Jan. 5, 1943. J. R. BROWN 2,307,618

ENVELOPE OPENING MACHINE

Filed Nov. 21, 1941

Fig. 4.

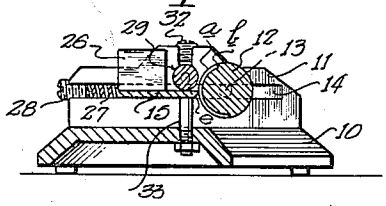


Fig. 1.

Fig. 5.

Fig. 3.

Fig. 2.

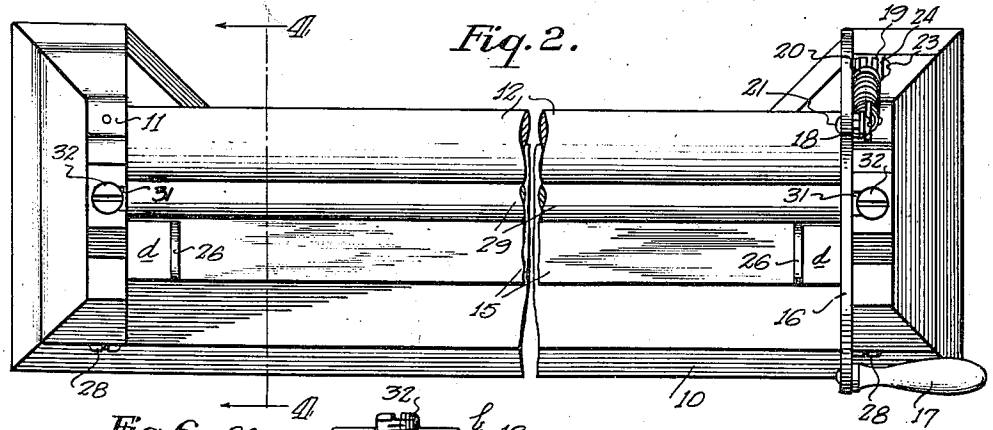
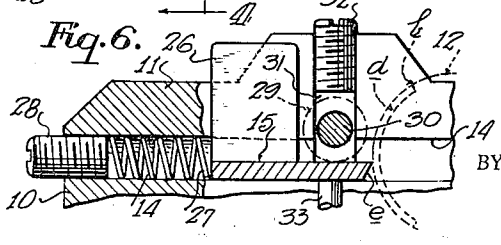


Fig. 6.



JOSEPH R BROWN
INVENTOR.

BY

ATTORNEY

Patented Jan. 5, 1943 2,307,618

UNITED STATES PATENT OFFICE

2,307,618

ENVELOPE OPENING MACHINE

Joseph R. Brown, Dallas, Tex.

Application November 21, 1941, Serial No. 419,989

1 Claim. (Cl. 164—66)

This invention relates to cutting machines and more particularly to a machine designed for opening letter envelopes.

The principal object of the invention is to provide a simple machine, constructed for manual or automatic operation, whose purpose is to sever the folded edge of a letter envelope to open the same, to accomplish which, a lever actuated cylinder or mandrel is mounted in a frame and whose surface is provided with an elongated, undercut portion defining an abrupt spiral offset, cooperating with a relatively stationary plate as a complementary cutting and holding means for the envelope.

Another object of the invention is to provide the envelope holding plate or bed, with which the cutting mandrel cooperates, with means for retaining the same in operative relation to the cutting mandrel, said holding means being under adjustable spring tension and arranged to insure true parallelism between the mandrel and bed at all times.

Another object of the invention is to provide means in the form of a freely rotatable, cylindrical body overlying the contiguous portions of the bed and cutting mandrel, serving the dual function of imposing moderate pressure on an envelope to facilitate cutting thereof and affording a protection against possible injury by the cutter.

Still another object of the invention is to provide a novel form of mandrel operating lever and spring return, together with means to limit the travel of the lever in either direction.

With the foregoing objects as paramount, the invention has further reference to certain features of accomplishment which will become manifest as the description proceeds, taken in connection with the accompanying drawing wherein:

Figure 1 is a perspective view of an envelope opening machine constructed according to the present invention.

Figure 2 is a plan view thereof.

Figure 3 is an end view of the machine.

Figure 4 is a transverse section on line 4—4 on Figure 2.

Figure 5 is a fragmentary detail view in perspective, of the cutting mandrel, and

Figure 6 is a fragmentary detail view of the means for holding the bed or envelope supporting plate under spring tension.

Continuing with a more detailed description of the drawing: a base 10 is provided which is preferably a metal casting to provide sufficient weight to insure stability of the machine. The base is formed at either end with uprights 11, disposed transversely across the base to afford bearings for the ends of the rollers constituting the guard and cutting mandrel as well as supporting the ends of the bed, all of which will now be described.

The cutting mandrel is comprised of cylindrical body 12 having spindles *b* at either end receivable in horizontal slots 14, milled in the inner surfaces of the uprights 11. The mandrel 12 has a portion of its surface undercut at *a* to define an abrupt, spiral offset *b*, perpendicular to the surface and which offset, when the mandrel is rotated, drags along the length of the inner edge of the plate or bed 15, in contiguous engagement with the said mandrel and forming therewith a complementary cutting element.

As a means for rotating or oscillating the mandrel 12, a lever 16 is provided, having a handle 17. This lever is fixedly connected to one end of the mandrel 12 so that when it is moved forwardly and downwardly, the mandrel will rotate on its pivots. It is to be noted that the effective range of movement of the lever is directly over the center of gravity of the assembly and this, combined with the weight of the base 10, prevents displacement of the machine in operation.

In Figure 1, the lever 16 is in inoperative position while in Figure 3, it is in an intermediate position. In the latter figure the lever is shown as having its lower portion cut at an angle at *c*. This angle, when the lever is in raised position, rests flush against the base 10 thereby providing a movement limiting means for the lever.

The means for returning the lever to its original upright position after having been actuated is comprised of a pair of relatively parallel and slidable links 18 and 19, surrounding the intermediate portion of which is a spring 20. The link 18 is pivoted at 21 to the top of the lever 16, extends through the spring 20 and has an enlargement 22 on its opposite end engaging the lower end of the spring. The companion link 19 is pivoted at 23 to ears 24 on the base 10, extends also through compression spring 20 and has an enlargement 25 on its opposite end engaging the upper end of the spring. It is apparent therefore that as the lever 16 is moved forwardly, the links 18 and 19 will move axially in opposite directions, jointly compressing the spring 20, thereby building up energy therein

to return the lever 16 and consequently the mandrel 12 to their original, inoperative positions after a cutting operation.

The envelope supporting bed is comprised of a metal strip 15, previously referred to and to whose ends are attached special shaped angles at *d* which are bent abruptly upward at 26 to define guides for the sides or edges of an envelope being moved into cutting position in the machine. The doubled thickness ends *d* are received in the horizontal slots 14 earlier mentioned and against the outer edges of the strip 15, at either end, bear springs 27, followed by screws 28 by which tension of the springs may be adjusted. It will become apparent by examining Figures 4 and 6 that the width of the plate 15 is greater than that of the upright guides 26 and resting upon this plate, intermediate the guides 26 and cutting mandrel 12 is a roller 29 which, as previously stated, serves the dual purpose of providing a guard over the cutting area and of imposing sufficient pressure on an envelope in cutting position to properly position the edge thereof relative to the offset *b* of the mandrel for severance.

The roller 29 has spindles 30 (Fig. 6) entering vertical slots 31 in the uprights 11 and which slots intersect the horizontal slots 14 in which repose the ends of the bed 15 and the spindles of mandrel 12. The roller 29 is loosely mounted so that envelopes of varying thicknesses may be thrust thereunder with equal ease. Upward displacement of the roller is limited at either end by screws 32 in internally threaded bores in the upper ends of the slots 31.

It is to be understood that not only is the roller 29 loosely mounted but the bed 15 also is capable of some lateral displacement, it being held in yielding relation to the cutting mandrel by springs 27 and screws 28. This feature facilitates cutting the edges of envelopes and likewise minimizes wear on the effective cutting edge *e* (Fig. 6) of the bed which, it will be observed, is slightly raked to increase its effectiveness.

For optimum results in severing the edge of an envelope, it is provided that the bed 15 be adjustable vertically to change the spacing of its edge *e* relative to the offset *b* of the mandrel, it being understood that while limited, there is a certain amount of play permitted of the bed in its retaining slots 14. This adjustment is accomplished by means of pins 33, threaded into and extending upward from the base 10 and whose upper ends bear against the underside of the bed 15 near its effective edge *e*. By adjusting these pins as to height, minute adjustment of the bed is effected, retaining maximum rigidity thereof throughout its length.

Should any repairs or replacements be required, necessitating the dismantling of the machine, it is simply necessary to detach link 18 from lever 16, remove screws 32, lift the roller 29 out of slots 31, remove screws 28 and withdraw the bed 15 and cutting mandrel 12 from slots 14.

Manifestly, the construction as shown and described is capable of some modification and such modification as may be construed within the scope and meaning of the appended claim is also considered to be within the spirit and intent of the invention.

What is claimed is:

In an envelope-cutting machine the combination comprising a base provided with journal bearings rising from either end having horizontal grooves extending partially through the width of their confronting faces and further having vertical grooves communicating with said horizontal grooves, a mandrel having spindles receivable in said grooves and provided with an offset spirally extending from end to end to afford a cutting edge, a lever affixed to one end and extending at right angles from said mandrel for rotating said mandrel, a pair of relatively parallel arms in sliding relationship, one of which is pivoted to the free end of said lever and the other to said base, a spring surrounding said arms, means carried by the free ends of said arms to compress said spring when said lever is actuated for returning said lever to inoperative position, a plate disposed forwardly and in parallel relation to said roller for supporting an envelope in cutting position and having an edge in contiguous relation thereto as a cutting means complementary to the spiral offset of said roller, a coiled spring lying in each of the grooves of said journal bearing faces and bearing against the ends of said plate for yieldingly retaining said plate in operative position, a guard roller having pintles extending into the vertical grooves of said bearing faces for limited perpendicular displacement above and relative to the point of contiguity between said roller offset and plate, said roller also serving to bear upon and hold an envelope in cutting position on said plate, means for adjusting the pressure on said coil springs and means to vary the limit of perpendicular displacement of said guard roller.

JOSEPH R. BROWN.