E. A. BIRCHER.

MACHINE FOR OPENING ENVELOPS.

APPLICATION FILED DEC. 14, 1911.

1,194,701.

Patented Aug. 15, 1916.

2 SHEETS—SHEET 1.

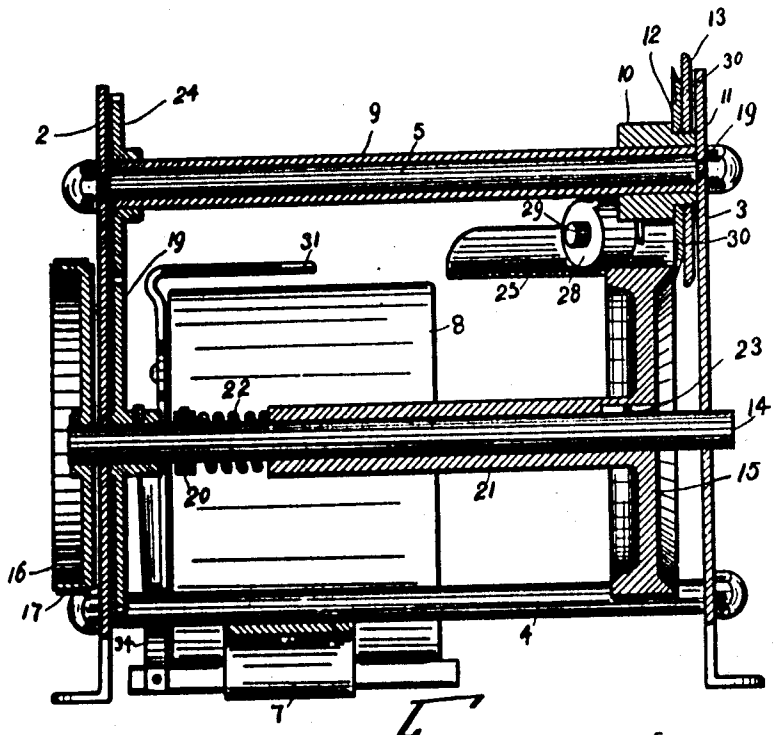
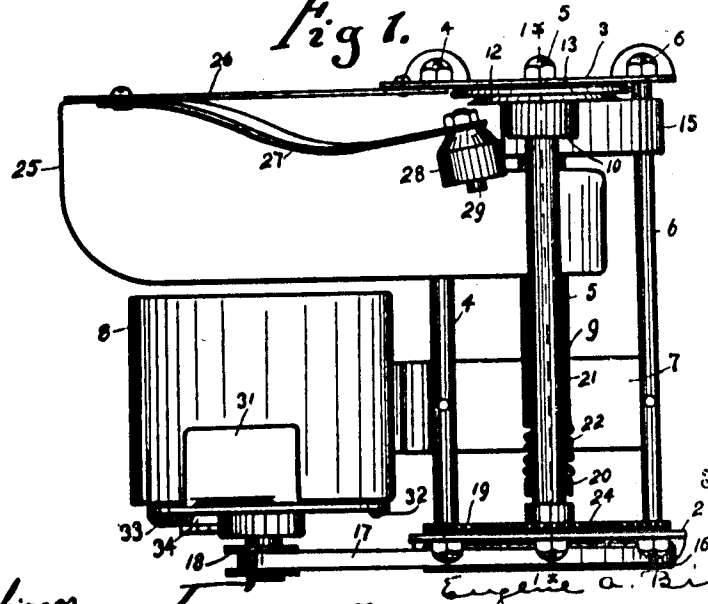


Fig 1.



Witnesses

Chas. Dechinger

Chas. Dechinger Jr.

Fig. 2.

Inventor

Eugene A. Bircher

By Frank Reifer

Attorney

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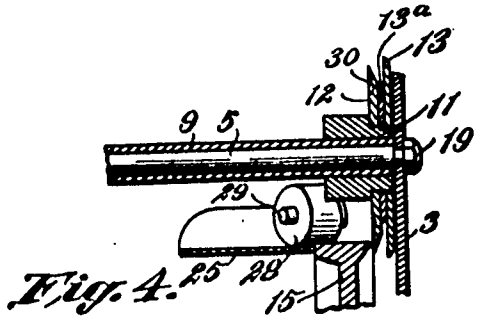


Fig. 4.

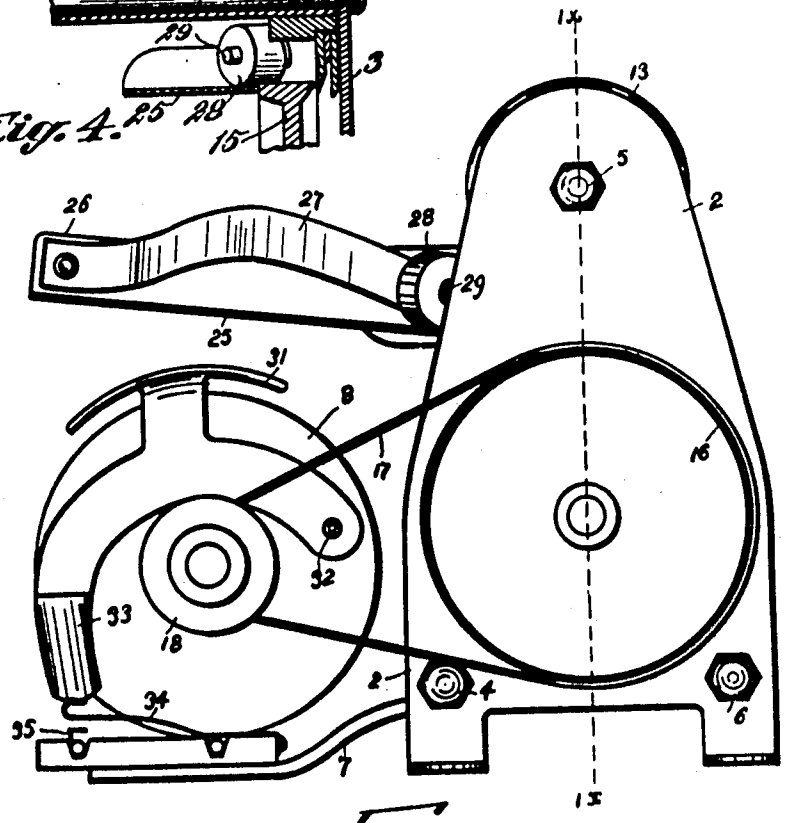


Fig. 3.

Witnesses

Eric Dochinger

Alice M. Thomas

Inventor

Eugene A. Bircher

By Frank Kerfoot

Attorney

THE HOOVER PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EUGENE A. BIRCHER, OF ROCHESTER, NEW YORK, ASSIGNOR TO HARRY C. NOBLES, OF ROCHESTER, NEW YORK, WILLIAM B. THURSTON, OF LIVONIA, NEW YORK, AND GEORGE A. COGSWELL, OF ROCHESTER, NEW YORK.

MACHINE FOR OPENING ENVELOPS.

1,194,701. Specification of Letters Patent. Patented Aug. 15, 1916.

Application filed December 14, 1911. Serial No. 665,853.

To all whom it may concern:

Be it known that I, EUGENE A. BIRCHER, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Machines for Opening Envelops, of which the following is a specification.

The object of this invention is to provide a machine for opening envelops such as are ordinarily used in mailing letters, the machine being constructed to open the envelop by cutting off a small portion therefrom along any edge of the envelop.

Another object of my invention is to construct the machine so that a rotary feed roll may be used to feed the envelops and a rotary cutter may be used to cut the envelops.

Another object of my invention is to adjust the feeding mechanism so that the edge on which the cut is intended to be made will be held in line with the cutting mechanism of the machine as the envelop passes through the machine.

Another object of my invention is to so construct the machine that it may be power driven, and the machine is preferably so designed as to contain therein an electric motor by which it may be driven.

These and other objects of my invention will be fully illustrated in the drawings, described in the specification and pointed out in the claims at the end thereof.

In the accompanying drawings, Figure 1 is a vertical transverse section through the machine on the line 1^x—1^x of Figs. 2 and 3. Fig. 2 is a top plan view of the machine. Fig. 3 is a side elevation of the machine. Fig. 4 is a detail view showing the manner of varying the distance between the cutting disk and the disk which determines the width of the cut.

In the several drawings like reference characters indicate like parts.

My machine preferably comprises the uprights 2 and 3, tied together by the stay rods 4, 5 and 6, which stay rods are shouldered and are provided with reduced ends which are threaded and which are engaged by nuts or other suitable holding devices for the purpose of clamping the uprights 2 and 3 firmly in place with the stay rods.

Rigidly connected to the stay rods 4 and 6 is the base plate 7 on which an electric motor 8 may be mounted so as to form an integral part of the machine. On the stay rod 5 is mounted to rotate a sleeve 9 which carries at one end a sleeve 10, the end 11 of which is reduced and threaded. On this reduced end is placed the disk cutter 12 and the washer 13 which is threaded to engage with the reduced end 11 of the sleeve 10, and between the washer 13 and the shouldered end of the sleeve 10, the disk cutter 12 is held in place. Between the disk 13 and the cutter 12 one or more washers may be inserted for the purpose of increasing the space between the edge of the cutting disk 12 and the face of washer 13. The inner face of the washer 13 will normally come in line with the flange 26 of the cutting table hereinafter described, so that the distance between the cutting edge of the rotary cutter and the inner face of the washer determines the depth of the cut which is made on the side of the envelop, and by interposing small washers 13^a between the washer 13 and the cutting disk 12, the depth of the cut may be increased to any desired amount (see Fig. 4).

Mounted to rotate in the uprights 2 and 3 is the shaft 14 on which is carried the feed roller 15. This shaft 14 carries at the left hand end, as shown in Fig. 1, the driving pulley 16 which is driven by a belt 17 from a pulley 18 on the shaft of the electric motor. This shaft 14 has keyed thereto the gear 19 which rotates therewith. Keyed to this shaft is also provided the collar 20 which rotates integrally therewith. The feed roller 15 is provided with a sleeve 21 which may or may not be integral therewith.

A spring 22 is pressed between the collar 20 and the sleeve 21 and tends to move the sleeve 21 and the roller 15 to the right along the shaft 14. The roller 15 is splined at 23, which permits the roller to move lengthwise with the shaft but compels the roller to rotate with the shaft when the shaft is rotated. The spring 22 forces the roller 23 to the right so as to make contact with the circular cutting blade 12, although it is obvious that the roller 15 might be rigidly mounted on the shaft 14 and the spring pressure

might be applied to the cutting blade 12 instead, to move it laterally against the roller.

The sleeve 9 with which the cutting blade 12 is mounted to rotate in unison, carries at its left hand end a gear 24 with which engages a gear 19 by which the two are driven in unison, the gearing being proportioned so as to cause the cutting blade to revolve with a peripheral velocity slightly in excess of the peripheral velocity of the feed roller 15.

Mounted on the upright 3 is the feed table 25 on which the envelops may be placed for the purpose of feeding them through the machine. This feed table has a flange 26 bent up on one side thereof, which flange is intended to hold the envelops in line with the cutting wheel as they pass thereunder. Mounted on this flange 26 is the spring arm 27 which carries at its forward end the soft roller 28 which bears lightly, preferably by gravity, upon the feed table 25 or the envelop as it passes between the roller 28 and the feed table 25.

The axis 29 upon which the feed roller is mounted is placed at an angle to the stay rod 5 around which the cutting wheel 12 rotates, so that as the envelop moves forward the roller 28 tends to move the envelop to the left and hold the edge thereof in line with the cutting wheel.

The roller 28 may be driven by the friction of the feed of the envelop or may be driven by power in any suitable way. The cutting blade 12 is undercut, as appears in cross section in Fig. 1 at 30, so that in the rotation of the feed roll 15 and the cutting blade 12 the sharp edge of the cutting blade is always brought to bear against the edge of the feed roll. The spring 22 presses the edge of the feed roll 15 against the edge of the cutting wheel so as to cause the two continually to grind against each other, insuring a sharp cut and also assisting to keep the edge of the cutting wheel sharp.

For the purpose of controlling the motor I provide the hand switch 31 shown in Figs. 1 and 3, which is pivoted at 32. This hand switch is provided at the bottom with the tip 33, made of fiber or other suitable material with which it contacts with the spring 34 which forms one side of the electric circuit. By depressing the switch 31 a spring 34 is brought into contact with the plate 35 which forms the other side of the circuit by which the current is fed to the motor for driving it.

Having thus described my invention, what I claim as new and patentable is as follows:

1. In a machine for opening envelops, the combination with a table and a guide flange thereon, of a disk mounted to rotate substantially in a line with the guide flange, a circular cutter having less diameter than the disk, rotatable about an axis common to the axis of the said disk and adjustable toward and from the said disk to vary the depth of the cut, and a feeding cutter yieldingly engaging the circular cutter to adapt itself to the adjustment of the said circular cutter.

2. In a machine for opening envelops, the combination with a table having a guide thereon, of a shaft supported above said table and having a screw threaded portion and a shoulder adjacent thereto, a circular cutter arranged on said screw threaded portion, and a disk of greater diameter than the cutter, having screw threaded engagement with said screw threaded portion and adapted to clamp the cutter against the shoulder, said disk serving to determine the width of the cut by its relative position to the circular cutter.

3. In a machine for opening envelops, the combination with a table having a guide flange thereon, of a pair of rotary cutters for removing one edge of an envelop movable along the guide, one of said cutters turning about an axis on one side of the table and the other of said cutters turning about an axis on the other side of the table, and a disk arranged to turn about an axis common to the upper cutter, said disk having a greater diameter than the cutter and being adjustable toward and from the cutter to vary the width of the chip to be cut from an envelop.

4. In a machine for opening envelops, the combination of a table having a guide flange thereon, of a disk mounted to rotate substantially in a line with the guide flange, and a circular cutter rotatable about an axis common to the axis of the said disk and adjustable toward and from the said disk, and a feeding cutter yieldingly engaging the circular cutter to adapt itself to the adjustment of the said circular cutter.

In testimony whereof I affix my signature in presence of two witnesses.

EUGENE A. BIRCHER.

Witnesses:
LENA M. ASH,
ALICE M. JOHANNS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."