

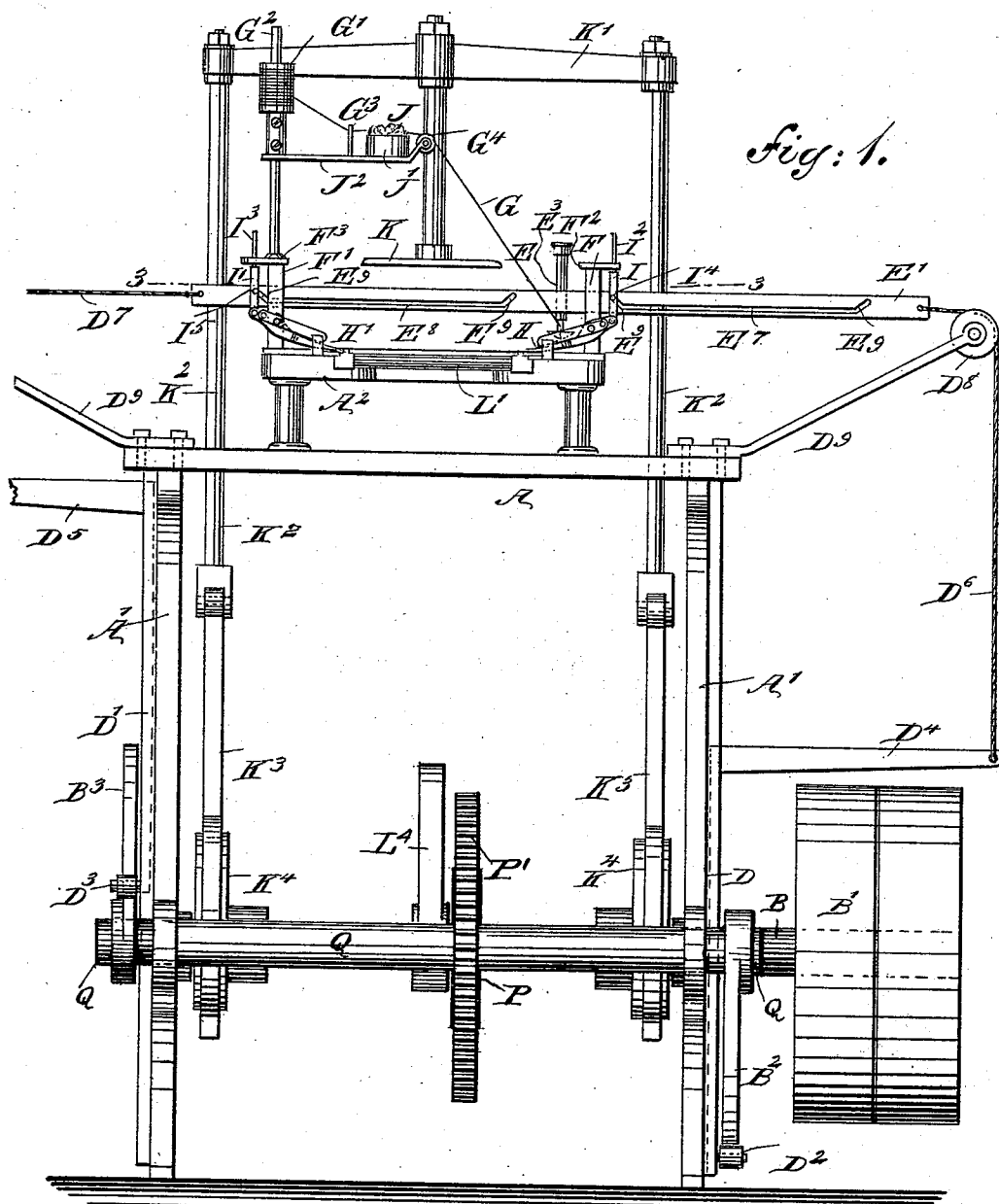
(No Model.)

3 Sheets—Sheet 1.

S. P. DENISON.
ENVELOPE THREADING MACHINE.

No. 534,601.

Patented Feb. 19, 1895.



WITNESSES:

Chas. Nidd
C. Sedgwick

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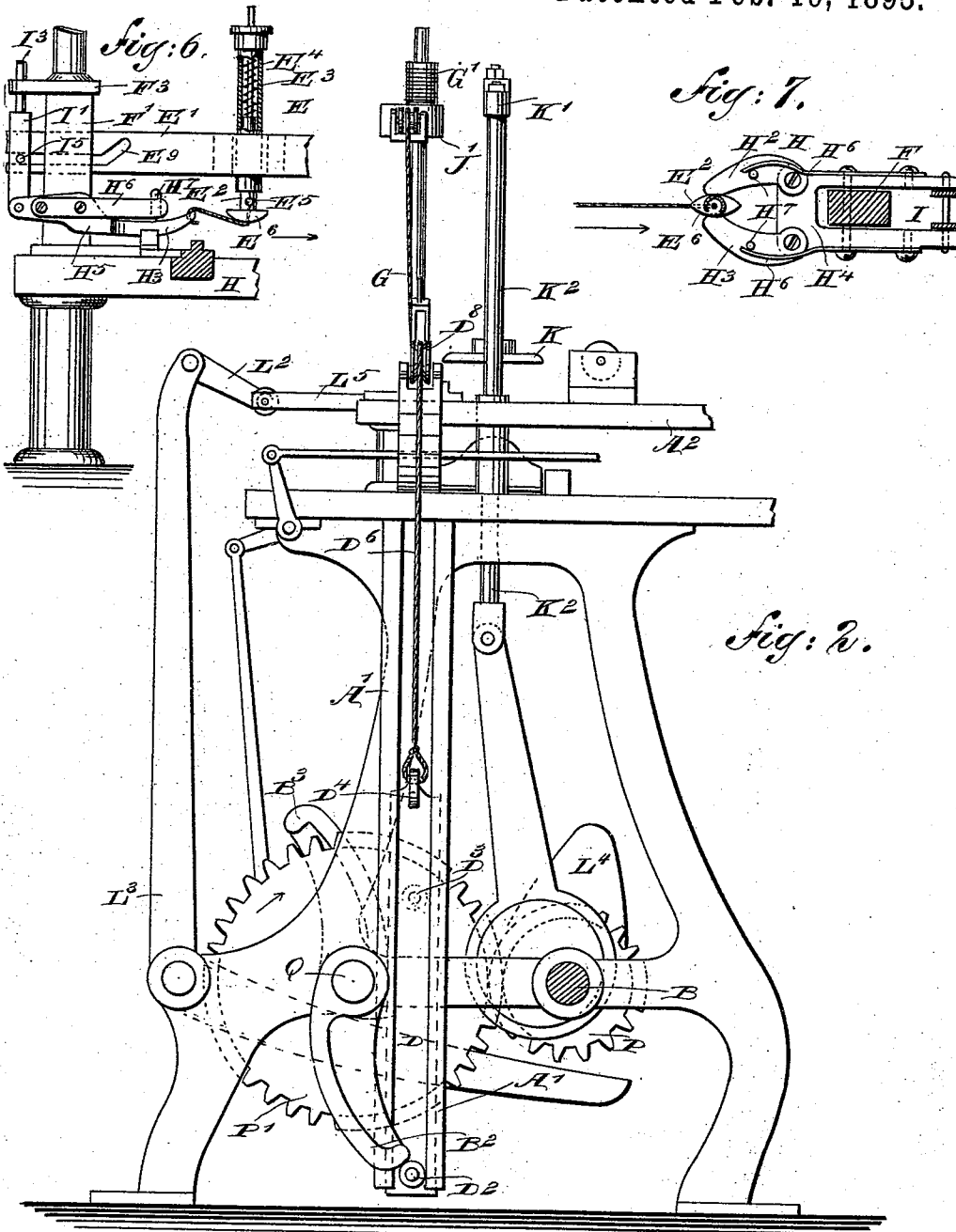
(No Model.)

3 Sheets—Sheet 2.

S. P. DENISON.
ENVELOPE THREADING MACHINE.

No. 534,601.

Patented Feb. 19, 1895.



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(No Model.)

3 Sheets—Sheet 3.

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Fig. 3.

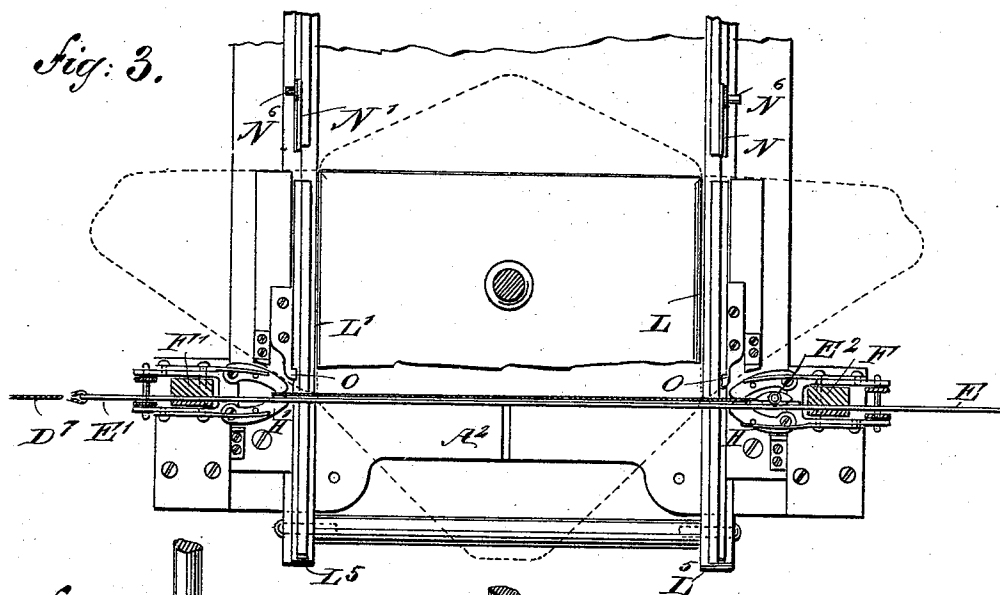


Fig. 4.

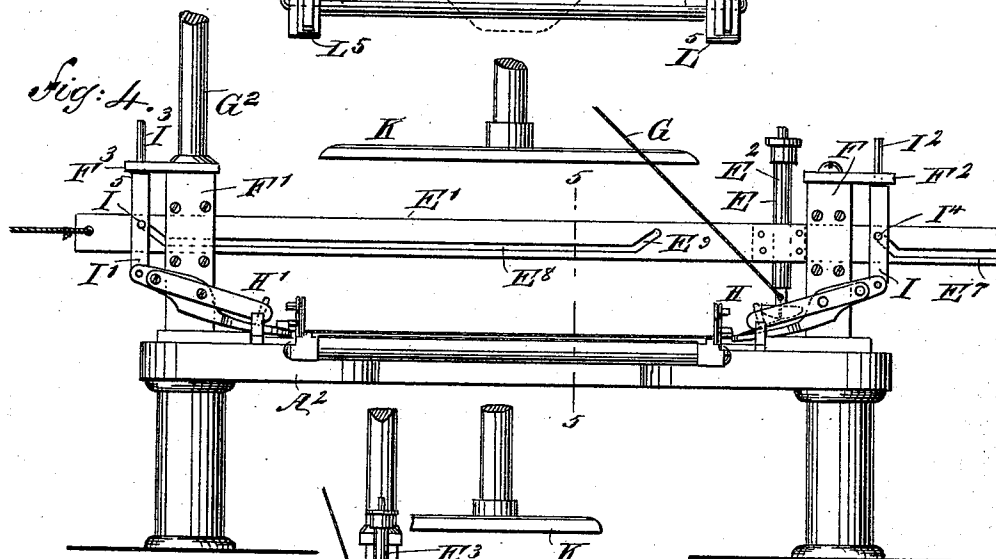
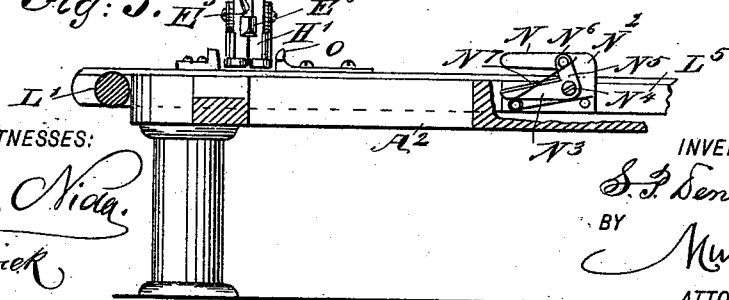


Fig. 5.



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UNITED STATES PATENT OFFICE.

SYLVESTER P. DENISON, OF BELLEVILLE, NEW JERSEY, ASSIGNOR TO
ELIZABETH SLOAN, OF NEW BRIGHTON, NEW YORK.

ENVELOPE-THREADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 534,601, dated February 19, 1895

Application filed December 23, 1893. Serial No. 494,532. (No model.)

To all whom it may concern:

Be it known that I, SYLVESTER P. DENISON, of Belleville, in the county of Essex and State of New Jersey, have invented a new and
5 Improved Envelope-Threading Machine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved machine, designed to rapidly and accurately attach an opening thread
10 to an envelope, so as to facilitate opening of the sealed envelope.

The invention consists of a pair of clamping devices arranged opposite each other, and
15 a reciprocating thread carrier adapted to carry and deliver a thread from one clamping device to the other, so as to stretch a thread between the clamping devices.

The invention also consists of certain parts
20 and details and combination of the same, as will be hereinafter described and then pointed out in the claims.

Figure 1 is a front elevation of the improvement. Fig. 2 is a side elevation of the same.
25 Fig. 3 is an enlarged sectional plan view of the same on the line 3—3 of Fig. 1. Fig. 4 is an enlarged front elevation of the upper part of the machine. Fig. 5 is a transverse section of the same on the line 5—5 of Fig. 4.
30 Fig. 6 is an enlarged front elevation of one of the clamping devices and the thread carrier, parts being shown in section; and Fig. 7 is an enlarged plan view of one of the clamping devices and the thread carrier, with parts
35 in section, the thread carrier being in position for opening the jaws of the clamping device.

The improved envelope threading machine is provided with a suitably-constructed frame A, in which is journaled the main driving
40 shaft B, carrying the usual fast and loose pulleys B', connected by belt with other machinery for imparting a rotary motion to the said main driving shaft B. To the said shaft is geared, by means of toothed wheels P and
45 P' respectively, a counter shaft Q. On the latter are secured the cams B² and B³, adapted to engage friction rollers D² and D³, respectively, held on the slides D and D', respectively, fitted to slide vertically in suitable

guideways A', formed on the sides of the 50 main frame A.

The upper ends of the slides D and D' are provided with outwardly-extending arms D⁴ and D⁵, respectively connected with ropes D⁶ and D⁷, respectively, extending upwardly and
55 passing over pulleys D⁸, journaled in suitable brackets D⁹, extending from the main frame A, as plainly illustrated in Fig. 1. The upper and horizontally-extending ends of the ropes D⁶ and D⁷ connect with a slide E' forming part of the thread carrier E, and mounted
60 to slide longitudinally in suitable bearings F and F' attached to a bed plate A², supported on the upper part of the main frame A.

The thread carrier E serves to carry the
65 thread G, from one clamping device to another and also to manipulate the clamping devices H and H', located opposite each other directly under the slide E', which latter also imparts motion to the said clamping devices, as
70 hereinafter more fully described. The thread carrier E is provided with a vertically disposed rod E², mounted to slide vertically in a casing E³, secured on the slide E', as plainly shown in the drawings, especial reference being had
75 to Fig. 6. A spring E⁴, coiled in the casing E³, presses the said rod E², so as to hold the latter normally in a lowermost position, and to permit it to yield upwardly when riding
80 over one of the clamping devices, as herein- after more fully described.

In the lower end of the rod E² is arranged an opening E⁵, extending downwardly through a foot E⁶, securely held or formed on the lower
85 end of the rod E², the said foot standing in alignment with the clamping devices H and H' to open the jaws thereof, as hereinafter more fully described. The thread G passes through the opening E⁵ to the under side of
90 the foot E⁶ to be delivered by the latter to the jaws of the clamping devices, so as to stretch the thread between the said devices.

Each of the clamping devices H or H' is provided with a set of jaws H² and H³, pivoted on the arms H⁴ and H⁵, respectively, ful-
95 crumed on the respective bearings F and F', in which the slide E' is mounted. Each set of jaws H², H³ is held in a closed position by

springs H^6 , fastened to the respective arm H^4 or H^5 and pressing on pins or projections H^7 , secured or formed on each individual jaw H^2 and H^3 . The outer ends of the pivoted arms H^4 and H^5 are pivotally connected with vertically-disposed frames I and I' , respectively provided with pins I^2 and I^3 , respectively, fitted to slide in suitable bearings F^2 and F^3 , respectively, attached to the upper ends of the bearings F and F' , respectively.

The frames I and I' are provided with transversely-extending pins I^4 and I^5 , respectively, engaging longitudinally-extending slots E^7 and E^8 , respectively, formed in the slide E , as plainly illustrated in Figs. 1, 4 and 6, the ends of each slot E^7 or E^8 , being curved upwardly, as at E^9 , so that a vertical sliding movement is given to the frames I and I' whenever the pins I^4 and I^5 travel up or down in the said upwardly-bent ends E^9 of the slots E^7 and E^8 . The sliding movement given to the said frames I and I' causes a swinging movement of the arms H^4 and H^5 , to cause the sets of jaws H^2 , H^3 , to swing up and down, to carry the thread clamped between the two sets of jaws downward, into a lowermost position and onto the paper blank to be formed into an envelope. The thread G is moistened or gummed and unwinds from a spool G' , supported on a spool carrier G^2 , attached to the upper end of the bearing F' , as plainly shown in Fig. 1. The thread after leaving the spool G' passes through a fixed eye G^3 , and then over a sponge J , held in a vessel J' containing liquid gum, so that the thread in passing through the sponge J takes up the gummy substance absorbed by the sponge, whereby the thread is coated with sufficient gummy substance to properly adhere to the envelope blank at the time the thread is stretched between the clamping devices and moved downward in contact with the paper, as previously described. The thread after leaving the sponge passes over the roller G^4 journaled in the bracket J^2 , carrying the said vessel J' and the eye G^3 as plainly illustrated in Fig. 1. The thread, after leaving the pulley G^4 , extends downward and passes through the opening E^5 in the rod E^2 to the under side of the foot E^6 which delivers the thread to the clamping devices H and H' . The paper blank for forming the envelope is pressed down onto the bed plate A^2 by means of a plunger K so as to form the flaps for the envelope, the front edge of the said plunger forming the bottom flap in such a manner that the joint of this flap with the front of the envelope is in alignment with the thread held between the clamping devices H and H' , so that when the latter deliver the thread onto the paper it stands in the joint between the lower flap and the front, as will be readily understood by reference to Fig. 3.

The plunger K forms part of an envelope machine of any approved construction, the said plunger being held on a beam K' pro-

vided with arms K^2 extending downwardly, and pivotally-connected with the eccentric rods K^3 of eccentrics K^4 , secured on the main driving shaft B . Thus, when the latter is rotated, the plunger K is moved downward at the proper time to cause the flaps of the envelope blank to turn into a vertical position to permit the clamping devices H and H' to place the thread into the joint of the lowermost flap and front, as previously described.

The rotary motion of the shaft B causes a reciprocating of the slide E' so that the frames I and I' are actuated as previously described, and the rod E^2 of the thread carrier moves from one side to the other at the time the jaws H^2 , H^3 , are in an uppermost position. As the foot E^6 moves toward one set of closed jaws H^2 , H^3 , it finally passes with its forward pointed end between the closed ends of the jaws, and on the further longitudinal movement of the slide E' , the foot causes the jaws H^2 , H^3 , to open so as to carry the thread between the two jaws, which again close by the action of the springs H^6 , as soon as the rear pointed end of the foot E^6 , has left the jaws on the inside. At this time the ends E^9 of the slots in the slide E' engage the pins I^4 , I^5 , so that the frames I and I' are caused to slide upward, thereby imparting a swinging motion to the arms H^4 , H^5 , to carry the sets of jaws H^2 , H^3 , downward and consequently the thread stretched between the two sets of jaws in a like direction and in contact with the envelope. The thread stretched between the two sets of jaws is then cut close to the jaws by the cutting mechanisms L and L' hereinafter more fully described, after which the slide E' returns and in doing so, causes the arms H^4 , H^5 to swing upward at their inner ends, at the same time carrying the foot E^6 over the closed ends of the respective sets of jaws H^2 , H^3 , so that the cut off end of the thread remains in the closed jaws and is securely held therein to permit the carrier to again stretch the thread back over to the other clamping device in the manner above described.

It is understood that the foot E^6 readily slides up the closed end of the set of jaws, as the spring E^4 permits the rod E^2 to yield, and as soon as the foot E^6 has passed the closed ends of the set of jaws, the spring E^4 again presses the rod E^2 downward so as to bring the foot E^6 in alignment with the closed ends of the set of jaws H^2 , H^3 and to permit the said foot to open the other set of jaws, as previously explained.

The cutting mechanisms L and L' previously mentioned are provided with two cutters N , N' mounted on a frame L^5 fitted to slide transversely in suitable bearings arranged in the bed plate A^2 . The forward end of this frame L^5 is pivotally-connected by a link L^2 , with a bell crank lever L^3 , (see Fig. 2) fulcrumed on the lower part of the main frame A and adapted to be actuated by a cam L^4 , secured on the main driving shaft B .

Thus, when the latter is rotated the bell crank lever L^3 is actuated and an intermittent reciprocating motion is given to the frame L^5 so that the two cutting mechanisms L and L' are moved to and from the thread stretched between the clamping mechanisms H and H' , to cut the thread simultaneously at two places; that is, next to the closed sets of jaws H^2, H^3 .

Each of the cutting mechanisms L and L' (see Fig. 5) is provided with the fixed knife N^2 , secured to the frame L^5 and the pivoted knife N^3 fulcrumed at N^4 on the fixed knife N . The pivoted knife N^3 is provided with an angular arm N^5 , carrying a pin N^6 pressed on by a spring N^7 , so as to hold the pivoted knife N^3 normally in an open position. The pin N^6 is also adapted to be engaged by a fixed pin O secured on the bed plate A^2 close to the clamping mechanisms H and H' , so that on reciprocating the frame L^5 , the pins N^6 are brought in contact with the corresponding fixed pins O to impart a swinging movement to the pivoted knives N^3 , so as to close the same at the time the thread which projects between the clamping mechanisms is between the knives N^2, N^3 of the cutters N and N' . The knives N^3 in closing cut the thread close to the closed jaws H^2 and H^3 , of the clamping mechanisms H and H' . As soon as the thread is cut the frame L^5 returns to its outermost position shown in Fig. 3, so that the severed thread remains on the envelope blank, adhering thereto by the adhesive substance with which each thread is coated. The frame L^5 in moving into its outermost position moves the pins N^6 away from the fixed pins O , so that the springs N^7 again open the pivoted knives N^3 , as illustrated in Fig. 5. After the thread is cut and attached to the envelope blank, the latter is again treated in the usual manner by folding the several flaps, so that the thread is inclosed inside of the envelope at the joint of the front and lower back flap, with the ends preferably projecting beyond the sides of the envelope. An envelope constructed in this manner can be readily opened by pulling on the projecting end of the thread so as to break the joint between the back flap and the front, to remove the contents of the sealed envelope.

It is understood that the several devices are constructed in such a manner and operated from the main driving shaft B , so as to move in unison in the manner above described to accomplish the desired result.

It will be further understood that the cutting mechanism is reciprocated twice for each reciprocation of the thread carrier, so as to cut the thread each time it has been stretched between the clamping devices.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. An envelope threading machine provided with a pair of clamping devices arranged op-

posite each other, and a reciprocating thread carrier adapted to carry and deliver a thread from one clamping device to the other, so that the thread is taken hold of by and stretched between the clamping devices, substantially as shown and described.

2. An envelope threading machine provided with a pair of clamping devices arranged opposite each other, a reciprocating thread carrier adapted to carry and deliver a thread from one clamping device to the other, so that the thread is taken hold of by and stretched between the clamping devices, and a gumming device for gumming the thread previous to passing to the said carrier, substantially as shown and described.

3. An envelope threading machine provided with clamping devices for holding the thread stretched a reciprocating cutting mechanism arranged to slide transversely of the thread and having two cutters adapted to simultaneously cut the stretched thread at two places, each of the cutters being provided with a pivoted knife, and means for actuating the pivoted knife to cut the thread as set forth.

4. An envelope threading machine, comprising a pair of clamping devices arranged opposite each other and adapted to hold a thread in a stretched condition, a thread carrier adapted to move the thread from one clamping device to the other, and means, substantially as described, for actuating the said clamping devices from the said carrier, as set forth.

5. An envelope threading machine provided with clamping devices and a thread carrier comprising a reciprocating slide, and a yieldingly mounted rod fitted to slide on the said slide, and provided with an opening for the thread and with a foot for opening the clamping devices to deliver the thread to the same, substantially as shown and described.

6. An envelope threading machine, comprising a reciprocating slide having slots, a rod mounted yieldingly on the said slide and provided with an opening for the thread and with a foot, and two clamping devices arranged opposite each other and each provided with a pair of spring pressed jaws adapted to be opened by the said foot, substantially as shown and described.

7. An envelope threading machine, comprising a reciprocating slide having slots, a rod mounted yieldingly on the said slide and provided with an opening for the thread and with a foot, two clamping devices arranged opposite each other and each provided with a pair of spring pressed jaws adapted to be opened by the said foot, pivoted arms carrying the said sets of jaws, and frames pivotally-connected with the said arms and provided with pins engaging the said slots in the slide, substantially as shown and described.

8. An envelope threading machine, comprising a reciprocating slide having slots, a rod mounted yieldingly on the said slide and

provided with an opening for the thread and
with a foot, two clamping devices arranged
opposite each other and each provided with
a pair of spring pressed jaws adapted to be
5 opened by the said foot, pivoted arms carry-
ing the said sets of jaws, frames pivotally-
connected with the said arms and provided
with pins engaging the said slots in the slide,

and means, substantially as described, for
imparting a reciprocating motion to the said ro
slide, as set forth.

SYLVESTER P. DENISON.

Witnesses:

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F. W. HANAFORD.