No. 629,824. Patented Aug. 1, 1899.

E. SOUTHWORTH.

CUTTING MACHINE.

(Application filed Mar. 29, 1899.)

(No Model.)

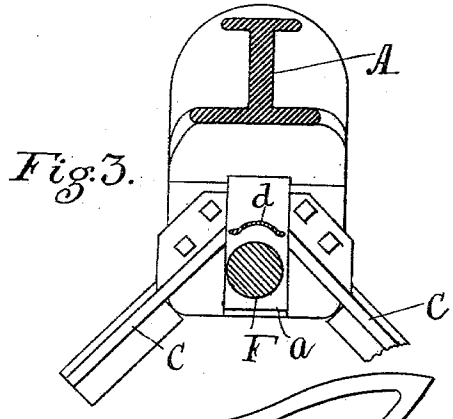


Fig. 3.

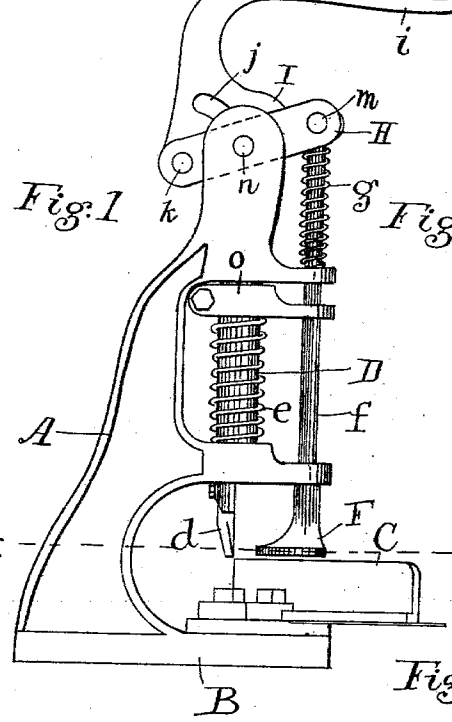


Fig. 1

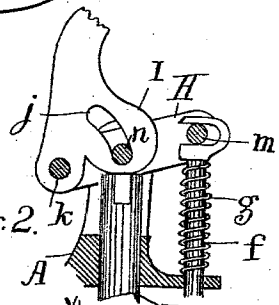


Fig. 2.

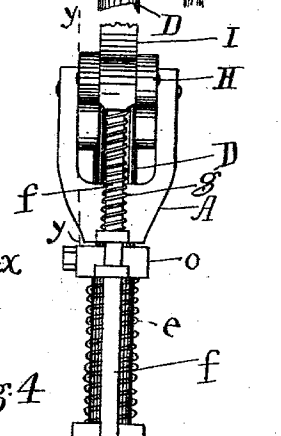
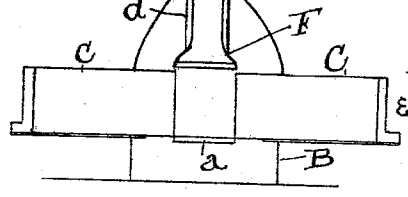


Fig. 4



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UNITED STATES PATENT OFFICE.

EDWARD SOUTHWORTH, OF PORTLAND, MAINE.

CUTTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 629,824, dated August 1, 1899.

Application filed March 29, 1899. Serial No. 710,960. (No model.)

To all whom it may concern:

Be it known that I, EDWARD SOUTHWORTH, a citizen of the United States of America, and a resident of Portland, Cumberland county, State of Maine, have invented certain new and useful Improvements in Round-Cornering Machines, of which the following is a specification.

My invention relates to round-cornering machines such as are used by printers and bookbinders for rounding the corners of books, pamphlets, &c. These machines have a curved knife for cutting the corners of the paper and a clamp or presser-foot for holding the paper in place during the operation of cutting.

In the round-cornering machine hitherto in use, so far as I am aware, the presser-foot acted on the paper with a substantially uniform pressure whatever its thickness and whatever resistance the paper offered to the passage of the knife. Thus when the knife became dull the presser-foot would not hold the paper any more firmly than when it was sharp, so that in the former case the paper was liable to move while it was being cut because it was not clamped firmly enough.

The object of my invention is to construct a round-cornering machine in which the force applied to hold the paper through the presser-foot will be increased or diminished according to the force applied to the knife. This result is accomplished by pivoting the presser-bar at one end of a centrally-pivoted lever and the cam which acts to force down the knife at the other end, so that the reaction on the pivoting-point of the cam, which is caused by the resistance of the knife-bar or plunger, will tilt up the lever and force down the presser-bar, and the greater the resistance of the knife the greater will be the force applied to depress the presser-bar. Thus the pressure of the presser-foot on the paper is automatically regulated with great accuracy by the resistance of the paper, caused by the varying degrees of sharpness of the knife and the thickness and quality of the paper.

I illustrate my invention by means of the accompanying drawings, in which—

Figure 1 is a side view of my machine. Fig. 2 is a section through the line $y\ y$ in Fig. 4, showing the upper part of the machine only. Fig. 3 is a section on the line $x\ x$ of Fig. 1, and Fig. 4 is a front view with the handle shown as cut away.

B represents the base of the machine, and A is a suitable standard to which the moving parts are attached.

The curved knife *d* is attached to the lower end of the plunger D, which is mounted in suitable guides in the standard A.

The plunger D is depressed in the operation of cutting by means of the cam I, which preferably acts on its upper end.

The cam I is provided with a suitable handle *i*, and it is pivoted to one end of the lever H, preferably formed with two separate side pieces, as shown in Fig. 4. The lever H is pivoted to the upper end of the standard A by means of a fixed pivot *n*, which passes through it at a point between the ends. The cam I is pivoted at one end of this lever, and the upper end of the presser-bar *f* is pivoted at the opposite end. As herein shown, the cam I is interposed between the two sides of the lever H, and it has a guide-slot *j*, through which passes the pivot *n*, the central pivot of the lever H.

k represents the pivot at one end of the lever, which pivots the cam, and *m* is the pivot at the other end, which pivots the upper end of the presser-bar *f*, and the connection with the presser-bar is made by means of a horizontal slot, which allows for the necessary movement of the pivot *m* as the lever tilts up and down.

The presser-bar *f* is mounted in suitable guides on the front part of the standard A, and on its lower end is the presser-foot or clamp F, which holds the work down while it is being cut by the knife *d*.

For the purpose of automatically lifting the plunger after the act of cutting I provide a spring *e*, which is coiled around the plunger and presses normally upward against the collar *o*, which is clamped to the plunger. A similar spring *g* is applied to the presser-bar *f* for the purpose of automatically lifting the presser-foot when the operating force on the lever is removed.

Suitable guides C are provided and secured on the base of the machine to guide the paper to its proper position, and a cutting-block *a* receives the lower edge of the knife when it comes down.

The operation of my device will clearly appear from what has been said. When the handle *i* is depressed, the cam tends to force downward the plunger and the reaction on the pivot *k* of the cam forces the rear end of the lever H upward and correspondingly forces the forward end of the lever, with the presser-bar *f*, downward, the lever being centrally pivoted in a fixed position. The form of the cam is such that the plunger is forced down much more slowly than the presser-bar, which descends quickly as soon as the handle is brought downward. Thus the presser-foot comes quickly down onto the work, and as the plunger follows and cuts the paper the force which acts to press down the presser-foot will be greater or less, according to the resistance which the knife meets with and the consequent upward thrust on the pivot *k*. If the knife is sharp and the paper cuts easily, a comparatively light pressure will be exerted on the presser-foot; but if the knife is dull and the resistance great a heavy pressure will be brought to bear on the paper.

The parts are so proportioned and adjusted that the pressure on the presser-foot will always be sufficient to hold the paper firmly, but will not be excessive so as to deface the paper.

I claim—

1. The herein-described round-cornering machine having a plunger with a cutting-knife at its lower end, a lever pivoted to the machine at a point between its ends, a cam for depressing said plunger pivoted to one end of said lever, a presser-bar pivoted to the other end of said lever and a presser-foot on the lower end of said presser-bar for clamping the work.

2. The herein-described round-cornering machine having a plunger with a cutting-knife at its lower end, a lever pivoted at a point between its ends to the machine, and located above the upper end of said plunger, a cam adapted to act on the top of said plunger to depress the same and pivoted at one end of said lever, a presser-bar pivoted at the other end of said lever and a presser-foot on the lower end of said presser-bar.

3. The herein-described round-cornering machine having a plunger with a cutting-knife at its lower end, a lever pivoted at a point between its ends to the machine by means of a fixed pivot and located over the upper end of said plunger, a cam adapted to act on the upper end of said plunger and pivoted at one end of said lever, said cam being provided with a slot through which said fixed pivot passes, a presser-bar pivoted to the other end of said lever and a presser-foot at the lower end of said presser-bar.

4. The herein-described round-cornering machine having a plunger with a cutting-knife at its lower end, a lever pivoted at a point between its ends to the machine over the upper end of said plunger, a cam adapted to act on the top of said plunger to depress the same and pivoted at one end of said lever, a presser-bar pivoted at the other end of said lever, a presser-foot on the lower end of said presser-bar and springs for lifting said plunger and said presser-bar.

Signed by me, at Portland, Maine, this 24th day of March, 1899.

EDWARD SOUTHWORTH.

Witnesses:
CONSTANT SOUTHWORTH,
S. W. BATES.