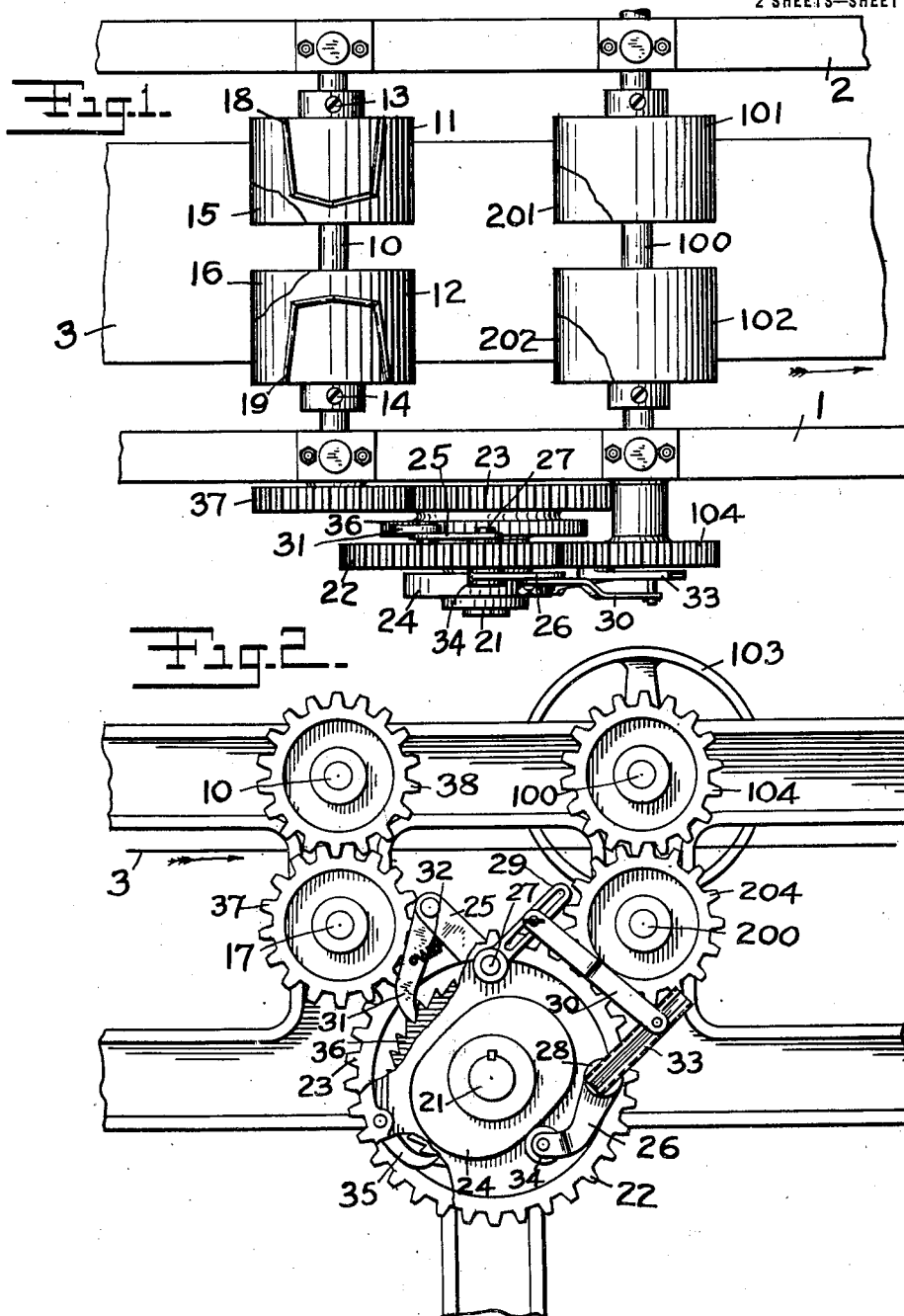


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APPLICATION FILED JULY 26, 1917.

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2 SHEETS—SHEET 1.



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Fig. 3.

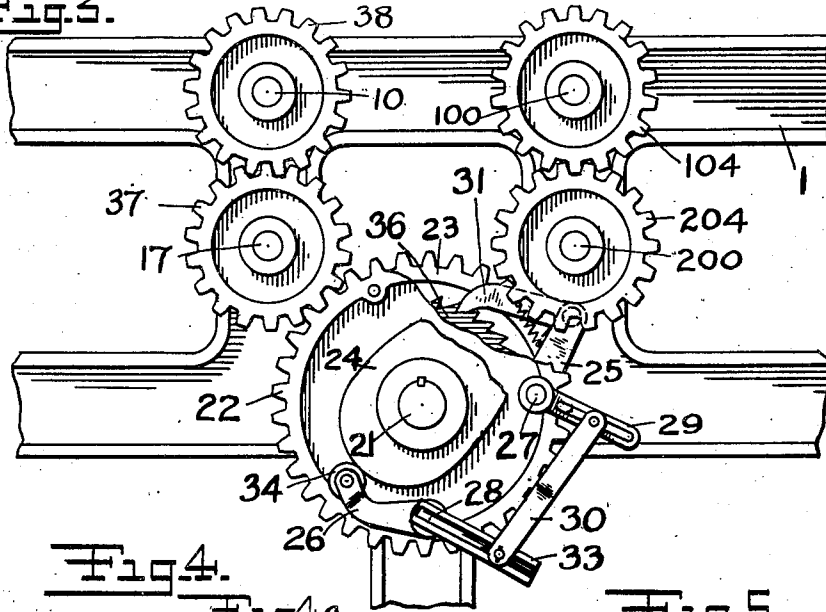


Fig. 4.

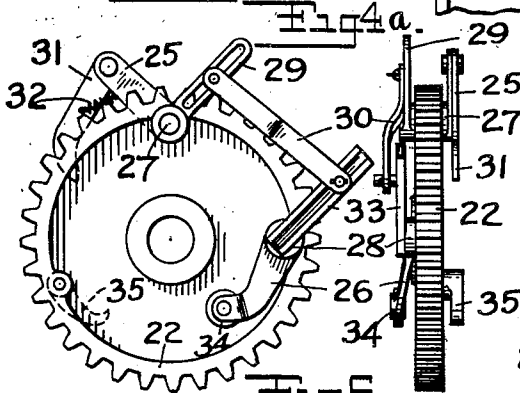


Fig. 4a.

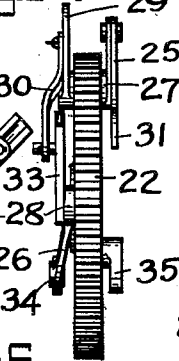


Fig. 5.

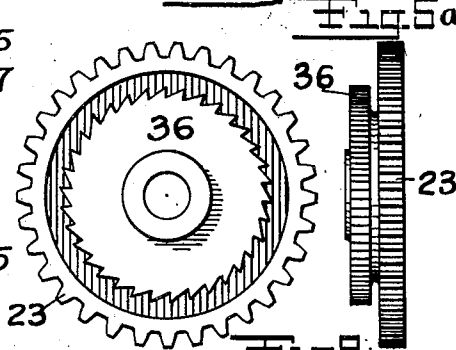


Fig. 5a.

Fig. 6.

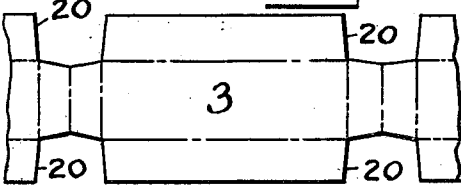


Fig. 7.

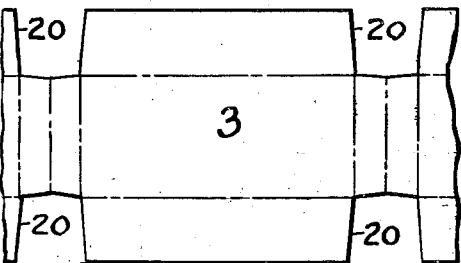


Fig. 8.

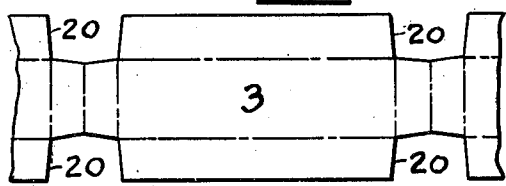
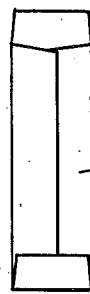


Fig. 8.

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UNITED STATES PATENT OFFICE.

ABRAHAM NOVICK, OF NEW YORK, N. Y., ASSIGNOR TO F. L. SCHMIDT COMPANY, A CORPORATION OF NEW YORK.

ADJUSTABLE CUTTER FOR ENVELOP-MACHINES.

1,306,499.

Specification of Letters Patent.

Patented June 10, 1919.

Application filed July 26, 1917. Serial No. 182,835.

To all whom it may concern:

Be it known that I, ABRAHAM NOVICK, a citizen of the United States, and resident of the city of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Adjustable Cutters for Envelop-Machines, of which the following is a specification.

This invention relates to adjustable envelop cutting mechanism and is especially adapted to that type of cutter which makes cuts in a continuously moving web of paper.

The object of this invention is the provision of mechanism which is capable of adjustment so that cuts for forming envelop blanks of various widths and lengths may be made by said mechanism in a moving web of paper.

A further object of this invention is the provision of simple and easily adjustable mechanism for accelerating the angular velocity of the usual type of revoluble cutters between cuts through a predetermined angle whereby cuts spaced longitudinally as desired are made in a web of paper moving at a uniform rate.

To attain these objects, I employ the mechanism shown in its preferred form in the accompanying drawings, in which—

Figure 1 is a plan view of my improved mechanism.

Figs. 2 and 3 are front elevations of the same showing different positions assumed by certain parts of the mechanism.

Figs. 4 and 4^a are front and side views respectively of the pawl-carrying gear and the mechanism carried thereby and Figs. 5 and 5^a are front and side views respectively of the ratchet carrying-gear.

Figs. 6, 7 and 9 are plan views of a web of paper having variously spaced cuts therein made by my mechanism whereby envelop blanks of various sizes longitudinally and transversely may be formed, and Fig. 8 is a view of a completed envelop formed from one of said blanks.

The various shafts and studs of my improved mechanism are suitably supported and journaled in the main frames 1 and 2. Feed roll shaft 100 carries feed rolls 101 and 102 which coöperate with rolls 201 and 202 respectively, on shaft 200, for continuously feeding the web of paper 3 at a uniform

rate. Shaft 100 is driven through pulley 103 on said shaft from a source of power not shown.

Cutter roll shaft 10 carries a pair of cutter rolls 11 and 12 adjustable widthwise of the web along said shaft. Set screws as 13 and 14 respectively secure said rolls 11 and 12 to shaft 10 in the desired position, said cutter rolls being of such diameter that they do not engage the web of paper. Rolls 15 and 16 are mounted on shaft 17 and act as anvils for cutters 18 and 19 to work against. Said cutters are suitably mounted in rolls 11 and 12 and may be of any of the usual types adapted for making cuts in a moving web of paper.

The feed rolls, anvil rolls, and cutters are so proportioned that they will have the same circumferential velocity, and so that said cutters and anvil rolls move at the same rate as the paper during the cutting operation. The diameter of the cutters illustrated is such that envelop blanks of the greatest length desired at any time are cut when the cutters rotate continuously at a uniform angular velocity.

For lessening the distance between cuts in web 3 (Figs. 6 and 9) longitudinally of said web, the driving mechanism hereinafter described is inserted between feed roll shaft 100 and cutter roll shaft 10.

Gear 104, on shaft 100, drives gear 204 on shaft 200. Stationary stud 21 in frame 1 carries pawl gear 22 and ratchet gear 23 both loosely mounted thereon, gear 22 meshing with gear 204. On said stud 21 is mounted stationary cam 24. Gear 22 carries bell crank levers 25 and 26 pivoted at 27 and 28, respectively. Pawl bell crank lever 25 has arm 29 thereof slotted to adjustably hold link 30, the other arm of said crank 25 carrying pawl 31 held by the usual spring 32. Cam roll bell crank lever 26 has one arm 33 thereof slotted to adjustably hold link 30, the other end of said crank carrying cam roll 34 for engaging cam 24. Stationary pawl 35 is mounted on gear 22 for preventing any rearward rotation of ratchet 36 of gear 23, said pawls 31 and 35 being adapted to engage said ratchet 36. Ratchet gear 23 meshes with gear 37 on anvil roll shaft 17, said gear 37 engaging cutter shaft gear 38 on shaft 10.

The operation of my improved mechanism is as follows:

The web of paper 3 is advanced at a uniform rate by the rotation of pulley 103 from a suitable source of power, whereby feed rolls 101, 102, 201 and 202, together with gears 104, 204 and 22 are rotated.

The rotation of gear 22 carries cam roll 34 around cam 24 thereby oscillating bell crank lever 26. When one end of link 30 is set in slotted arm 33 exactly opposite the center of pivot 28, it is obvious that link 30 will cause no oscillatory motion of bell crank lever 25, and pawl 31 will therefore continually engage the same tooth of ratchet 36 causing motion of ratchet gear 23 in the same direction and at the same speed as that of pawl gear 22, whereby the entire mechanism comprising the gears 22 and 23, bell crank levers 25 and 26, the pawls and ratchet will rotate as a unit.

If it is desired to shorten the distance between cuts 20 longitudinally in web 3, cutters 18 and 19 are speeded up between cuts for a predetermined portion of the revolution by properly setting link 30 in slotted arms 29 and 33, whereby bell crank lever 25 is oscillated and pawl 31 moves ratchet 36 and gear 23, thereby increasing the angular velocity of rolls 15, 16, 11 and 12 through the predetermined angle, but causing no change in the rate of motion of the paper. Rearward motion of gear 23 relative to gear 22 is prevented by means of stationary pawl 35, which is pivoted to gear wheel 22 and is always in contact with the ratchet of gear wheel 23.

The web of paper moving as it does at a uniform speed through feed rolls 101, 102, 201 and 202, cuts 20 are spaced as closely together as may be desired. Adjustment of the angle through which acceleration of the cutters takes place is determined by the position of link 30 in the slotted arms 29 and 33. The entire mechanism is properly synchronized so that the above described acceleration of the cutters takes place between successive cutting operations.

In the mechanism illustrated, gears 22 and 23 are made exactly twice the diameter of the remaining gears shown and a double cam is therefore shown on stud 21. The movement of pawl 31 and ratchet 36 occurs twice in one revolution of the other gears. It is obvious that gears 22 and 23 may be of the diameter as the remaining gears and a single cam employed without changing the resulting movements.

It is also clear that during the cutting operation the cutters, feed rolls, anvil rolls and paper have each the same circumferential and linear speeds.

The cutters 18 and 19 shown are adapted for the formation of envelop 39 (Fig. 8) though this invention is not limited in its

adaptation to the particular shape and type of said cutters.

While, in the drawings and description, it is the cutters that are shown speeded up, it is obvious that the same result is obtainable by speeding up the movement of the web of paper by the use of the mechanism described above.

What I claim is:

1. In an envelop machine, means for continuously advancing a web of paper, cutters arranged to rotate through a predetermined interval including the cutting operation at the same linear speed as that of said web for making cuts in said web during the continuous advancement of said web, and adjustable means operating through a predetermined angle in advance of the cutting operation for accelerating and for preventing the retarding of, the angular velocity of said cutters, for spacing said cuts longitudinally of said web.

2. In an envelop machine, adjustable means for accelerating the angular velocity of a cutter-carrying shaft, comprising a stud, a pair of gears loosely mounted on said stud, a pawl on one of said gears, a ratchet on the other of said gears adapted for engagement with said pawl, means for operating said pawl for rotating said ratchet-carrying gear relatively to said pawl-carrying gear, and means for operatively connecting said ratchet-carrying gear to said shaft.

3. In an envelop machine, adjustable means for accelerating the angular velocity of a cutter-carrying shaft through a predetermined angle comprising a stud, a pair of gears loosely mounted on said stud, means operatively connecting one of said gears to said shaft, means for driving the other of said gears, and adjustable means for locking said gears together to rotate as a unit and for accelerating the angular velocity of the shaft operating gear during part of a revolution while said gears are rotating.

4. Means for making cuts adjustably spaced longitudinally and transversely in a continuously advancing web of paper, comprising cutters adjustable widthwise of said web and means for operating said cutters for making cuts adjustably spaced longitudinally of said web comprising a pair of gears operatively connected to said cutters and means for accelerating, while preventing the retarding of the angular velocity of one of said gears relatively to the other of said gears through a predetermined part of a revolution of said gears in advance of the cutting operation and for rotating said gears at the same speed for the remainder of said revolution.

5. In an envelop machine, means for continuously advancing a web of paper at a uniform rate, cutters arranged to rotate through a predetermined part of a revolution

tion including the cutting operation at the same linear speed as that of said web for making cuts in said web during the continuous advancement of said web, and adjustable means for accelerating while preventing the retarding of the angular velocity of said cutters through a predetermined angle for spacing said cuts longitudinally of said web, said acceleration taking place between successive cutting operations.

6. In an envelop machine, means for continuously advancing a web of paper, means adjustable widthwise of said web for making cuts in said web during the continuous advancement of said web and adjustable means for accelerating the angular velocity of said cutters between cuts comprising a stud, a pair of gears loosely mounted on said stud, a pawl on one of said gears, a ratchet on the other of said gears adapted for engagement with said pawl, means for operating said pawl for rotating said ratchet-carrying gear relatively to said pawl-carrying gear and means for operatively connecting said ratchet-carrying gear to said cutters.

7. In an envelop machine, means for continuously advancing a web of paper at a uniform rate, revoluble cutters for making cuts in said web during the continuous advancement of said web, and adjustable means for accelerating the angular velocity of said cutters between cuts through a predetermined angle for spacing said cuts longitudinally of said web comprising a stud, a pair of gears loosely mounted on said stud, means operatively connecting one of said gears to said cutters, means for driving the other of said gears and adjustable means for locking said gears together to rotate as a unit and for

accelerating while preventing the retarding of the angular velocity of the cutter operating gear during a part of a revolution of both of said gears, and for causing said gears to rotate at the same speed during the remainder of said revolution.

8. In an envelop machine, means for advancing a web of paper at a uniform rate, cutters adjustable widthwise of said web for making cuts in said web adjustably spaced longitudinally, and means for operating said cutters comprising a pair of gears operatively connected to said cutters and means for accelerating while preventing the retarding of the angular velocity of one of said gears relatively to the other of said gears during a part of a revolution of both of said gears and between the successive cutting operations, and for causing said gears to rotate at the same speed during the remainder of said revolution.

9. In an envelop machine, means for continuously advancing a web of paper at a uniform rate, revoluble cutters for making cuts in said web during the continuous advancement of said web and adjustable means for accelerating the angular velocity of said cutters comprising a stud, a pair of gears loosely mounted on said stud, a pawl on one of said gears, a ratchet on the other of said gears adapted for engagement with said pawl for rotating said ratchet-carrying gear relatively to said pawl-carrying gear, and means for operatively connecting said ratchet-carrying gear to said cutters.

Signed at the city of New York in the county of New York and State of New York this 24th day of July A. D. 1917.

ABRAHAM NOVICK.