Oct. 31, 1933. W. H. RIFE 1,933,121

APPARATUS FOR MAKING LINED ENVELOPES

Filed Feb. 8, 1932 4 Sheets-Sheet 1

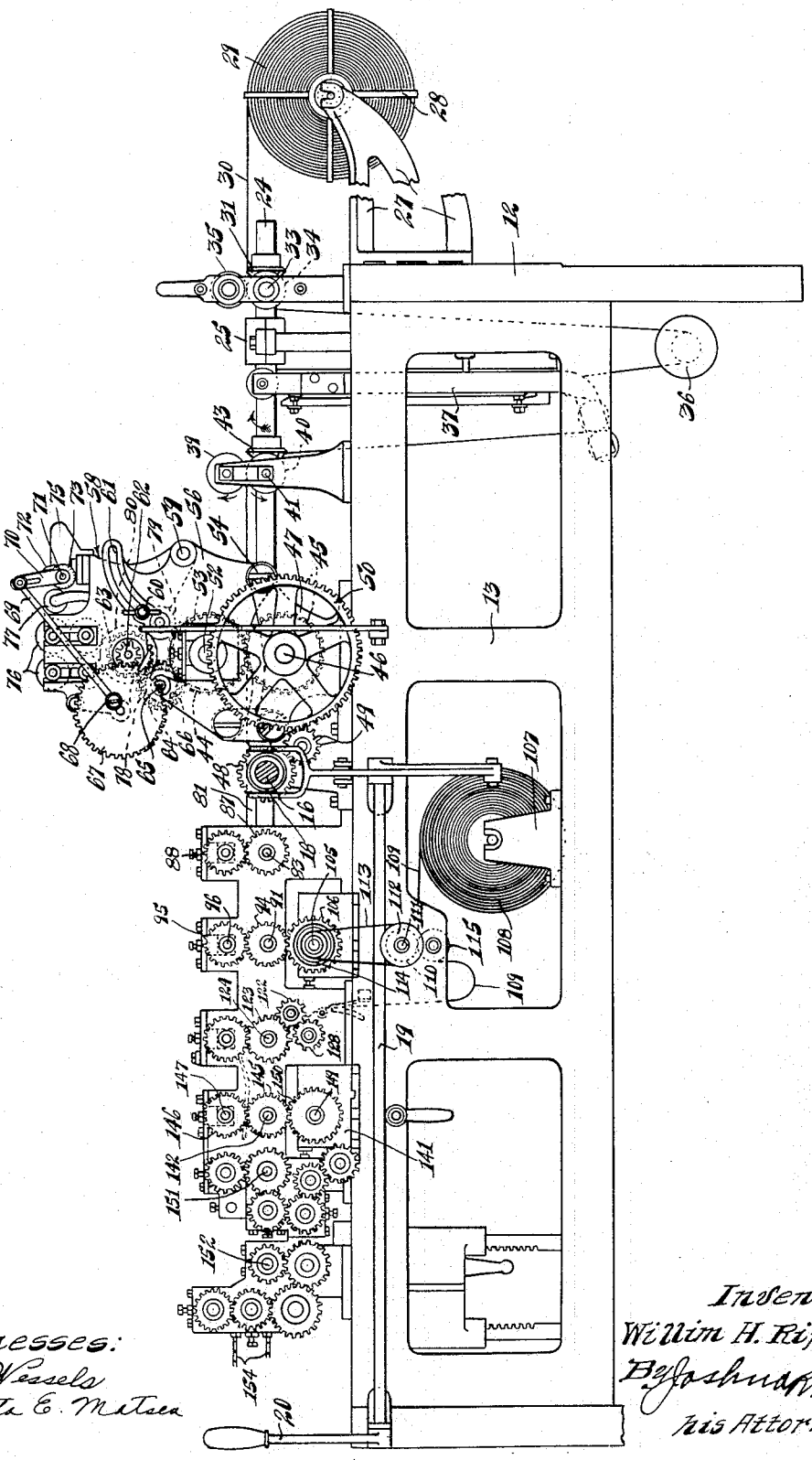


Fig. 1

Witnesses:
C. E. Wessels
Anita E. Metsen

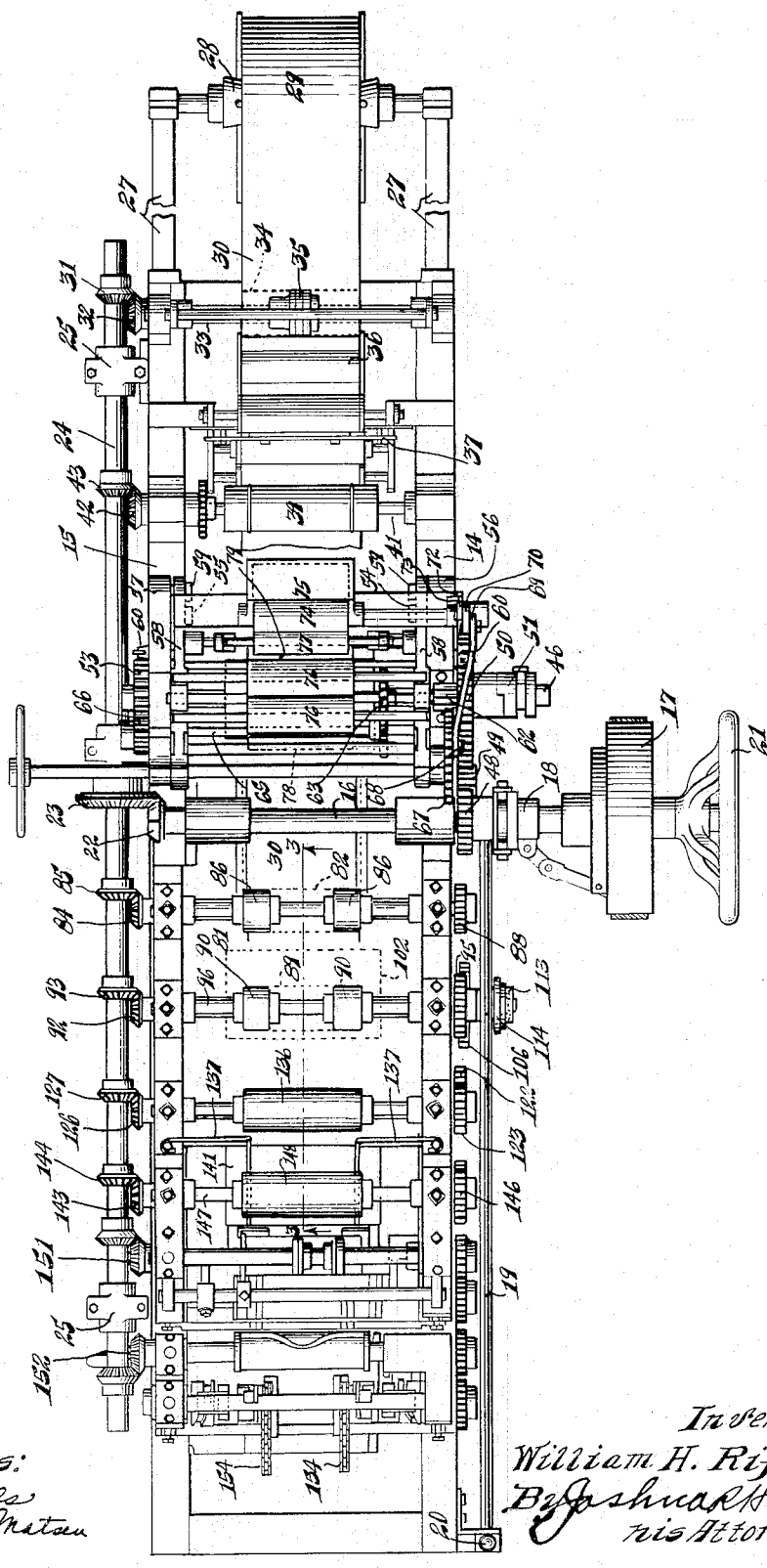
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APPARATUS FOR MAKING LINED ENVELOPES

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Fig. 2



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APPARATUS FOR MAKING LINED ENVELOPES

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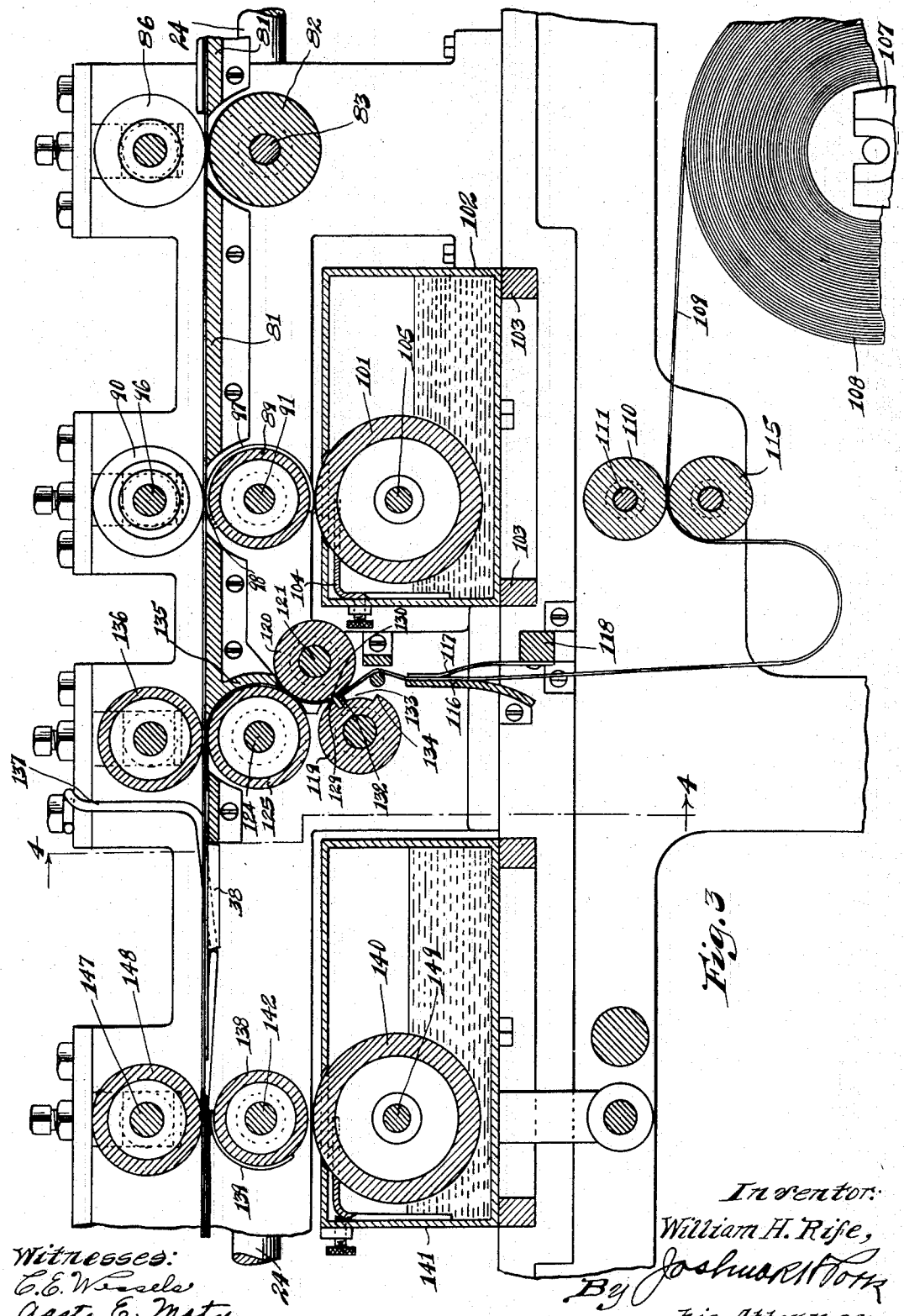


Fig. 3

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APPARATUS FOR MAKING LINED ENVELOPES

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Fig. 4

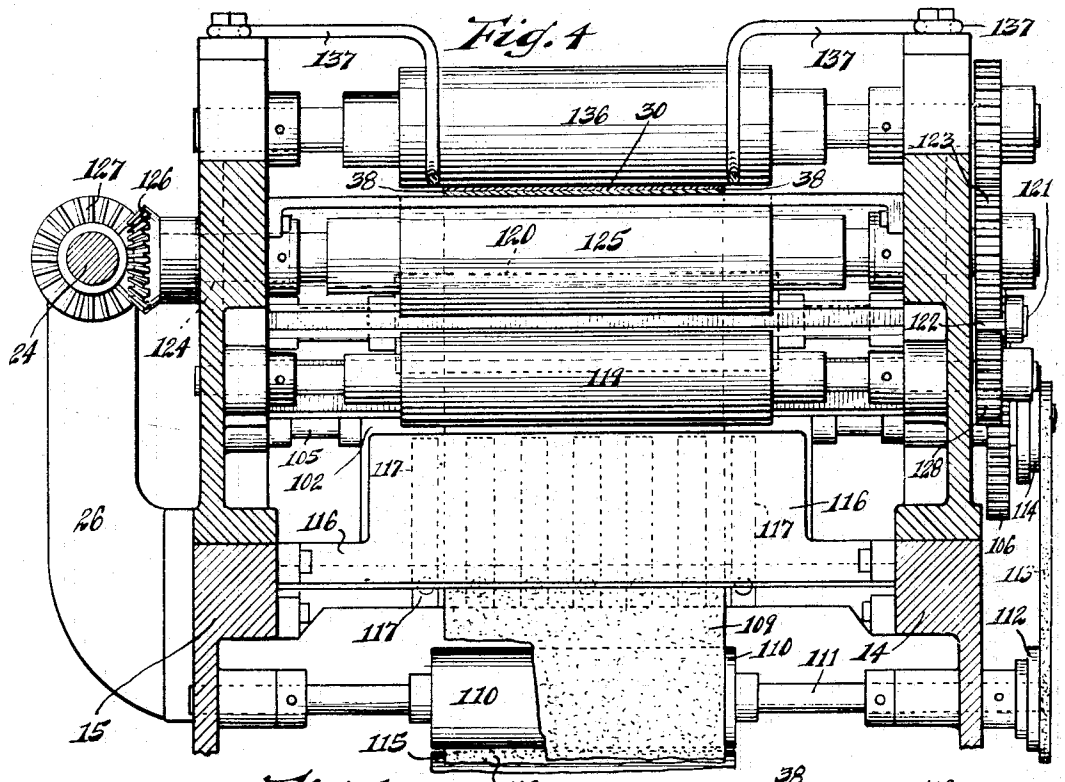


Fig. 5

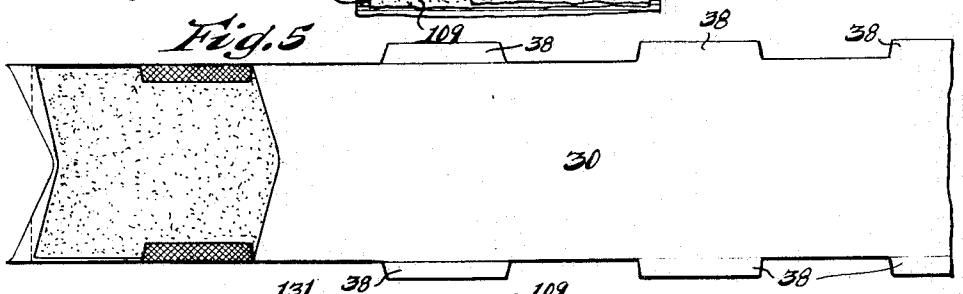


Fig. 6

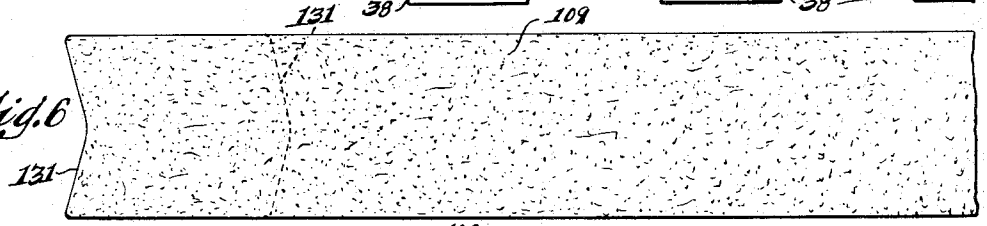


Fig. 8

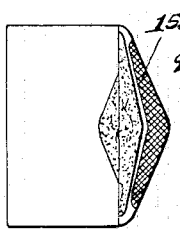
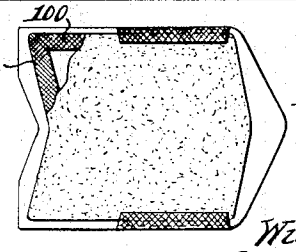


Fig. 7



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Patented Oct. 31, 1933 1,933,121

UNITED STATES PATENT OFFICE

1,933,121

APPARATUS FOR MAKING LINED ENVELOPES

William H. Rife, Chicago, Ill., assignor to Columbia Envelope Company, a corporation of Illinois

Application February 8, 1932. Serial No. 591,657

3 Claims. (Cl. 93—63)

This invention relates to an apparatus for making lined envelopes, and an object of the invention is to provide an improved apparatus for applying a lining patch to the inner surface of an envelope web during the course of manufacture in what is known as the continuous method. In the continuous method the paper web forming the body of the envelope is unwound from a roll of blank paper, and the present invention contemplates also the unwinding during the course of manufacture of the lining paper from a separate roll; and the machine is characterized by the transverse severing of the lining paper into blanks and sealing of the blanks to the surface of the envelope web, which latter becomes the inner surface of the envelope proper, after which the envelope web, with the lining strips properly applied thereto in spaced relation to allow for unlined portions, is transversely severed and the severed portions then trimmed, sealed and folded with adhesive applied to the closure flap to produce a complete lined envelope. In addition to the foregoing and general objects, the invention provides an improved machine for applying lining paper upon one side of an envelope paper web, in combination with a machine which produces typed printed matter upon the opposite side, in such manner that the printed matter appears upon the exterior of the completed envelope and the lining paper upon the interior. The machine employed and disclosed is much more rapid, efficient and economical than those heretofore employed, and the envelopes are completely formed with a separate paper lining provided, without the intervention of manual labor except such as is necessary to replenish a used roll of paper and to see that the parts are functioning properly, and also without the relatively slow process of arranging the envelope blanks or the lining paper blanks in stacks or piles preparatory to the envelope fabricating operations.

Other objects will appear hereinafter.

The invention consists in the combinations and arrangements of parts hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings, forming a part of this specification, and in which:

Fig. 1 is a side elevational view of a preferred embodiment of the machine embodying the invention, with the engaging clutch mechanism omitted to more clearly illustrate the construction;

Fig. 2 is a top plan view of the apparatus shown in Fig. 1;

Fig. 3 is an enlarged vertical longitudinal sectional view, taken substantially on the line 3—3 of Fig. 2;

Fig. 4 is a vertical transverse sectional view, taken substantially on the line 4—4 of Fig. 3;

Fig. 5 is a diagrammatic view showing the envelope web in different stages of operation;

Fig. 6 is a face view of a web or strip of the lining paper with a portion to be severed indicated;

Fig. 7 is a plan view of the envelope with the lining paper applied, before making the hinge fold to bring the back and front portions together; and

Fig. 8 is a view of the completed envelope with the back and front portions brought together, seams formed along the lateral edges with the side flaps, and adhesive applied to the closure flap.

As illustrated in the drawings, the preferred embodiment of my invention and illustrative mechanism for carrying out the novel method, comprises a frame 12 having vertical intermediate standards 13 and longitudinally extending parallel side rails 14 and 15, which may be channel shaped, as shown in Fig. 4. A drive shaft 16 is suitably journaled in the frame of the machine and carries loosely mounted drive pulley 17. Clutch mechanism 18 is controlled by rocking rod 19, by means of shifter handle 20. Hand wheel 21 is preferably provided for movement of the various machine parts for adjusting purposes, and bevel drive pinion 22 mounted on the opposite end of drive shaft 16 is adapted to mesh with bevel gear 23 secured to longitudinally extending countershaft 24 suitably journaled in bearings 25, each of which is carried by a bracket 26, as shown in Fig. 4.

Mounted upon the right hand extremity of the machine, as shown in Figs. 1 and 2, is a reel bracket 27 adapted to rotatably support reel 28 which carries a roll of paper 29, from which paper web 30 is unwound and fed into and through the machine. Bevel pinion 31 of shaft 24 meshes with bevel pinion 32 affixed to transverse shaft 33, journaled in the frame of the machine, and upon which is mounted power driven feed roll 34 normally having frictional contact with an upper idle roller 35 so arranged that paper web 30 is fed forwardly. After passing between rollers 34 and 35, the paper web preferably passes around, in suspending manner, a floating spool 36 which serves to maintain the web in smooth condition, and thereafter the paper passes upwardly and thence downwardly through a creasing device

37, which is not shown in detail because individually used heretofore, and by means of which the lateral marginal portions of the web are creased to later form creased side flaps 38 after serrations are cut in the marginal portions. The web is then carried between trimming rollers 39 and 40, which are geared together, the latter being mounted upon transverse shaft 41 which carries bevel pinion 42 driven by a bevel pinion 43 upon shaft 24. Cutting rollers 39 and 40 serve to cut out the intermediate portions or serrations between the successive side flaps 38, and thereafter web 30 is carried between a type printing roller 44 and lower press roller 45. Type printing roller 44 carries a cylindrical type holding plate or form for impressing any desired printed matter upon the surface of the web which is later to constitute the exterior of the finished envelope.

Press roller 45 is mounted upon transverse shaft 46 suitably journaled in side plates 47. Splined upon drive shaft 16 but slidably mounted with clutch member 18, is pinion 48 which meshes with an idle pinion 49, which in turn is in mesh with gear 50 loosely mounted on shaft 46 and having a hub portion adapted to form a jaw clutch in cooperation with clutch member 51 keyed to shaft 46. The upper type printing roller 44 is carried by shaft 52, upon which is mounted gear 53 meshing with a similar gear mounted upon the lower shaft 46, whereby type printing roller 44 and pressure roller 45 travel at uniform speed in opposite directions.

Shaft 52 is preferably journaled in a hinged frame assembly adapted to be swung on shafts 54 and 55. This assembly comprises a side plate 56, as shown in Fig. 1, and a corresponding side plate 57 disposed on the opposite side of the machine. This arrangement is desirable for resetting the type in roller 44, and similarly the inking mechanism assembly 58 is swingably mounted on pivot 59 and a corresponding pivot on the opposite side of the machine, and may be held in any desired elevated position by means of wing nut 60 threaded on a stud slidable in arcuate slot 62. The inking mechanism, for applying ink to the type printing roller 44, need not be described in detail because not separately novel and is subject to considerable alteration in view of the fact that the only purpose is to apply ink to the type printing roller. In the embodiment shown, pinion 62 is secured to a transverse shaft upon which is also mounted gear 63, which is in mesh with gear 64 mounted on shaft 65, which carries gear 66 driven by gear 53. Pinion 62 is adapted to drive gear 67 carrying an offset crank pin 68, to which is connected one end of pitman 69, connected at the opposite end to rock arm 70 loosely mounted on shaft 72, which is adapted to intermittently engage rotary ratchet 73 keyed to shaft 71. Shaft 71 carries roller 74 which supplies ink from an ink container 75 to a plurality of inking rolls 76 through an intermediary roller 77. In this manner the ink is supplied from the reservoir and evenly distributed before application to the type printing roller 44, as is understood. Inking rollers 78 and 79 are in direct contact with the type printing roll 44 and are driven by frictional contact with an intermediate roller 80, which in turn is driven by frictional engagement with the two lower pairs of rollers 76.

Beyond rollers 44 and 45 the web 30 travels upon table 81 which is suitably recessed transversely for the various rollers and is next engaged by propelling power driven roller 82 secured to shaft 83 carrying pinion 84, in mesh with drive pinion 85. Upper pressure roller 86 is preferably provided with a resilient surface and is in frictional contact with roller 82. Preferably, rollers 82 and 86 are geared together by means of gears 87 and 88, respectively. The paper web 30 next passes between a lower paste applying roller 89 and upper pressure roller 90. Roller 89 is mounted upon shaft 91, which carries bevel pinion 92 driven by bevel gear 93, and shaft 91 carries at the opposite end gear 94 which meshes with gear 95 mounted on the shaft 96, which carries roller 90. Paste applying roller 89 is provided with a segmental portion 97 on the surface, which is formed of an outline to correspond to the portion of the under surface of web 30 that is intended to receive paste for adhesion of the lining paper later applied. This segmental portion may be of any desired outline to suit different types of envelopes, but in the present embodiment, consists of portion 98 extending transversely of the web to apply the transverse adhesive 99 shown in Fig. 7, and the segments 97 extend circumferentially on roller 89 to provide longitudinal adhesive 100 shown in Fig. 7, and similar adhesive on the opposite side.

Paste applying roller 101 is immersed in paste tank 102, supported by cross rails 103, and preferably is provided with an adjustable scraping plate 104 interiorly mounted. It will be noted that roller 101 does not directly contact with the body portion of roller 89, but only with the segmental portions 97 and 98 which apply the corresponding outline of adhesive on the under surface of web 30. Roller 101 is mounted upon shaft 105, which carries gear 106, driven by gear 94. The next operative step consists in applying the patches of lining paper to the under surface of web 30 for adhesion thereto by means of the paste applied as just described, and is carried out as follows.

Suspended in the lower portion of the machine, by means of oppositely disposed brackets 107, is a roll of lining paper 108. This lining paper is preferably of lighter stock than the web which forms the envelope proper, and generally carries an ornamental design. Upon being unwound from the roll 108, the lining web, which to distinguish from the envelope web 30 will be designated as the lining strip 109, passes between feeding roller 110 mounted on shaft 111 which preferably carries a cone pulley 112 for regulating speed, driven by belt 113 passing over a corresponding pulley 114 mounted on shaft 105. Roller 110 is maintained in frictional contact with roller 115 and is preferably geared thereto as shown. By this manner, the lining strip 109 is unwound from the reel and hangs in a bight as shown, and then extends upwardly between shoe plate 116 and leaf spring member 117 mounted in block 118 and adapted to lightly bear against the paper strip so as to merely yieldingly maintain the same in position. Thereafter lining strip 109 passes between cutting roller 119 and complementary roller 120. Roller 120 is mounted upon transverse shaft 121, which carries gear 122 adapted to mesh with gear 123 secured to transverse shaft 124, which carries roller 125, and the opposite end of shaft 124 carries pinion 126 driven by bevel gear 127. Severing roller 119 carries gear 128, which in turn is driven by gear 122 mounted on shaft 121, causing rollers 119 and 120 to rotate in opposite directions at uniform speed.

Mounted upon the periphery of roller 119 and suitably held in a groove, is a severing knife 129

adapted to transversely sever the lining strip 109 for the desired length for each envelope, and complementary roller 120 is provided with a corresponding groove 130 to complete the severing operation. This operation serves to sever the lining strip 109 into individual lining patches substantially on the lines 131, as shown in Fig. 6, or in accordance with any modified shape that may be desired. It will be understood that rollers 119 and 120 continuously operate, and after a severing operation the paper is carried forward a slight distance by means of roller portion 132 which follows the knife 129. This serves to present a sufficient edge portion for the next following gripping and feeding operation. Inasmuch as the lining patches are spaced apart upon the under side of the paper web, it is necessary to provide intervals in the lining feed, and therefore a suitable recess 133 is provided in roller 119, during the passage of which the lining feed is interrupted. As shoulder 134 on roller 119 comes in contact with the surface of roller 120 the projecting edge of the liner 109 is engaged and the feed continued between rollers 120 and 125, during which operation the severed lining patch is carried through an arcuate path in guided contact with guide shoe 135. This operation serves to bring the lining patch in position for contact with the under surface of the paper web 30 and in registry with the portions to which paste or adhesive has been applied as described, and the patch is then sealed to the web in passage between rollers 125 and upper pressure roller 136. Rollers 125 and 136 are preferably geared together by means of gears 123 and 137, respectively.

At this point the envelope web which has had printed matter applied, if desired, to the upper surface which ultimately forms the outer surface of the finished envelope, has a lining patch adhered to the under surface of the web, or the side which is disposed on the interior of the printed envelope. Also, the side marginal edges are trimmed or serrated to provide the side sealing flaps 38. The mechanisms which perform the subsequent operations of applying an adhesive to the side flaps, indenting and severing the envelope web transversely to provide envelope blanks, trimming off the corners of the severed blanks, creasing and forming the hinged fold to bring the back and front portions together, and applying an adhesive to the upper closure flap, are not individually novel and is referred to in the present description to complete the disclosure and mode of operation. Therefore, it will be unnecessary to describe this portion of the apparatus in detail.

After passing between rollers 125 and 136 the side flaps 38 are turned under by means of folding wires 137 and adhesive is applied to these flaps by paste applying roller 138, carrying the suitable segmental portions 139 which register with the flaps 38. Segments 139 receive paste from the paste supplying roller 140, the major portion of which is immersed in paste receptacle 141. Roller 138 is mounted upon shaft 142 which carries bevel pinion 143 driven by bevel gear 144, and on the opposite end is provided with gear 145 meshing with gear 146 which is mounted upon shaft 147 carrying the upper pressure roller 148. Similarly, paste supplying roller 140, which is mounted on shaft 149, is driven by gear 150 likewise mounted on shaft 149 and adapted to mesh with gear 145. The mechanism for completing the envelope is not individually novel and includes two transverse power driven shafts 151 and 152.

In these subsequent operations the web, as shown in Fig. 5 with the lining patches applied thereto, is severed transversely to provide the envelope blank shown in Fig. 7. These blanks are then successively folded, as shown in Fig. 8, bringing the back portion in contact with the side flaps 38 to which the back portion is sealed, and adhesive 153 is applied to the top closure flap. After the completed envelopes are formed they are carried from the machine by endless chain conveyors 154.

As is understood in the art, a quick drying ink is preferably employed in the printing operation, and throughout the foregoing description the general operation of the machine and the detailed method of carrying out the method steps have been indicated, in which the various parts of the machine have been described both in connection with structure and function.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In an envelope making machine, means for progressively advancing a web of paper, means for applying paste thereto for attaching a lining patch, a pair of power driven rollers adapted to advance a strip of lining paper, said rollers being driven from the paste applying mechanism and timed therewith, a rotary cutter for severing said lining strips into the proper size and shape and means associated with said cutter to cause intermittent advance of the severed portions of the strips, substantially as described.

2. A device as set forth in claim 1 in which the driving connection between the paste mechanism and the lining strip feed rollers is adapted for adjustment to adjust the timing of said elements relative to each other.

3. A device as set forth in claim 1 further characterized by a tension device between the feed rollers for the lining strip and the severing mechanism and said feed rollers being adapted to maintain a loose bight in the lining strip, substantially as described.

WILLIAM H. RIFE.