Nov. 5, 1929. A. NOVICK 1,734,742

FOLDING MECHANISM

Filed Nov. 25, 1927 2 Sheets-Sheet 1

Fig. 1.

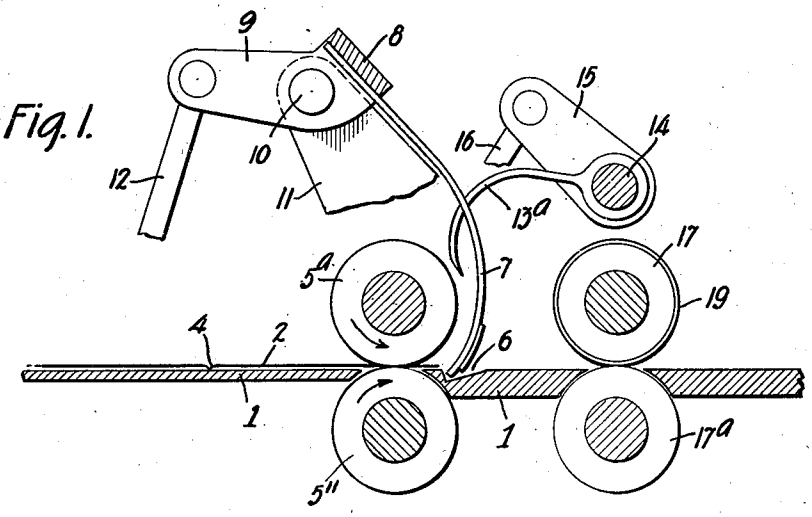


Fig. 2.

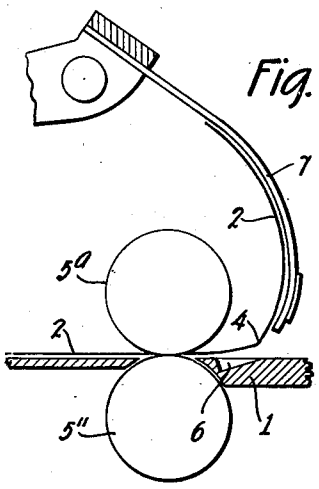
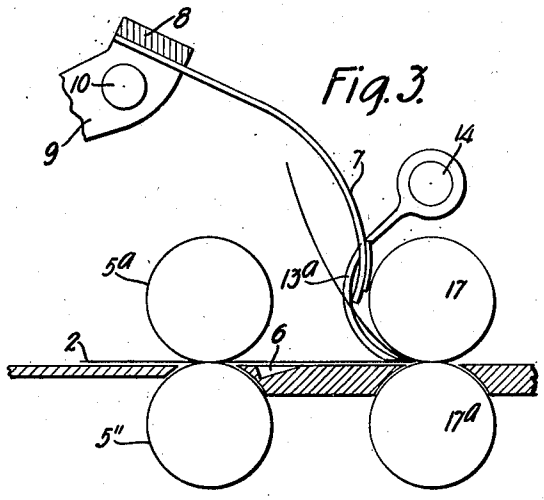


Fig. 3.



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Fig. 4.

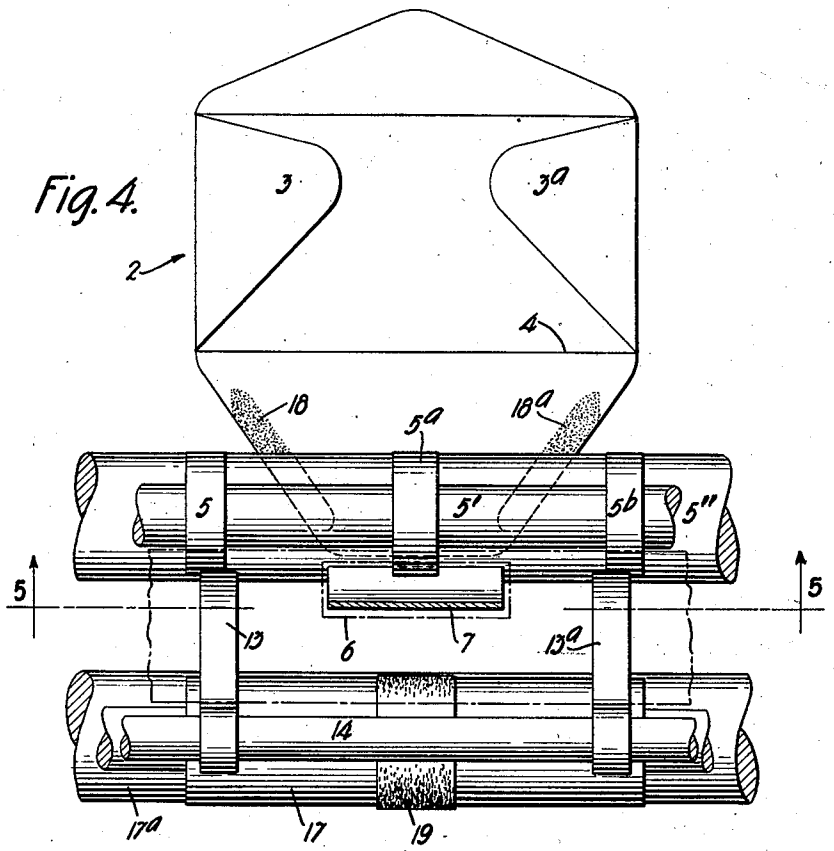
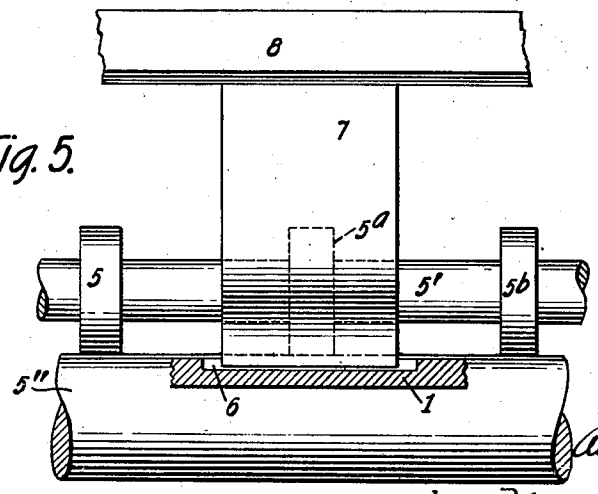


Fig. 5.



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UNITED STATES PATENT OFFICE

ABRAHAM NOVICK, OF FLUSHING, NEW YORK, ASSIGNOR TO F. L. SMITHE MACHINE CO., INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

FOLDING MECHANISM

Application filed November 25, 1927. Serial No. 235,536.

This invention relates generally to rotary envelope making mechanism, and specifically to flap-folding devices comprising a part of such mechanism.

An object of the invention is the provision of means for rapidly and accurately folding the freshly-gummed and preliminarily-scored bottom flap of envelope sheets.

The following is a description of an envelope bottom-flap folding device embodying the invention in its present preferred form; but it will be understood that various modifications and changes may be made therein without departing from the spirit of the invention and without exceeding the scope of the claims.

The invention will best be understood by reference to the accompanying drawings, wherein the present preferred embodiment is illustrated, and in which Fig. 1 is a sectional view showing the device and some of its associated parts in position to receive an envelope sheet; Fig. 2 is a sectional view similar to Fig. 1, but with some of the parts omitted, and with the remaining parts in the positions which they occupy when the envelope sheet has been partially fed thereto; Fig. 3 is a sectional view similar to Fig. 1, but with some of the parts omitted, and with the remaining parts in the positions which they occupy at a later stage in the folding operation; Fig. 4 is a top plan view of the device with an envelope sheet in position to be fed thereto; and Fig. 5 is a section on the line 5—5 of Fig. 4, looking in the direction indicated by the arrows.

Like reference characters indicate like parts throughout the drawings.

Referring to the drawings, 1 denotes a table along which are fed, by means not shown, envelope sheets or blanks such as 2, which have been preliminarily scored along the line 4 of the proposed fold, and the side flaps 3 and 3^a of which sheets have been folded. In the course of the feeding operation, the envelope sheet enters the bite of feed rollers 5, 5^a, 5^b and feed roller 5″. Feed rollers 5, 5^a and 5^b are mounted upon shaft 5′ (Fig. 4), above an opening formed in the table 1, while feed roller 5″ is mounted below said opening. Also formed in this table is a depression, 6, into which the lower edge of a curved deflecting blade 7 is adapted to enter to a point where said edge is below the top of the table. The blade 7 is attached, to cross-bar 8, having ears 9 mounted upon and adapted to be oscillated about studs 10, supported in brackets such as 11. One of the ears is connected through suitable mechanism such as the link 12 actuated by a cam or other well-known means (not shown). Co-operative with deflecting blade 7 to bend the envelope sheet along the line of the score 4 are two tucker fingers, 13 and 13^a, mounted upon a common shaft, 14, adapted to be oscillated, through suitable mechanism such as link 16 and lever 15, by the cam hereinbefore referred to as actuating the deflecting blade 7 and its associated parts.

As the leading edge of the bottom flap passes through feed rollers 5, 5^a and 5^b, and feed roller 5″, the relatively sharp edge of the table which defines the rear side of the opening in which said rollers operate, serves as a stripper to insure that the flap shall be separated from the bottom roller 5″. The timing of the mechanism is such that while the leading edge of the flap is being stripped from the roller 5″, and for a considerable interval thereafter, the lower edge of the deflecting blade 7 is in the depression 6, whereby such leading edge of the flap is permitted to overlap the said lower edge of the blade. Under the urge of the feed rollers, the leading edge of the envelope sheet contacts with the concave surface of the now stationary deflecting blade, and the flap is bent upwardly to conform generally to such concave surface. When the flap has advanced to a point where about one-half its width is in contact with the concave surface of the deflecting blade, the blade swings backward, at a rate, however, somewhat less than the rate at which the flap is advanced over its surface. In the progress of this movement of the envelope sheet and the deflecting blade, the sheet will assume a position and form similar to that indicated in Fig. 2, wherein the flap is at a roughly right angle to the main body of the envelope sheet.

It will be understood that the score which has been formed in the envelope sheet, preliminary to the feeding of the latter into the folding device, is not sharp, but is only sufficient to produce a slight break in the curve which is imparted to the sheet by reason of contacting of the same with the deflecting blade. It is now necessary to definitely form the fold on the line of the score. This is effected by the downward and rearward movement of the tucker fingers 13 and 13ª, from the position shown in Fig. 1 to that shown in Fig. 3. The mechanism is so timed that these tucker fingers engage the sheet at the score at a time when the bottom flap has reached its point of maximum upward movement. The downward and backward movement of the fingers sweeps the flap over the lower edge of the deflecting blade, thereby forming the fold on the score line and inserting the envelope into the bite of rollers 17 and 17ª, by which latter rollers the fold is completed and the gummed portions 18 and 18ª of the bottom flap are caused to adhere to the side flaps 3 and 3ª. Roller 17 is provided with a portion 19 formed of rubber or other resilient substance, to insure a positive feed of the envelope sheet without undue pressure thereupon.

The feeding of the envelope sheets is with reference to the score 4; and the tucker fingers 13 and 13ª being timed to synchronize in movement with the movement of this feeding mechanism, proper contact of the tucker fingers along the line of the score is assured, irrespective of any slight differences which may occur in the width of the bottom flaps, such as may be due to curling or like causes.

The device comprises simple, efficient and inexpensive means for rapidly and accurately effecting a fold of the bottom flap of an envelope sheet, but may be used for other purposes as will be readily understood by those based on the art.

While I have described what I believe to be the best embodiment of my invention, I do not wish to be confined to the embodiment shown, but what I desire to cover by Letters Patent is set forth in the appended claims.

I claim:

1. In envelope-making machinery, a bottom flap-folding device comprising means for feeding an envelope blank in which a preliminary score has been formed, a pivoted depending deflecting member arranged to move into and out of the path of movement of the blank for deflecting upward said flap of said blank, said deflecting means being constructed and arranged to remain stationary upon initial contact of the flap therewith and to thereafter move away from said feeding means at a rate lower than the rate of advance of the envelope blank, a pivoted tucker finger co-operative with said deflecting means for partially folding the blank at said score line and for removing it out of contact with said deflector member and means for completing said fold.

2. In envelope-making machinery, a flap-folding device comprising a support for envelope blanks, rollers for feeding said blanks, means for stripping a blank from one of said rollers, a depending deflecting blade for said blank, means for shielding the edge of said blade including a member permitting said blade to go below the advancing edge of the blank, and means co-operative with said deflecting blade to fold the blank preliminarily on the line of a score formed therein.

3. In envelope making machinery, a device for folding the bottom flap of a blank, comprising means for feeding the envelope in which a preliminary score has been formed, a table in advance of said feeding means in position to receive the blank from said feeding means, said table having a depression therein, means cooperating with said feeding means for upwardly deflecting said bottom flap, said means being constructed and arranged to remain stationary upon initial contact of the flap therewith, and to thereafter move away from said feeding means at a rate lower than the rate of advance of the envelope blank, said deflecting means moving into said depression whereby the edge thereof is below the advancing edge of the blank, and means for completing said fold.

In testimony whereof I have affixed my signature to this specification.

ABRAHAM NOVICK.