are more or less applicable to most envelope-machines now in use, but are described herein as applied to the envelope-machine patented by us February 22, 1876.

Their nature is shown in the following description and accompanying drawings, showing an embodiment of our improvements.

Figure 1 is a side view of a machine with our improvements in place, the other parts (not necessary to show their operation or connection) being omitted. Fig. 4 is a front view of the same as seen from the left of Fig. 1. Fig. 7 is a plan or view of the same from above; and Figs. 2, 3, 5, 6, and 8 show some parts in detail on a larger scale.

A is the frame of the machine; B, the "blank-support" or feed-table turning on a stud or pivot, D, so as to be turned out, as shown in broken lines at B″, Fig. 7, to be returned under the pile of blanks, which we put on in double the usual quantity—that is, twice as many as the play or motion of the "pick-up" A′ is intended to take up—and the table B is turned under them and raised to rest on the lower notch K′ in the stand K, as shown in broken lines at B′, Fig. 1, remaining in that position until one-half the pile of blanks is taken off by the machine, when the attendant raises the table B and remainder of the pile till the table rests on the second notch in K, and the rest of the pile is fed off.

In changing the table B, when turning out it leaves what blanks there may be to fall on the top of the pile below, and be the first to be fed from it, thus feeding successively all that are put in without mixing or requiring close attention to see that the last one is taken before shifting the table in changing kinds of paper, and by the use of a tell-tale, consisting of a bell, Q, attached to the machine, and a hammer, P, on an arm of the pick-up, adjusted to strike the bell, to warn the tender of the time to renew the pile or raise the table, as the case may be, she is relieved of most of the usual care and watch of the feed, and has more time for banding, as we save more than one-half the time heretofore used on the feed.

To facilitate raising the table B, a cord, H, is attached to it, passing over a pulley, E, on the top of D, and connecting to a weight or spring counterbalancing the weight of B. Another standard may be used near the other end of B, with notches similar to K, and thus support both ends of the table B.

The pile of blanks in the machine lies with the "back-flap," so called, under the pick-up, and with its point under the cap of the separator R. The pick-up A′ has a stud or lip, Z, extending over the separator R, placed at such a distance from the bottom of the pick-up that when it rests on the top sheet the lip Z shall set the separator so that its projecting cup shall be just above the top of the pile, but not resting on it, the separator R being held in place on its stem by the friction-spring S, or similar means. Great difficulty has been found heretofore in always feeding only a single blank, especially in fast-running machines, and various devices tried to accomplish this, the most successful being such as rest on the pile or weight-separators, because acting sooner than the stationary ones, yet the weight of these resting on the pile, pressing the top blank to the others, excluding the air, tends to lift more by suction, and also causes more or less friction between the top blank and the next, and the weight-separators are very liable to bound or hop when the pick-up strikes the pile, and thus be out of place when most wanted, and they require adjusting to lap more or less on the paper for the different kinds of paper.

By setting our separator just above the top blank, where it requires no alteration for thick or thin papers, it works as soon as the sheet or blank is lifted, turning its point down, as in

Fig. 8, where C′ is the top blank, being taken up past the separator by the pick-up. Thus it will be seen we overcome the difficulties of former separators, and retain all their good qualities, ours being simple in construction, automatic and effective in operation.

Evidently other forms of separator may be used, and other means of holding and adjustment, as a lever let fall on the pile when the pick-up is out of the way, or other devices used to set it to the height of the pile, which it is not deemed necessary to describe here, as they are obvious.

After the pile of blanks is in place, and before one is taken, the sealing or gumming of the sealing-lap is performed. This, in general, is the same as in our aforesaid patent.

G is the gum-box, having a roll, I, turning with a part of its surface in the gum, and H is another roll, turning, but not at the same speed. We prefer to run its surface much slower, and in the same direction on their contiguous sides, while both are driven by any suitable means. The roll H is hung in eccentric collars D′, Fig. 2, so that its distance from I may be accurately set to "doctor" or keep an even smooth coating of gum on the roll I, from which it is taken by the roll M. The two rolls I and H draw up the gum between them in the box, keeping a continuous circulation, preventing it from settling, drying, or clogging, as is so common in the ordinary gum-boxes. On the other side of I we place the guard H′, having points extending nearly to the roll, to catch any pieces of paper or tags that may be brought by the roll M, or otherwise effectually preventing their entering the gum-box.

It is well known that more or less grit and foreign substances are held in the gum solution, and these catch and grind or clog under the stationary or scraping doctor heretofore used, making an uneven coating of gum on the roll I, and frequently grinding creases in the roll or doctor, or uneven streaks in both, and the accumulation of settlings with the drying of the gum standing in the box is facilitated by the scraping-doctors, and renders frequent soakings and cleaning of the boxes necessary, while with our improved rolling doctor there is little or no drying or settling, and the grit passing through the rolls does no damage, but, on the contrary, with their difference of motion, keeps them both ground perfectly true.

Other means of setting the doctor-rolls H may be used, and their relative motion varied, though we prefer those described.

The roll M takes the gum from the roll I and bath, carries some to the pick-up A′, under which it is carried by its rods N N, and on its return, being dropped with its guideways L down, so as to bear on the pile of blanks, it gums the upper one, as in our former patent, the curved form of the ways favoring this action, and the loose collars P′ P′ on its ends allow the roll to turn and roll on the paper with its surface slightly compressed or flattened, as shown in Fig. 3, where C′ shows the position of the top blank.

The gumming and sealing rolls heretofore used, being made of the compound used by printers for ink-rolls, and covered by a thin tube of india-rubber, or other water-proof covering, have been practically impossible to make truly cylindrical, and, consequently, would take an uneven coating of gum from the roll I, and they were also liable to melt or run when left over night, particularly in hot weather.

Our invention overcomes these objections. We make the roll M of solid india-rubber on its shaft, and turn or otherwise make its outer surface a true cylinder. It receives an even smooth coat of gum from I, and, unlike the old style, which, with its uneven coating of gum, required a wiping or slipping motion on the paper to give a good coat, ours only needs compressing slightly, and is allowed to roll on the paper, giving a smooth even coating to the sealing-lap without streaks, drops, or bubbles, thus facilitating the drying very much. The arbor or shaft of M is made a sufficient support for it, and runs in boxes N′, Fig. 5, having adjustable eyes O′, secured by suitable nuts on the rods N N, giving the roll adjustability in all directions, the eyes, when the nuts are loosened, turning and allowing it to be leveled, the loose collars P′ on its ends guiding it in the ways L. By this arrangement we do away with the girt or brace near the roll, heretofore thought necessary, and constantly accumulating gum and clogging up.

The blank is taken to the folders and folded in the usual way, except that to the arbor or shaft which carries the pressing or back folder we attach a segment, *u*, with a strap or similar connection to the spring T, which gives the desired pressure without the vibrating motion of the crank or lever heretofore used, which was so sure to soon break the spring in running fast. The envelopes, after being folded, are taken and deposited in the drying-belt, which we attach in the vertical position shown in Fig. 1, supporting it by the arms *b b* from the machine by its upper roll, and apply a blast-tube, *x*, on one side, having holes so arranged as to direct a current of air across the belt from end to end of the envelopes, drying them rapidly, the air being supplied by a fan or other means at *d*, one fan being found sufficient for several machines. The envelopes, when taken from the belt, are deposited on the plate Q′, by which they are carried up into the box or trough at K′, the plate Q′ having a slot to pass the arms W without turning them when there is no envelope on Q′, and when one is being carried up it turns an arm of W, and thus the count is made by the envelopes as they are put into K′. The arms W are attached to a sleeve on the shaft Y, and are geared to it by the wheels V′, so that the shaft Y shall turn once round for every twenty-five envelopes counted, or

the number desired in a bunch. Near the end of Y is a notched collar, w', on which rests a pin or stud in the connection T′, slipping into the notch and out again as the shaft is turned. At S′ are two curved ways or slides, over which each envelope slides on its way to K′. These ways are attached to the connection T′ by a lever, T″, in such a manner that when its pin falls into the notch in u, a spring or weight shall lift the ways S′ to the position shown in broken lines, Fig. 4, and the next one or more envelopes are elevated above the others, thereby marking the bunches accurately for banding. On the shaft Y is a worm, W′, Fig. 6, to drive a pair of differential gear, a l, one of which is connected to a dial, and the other to a pointer over it, the latter so arranged that the pointer may be set by its shaft, the lower end of which is slotted or squared for that purpose, thus making the index or pointer adjustable and easily set to place of beginning at any time for a new count. The gear a and l has a different number of teeth, and so arranged that when a thousand envelopes have been counted by the arms W the pointer shall have moved one space on the dial, thus correctly indicating the exact number of thousands made per day, or other period of time.

Thus it will be seen that we do not count or register the revolutions of the machine, but only the actual envelopes made, and the overseer can see at any time by the indicator V how many have been made by the machine, and at night, having taken off the number, set the pointer of the indicator for a new count. The envelopes, being correctly counted, are in a convenient position for the tender to band them.

These improvements all facilitate the running the machines at a high speed, and, combined, enable one girl to tend two machines.

Having described our improvements in envelope-machines, what we claim therein as our invention, and desire to secure by Letters Patent, is—

1. The feed-table B, in combination with one or more standards, K, having two or more supporting-notches, as and for the purposes described.

2. The combination of the notched standards K, feed-table B, and the counter-balances, substantially as described.

3. The separator R, in combination with its holder S and the lip Z on the pick-up A′.

4. The automatically-adjusted separator R, retained in place by friction-spring S, in combination with the pile of blanks, substantially as set forth.

5. The combination of the gum-box, the continuously-driven roll I, its rolling doctor H, the pick-up, and the gearing-roll M, working between the pick-up and roll I, as and for the purposes described.

6. The combination of the roll M, its universally-adjustable boxes and eyes N′ O′, and the rods N, substantially as described.

7. The guard H′, in combination with the roll I and box G, as above set forth.

8. The combination of the pipe x, having holes to direct the blast across from end to end of the envelopes, and the drying-belt, substantially as above set forth.

9. The lifting-plate Q′, curved ways S′, their lifting mechanism T″, and connection T′, to a counting mechanism, in combination, substantially as specified.

Witness our hands this 23d day of August, A. D. 1876.

HENRY D. SWIFT.
D. WHEELER SWIFT.

Witnesses:
EBEN W. HOXIE,
JAS. G. ARNOLD.