H. D. TAYLOR.

MACHINE FOR OPENING ENVELOPS.

APPLICATION FILED JULY 24, 1913.

1,158,583. Patented Nov. 2, 1915.

3 SHEETS—SHEET 1.

Fig. 1

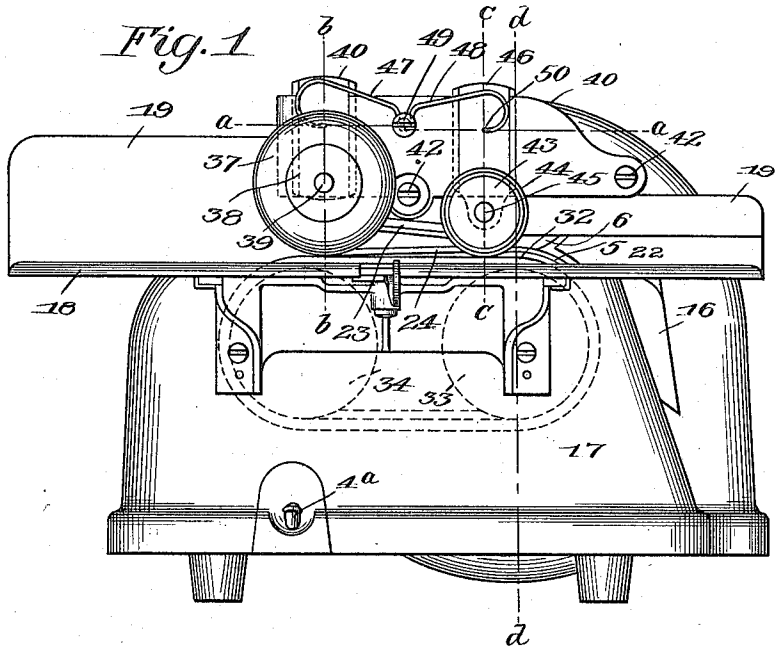


Fig. 2

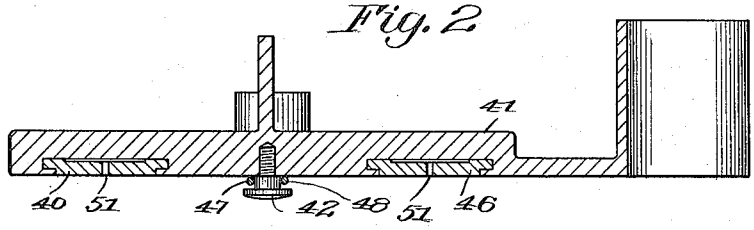


Fig. 3

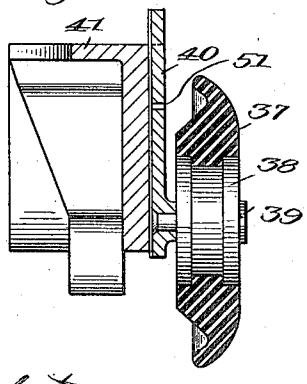
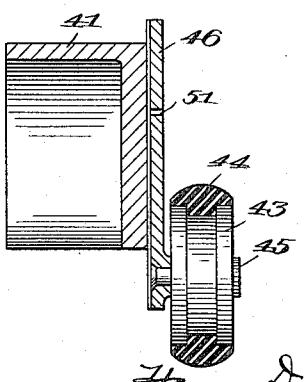


Fig. 4



Witnesses

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3 SHEETS—SHEET 2.

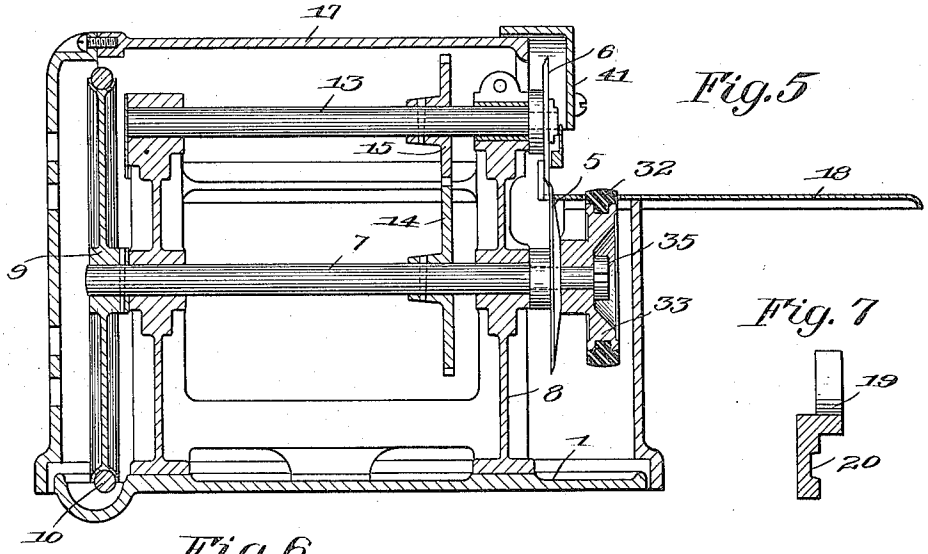


Fig. 5

Fig. 7

Fig. 6

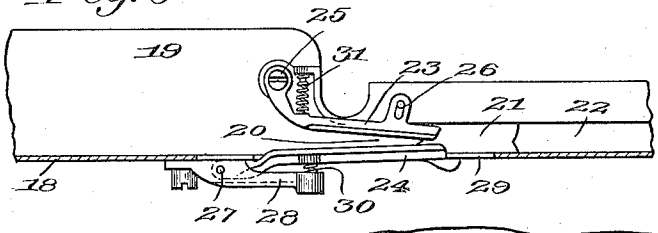


Fig. 9

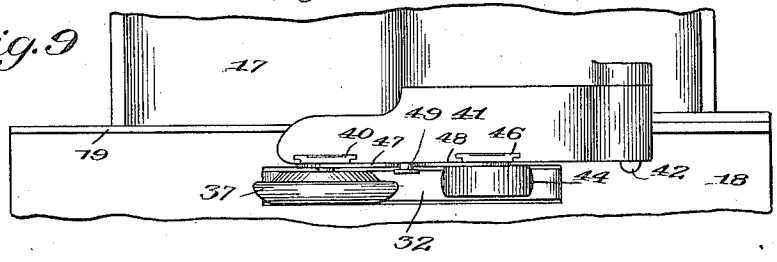
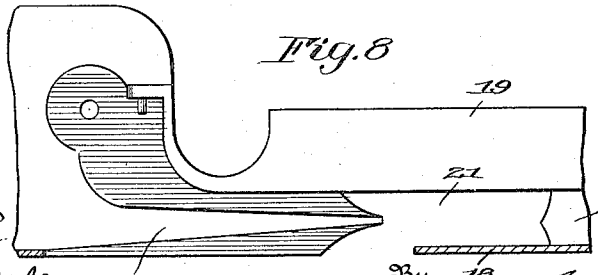


Fig. 8



Witnesses

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3 SHEETS—SHEET 3.

Fig. 10

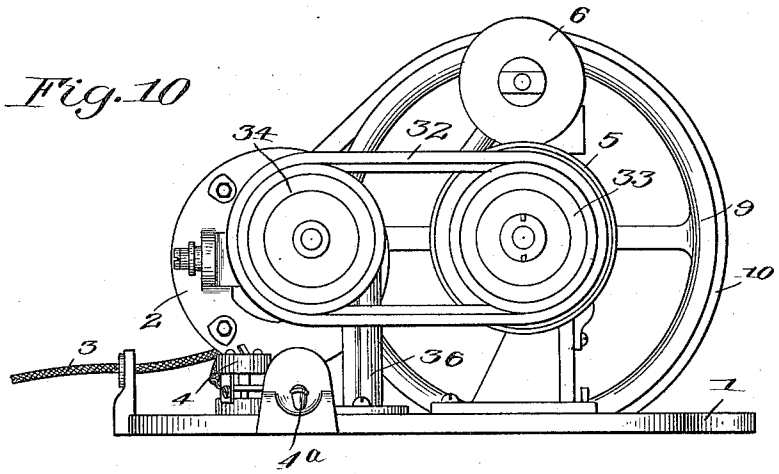
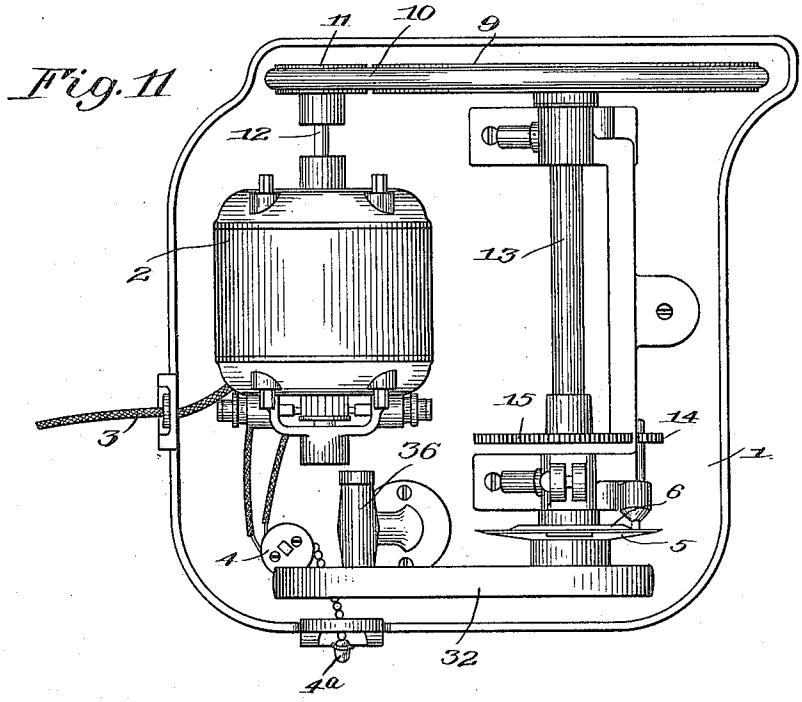


Fig. 11



Witnesses

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UNITED STATES PATENT OFFICE.

HENRY D. TAYLOR, OF ROCHESTER, NEW YORK, ASSIGNOR TO LIGHTNING LETTER OPENER COMPANY, OF ROCHESTER, NEW YORK, A CORPORATION.

MACHINE FOR OPENING ENVELOPS.

1,158,583. Specification of Letters Patent. Patented Nov. 2, 1915.

Application filed July 24, 1913. Serial No. 780,978.

To all whom it may concern:

Be it known that I, HENRY D. TAYLOR, of Rochester, in the county of Monroe and State of New York, have invented a new and useful Improvement in Machines for Opening Envelops, which improvement is fully set forth in the following specification, and shown in the accompanying drawings.

The present invention relates to machines for opening envelops and an object of this invention is to provide an improved construction in which the envelops are fed forwardly along and laterally toward a guide which directs the envelops to a suitable cutting mechanism.

To this and other ends the invention consists in certain parts and combinations of parts all of which will be hereinafter described, the novel features being pointed out in the appended claims.

In the drawings: Figure 1 is a front view of a machine embodying the present improvements; Fig. 2 is a section on the line *a*—*a*, Fig. 1; Fig. 3 is a section on the line *b*—*b*, Fig. 1, through the feeding and deflecting roller and the supporting cap; Fig. 4 is a section on the line *c*—*c*, Fig. 1, through the feed roller which is located in proximity to the cutting mechanism; Fig. 5 is a vertical section through the machine on the line *d*—*d*, Fig. 1; Figs. 6, 7 and 8 are detail views of the guide; Fig. 9 is a top view of the machine in proximity to the feeding and deflecting mechanism; Fig. 10 is a view in elevation of the parts arranged within the inclosing casing; and Fig. 11 is a view in plan of the parts shown in Fig. 10.

Referring more particularly to the drawings, 1 indicates the base on which may be arranged a motor 2 of any suitable type. In this instance, the motor is electric and is supplied by a current through the line wires 3 and is controlled by a rotary snap switch 4 which does not form the subject matter of the present invention. There is also provided, preferably on the base 1, a cutting mechanism which may embody two rotary cutters 5 and 6, the latter being arranged above the former.

The cutter 5 is of peculiar formation, one side thereof being flat throughout its entire surface while the other side has a central flattened portion, a cone-shaped portion surrounding said flattened portion and a beveled edge the flat side of which coöperates with the flattened face of the cutter 5 so that the cuttings are deflected downwardly by the cutter 6 into a chute 16 which is carried by the casing 17 inclosing the motor and other operative parts of the machine.

The cutter 5 is carried by a shaft 7 turning in a frame 8 on the base 1, said shaft having a large drive wheel or pulley 9 at its rear end about which passes a belt 10 which also passes about a pulley 11 on the shaft 12 of the motor 2, the size of the pulleys 9 and 10 being such that the speed of the shaft 7 is less than that of the motor shaft 12. Driving connection between the shaft 7 and a shaft 13, on which the cutter 6 is arranged, is established by two gear wheels 14 and 15 arranged respectively on the shafts 7 and 13, the gear 14 being greater in diameter than the gear 15 so that the peripheral speed of the cutter 6 is greater than the peripheral speed of the cutter 5. The shaft 13 is mounted to turn on the frame 8 above the shaft 7.

On the casing of the machine there may be supported a table 18 which has an upwardly-extending guide flange 19 projecting from the inner edge thereof, said flange serving to direct the envelops to the cutting knives and preferably having a groove 20, the upper and lower walls of which converge toward a recess 21 in which the cutters 5 and 6 operate, the guide being provided with a grooved portion 22 beyond the recess to still further guide the envelops after they have been opened by the cutting mechanism.

While the envelops are traveling in the groove 20, they are subjected to a slight pressure on opposite sides and in proximity to the portions in the groove 20 for a purpose which will be more fully described hereinafter. These pressure devices may embody two pivoted arms 23 and 24, one coöperating with the upper surface of the envelop and the other coöperating with the lower surface of the envelop. The arm 23 is pivoted at its forward end at 25 to the guide flange 19 and is guided on a pin 26 at its rear or free end, a spring 31 operating on the arm 23 to yieldingly press the said arm downwardly. The arm 24 is pivoted at 27 at its forward end to a bracket 28 arranged on the under side of the table 18 and extends upwardly through a slot 29 in the table, a spring 30 being interposed between the arm 24 and the bracket 28 to press

the arm 24 upwardly. The forward ends of the arms 23 and 24 extend substantially to the meeting point of the two edges of the cutters 5 and 6 and slightly beyond the end of the groove 20 so that the pressure is exerted on the envelops substantially until the point of cutting is reached.

With the purpose in view of providing a feeding and deflecting mechanism which will carry the envelops along the guide to the cutting mechanism and at the same time will deflect the envelops laterally with force against the guide, the following is provided: A feeding member operates through the table 18 and preferably embodies an endless belt 32 made of rubber and substantially T-shaped in cross section in order that it may be properly held to its two grooved pulleys 33 and 34. The pulley 33 may be secured to the shaft 7 by a bolt 35 which also secures the knife 5 to the shaft 7, whereas the pulley 34 is journaled on the bracket 36 projecting upwardly from the base 1. With this arrangement, the belt or feed member 32 operates from a point in advance of the cutting mechanism and coöperates with the envelop from such point up to and beyond the cutting point of the cutting mechanism. The speed of this belt is the same as that of the lower cutter 5 of the cutting mechanism and is less than that of the upper cutter 6 so that the upper cutter produces a shearing action on the edges of the envelops in connection with the lower cutter 5.

Coöperating with the feed member 32 which engages one side of the envelop is a deflecting member 37 which is in the form of a wheel or roller made of rubber or other suitable yielding material and having a mushroom shape whereby when it engages an envelop, its periphery will yield laterally and shift the envelop laterally to the guide flange 19. This rubber roller has a metallic center 38 which is journaled on a stub shaft 39 the latter being carried by a slide 40 movable on vertical ways upon a cap 41 which by bolts 42 is secured to the frame or casing 17 of the machine and incloses or covers the cutter 6 while at the same time projecting or overhanging the guide flange 19 and table 18. The deflecting roller or member 37 is arranged directly above the feeding belt 32 and operates at all times in the plane of the latter so as to engage the envelop on that face opposite the face which is engaged by the feeding member 32. After the envelop has been deflected by the deflecting member 37, it is carried by the belt and said deflecting roller 37 to a roller 43 which operates substantially in a vertical plane with the cutting point of the cutting mechanism so that the tendency of the cutters to shift the envelops away from them is overcome and the envelops are held firmly, between the roller 43 and the feeding member 32 during the cutting action. The roller 43 may have a yielding or resilient periphery 44 made, in this instance, of rubber of T-shape in cross section and the said roller 43 turns upon a journal 45 rigidly carried by a slide 46 which is guided on vertical ways on the cap 41 before mentioned.

In order that both of the rollers 37 and 43 will be held with yielding pressure toward the feed belt 32, a spring is provided in the form of two yielding arms 47 and 48 secured centrally by a fastening 49 and having their free ends looped at 50 and then fitted in openings 51 in the slides 40 and 46.

In the operation of the machine, the rotary snap switch 4 is shifted by the controller 4^a to start the motor 2 which drives the cutters 5 and 6 so that their meeting edges move in the direction of the line of feed through the machine and the belt or feed member 32 has its effective portion moving in the same direction. As both of the rollers 37 and 43 contact with this belt when no envelops are being operated upon, both of these rollers will be driven by such contact. Upon the introduction of an envelop at the meeting point between the roller 37 and the belt 32, the envelop is grasped between these two elements and carried forwardly. The upper or deflecting roller 37 moves upwardly with its slide 40 to correspond to the thickness of the envelop and, at the same time, its periphery yields or shifts laterally thereby causing a like movement of the envelop toward the guide flange 19. This deflection of the envelop is of sufficient force to press the edge of the envelop against the guide and, at the same time, to cause the envelop to slip on its contents and bulge slightly. The edge of the envelop then enters into the tapering groove 20 and is pressed on opposite sides by the fingers or arms 23 and 24 which act on this bulged portion in such a manner that the envelop is spread or expands into the groove 20 which will not take the contents, thereby permitting the cutters to act upon the envelop without cutting the contents. The arrangement of the cutters is such that the shaving or clipping is carried downwardly into the chute 16 by the cutter 6, and the envelop is held against lateral deflection by the cutters by reason of the fact that it is engaged on opposite sides by the belt 32 and the roller 43 in proximity to the cutting point. After the envelop is trimmed, it is discharged at one end of the table by the momentum produced by the feeding mechanism.

A machine for opening envelops constructed in accordance with this invention positively moves the envelops to the cutting mechanism and also positively forces the envelops laterally toward the guide. The de-

vice for deflecting the envelops laterally is so mounted that it does not produce any wearing action on the feeding belt but at all times moves in a plane with said belt. It is thus possible to obtain a longer life in the machine and there are not so many parts liable to get out of order, the roller being rigidly mounted upon a slide mounted firmly above the table.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a machine for opening envelops, the combination with a cutting mechanism, a guide for directing the envelops to the cutting mechanism, and an endless belt having its effective portion traveling substantially in the direction of the line of feed through the machine, of a roller operated in the plane of the belt and having a laterally yielding periphery for shifting the envelops laterally toward the guide.

2. In a machine for opening envelops, the combination of a cutting mechanism and a guide for directing envelops to the cutting mechanism, of an endless belt having its effective portion operating substantially in the direction of the line of feed through the machine, and two rollers coöperating with said belt and operating in a plane with the latter, the forward roller having a laterally-yielding face which shifts the envelops laterally against the guide.

3. In a machine for opening envelops, the combination with a cutting mechanism, a guide for directing envelops to the cutting mechanism, and a feeding member for moving envelops in the direction of the line of feed through the cutting mechanism, of a deflecting roller operating in a plane with said feeding member and having its bearing yieldingly supported, said deflecting roller being provided with a laterally movable periphery which shifts the envelops laterally toward the guide.

4. In a machine for opening envelops, the combination with a cutting mechanism, a guide for directing the envelops to the cutting mechanism, and a feeding member for moving the envelops along the guide, of a deflecting roller coöperating with the feeding member to shift envelops laterally to the guide, and a slide movable in a line perpendicular to the guide and carrying the deflecting roller.

5. In a machine for opening envelops, the combination with a table, a guide flange projecting upwardly from the table and provided with a recess, and a cutting mechanism operating through said recess to cut envelops moving along the guide flange, of a feeding member operating through the table to coöperate with the underside of envelops in order to carry them to the cutting mechanism, a deflecting roller arranged above the table to coöperate with the upper faces of envelops to shift them laterally toward the guide flange, a vertically movable slide operating above the table and carrying the deflecting roller, and a spring acting on said slide to hold the deflecting member with pressure toward the feeding member.

6. In a machine for opening envelops, the combination with a table, a guide flange projecting upwardly therefrom and provided with a recess and a cutting mechanism operating through said recess to cut envelops movable along the guide, of a cap for the cutting mechanism, overhanging the table, a feed belt operating through the table in the direction of the length of the guide flange, two slides vertically movable on the cap, two rollers carried by the slides and coöperating with the feed belt, and spring means acting on the slides.

7. In a machine for opening envelops, the combination with a cutting mechanism, a guide for directing envelops to the cutting mechanism, and a feed belt having its effective portion moving in a direction parallel with the guide to feed envelops to the cutting mechanism, of a pair of rollers coöperating with the feed belt, one of said rollers acting to feed the envelops laterally toward the guide and the other being arranged to hold the envelops while the cutting mechanism is acting on such envelop, two separate slides by which said rollers are carried, and a single spring acting upon both slides.

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