

D. M. Smyth *Sheet 1 of 4 Sheets*
Envelope Mach.

N^o 91,575.

Patented Jun. 22, 1869.

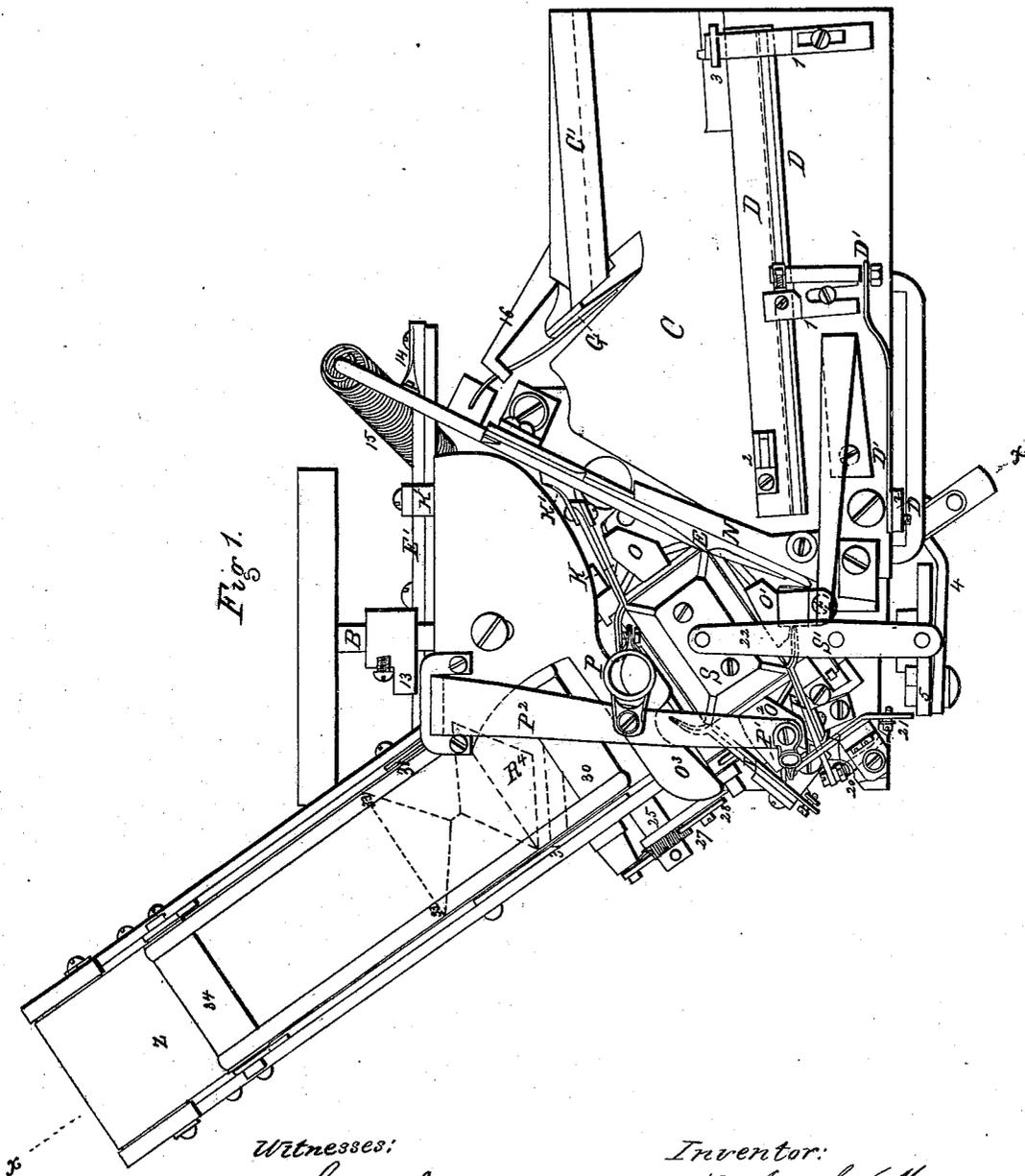


Fig. 1.

Witnesses:

Chas. & Smith
Geo. T. Pinelney

Inventor:

D. M. Smyth

D. M. Smyth. Sheet 2. of 4 Sheets.
Envelope Mach.

N^o 91,575.

Patented Jun. 22, 1869.

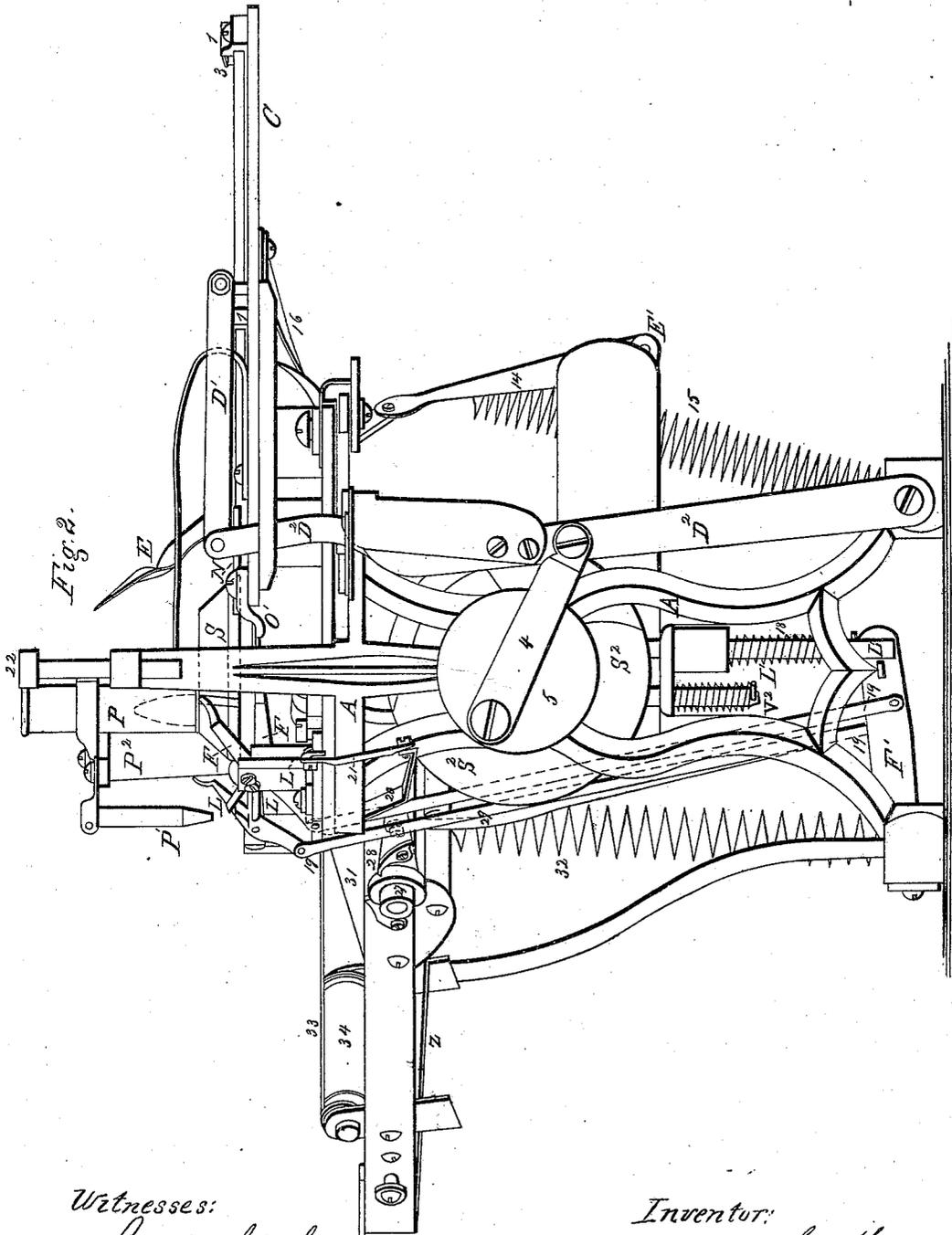


Fig. 2.

Witnesses:

Chas. S. Smith
Geo. J. Pineberry

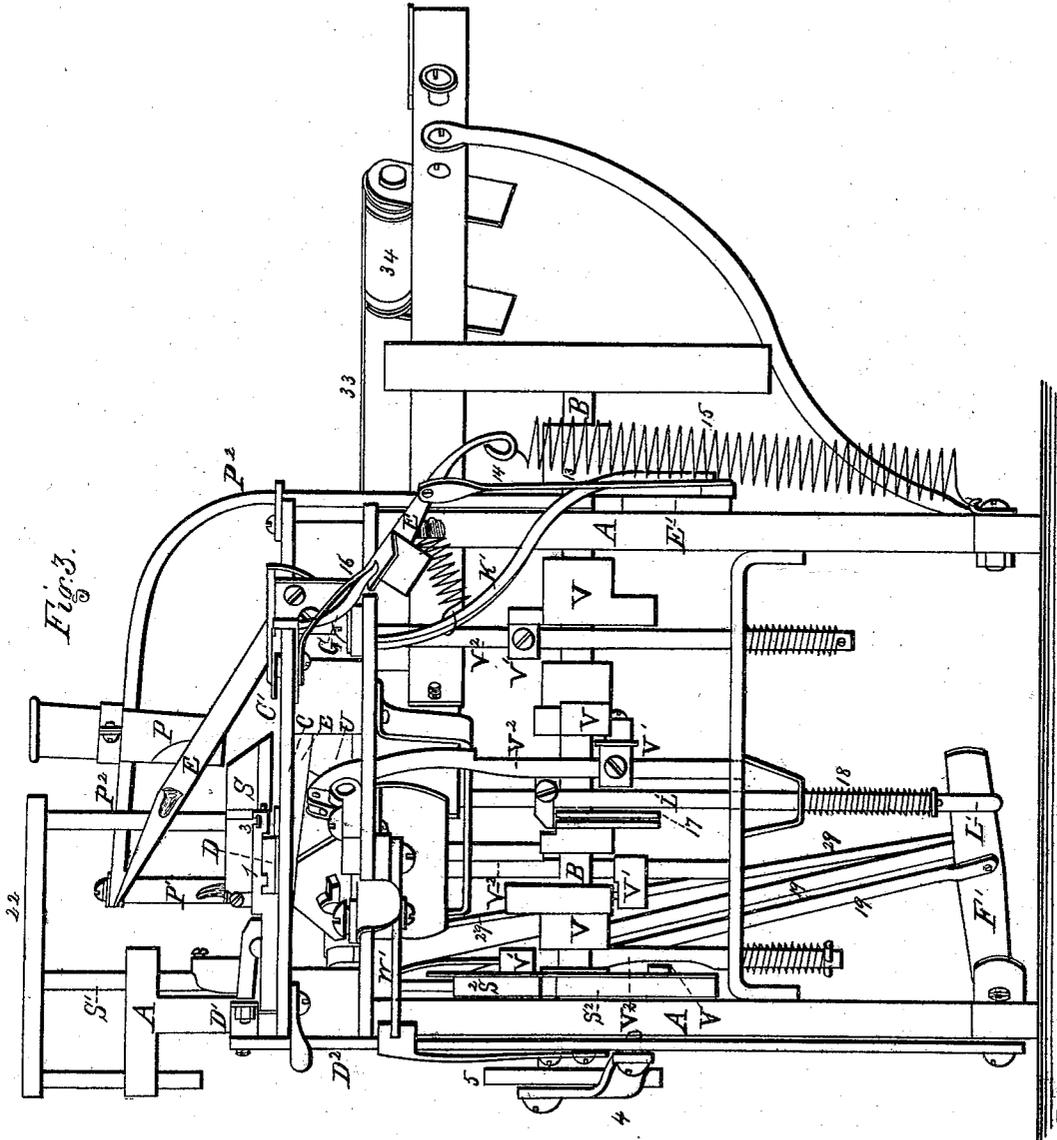
Inventor:

D. M. Smyth

D. M. Smyth. Sheet 3, 4, Sheets.
Envelope Mach.

N^o 91,575.

Patented Jun 22, 1869.



Witnesses:

Chas. Smith
Geo. J. Pinckney

Inventor:

D. M. Smyth

UNITED STATES PATENT OFFICE.

D. M. SMYTH, OF ORANGE, NEW JERSEY, ASSIGNOR TO D. APPLETON & CO.,
OF NEW YORK CITY.

IMPROVEMENT IN ENVELOPE-MACHINES.

Specification forming part of Letters Patent No. 91,575, dated June 22, 1869.

To all whom it may concern:

Be it known that I, D. M. SMYTH, of Orange, in the county of Essex and State of New Jersey, have invented and made a new and useful Improvement in Envelope-Machines; and I do hereby declare the following to be a full, clear, and exact description of the said invention, reference being had to the annexed drawing, making part of this specification, wherein—

Figure 1 is a plan of the machine, the strip of paper and the envelope-blank not being shown. Fig. 2 is a side elevation endwise of the main shaft. Fig. 3 is an elevation of the machine at the end where the paper is fed in. Fig. 4 is a partial section of the followers and folders at the line *x x*, illustrating the manner in which the envelopes are folded and lap one under the other as they pass out of the folder upon the delivery-belt. Fig. 5 represents the strip of paper and the envelope-blank in its proper relation thereto.

Similar marks of reference denote the same parts.

Envelopes have heretofore usually been cut out by knives shaped like the outline of the envelope. Several sheets are cut out at each stroke of the knives. They, however, have to be separated subsequently, folded, and gummed.

In practice, it is impossible to make use of dies or knives for cutting out one envelope at a time from a sheet, because, after a very few strokes of the knife or die, the paper ceases to be cut clean and smooth at the edge. There being nothing of a shearing cut to keep the edges in good condition, the smallest imperfection in the cutting-edge will cause the paper to tear, or leave the edge of the envelope-blank rough.

My invention obviates all the said difficulties that have been experienced in practice; and consists in a series of swinging shears, arranged and applied so as to cut out the envelope-blank from a sheet or long strip of paper, so that there is little or no waste, except at the necessary gores removed at the angles of the envelope, to allow the flaps to lap in folding.

I find, practically, that shears arranged to cut out one blank envelope at a time will not

become dull, except by very long use, and then can easily be ground, and that the envelope-blank is cut out with smooth edges, and very handsomely.

I will proceed to describe the successive operations of my said machine.

In the drawing, A is a frame, of suitable size and shape, carrying the main shaft B, to which the actuating-power is applied that moves the respective parts. C is a bed, over which a long sheet or strip of paper of the proper width is passed. C' is a stationary gage, and D is a movable feeding-bar, fitted to slide endwise in the adjustable bars 11, that can be moved to accommodate different widths of paper.

Upon the feeding-bar D is a spring-pawl or clamping-tooth, 2, that grasps the paper to carry it forward, and slides freely over the surface on the return motion; and 3 is a similar pawl on the bar 1, to hold the paper from moving back.

The feeding-bar D is moved endwise by the link D¹, lever D², and connecting-bar 4 to the crank-pin of the disk 5.

Suitable stops and adjustments may be provided to render the feed of the paper accurate, so that only the proper amount will be passed into the machine.

Upon reference to Fig. 5 it will be seen that the diamond shape of the envelope-blank results from a cut that is diagonal to the strip of paper at the line 6 6. This is effected by the shears E, which also have a bend in them, so as to cut the gore or notch 7.

The gore or notch 8 is cut by the shears F; the third gore 9 by the shears I; the fourth gore 10 by the shears K; and, in order to clip off the points of the diamond-shaped blank at 11 and 12, I employ the shears L and G, the shear G acting upon the edge of the strip of paper before the same arrives at the shear E.

Each shear is composed of two blades—one stationary, fastened to the bed, the other a swinging lever-blade; and I remark that I do not limit myself to any particular means for actuating these shears. I have, however, shown the following devices:

The cam 13, lever E', and connecting-rod 14 are employed to close the shears E and G, and the springs 15 and 16 to open them.

The rear end of the shear G rests upon a flange on the handle end of the shear E, so as to be actuated thereby. The shear K is also actuated from the lever E' by the link K.

The shears F, I, and L, are actuated by the lever F', sliding rod L' and cam 17, the return-movement proceeding from the spring 18. The lever F' is connected by the rods 19 to the respective shears F and I, and the shear L is actuated by an arm, 20, from one of the rods 19, and a link, 21, to the other end of the shear.

The strip of paper, in approaching the shear E, slides under the bar N, that keeps it smooth, and the paper rests upon the supporting portions O O¹ O² O³; and at P and P' are paste-holders fitted to act upon the envelope near the end 11, and at the flap R³ of the envelope-blank. These pasters are upon the slide and arm P², that is drawn down by the lever E' as the envelope is cut out.

The follower S is sustained by the head 22, and rod S¹ to the cam S². The shape of this cam is such that it holds the follower S just above the paper while it is being cut out, so as to prevent its buckling or moving under the action of the shears; and directly below said follower S is a second follower, T, upon the upper end of the rod L', and the parts are so timed that the follower T is elevated when the cutting of the blank by the shears is complete; then the cam S² allows the follower S to drop, carrying the envelope-blank in between four swinging flap-holders, two of which, U U, are shown in Fig. 4. These flap-holders are of usual construction, and are actuated by the cams V, arms V¹, and rods V², to the cranks of the folders.

The parts are so timed that the follower S rises immediately; then the flap R¹ is first turned; next, the flap R², bringing its pasted end over upon R¹; then the flap R³ is turned over upon R¹ R²; the flap R⁴ is then turned down over the other flaps. This done, the follower T descends with the envelope, and the pusher W, actuated by the bent lever W' and a projection on the lever D², slides the envelope off the follower T upon a table, Y, and beneath the preceding envelope, the flap R⁴ turning up, as shown in Fig. 4.

The endless belt Z passes around the rollers 25 26, and is moved along progressively by the ratchet 27, lever and pawl 28, and connecting-rod 29,

To the lever F', and over the belts Z, is a roller, 30, in a swinging frame, 31, kept toward

the belt Z by the spring 32; and the bands 33 pass from 30 to a roller, 34. These act on the ends of the envelopes, to cause them to travel along with the belt Z.

The roller 30 is a little to the rear of the roller 25, so that, as the pusher W slides the envelope in between Z and 30, its rear edge will be slightly elevated, so that the next envelope will slide in beneath it; and as the envelopes are carried along beneath the roller 30 they are pressed sufficiently to properly fold them, causing the pasted surfaces to adhere; and the flaps R⁴ lie one over the other, lapping so that narrow surfaces are left exposed for gum or adhesive material, to be applied as they lie upon the apron or belt Z, and this belt may be extended a sufficient distance to allow the mucilage to dry by natural or artificial means.

This machine produces the envelopes complete, one at a time, and the edges are cut smoothly and accurately, and there is not the waste of paper usual in other machines.

What I claim, and desire to secure by Letters Patent, is—

1. A swinging shear, placed diagonally to the feeding mechanism, and formed with a bend, so as to separate the paper diagonally of the strip and simultaneously form one of the gores of the envelope-blank, substantially as set forth.

2. The arrangement herein set forth of a series of swinging shears for cutting out the gores of the envelope-blank, in combination with mechanism for feeding in the strip of paper, and for folding the envelope, substantially as set forth.

3. The pusher W, arranged and operating substantially as set forth, in combination with the followers S and T and folders U, for folding and delivering the envelope, as set forth.

4. The rollers 25 and 30, placed so as to raise the rear portions of the envelopes as they are delivered from the folder, in combination with the pusher W, that passes the envelope beneath those previously delivered, and the belt Z, that conveys the envelopes away, substantially as set forth.

In witness whereof I have hereunto set my signature this 7th day of April, A. D. 1869.

D. M. SMYTH.

Witnesses:

CHAS. H. SMITH,
GEO. T. PINCKNEY.