Feb. 12, 1935. M. JOACHIMCZYK 1,990,944

ENVELOPE MACHINE

Filed Aug. 15, 1932 6 Sheets-Sheet 1

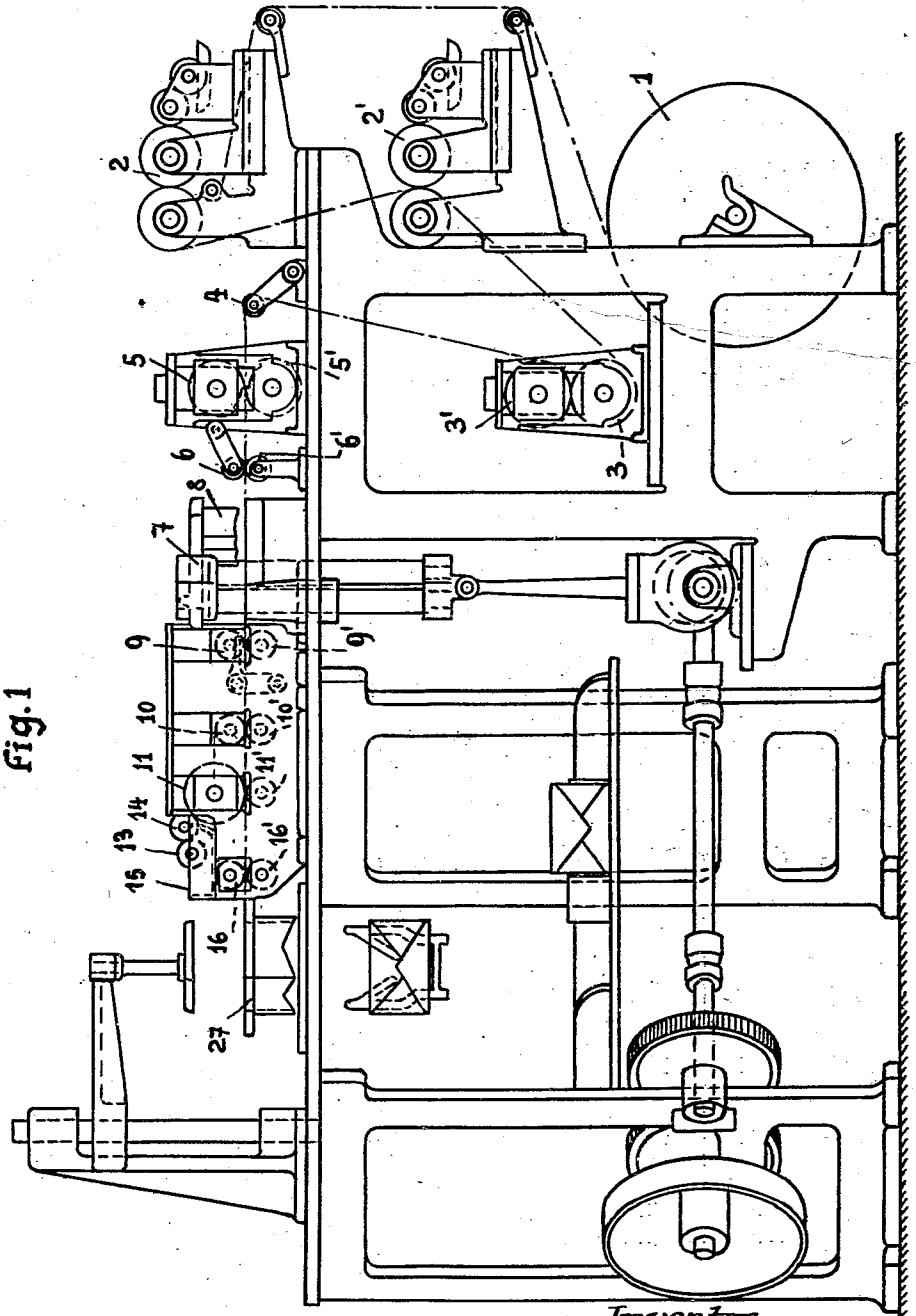


Fig. 1

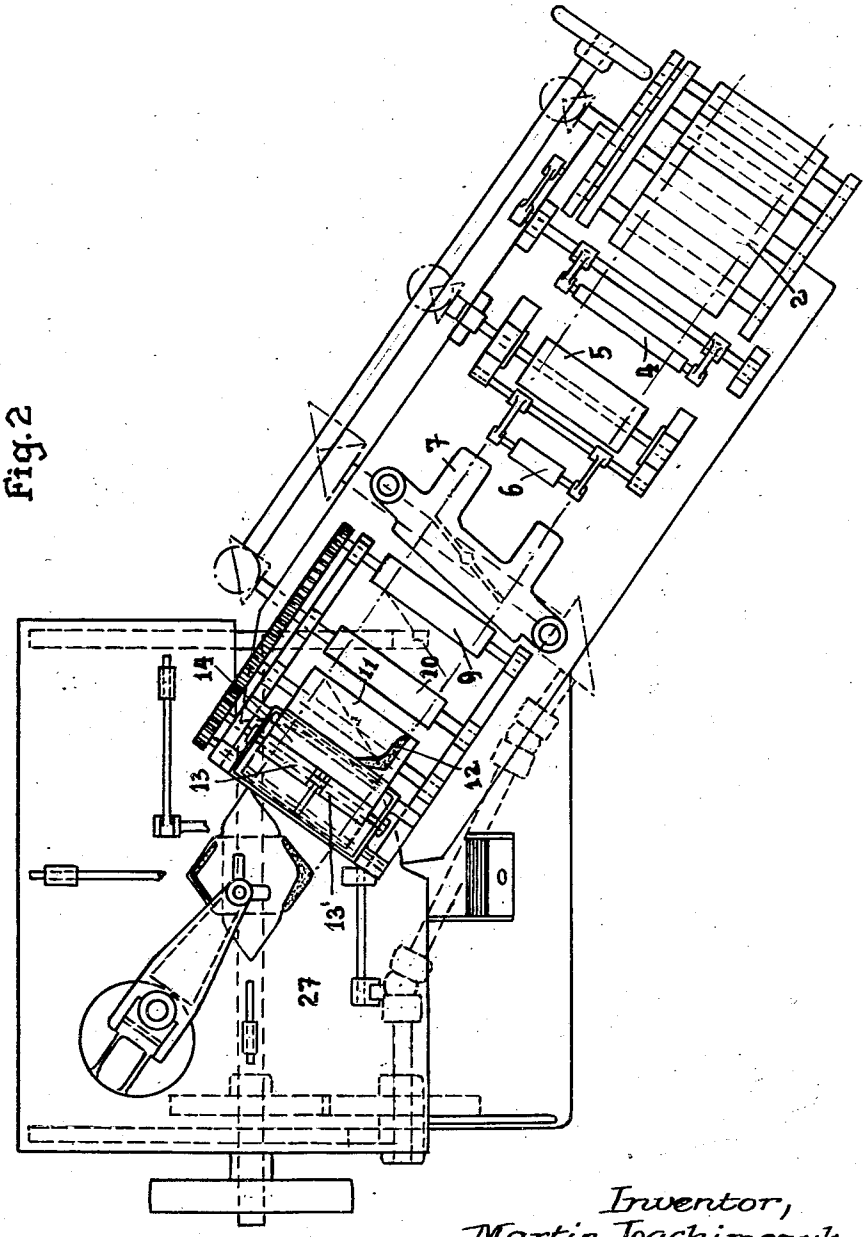
Inventor,
Martin Joachimczyk.
by J. W. Dalton,
Attorney.

Feb. 12, 1935. M. JOACHIMCZYK 1,990,944

ENVELOPE MACHINE

Filed Aug. 15, 1932 6 Sheets-Sheet 2

Fig. 2



Inventor,
Martin Joachimczyk.

by

Attorney.

Feb. 12, 1935. M. JOACHIMCZYK 1,990,944

ENVELOPE MACHINE

Filed Aug. 15, 1932 6 Sheets-Sheet 3

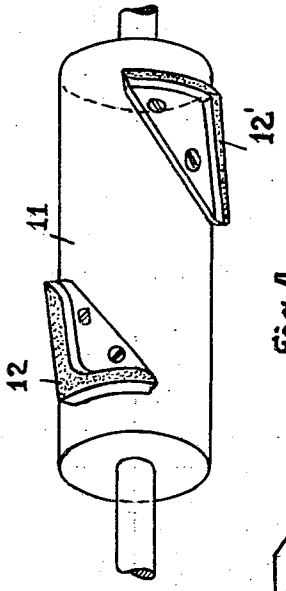


Fig. 4

Fig. 3

Inventor,
Martin Joachimczyk.

by J. W. Dahn,
Attorney.

Feb. 12, 1935. M. JOACHIMCZYK 1,990,944

ENVELOPE MACHINE

Filed Aug. 15, 1932 6 Sheets-Sheet 4

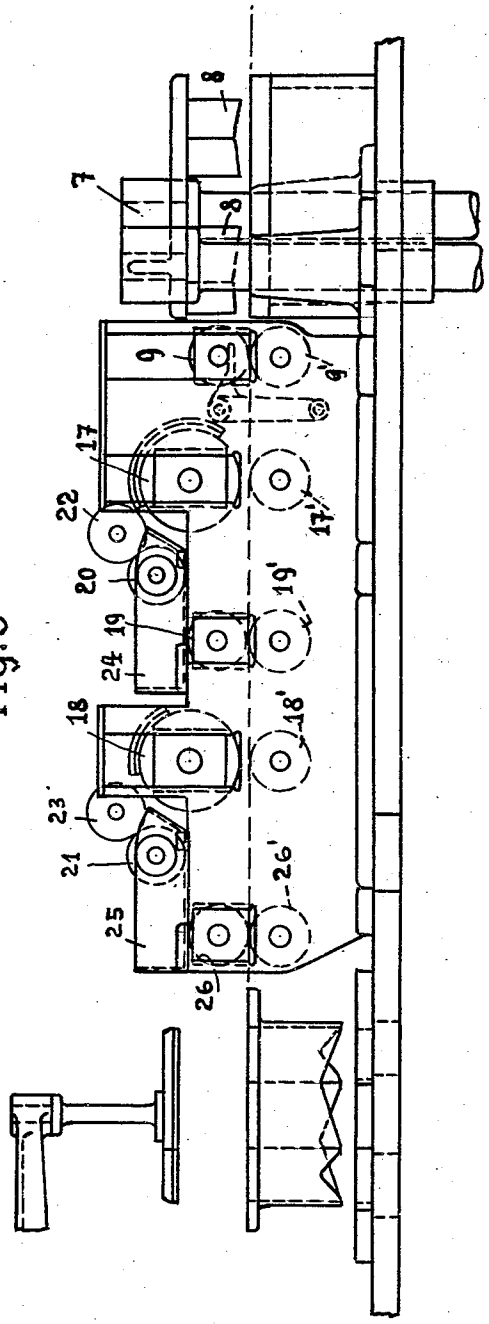


Fig. 5

Inventor,
Martin Joachimczyk,

by F. W. Dahm,
Attorney.

Feb. 12, 1935. M. JOACHIMCZYK 1,990,944

ENVELOPE MACHINE

Filed Aug. 15, 1932 6 Sheets-Sheet 5

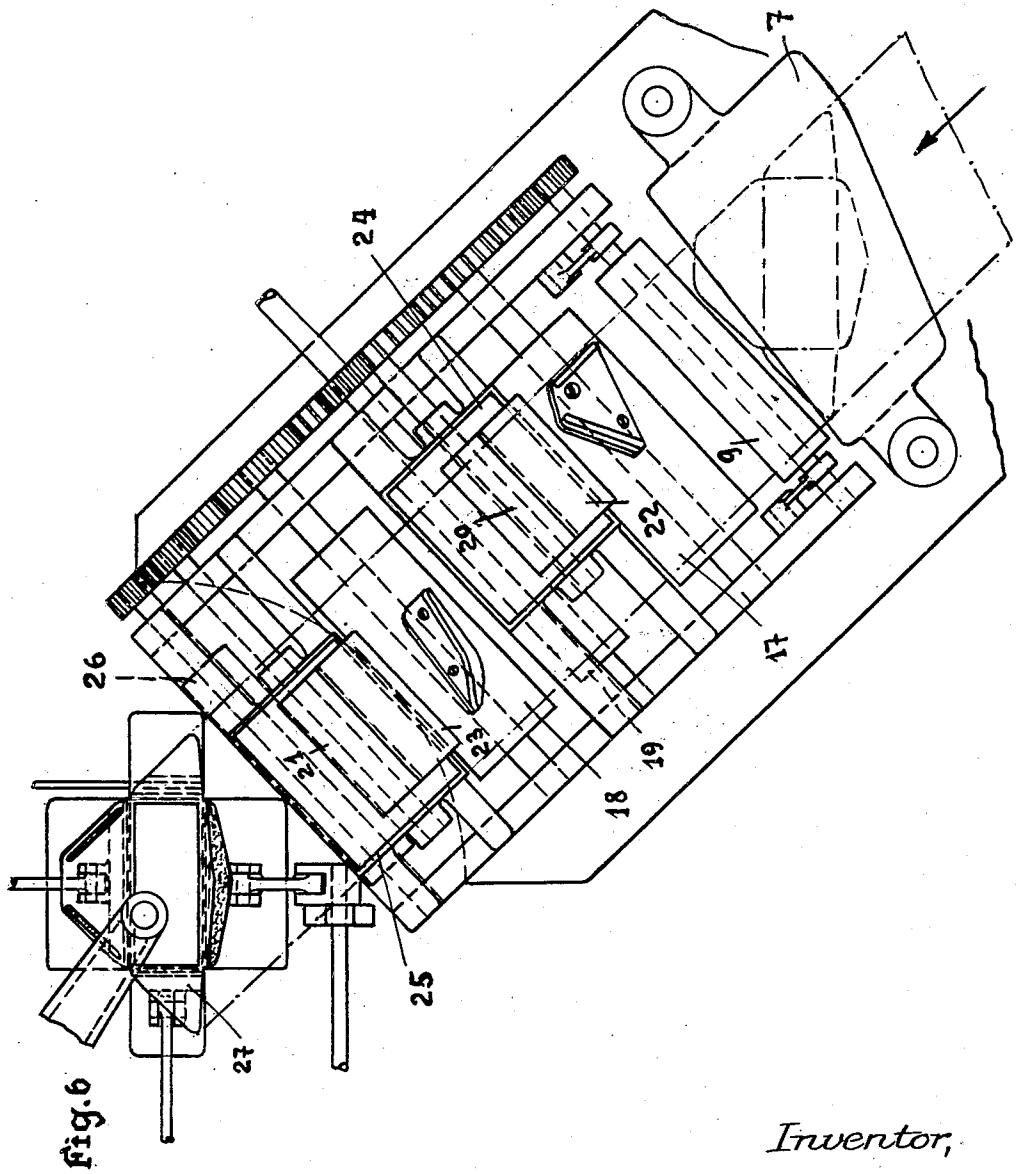


Fig. 6

Inventor,
Martin Joachimczyk,
by J. W. Dahn,
Attorney.

Feb. 12, 1935. M. JOACHIMCZYK 1,990,944

ENVELOPE MACHINE

Filed Aug. 15, 1932 6 Sheets-Sheet 6

Fig. 7

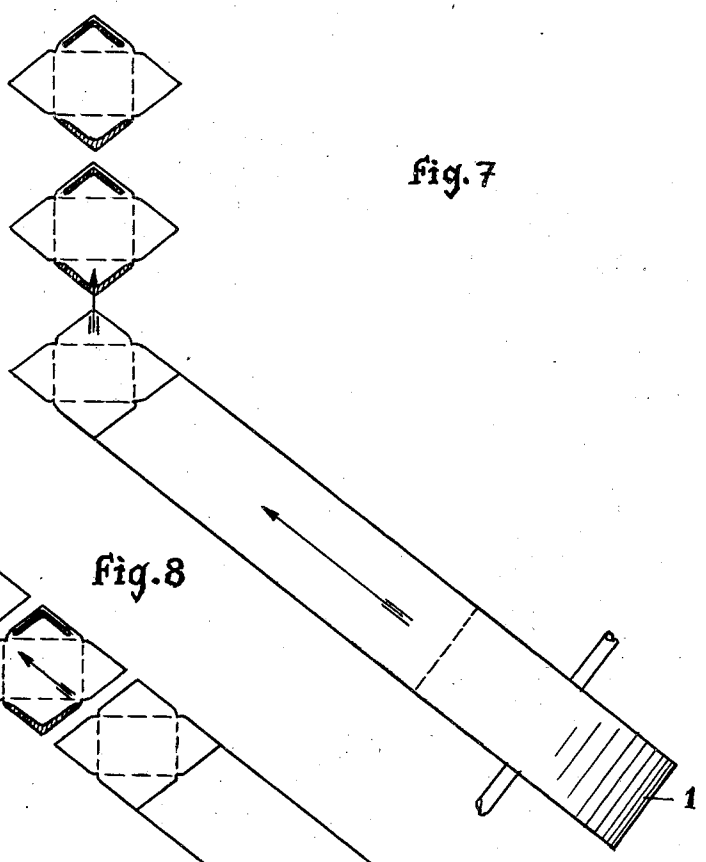
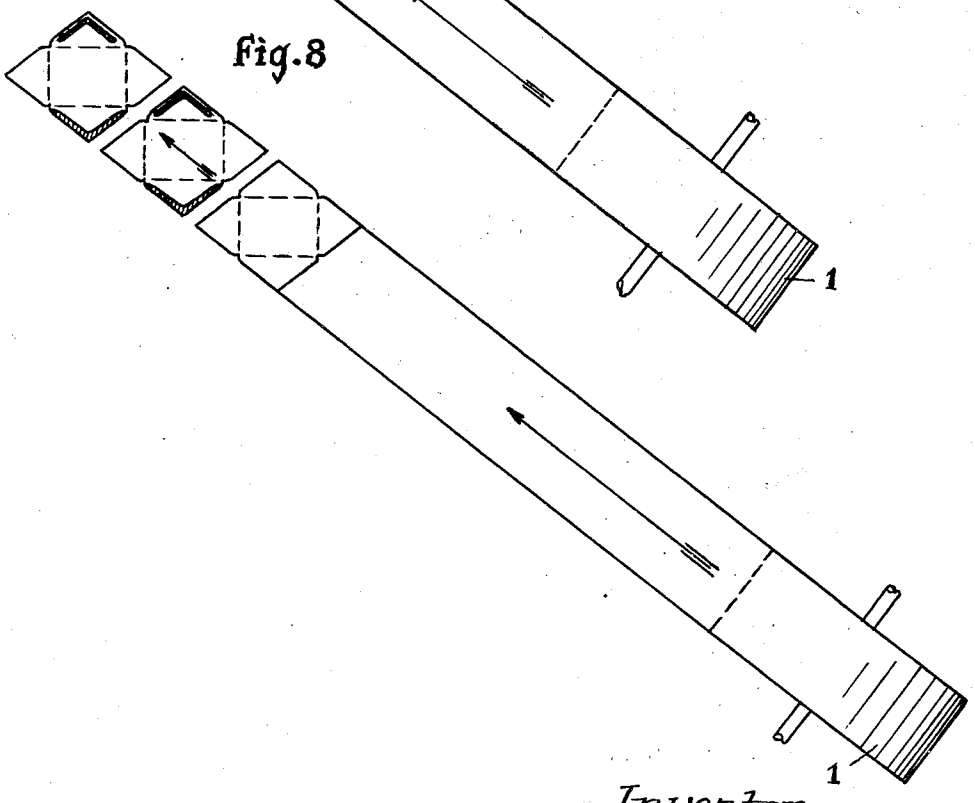


Fig. 8



Inventor,
Martin Joachimczyk.
by [signature],
Attorney.

Patented Feb. 12, 1935 1,990,944

UNITED STATES PATENT OFFICE

1,990,944

ENVELOPE MACHINE

Martin Joachimczyk, Berlin-Charlottenburg, Germany

Application August 15, 1932, Serial No. 628,928
In Germany August 20, 1931

15 Claims. (Cl. 93—63)

The present invention relates to machines for making envelopes, in which the closing flap and the flaps constituting the body of the envelope are all of three-cornered or trapezoidal form. The machine according to the invention leads the paper web drawn off a spool in a straight line viewed in plan to a stamping device for cutting off the blanks, thereupon advances the blanks in the same feeding direction as that of the web to the gumming and folding means, by which the blanks are gummed and folded without changing their position with regard to the feeding direction.

Envelope machines operating from a spool of paper are known, but in all these machines the cut blanks are fed to the gumming and folding devices in a different direction from that in which the web is fed to the cutting part of the machine, so that the final direction of the blanks is oblique to that in which the web is originally moved. This obliquity, which, owing to the nature of working processes of these machines and especially of the folding device is necessary and cannot be avoided, involves considerable drawbacks in the whole working of the machine. It is especially difficult to use a high speed of rotation which is very advisable for economical reasons in these machines, and also to ensure a satisfactory working of the machine and accuracy in the envelopes produced.

In order to understand the above-mentioned difficulties, it is necessary to consider closely the construction of these machines.

In a machine in which the direction of feed of the preparatory part of the machine is not in the same straight line as that of the finishing part of the machine, it is absolutely necessary that the cut blank which is moving in the feeding direction of the preparatory machine must remain stationary for a fraction of a revolution in order to ensure the accurate position of the blank, and then must immediately be moved forward in the direction of the finishing part of the machine for the purpose of gumming and folding.

The above-mentioned drawbacks are due to feeding the blanks to the gumming and folding devices in a direction different from that of the web. The blank passing from the preparatory machine at a considerable speed is abruptly brought to rest, so that in the given fraction of time it must be further moved on at an increased speed towards the finishing machine in order to obtain the requisite distance between the blanks.

If oscillating grippers are used as the means for advancing the blanks, the latter, owing to the lost motion, cannot operate at as high speed as rotary machines. Also, the method of operating rotating envelope machines, in which feeding rollers are used, involves an inconvenient mounting of the different pairs of rollers. Also, the angle included between these machines considerably increases the difficulty of, and may even preclude, obtaining a satisfactory mounting of the last feed rollers of the preparatory machine and of the first feed rollers of the finishing machine. These pairs of rollers act so that the blank at the moment of its release is seized by the first feed rollers of the finishing machine and carried forward from the last feed rollers of the preparatory machine.

There is a very considerable difficulty in the exact adjustment of these rollers; the correct co-operation of these pairs of rollers is, with other considerations, most important for the satisfactory working of the whole machine.

Besides these constructions, machines operating from the spool for making envelopes are known in which, while a relative inclination between the two feeding directions is maintained, endeavours have been made to improve the abrupt passage of the blank at the junction of the preparatory and finishing parts of the machines. For this transition or for the rotation of the blanks from the feeding direction in the preparatory machine into the feeding direction in the finishing machine, coned rollers have been mounted at the junction of these paths. In this construction, as already described, the dangerous stopping in the feeding direction of the blank is avoided. This construction fails, however, at the high speeds of rotation and due to the imperfect action, under these conditions, of the coned rollers.

A similar construction provides pivoted grippers for transferring the blanks from the preparatory to the finishing machine. This arrangement of the grippers, of which the movements are partly oscillating and partly rotational, has considerable drawbacks. The blank cut off from the web must be seized during its stationary period by the grippers and then swung round and again laid on and fed further by the rollers. The blank must be again exactly adjusted in the folding and gumming machine either before or after it has been swung round.

A perfectly satisfactory and exact working, more particularly at high speeds of rotation, cannot be obtained with these devices and, consequently, these constructions have not, in practice, proved successful.

A further point of importance in all these forms

of construction remains to be mentioned, namely that with the inclined position the arrangement of the means operating the rollers and other moving parts is made more difficult.

For these reasons in existing envelope making machines in which the feeding direction of the blanks is different from that of the web taken from the spool, this alteration of direction is associated with great difficulties. In contrast to the known machines, an envelope-making machine according to the invention, operating from the spool, fulfils all the necessary requirements by combining the direction of feed in the preparatory machine with the direction of feed in the finishing machine, so that there is no relative inclination, as formerly, between the two feeding directions. With this new arrangement all the difficulties are directly obviated. To a certain extent the two machines are combined in a single machine for obtaining the products, since the web and the blank, viewed in plan, are advanced by means of rollers rotating at any required speed in the same direction from the commencement to the end of the path, and in this, in plan view, straight line the blank is gummed and folded into the finished envelope without changing its position relatively to the feeding direction.

Two forms of the device for carrying out the process according to the invention are shown by way of example in the accompanying drawings in which

Fig. 1 is a front view of an envelope machine, and

Fig. 2 is a plan of the same.

Fig. 3 is a plan of the gumming device and the adjacent feeding rollers on an enlarged scale,

Fig. 4 represents a plan view of the upper gumming roller and the gummers provided thereon,

Fig. 5 is a detail front elevation of another form of an envelope machine, showing two pairs of gumming rollers and the cooperating feeding rollers,

Fig. 6 is a plan view of the parts, shown in Fig. 5, and of the blanks to be treated.

Fig. 7 represents the former method of feeding the blanks from the stamping device to the gumming and folding apparatus in a direction oblique to that of the web, and

Fig. 8 shows the execution of the feeding process according to the invention.

In the construction shown, the paper web is unwound from a supply spool 1 and is constantly fed by two feed rollers 3, 3' to two printing devices 2, 2' for printing the web on both sides. The web then passes over a tensioning roller 4 to intermittently operating rollers 5, 5' provided on their circumference with recesses which lead the web to another pair of feeding rollers 6, 6', the upper one of which is adapted to be raised and lowered in accordance with the working of the stamping device. By means of these rollers the web is advanced to a stamping device 7 having knives 8 for cutting off the blank. The waste is first stamped out and thereupon the blank still adhering to the web is led in the forward direction of the web to the front side of the cutting device by which a blank is cut off from the web. Thereupon the blank is fed forward by a pair of intermittently acting rollers 9, 9', the upper one is also adapted to be raised, when the web is brought to rest. The blanks thereupon are gripped by constantly driven rollers 10, 10', which feed them to a pair of gumming rollers 11, 11'. The upper roller carries gummers 12, 12', that are provided with gum by rollers 13, 13' and a transfer roller 14. The rollers 13, 13' are arranged on the same shaft and each dips into a separate compartment of a vessel 15 containing the gum for the respective gummers. Feeding rollers 16, 16' are provided adjacent to the gumming device which advance the gummed blank to the folding box, in which it is inserted in order to be folded to form the envelope in known manner. Instead of rollers oscillating grippers or carriages may be employed for advancing the gummed blanks to the folding box 27.

In the form of construction partly shown in Figs. 5 and 6 the preparatory part of the machine is performed in the same manner as previously described, but adjacent to the stamping device 7 a pair of intermittently acting rollers 9, 9' is arranged, that immediately feed the gripped blanks to a pair of gumming rollers 17, 17' provided with the gummers for applying adhesive to one flap of the envelope-blank, whereas the other flap is gummed by another pair of gumming rollers 18, 18', since the closing flaps in the form of envelopes made by this machine are partly in alignment with another, so that by using only one pair of gumming rollers different adhesives cannot be applied to the closing flaps of the envelopes. The blanks after being gummed by the rollers 17, 17' are gripped by constantly driven feeding rollers 19, 19', which bring them to the rollers 18, 18' applying the appropriate gum to the other flap. The upper rollers 17, 18 are provided with adhesive by rollers 20, 21 and transfer rollers 22, 23 respectively, the rollers 20, 21 dipping in a vessel 24 or 25. A pair of constantly driven rollers 26, 26' brings the gummed blanks to the folding apparatus in the same manner as in the first form of execution.

As is seen in the drawings, more particularly in Fig. 2, the web, viewed in plane, is laid in a straight line to the stamping gear and is there cut. From the stamping gear the blanks are advanced to the gumming and folding means in the same feeding direction as that of the web entering the stamping device and are gummed by the rotating gumming devices and brought into the folding boxes without changing their position relatively to the feeding direction.

I claim:

1. An apparatus for making envelopes with three-cornered or trapezoidal closing flaps comprising a stamping device, gumming rollers, a folding device, a pair of rollers for unrolling a paper web continuously from a spool, a plurality of rollers adapted to tension the web and feed it in a straight line, viewed in plan, to the stamping device for cutting off a blank, means cooperating with the cutters for advancing the blank in the same feeding direction as that of the web to a pair of gumming rollers, the upper roller being provided with gummers, means cooperating with the gummers for gripping the blanks at the ungummed part and advancing them in the same feeding direction as that of the web and in an unvaried position with regard to said direction to the folding device.

2. In an envelope machine, a source of supply, coacting rollers feeding a web from said source, stamping means for cutting blanks from said web, rollers for tensioning the web and feeding it in a straight line (if viewed in plan) to said stamping means, the major axis of a cut-off blank being at an angle to the line of travel of the series of blanks, a pair of continuously rotating rollers, intermittently acting rollers coacting with the stamping means to advance the blanks to said

continuously rotating rollers in the feeding direction of the web while maintaining their relative position, a rotary gumming device, said continuously rotating rollers feeding the blanks to the gumming device, a folding device, and a second pair of continuously acting feed rollers arranged to engage the ungummed portion of a blank while it is still gripped by the first-named pair of continuously rotating rollers and while the gumming device is in contact with the blank and to move the blank in the same feeding direction to the folding device, whereby the blank is folded while in the same relative position as when severed from the web.

3. In envelope making apparatus, the combination of a pair of rollers for feeding a web of paper, means for cutting from the web blanks each having its major axis at an angle to the line of travel of the web, means for tensioning the web and feeding it in a straight line (if viewed in plan) to said cutting means, a first pair of continuously acting feed rollers, intermittently acting rollers cooperating with the cutting means to feed the blanks to said first pair of rollers, a rotary gummer to which said first pair of rollers feeds said blanks in the same straight line of travel, continuously acting feed rollers including upper rollers having reduced peripheral areas to prevent contact with the gummed portions of a blank, said last-named feed rollers including a pair positioned to grip a blank while it is being advanced by said first pair of rollers, and a folding device to which the blank is fed in the same feeding direction by said last-named rollers in the same feeding direction and in the same relative position as when severed from the web.

4. In an envelope making apparatus, means for supplying a web of paper, means for cutting therefrom blanks each having its major axis at an angle to the travel of the web, means for guiding the web in a straight line (if viewed in plan) from the source to said cutting means, a folding device, rotary gumming means, and a feeding roller positioned to engage the ungummed body portion of the blank and coacting with the gumming means to advance the blanks toward the folder in unchanged relative position.

5. In an apparatus for making envelopes, the combination of means for feeding a paper web from a source of supply, means for cutting from the web a blank having its major axis at an angle to the direction of movement of the web, means for guiding the web from said source of supply to said cutting means, means for gumming the blank, a stationary plunger-type folding device, and means for feeding the blanks in the same feeding direction, viewed in plan, as that of the web entering the cutting device from the cutting means to the gumming means and the folding elements of the said plunger folding device, whereby the blanks are folded while in the same relative position as when severed from the web.

6. In an apparatus for making envelopes the combination of means for feeding a paper web from a source of supply, means for cutting from the web a blank having its major axis at an angle to the direction of movement of the web, means for guiding the web from said source of supply to said cutting means, means for gumming the blank comprising a rotary gummer cylinder, a stationary plunger-type folding device, and means for feeding the blanks in the same feeding direction, viewed in plan, as that of the web entering the cutting device from the cutting means to said rotary gumming means and from there to the folding elements of the said plunger folding device, whereby the blanks are folded while in the same relative position as when severed from the web.

7. In an apparatus for making envelopes the combination of a source of supply, coacting rollers feeding a web from said source, cutting means for cutting blanks from said web, means for guiding the web to said cutting means, the major axis of the cut-off blanks being at an angle to the line of travel of the web, gumming means comprising a rotary gummer cylinder, feed rollers adapted to move the blanks in the feeding direction of the web while maintaining their relative position to said rotary gumming means, a folding device, and means cooperating with the gumming means for gripping the blanks at the ungummed part and advancing them to the folding means in the same relative position as when cut off and in the same feeding direction, viewed in plan, as that of the web entering the cutting device, whereby the blanks are folded while in the same relative position as when severed from the web.

8. In an apparatus for making envelopes the combination of a source of supply, coacting rollers feeding a web from said source, cutting means for cutting blanks from said web, means for guiding the web to said cutting means, the major axis of the cut-off blanks being at an angle to the line of travel of the web, gumming means comprising a rotary gummer cylinder, continuously acting feed rollers adapted to move the blanks in the feeding direction of the web while maintaining their relative position to said rotary gumming means, a folding device, and further continuously acting feed rollers arranged to engage the ungummed part of the blank while the blank is still gripped and moved forward by the first-named continuously acting feed rollers and while the gumming of the blank is taking place and to move the blank towards the folding means in the same relative position as when cut off and in the same feeding direction, viewed in plan, as that of the web entering the cutting device, whereby the blanks are folded while in the same relative position as when severed from the web.

9. In an apparatus for making envelopes the combination of a source of supply, coacting rollers feeding a web from said source, cutting means for cutting blanks from said web, means for guiding the web to said cutting means, the major axis of the cut-off blanks being at an angle to the line of travel of the web, gumming means comprising a rotary gummer cylinder, continuously acting feed rollers adapted to move the blanks in the feeding direction of the web while maintaining their relative position to said rotary gumming means, a stationary plunger-type folding device and further continuously acting feed rollers arranged to engage the ungummed part of the blank while the blank is still gripped and moved forward by the first-named continuously acting feed rollers and while the gumming of the blank is progressing and to move the blank towards the folding elements of the said plunger folding device in the same relative position as when cut off, and in the same feeding direction, viewed in plan, as that of the web entering the cutting device, whereby the blanks are folded while in the same relative position as when severed from the web.

10. In an apparatus for making envelopes the combination of a source of supply, coacting rollers adapted to feed a web from said source,

cutting means for cutting blanks from said web, means for guiding the web to said cutting means, the major axis of the cut-off blanks being at an angle to the line of travel of the web, continuously acting feed rollers and intermittently acting rollers coacting with the cutting means to advance the blanks to said continuously acting feed rollers in the feeding direction of the web while maintaining their relative position, gumming means comprising a rotary gummer cylinder, said continuously acting feed rollers being adapted to move the blanks to said rotary gumming means, a folding device, and means cooperating with the continuously acting feed rollers and the gumming means for gripping the blanks at their ungummed part and advancing them to the folding means in the same relative position as when cut off and in the same feeding direction, viewed in plan, as that of the web entering the cutting device, whereby the blank is folded while in the same relative position as when severed from the web.

11. In an apparatus for making envelopes the combination of a source of supply for delivering a web, stamping means having blades operating vertically to the web for intermittently cutting from said web blanks each having its major axis at an angle to the line of travel of the web, intermittently acting feed rollers coacting with the stamping means, continuously acting rollers for feeding the web from said source of supply to the intermittently acting rollers, means for gumming the blanks, a folding device, and means for feeding the blanks from the cutting means to the gumming means and the folding means in the same relative position as when cut off and in the same feeding direction, viewed in plan, as that of the web entering the stamping device, whereby the blanks are folded while in the same relative position as when severed from the web.

12. In an apparatus for making envelopes the combination of a source of supply for delivering a web, stamping means having blades operating perpendicularly to the web for intermittently cutting from said web blanks each having its major axis at an angle to the line of travel of the web, intermittently acting feed rollers coacting with the stamping means, continuously acting rollers for feeding the web from said source of supply to the intermittently acting rollers, gumming means comprising a rotary gummer cylinder, a stationary plunger-type folding device, and means for feeding the blanks from said cutting means to said rotary gumming means and from there to the folding elements of the said plunger folding device in the same relative position as when cut off and in the same feeding direction, viewed in plan, as that of the web entering the stamping device, whereby the blanks are folded while in the same relative position as when severed from the web.

13. In an apparatus for making envelopes the combination of a source of supply for delivering a web, stamping means having blades operating at an angle to the web for intermittently cutting from said web blanks each having its major axis at an angle to the line of travel of the web, intermittently acting feed rollers coacting with the stamping means, continuously acting rollers for feeding the web from said source of supply to the intermittently acting rollers, continuously acting feed rollers, further intermittently acting rollers coacting with the stamping means to advance the blanks to said continuously acting feed rollers in the feeding direction of the web while maintaining their relative position, gumming means comprising a rotary gummer cylinder, said continuously acting feed rollers being arranged to move the blanks to said rotary gumming means, a plunger-type folding device, and means cooperating with the gumming device for gripping the blanks at the ungummed part and advancing them to the folding elements of the said plunger folding system in the same relative position as when cut off and in the same feeding direction, viewed in plan, as that of the web entering the stamping device whereby the blank is folded while in the same relative position as when severed from the web.

14. In an apparatus for making envelopes in combination a source of supply for delivering a web, stamping means having blades operating perpendicularly to the web for intermittently cutting from said web blanks each having its major axis at an angle to the line of travel of the web, intermittently acting feed rollers provided with peripheral recesses coacting with the stamping means, continuously acting rollers for continuously drawing the web from said source of supply and feeding the web to the intermittently feeding rollers, rotary gumming means for completely gumming the blank, a stationary plunger-type folding device, and means for feeding the blanks from said cutting means to said gumming means and the folding elements of the said plunger folding device in the same relative position as when cut off and in the same feeding direction, viewed in plan, as that of the web entering the stamping device, whereby the blanks being completely gummed are folded while in the same relative position as when severed from the web.

15. In an apparatus for making envelopes in combination a source of supply for delivering a web, stamping means having blades operating vertically to the web for intermittently cutting from said web blanks each having its major axis at an angle to the line of travel of the web, intermittently acting feed rollers provided with peripheral recesses coacting with the stamping means, continuously acting rollers for continuously drawing the web from said source of supply and feeding the web to the intermittently feeding rollers, continuously acting feed rollers, further intermittently acting rollers coacting with the stamping means to advance the blanks to said continuously acting feed rollers in the feeding direction of the web while maintaining their relative position, rotary gumming means for completely gumming the blank, said continuously acting feed rollers moving the blanks to said rotary gumming means, a stationary plunger-type folding device, and further continuously acting feed rollers arranged to engage the ungummed part of the blank while it is still gripped and moved forward by the first-named continuously acting feed rollers and while the gumming of the blank is proceeding and to move the blank together with further feeding means to the folding elements of the said plunger folding device in the same relative position as when cut off and in the same feeding direction, viewed in plan, as that of the web entering the stamping device, whereby the blank being completely gummed is folded while in the same relative position as when severed from the web.

MARTIN JOACHIMCZYK.