2 Sheets—Sheet 1

J. W. & R. H. LUFKIN.

MACHINE FOR CUTTING AND FOLDING LEATHER.

No. 191,006. Patented May 22, 1877.

FIG. 1.

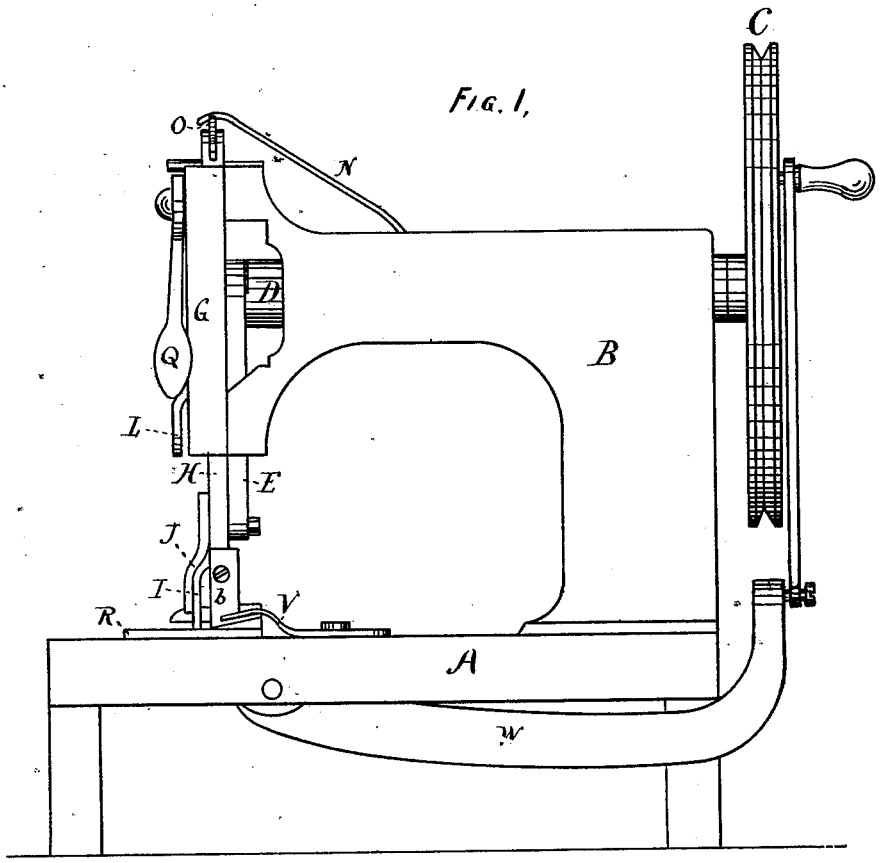


FIG. 5.

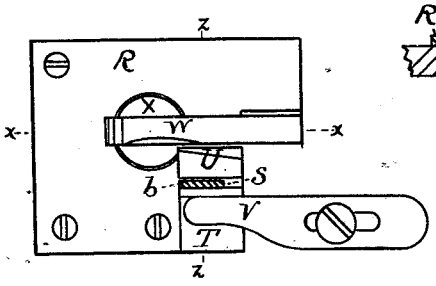
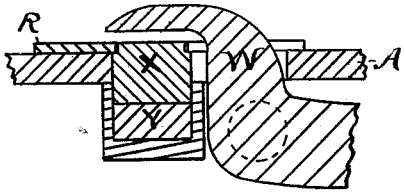


FIG. 6.



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2 Sheets—Sheet 2.

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FIG 2

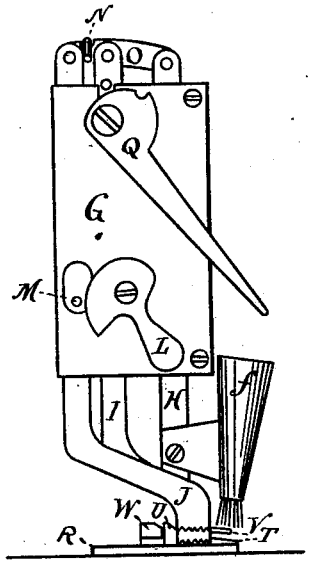


FIG 3

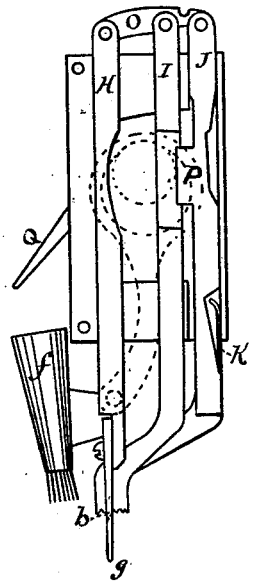


FIG 4.

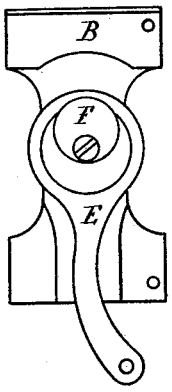
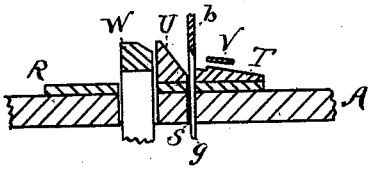


FIG. 7.



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UNITED STATES PATENT OFFICE.

JOHN W. LUFKIN AND RICHARD H. LUFKIN, OF CHELSEA, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR CUTTING AND FOLDING LEATHER.

Specification forming part of Letters Patent No. **191,006**, dated May 22, 1877; application filed September 8, 1876.

To all whom it may concern:

Be it known that we, JOHN W. LUFKIN and RICHARD H. LUFKIN, both of Chelsea, in the county of Suffolk and Commonwealth of Massachusetts, have invented a new and useful or Improved Folding-Machine for Turning the Edges of Shoe-Vamps, and for other analogous purposes, which invention is fully set forth in the following specification, reference being had to the accompanying drawings.

The object of our invention is to enable workmen to perform, with unusual rapidity and neatness, and at a single operation, the labor of pasting, cutting, folding, and pressing the edges of work requiring to be folded; and the invention consists in a mechanism or machine constructed and adapted expressly to perform said operations automatically, as hereinafter fully described.

Figure 1 is a side elevation of the machine. Fig. 2 is an elevation of the head, attached to the arm or goose-neck of the machine, and containing some of the principal operative parts. Fig. 3 is a view of the head detached from the arm, and the reverse of that shown in Fig. 2, giving a view of the construction and arrangement of the parts therein. Fig. 4 is the end of the arm or goose-neck, with the head and parts (Fig. 3) removed, and shows, attached to the driving-shaft, the eccentric strap and cam for operating the feed and knife. Fig. 5 is a top view of the bed-plate and devices attached thereto. Fig. 6 is a longitudinal section through *x x*, Fig. 5. Fig. 7 is a cross-section through *z z*, Fig. 5.

A, Fig. 1, is the bed of the machine; B, the arm or goose-neck; C, the driving-wheel; and D, the driving-shaft. Upon the shaft D is an eccentric strap, E, and a cam, F, Fig. 4. In the head or cap, Figs. 2 and 3, which is attached to the goose-neck, are the cutter-bar H, presser-bar I, and feed-bar J. These bars move freely in vertical slots or grooves in head G; and feed bar J has also a lateral movement imparted to it in one direction by cam F, dotted in Fig. 3, and in the opposite direction by spring K, shown in same figure. The extent of this latter movement, and consequently the intermittent progress of the material past the knives, is regulated and controlled by the cam L, Fig. 2, set in any required position, and against which the pin M in said bar, which projects outward through the slot in the cap G, acts by force of said spring. When the driving-shaft D is rotated the eccentric strap E, attached also to the cutter-bar H, which carries a cutting-blade, causes said bar to reciprocate vertically, and, as it reaches its extreme upward movement, it raises bar I sufficiently to remove its presser-foot from the material under it, while the feed-bar J is at same time forced down upon said material by a spring, N, one end of which is attached to the machine-arm, while the other acts freely in a notch in the connecting-bar O, which is pivoted to said bars at their top ends; and while said feed-bar is thus forced down upon the material it is moved laterally, for the purpose of feeding or carrying the material forward, by the cam F acting against the said bar at P, Fig. 3. When this movement of the feed-bar has taken place the cutter-bar has commenced to descend, and in its downward movement, and before any upward movement of the feed-bar has occurred, it carries the presser-bar I down until its foot rests firmly upon the material being folded, and then, continuing its descent, it raises the feed-bar J, through the connecting-bar O rocking upon its pivot in the end of the bar I, and said bar J, being so raised, is then carried backward laterally by spring K, to renew its hold upon the material at its next descent. Thus the bars H I J are caused to move relatively to each other and carry forward and cut the edges of the material, as required. To raise both the feed and presser bars from the material at the same time the cam-lever Q is employed.

While this feeding device is, by reason of the alternate movement of the bars I and J, and their rough feet, very effective in its hold upon, and reliable in its movement of, the work, yet its arrangement being such that it works wholly from above, and, therefore, comes in contact with the material only upon one side, and that the unfinished side, it does not mar the finished surface of the material upon which it operates, and this constitutes one of its important advantages over feeding devices for such purpose, operating on the under and finished side, or upon both sides, of the material.

Upon the bed A is a plate, R, Fig. 5, which

is slotted at S for the passage of the vertical reciprocating cutting-blade *b*, which does its cutting in conjunction with the inclined shearing-block T, Fig. 7. Also, upon said plate is the folding-block U; and to the bed of the machine is attached an adjustable guide, V, and up through a slot in said bed projects the end of the fold-presser W, which is pivoted beneath the bed, as shown, and the opposite end of which is connected by a link to the driving-wheel C, and is thereby operated, as shown in Fig. 1. This fold-presser acts upon the surface of the yielding block X, which is seated upon an elastic cushion or spring, Y, in a recess in the bed of the machine, as shown in Fig. 6.

The edge of the material to be folded is passed under the guide V and upon the shearing-block T, and is carried by the feeding devices, already described, over said shearing-block, across the path of said reciprocating blade, which, in conjunction with said shearing-block, slits said edge, and against the folding-block U, which turns the edge partially over and under the fold-presser W, which sets the fold down properly, this last operation being performed upon the yielding surface X, to avoid cracking or breaking the finished surfaces of enameled or other easily-fractured materials upon the edge of the fold.

It is plain that a yielding surface may be employed on either or both sides of the material, to close the fold, with the same result. The plate on the under side may be made rigid, and a yielding presser-plate may be applied to the fold-presser W; but the arrangement shown is considered preferable.

The reciprocating cutting-blade *b* has a back, *g*, Fig. 7, which extends beyond its cutting-edge downward through the slot S, and never rises entirely above or out of said slot. The edge of the work may be guided against this back, which will thus serve to gage or limit the extent of the cut in said edge to the depth or width of the blade.

The method of cutting herein described has several important advantages over the plan of cutting by a single knife driven down through the work onto a soft-metal block. In the latter case the knife dulls more readily, runs harder, is more noisy and jarring in its operation, and soon embeds itself in the block, and thereby fails to make a clean cut, and thus destroys the blocks and requires frequent adjustment, while by our method the knives hold their edges longer, cut with more certainty, run easier and with less noise, do not require so nice or frequent adjustment, and save the expense, which is considerable, of soft-metal blocks.

To the cutter-bar H we attach a cup or fountain, *f*, Fig. 2, which may be supplied with any suitable flowing, adhesive substance, and as the material is fed along under the guide V, as described, the brush inserted in the bottom of said fountain is brought down, by the action of said cutter-bar, in front of said guide and upon the material, and thus the glutinous substance is automatically applied to the edge thereof as it passes along to the succeeding operations of cutting and folding, and is so prepared that when the edge is finally doubled down by the fold-presser W it will firmly adhere and remain folded, as desired.

It is obvious that a fountain may be constructed and arranged in various ways, so as to automatically prepare the edge with a glutinous coating preceding the operation of folding without departing from our invention.

We are aware of the patent granted to Edward Corbett April 24, 1877, and we are familiar with the subject-matter of said patent, and we claim nothing therein, except so far as the same may enter into new and patentable combinations in our invention; but,

What we claim as our invention is—

1. In combination with the work-supporting bed A and vertically-reciprocating cutter *b*, arranged with the line of its edge at right angles to the line of feed, the shearing block T, arranged relatively to the cutter, as described, whereby the path of the cutter is coincident with the vertical face of the block, and the material is cut by the shearing action of the block and cutter, all substantially as described and shown.

2. In combination with a work-supporting bed, A, and a vertically-reciprocating cutter, *b*, of the reciprocating feed-bar J and presser-bar I, arranged to operate above the work, and to alternately act upon and recede therefrom, whereby it is alternately fed forward by bar J, and held in position by bar I for the action of the cutter, substantially as described and shown.

3. In combination with a cutting-blade, *b*, and a feeding and retaining mechanism, as described, of the folding-block U, and reciprocating fold-presser W, when arranged to operate relatively to and conjointly with each other, substantially as described and shown.

4. In combination with a vamp cutting and folding mechanism, an elastic or yielding reciprocating fold-presser, substantially as described and shown.

5. In a vamp cutting and folding machine, and in combination with mechanism for cutting, feeding, and folding the work, a device for automatically applying an adhesive material to the edge to be folded, substantially as and for the purposes specified.

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