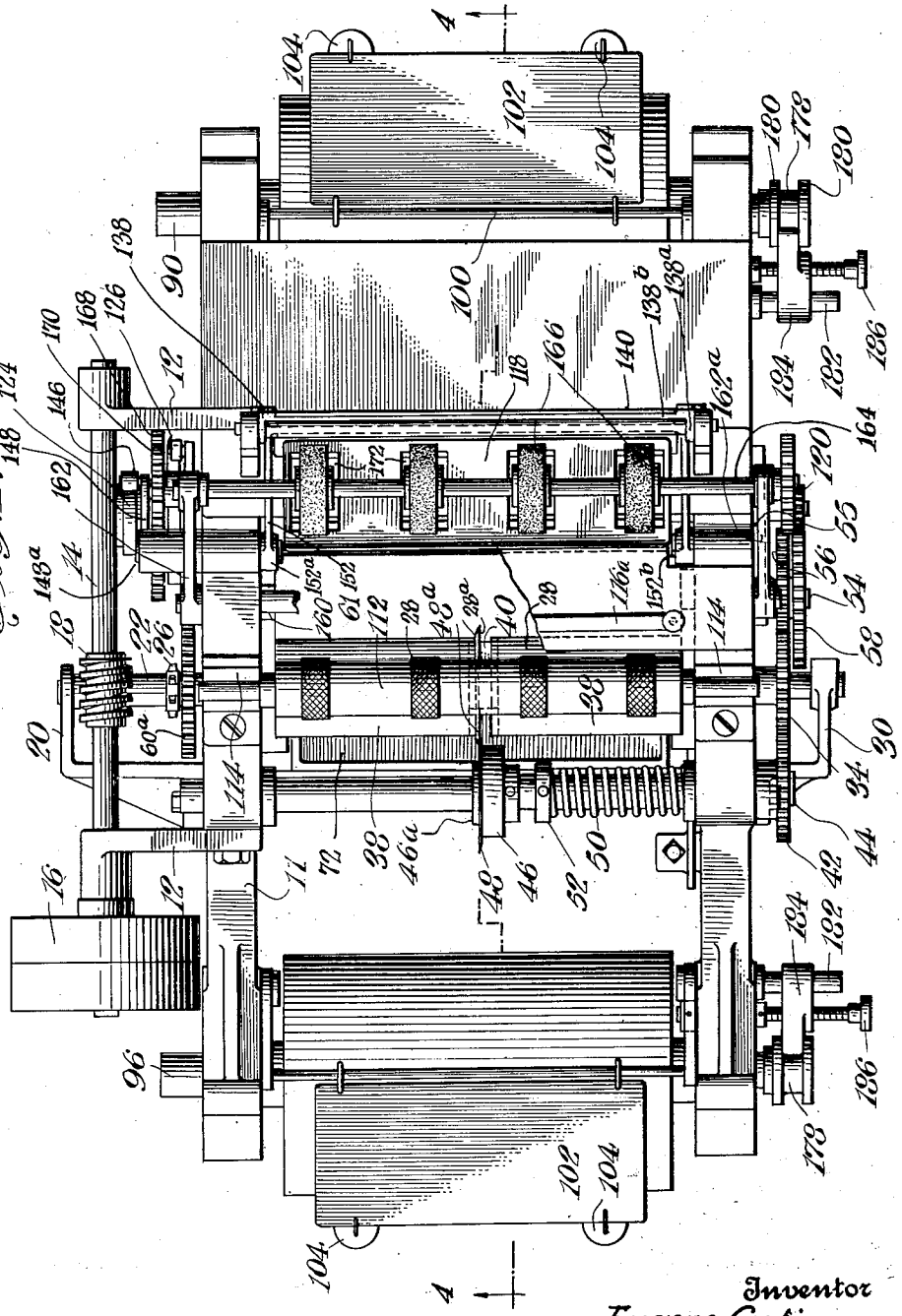
May 3, 1932. E. CONTI 1,857,113

MACHINE FOR MAKING ENVELOPES

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Fig. 1.



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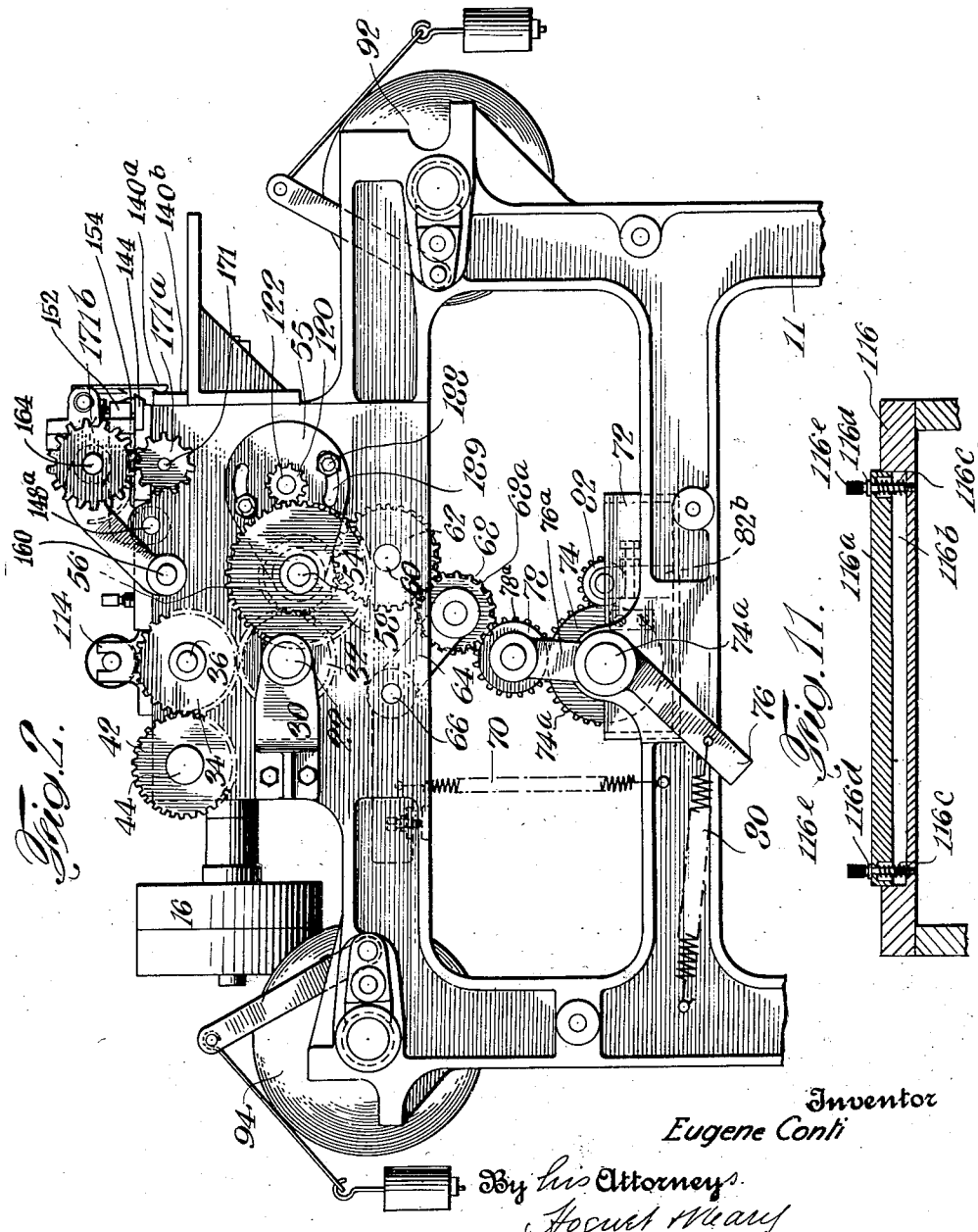


Fig. 1.

Fig. 11.

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MACHINE FOR MAKING ENVELOPES

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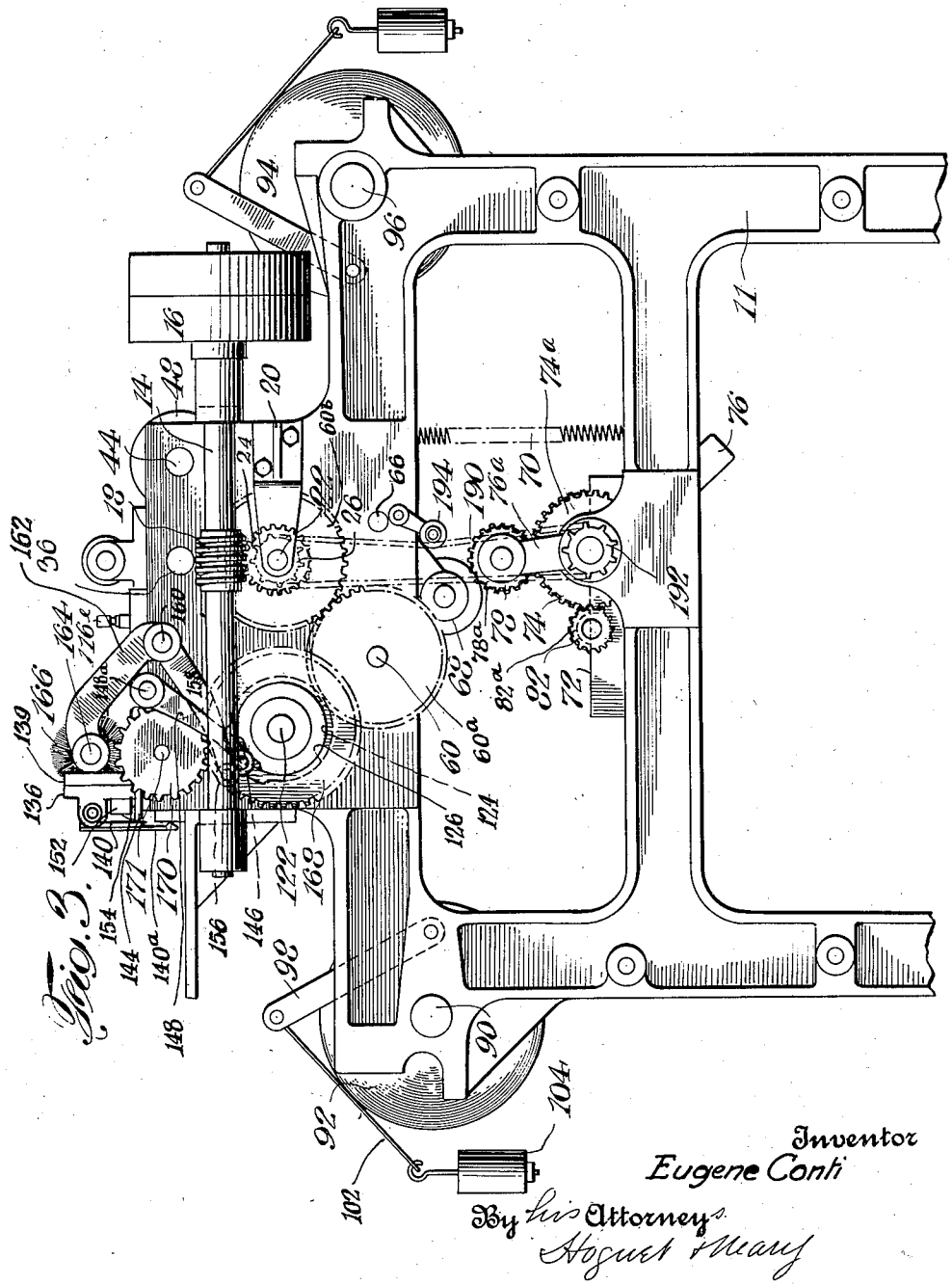


Fig. 3.

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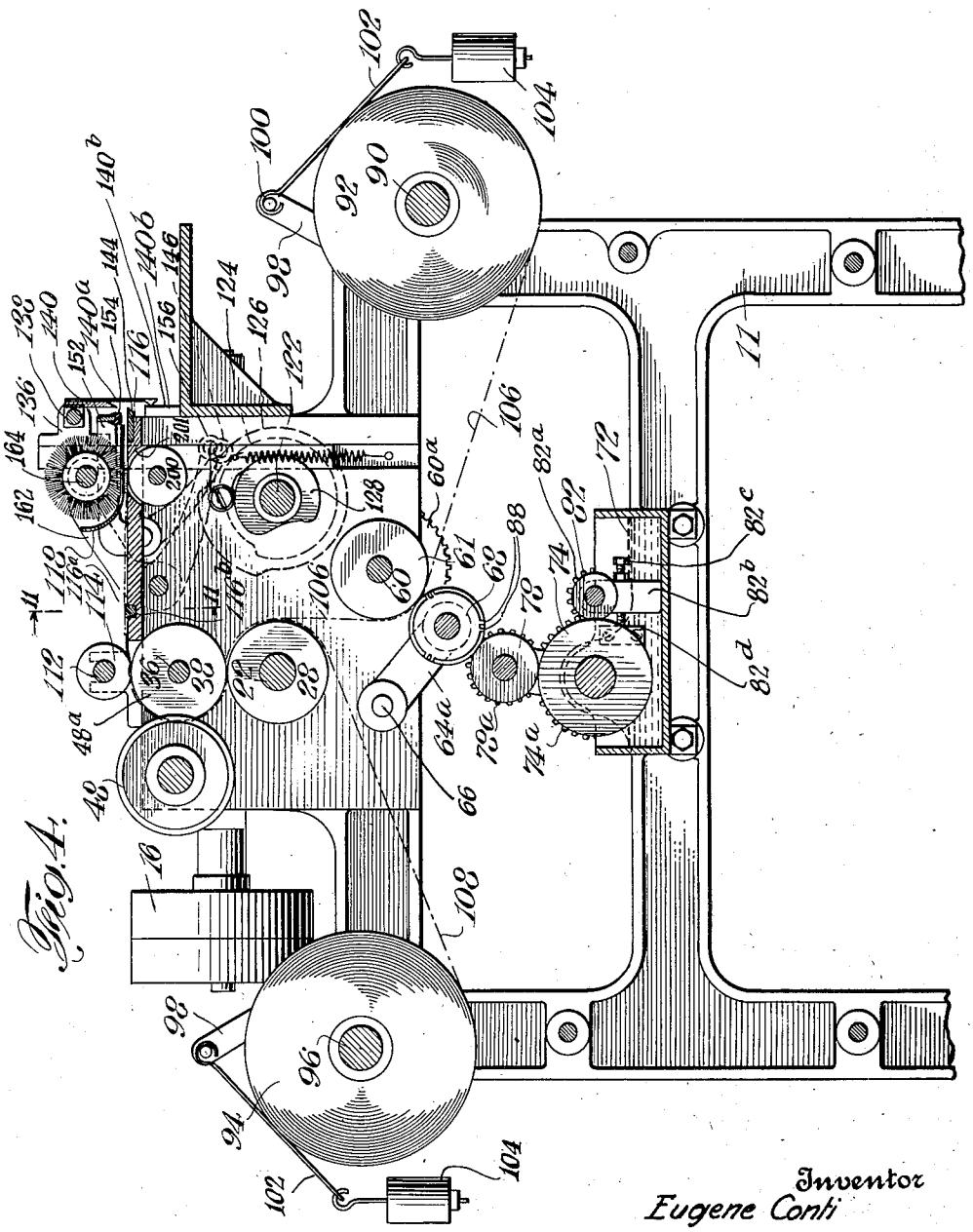


Fig. 4.

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MACHINE FOR MAKING ENVELOPES

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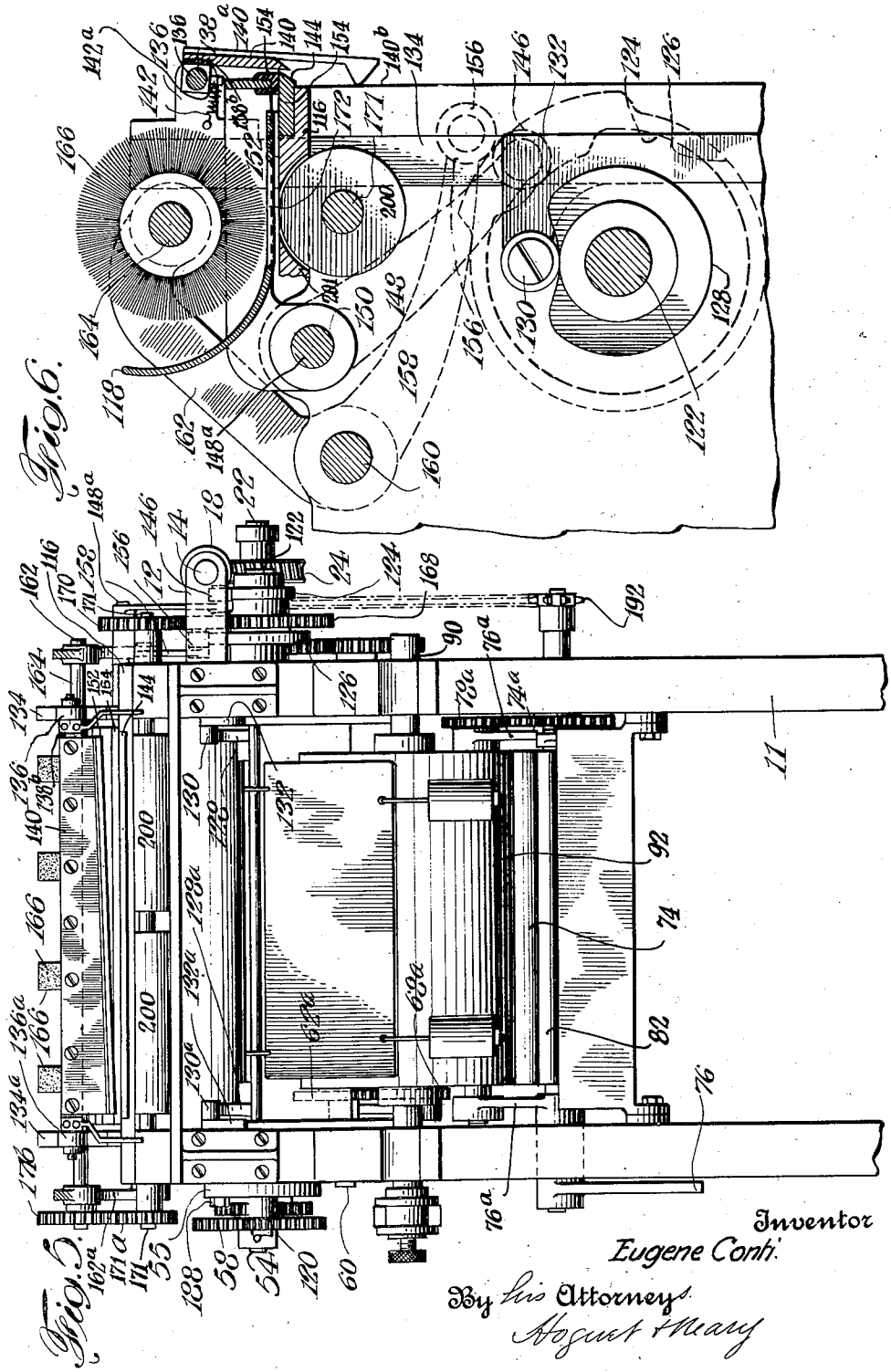


Fig. 6.

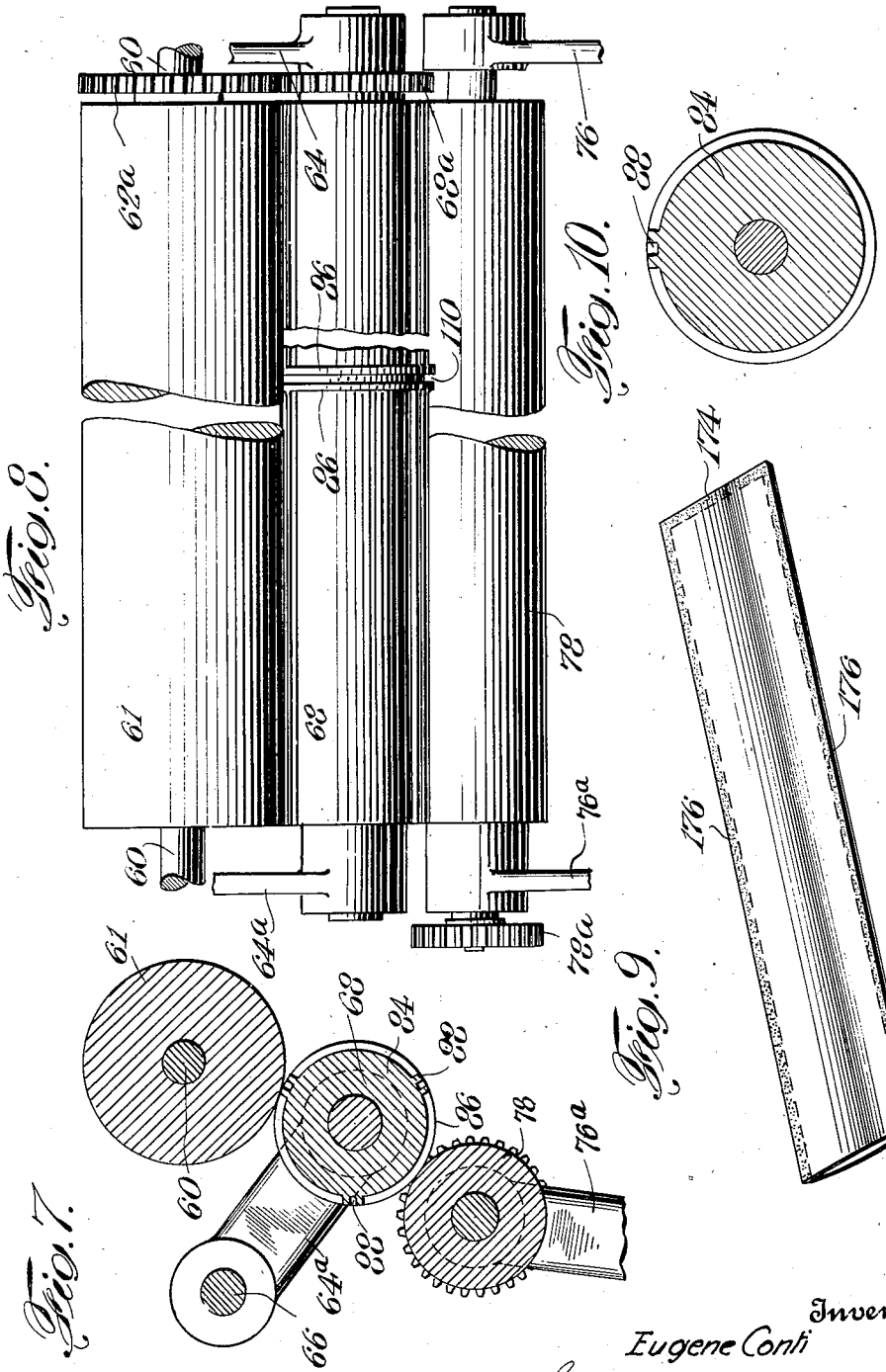
Fig. 5.

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MACHINE FOR MAKING ENVELOPES

Filed July 1, 1930 6 Sheets-Sheet 6



Inventor
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Patented May 3, 1932 1,857,113

UNITED STATES PATENT OFFICE

EUGENE CONTI, OF MT. VERNON, NEW YORK, ASSIGNOR TO ALEXANDER HERZ, OF NEW ROCHELLE, NEW YORK

MACHINE FOR MAKING ENVELOPES

Application filed July 1, 1930. Serial No. 465,077.

This invention relates to improvements in machines for making envelopes.

It is an object of my invention to construct a machine which will be useful in the manufacture of envelopes, and which shall be simple and rugged of construction.

Another object is to provide a machine for making envelopes embodying improvements and simplifications in the method of operating.

Many other objects and advantages will become apparent to persons skilled in the art as the specification proceeds.

My machine is particularly useful in the manufacture of envelopes or bags using the method disclosed in British Patent 203,264, in which two bodies of sheet material are superposed, the bodies having lines of adhesive on and within the area of the superposed meeting faces of the bodies, the lines of adhesive dividing the bodies into sections having the dimensions of the bags. The bodies are thus caused to adhere along the lines of the adhesive, are then cut into individual bags. The bodies or webs of sheet material are fed simultaneously over a plurality of rolls at least one of which is adapted to apply the adhesive to at least one of the meeting faces of the bodies or webs. The webs of sheet material may have a width equal to a multiple of the length of the bags and the bags may be provided with flaps by having one of the webs wider than the other. The layers of adhesive are conveniently disposed along transverse and longitudinal lines which permits the adhering webs to be cut longitudinally and transversely along the lines of adhesive into individual bags. The webs, of course, may be of any desired material that adapts itself to retaining adhesive, to passing over rollers and to being cut. The invention herein comprises refinement in the above process and apparatus.

My invention will be best understood from the following description taken in conjunction with the accompanying drawings in which like reference characters denote the same elements throughout and in which:

Figure 1 is a top plan view;

Figure 2 is an elevation view of one side of the machine;

Figure 3 is an elevation view of the other side of the machine;

Figure 4 is a vertical section taken on line 4—4 of Figure 1;

Figure 5 is an end elevation;

Figure 6 is a detail, partly in section, of the cam mechanism and associated parts;

Figure 7 is an enlarged detail, partially in section, of the pasting roll and its associated elements;

Figure 8 is an end elevation of the elements shown in Figure 7;

Figure 9 is a perspective view of an envelope as produced from my machine;

Figure 10 is a cross section of a pasting roll.

Figure 11 is a section on line 11—11 of Figure 4.

In the drawings, I have indicated the frame of the machine generally at 11. Extending laterally from one side of said frame are two brackets, 12—12. Journaled in the outer ends of these brackets is a main drive shaft 14, to which may be attached a drive pulley 16, which may be operated in any conventional manner, not shown. Mounted fixedly upon shaft 14 is a worm 18. A shaft 22 extends transversely of the frame 11 and is rotatably mounted therein and in a bracket 20. Upon this shaft 22 is mounted a gear 24, operatively connected with worm 18. A sprocket 26 is likewise mounted upon shaft 22, and its use will be indicated later.

Shaft 22 extends completely thru the frame work of the machine, and is journaled on the opposite side of the machine in a bracket 30. Mounted on shaft 22 are rollers 28, separated centrally by a cleft 28*a* (see Fig. 1). Between bracket 30 and the frame 11 is positioned a gear 32, fixed upon shaft 22. Gear 32 meshes with and drives another gear 34, which is mounted upon a shaft 36 extending transversely of and journaled in the frame above shaft 22. Mounted upon this shaft 36 and positioned to cooperate with rollers 28, are a pair of rollers 38, separated centrally by a cleft 40, positioned above cleft 28*a*, the use of which will be indicated later.

Gear 34 meshes with and drives a gear 42, which is fixedly mounted upon a transverse shaft 44. A rotary knife or cutter-blade 48 is mounted on and secured to the shaft 44 between and by means of collars 46 and 46*a* on opposite sides thereof. Cutter-blade 48 is held in contact with a complementary cutter-member 48*a* by a spring 50 which presses against collar 52 secured to the shaft 44. The member 48*a* is positioned in the cleft 40 and is secured to the end of one of the rollers 38.

A stub shaft 54, mounted in a bracket 55, carries a pinion 56 which meshes with and is driven by gear 32. A gear 58 is likewise mounted upon shaft 54 and operatively connected to pinion 56, and serves to drive a cam mechanism, as will be later described.

Below stub shaft 54 and extending transversely of the frame 11 is a shaft 60 journaled in said frame. Shaft 60 is driven by means of gear 60*a* secured to the end thereof and which meshes with a gear 60*b*, mounted upon and secured to the shaft 22. (See Figures 1 and 3). Between the sides of the frame 11 and remote from the gear 60*a* is a gear 62*a* mounted upon and secured to the shaft 60. Shaft 60 carries a roller 61 positioned between the sides of the frame 11. A bell-crank lever 64 mounted upon and secured to a shaft 66, which extends transversely of and is journaled in the frame 11, carries at the end of one arm one end of a roller 68. The other end of the roller 68 is carried by one end of an arm 64*a* which is also secured to the shaft 66. The opposite arm of bell-crank lever 64 is restrained by a spring 70 or other conventional means, thus tending to press roller 68 against roller 61, and to maintain gear 68*a* which is operatively connected to roller 68 in mesh with gear 62*a* mounted on shaft 60 and operatively connected with roller 61.

A receptacle 72 for adhesive is supported in the lower part of the frame 11. A roller 74 rotatable upon shaft 74*a*, which is journaled in the sides of frame 11, dips into this receptacle. On one end of the shaft 74 is secured an arm 76. Between the sides of the frame 11 and adjacent each side are arms 76*a* secured to the shaft 74*a*. A roller 78 is journaled opposite ends of the arms 76*a*. The relative diameters of rollers 74 and 78 are such that both are continuously in contact with one another. These rollers are operatively connected through gear 78*a* attached to roller 78, and gear 74*a* attached to roller 74. A spring 80, or other conventional means, serves to pull the lower end of said lever 76 in such a manner that roller 78 will tend to press continuously against roller 68. Journaled in the ends of adjustable brackets 82*b* within the receptacle 72 is a small roller 82, which serves as a wiper, to remove any excess of adhesive from the feed roller 74. Roller 82 is rotated by means of gear 82*a* attached to one end thereof, which in turn meshes with gear 74*a*. Brackets 82*b* may be moved to and from the roller 74 by means of adjusting screws 82*c* threadedly engaged therewith. The ends of screws 82*c* are rotatably secured in blocks 82*d* secured to opposite inner sides of the receptacle 72. Roller 82 may thus be moved to and from the roller 74 to regulate the amount of paste which is carried to the roller 78.

The detailed construction of roller 68 can best be seen by reference to Figures 7, 8 and 10. As will be seen, this roller comprises a cylindrical body 84. Extending around the circumference of the body are flange-like projections 86, of uniform radius. Extending longitudinally are a plurality of ribs 88, whose height is the same as that of radial projections 86. These projections are placed in pairs, each rib being slightly spaced from its associated member. It will be seen by reference to Figure 4 that roller 68 tends to press against roller 61, and that roller 78 in turn presses against roller 68. The contact of roller 68 with both of the other rollers will, of course, be solely through the ribs or projections previously described. It will be seen that, when the machine is in operation, an adhesive, in the receptacle 72, will be spread upon roller 74, transferred to roller 78, and will then be spread evenly and uniformly upon the projecting flanges of roller 68.

In one end of the frame 11, a shaft 90 is rotatably mounted. This shaft is adapted to hold a roll 92 of material, which, for convenience, shall be called paper. A similar roll 94 is likewise rotatably mounted upon shaft 96, at the opposite end of the frame. Arms 98 extend upwardly a short distance from opposite sides of the frame; and to these are attached rods 100, to which in turn, are pivotally fixed plates 102. These plates, acting in conjunction with weights 104, act as a brake or drag to prevent too rapid an unrolling of the material from rolls 92 and 94.

In operation, material from roll 92 will be led centrally of the machine, and passed between rollers 61 and 68. It will be seen that at this point adhesive will be applied to one face of the material, at the points where roller 68 would normally contact with roller 61.

From here, the sheet of material 106 is led upward and around rollers 28, where it meets a sheet 108 coming from roller 94. The adhesive on sheet 106 will cause it to adhere to sheet 108, thus forming the blank from which the completed envelopes are cut. These sheets pass together around roll 28, between this and rollers 38. At this point a longitudinal cut is made in the pasted material by means of rotating cutter 48, acting in conjunction with complementary cutter-member 48*a*. The location of this cut is made to coincide with the groove 110 between the projections 86 on roller 68 (Fig. 8). From here the material passes between rollers 38 and a

guide roller 112 loosely journaled at 114 at opposite sides of the top of the frame. The material is then led to the front end of the machine between a base plate 116 and guard 118, where it is subjected to a second and transverse cutting operation, about to be described. Between roller 112 and guard 118 the material passes over a member 116*a* extending transversely of the material and adjustably mounted in a slot 116*b* in the base plate 116. The member 116*a* is pressed upward by springs 116*c* (see Figure 11) and is limited in its upward movement by shoulders 116*d* on securing members 116*e*. Member 116*a* assists in keeping the transverse strips of adhesive in correct position during the cutting operation to be described hereinafter. The securing members 116*e* threadedly engage the base plate 116. The height of the member 116*a* may thus be adjusted by means of the securing members 116*e*.

Gear 58 drives a pinion 120 which is fixed upon a shaft 122 journaled in frame 11. This shaft extends across the machine and at the opposite side is located the cam mechanism shown in detail in Figure 6.

This cam mechanism comprises three cams, 124, 126 and 128. The first of these, to wit: 124, controls a keeper or work-holding mechanism 152, the second, to wit: 126, a work-advancing mechanism 166, and the third, to wit: 128, together with a complementary cam 128*a* (see Fig. 5) at the opposite side of the frame, controls a knife 140. A roller 130 engages cam surface 128, and a roller 130*a* engages cam surface 128*a*, and serve to reciprocate a plate 132 and a plate 132*a* which move bars 134 and 134*a* respectively. (See Figure 5.) These bars are mounted in vertical grooves on opposite sides of the frame. At the upper end of the members are ears 136 and 136*a* to which is secured a transverse rod 136*b*. To this transverse rod at 138 and 138*a* is pivoted a cutter-knife holder 138*b* by means of angular projections at the ends thereof. Secured to cutter-knife holder 138*b* is a cutter-knife 140. The cutter-knife 140 has attached thereto at the edge thereof and out of the path of the material a positioning member 140*a* which is adapted to contact and slide upon a portion 140*b* of the frame 11. A spring 142 attached to an arm 142*a* on the knife holding member 138*b* serves to press cutter-knife positioning member 140*a* against the surface 140*b* and thus to hold cutter-knife 140 in proper position with respect to the operative edge of the machine bed 144. During operation, as the cams 128 and 128*a* rotate, it will be seen that the knife blade 140 is reciprocated, and will periodically descend upon the strip of material which is being fed thereto, thus completing the formation of the envelope by cutting the envelope from the continuous strip of material. It will be seen from the description herein of the roller 68 that in forming an envelope pasted on three sides, the knife 140 will sever the paper between transverse strips of adhesive applied by adjacent ribs 88. Two upright edges and the bottom edge of the envelope are pasted together, leaving the upper edge open.

Cam 124 is engaged by a roller 146, and thus operates arm 148 which is secured to a shaft 148*a* journaled in and extending through one side of the frame 11. To the other end of shaft 148*a* and inside of frame 11 is secured one end of a U-shaped member 152, as shown at 152*a*. The opposite end of U-shaped member 152 is pivoted at the opposite inner side of frame 11, as shown at 152*b*. U-shaped member 152 carries a rubber cushion 154 which is adapted to press smoothly against the top surface of bed-plate 144. Cam 124 and cams 128 and 128*a* are so related radially that element 154 is lowered slightly before, and raised slightly after, the operation of the knife 140. (See Figure 2). This intermittent operation will tend to immobilize the material during the actual cutting period. Since the intermittent feed thus resulting is not duplicated in the parts of the machine previously described, there will be a periodic tendency of the material to bunch up between the holder 154 and roller 112. Guard 118 serves to prevent the material from coming into contact with brushes 166.

Cam 126 is engaged by a roller 156 mounted upon a rocker arm 158, secured to a shaft 160 journaled in and extending transversely of the frame 11. The rocker arm 158 has an upwardly extending arm 162. At the opposite end of shaft 160 and positioned outside of the frame is a complementary arm 162*a*. Journaled in the ends of arms 162 and 162*a* is a shaft 164 upon which is mounted a plurality of spaced brushes 166.

On the outer end of cam shaft 122 is fixedly mounted a gear 168. This gear engages with, and drives a gear 170, fixedly mounted upon the shaft 171. This shaft extends through the machine, and on the opposite side, exterior of the frame 11, is fixedly mounted a pinion 171*a*. This pinion meshes with a pinion 171*b*, mounted upon shaft 164, which carries brushes 166. The teeth of these two pinions are sufficiently long that the two will constantly mesh, regardless of the cam action described which raises and lowers the shaft 164.

A plurality of apertures 172 are provided in the guard 118, each aperture being positioned beneath a brush 166 in order to permit the brush to operate within the aperture and to come in contact with the material passing between the guard and the bed-plate 116. Spaced rollers 200, mounted upon shaft 171, operate within cut-out portion 201 in bed-plate 116 and project slightly above the upper surface of the bed-plate 116 so as to contact the material passing between bed-plate

116 and the guard 118. Rollers 200 cooperate with brushes 166 when lowered into contact with the opposite side of the material. Rollers 200 and brushes 166 cooperate in advancing the material and in maintaining the joined parts in position.

The operation of the machine should now be clear. A suitable drive mechanism is attached to pulley 16. This serves to furnish the power for operation. The material from the roll 92 is threaded between rollers 61 and 68. At this point it receives the adhesive, strips of which are laid across the material by elements 88 and two adjacent continuous strips down the length of the material by elements 86. From here the material 106 is led over rollers 28, where the surface to which adhesive has been applied contacts with and is affixed to the web of material 108 which is being fed from roller 94.

The double layer then bends back over rolls 38, and is cut longitudinally between the longitudinal strips of adhesive by cutter 48 and co-operating cutter 48*a*. It then travels between rolls 38 and 112, is threaded between base plate 116 and guard 118, where it periodically and alternately is contacted by brushes 166 and cushion 154; being fed forward by said brushes and rollers 200 while the knife 140 is held in raised position by its cam mechanism, and remains stationary while held by cushion 154 during the time the knife is in motion and being cut at a point between the closely spaced transverse strips of adhesive which have been applied by the transverse projections 88 of roller 68. By raising and lowering member 116*a*, the knife 140 and the transverse strips may be adjusted relative to each other so that the knife will descend between the transverse strips.

The completed product may appear as shown in Figure 9. The pasted end 174 is that resulting from the adhesive applied by projection 86; while the edges 176 result from the adhesive applied by projections 88.

In the operation as described, I have assumed that the sheet of material 106 would be exactly superimposed upon sheet 108. It is frequently desirable, however, to have these pass through the machine in a staggered relation with one another, in order that a free flap of material will appear at the open end of each envelope, or the roll of material 92 may be narrower than the roll of material 94. To secure this result, it is obviously only necessary to adjust the rolls of paper 92 and 94 in an axial direction, so that they will not completely overlap. How this may be done is illustrated in Figure 1. Shafts 90 and 96 are journaled in the frame 11 in such a manner that they are free to move axially. A collar 178 is mounted on one end of each shaft. These collars have flanges 180. Stub shafts 182 are mounted adjacent said shafts 90 and 96. Fingers 184 slide upon these stub shafts, their position being regulated by screws 186. The outermost extremity of these fingers engage with the flanges 180, thus providing a ready means for shifting said collars 178, and with them shafts 90 and 96 and consequently the rolls of material. By means of this structure flaps of any desired size may be made.

The size and shape of the envelopes resulting from the use of this machine depend, of course, upon the relative mechanical details of construction. For example, in Figure 7, I have shown the roller 84 provided with three sets of transverse pasting projections, while in Figure 10 I have shown a roll provided with only one set. It is obvious that envelopes made with the latter roll will be broader, that is longer along the edge 174 (Figure 9), than those that were made with roller shown in Figure 7. The length along side 176 is, of course, regulated by the original width of the material on rolls 92 and 94, being a certain proportion of the width thereof depending upon the position of the projections 86. It is, of course, understood that the roll 68 may be made in any desired form so as to provide envelopes of any size and shape and is not limited to the production of two envelopes for each transverse portion of the material.

While I have referred to the material on rolls 92 and 94 as paper, it is obvious that my machine is not limited to the use of this material. While paper is perhaps the most obvious material to use, any flexible composition might be used, such, for example, as the transparent product known as "cellophane". Fabric of suitable kinds might be used; or rubber sheeting, etc. Again, the material on one roll might be different from that on the other. I might, for example, use a backing of paper, and a front of cellophane.

The nature of the adhesive used is also subject to variation. Pastes, glues, adhesives of the pyroxylin type, or latex cements are examples of what might be used, depending of course upon the type of material being used for the envelopes.

When different size envelopes are to be made, the operation of the cams must, of course, be regulated accordingly. To make this possible, it is necessary to vary the ratio of the driving gears in some suitable manner. I accomplish this as follows: Bracket 55, which bears the stub shaft 54, is rotatable about an axis coinciding with cam shaft 122. It can be fixed in any position by means of bolts 188 which register with slots 189. Gears of different sizes may be substituted in place of the one shown at 56; and, by rotating bracket 55, these may be made to mesh properly with gear 32. The speed of rotation of gear 56, and consequently of cam shaft 122, through gear 58, can therefore be varied at will, or as necessity directs. These ratios will be regulated, as before stated, by the

size of the desired envelope, and will correspond or agree with the dimensions of the pasting roller 68.

Brushes 166 and rollers 200 are operated at a higher peripheral speed than that of the material in order to absorb the bunched material which occurs during the cutting operation. If this speed is sufficiently high, changes in the speed of rotation of shaft 122, corresponding to different size envelopes, may be made without changing the speed of rotation of shafts 171 and 164. For instance I find that a peripheral speed for rollers 200 and brushes 166 of three times that of the material is convenient.

Cylinder 74 is rotated from shaft 22 by means of sprocket 26, a chain 190, and sprocket 192. Idler pulley 194 serves to hold this chain properly taut.

It is obvious that many details of mechanical design may be made without changing the inventive concept of my machine. All these are to be considered as included in my invention, which is not to be considered limited by the illustrative details herein set forth by way of example, but is to be limited only by the prior art and the scope of the appended claims.

What I claim is:

1. In an apparatus for making envelopes, means for continuously feeding a sheet of material to a pasting roller, means for applying strips of adhesive to one surface of the sheet, means for continuously superimposing a second sheet upon the pasted surface of the first sheet, means for cutting said sheets adjacent the points of application of said adhesive, and means for immobilizing the sheets adjacent said cutting means during the cutting operation.

2. In an apparatus for making envelopes, means for continuously feeding a sheet of material to a pasting roller, means for applying a succession of pairs of relatively narrow, slightly spaced strips of adhesive transversely of said material, means for continuously applying a second sheet of material to the pasted surface of the first sheet, means for cutting said sheets between the strips of each pair, and means for immobilizing the sheets adjacent said cutting means during the cutting operation.

3. In an apparatus for making envelopes, means for continuously feeding a sheet of material to a pasting roller, means for applying a succession of pairs of relatively narrow slightly spaced strips of adhesive transversely of said material, means for applying a pair of closely spaced strips longitudinal of said sheet, means for continuously applying a second sheet of material to the pasted surface of the first sheet, means for continuously cutting said sheets between the strips of said longitudinal pair, means for intermittently cutting said sheets between the strips of each transverse pair, and means for immobilizing the sheets adjacent said intermittent cutting means during the cutting operation.

4. In an apparatus for making envelopes, means for feeding a sheet of material to a pasting roller, means for applying a succession of pairs of relatively narrow, slightly spaced strips of adhesive transversely of said material, means for applying a pair of closely spaced longitudinal strips approximately centrally of said sheet, means for applying a second sheet of material to the pasted surface of the first sheet, continuously operative means for cutting said sheets longitudinally between said strips of adhesive, intermittently operative means for cutting said sheets transversely, between the closely spaced strips of each pair, and means for adjusting said sheets transversely relative to each other.

5. In an apparatus for making envelopes, means for continuously feeding a sheet of material to a pasting roller, means for applying a succession of pairs of relatively narrow, slightly spaced strips of adhesive transversely of said material, means for applying a pair of closely spaced longitudinal strips approximately centrally of said sheet, means for continuously applying a second sheet of material to the pasted surface of the first sheet, continuously operative means for cutting said sheets longitudinally between said longitudinal strips of adhesive, intermittently operative means for cutting said sheets transversely between said transverse strips of adhesive, and means for intermittently feeding said continuously moving sheets to said last mentioned cutting mechanism.

6. In an apparatus for making envelopes, means for continuously feeding a sheet of material to a pasting roller, means for applying a succession of pairs of relatively narrow, slightly spaced strips of adhesive transversely of said material, means for applying a pair of closely spaced longitudinal strips approximately centrally of said sheet, means for continuously applying a second sheet of material to the pasted surface of the first sheet, continuously operative means for cutting said sheets longitudinally between said longitudinal strips of adhesive, means for cutting said sheets transversely between said transverse strips of adhesive, and means for intermittently immobilizing a portion of the work during said last mentioned cutting operation.

7. In an apparatus for making envelopes, means for feeding a sheet of material to a pasting roller, means for applying paired strips of adhesive to one surface of said sheet, means for applying a second sheet to the pasted surface of said first sheet, means for regulating the degree of overlap of said sheets, and means for cutting the sheets between the individual strips of each pair.

8. In an apparatus for making envelopes, a cutting knife, means for periodically reciprocating said knife, means for feeding the material being used to said knife, means for intermittently interrupting the action of a portion of said feeding means upon said work, and means for immobilizing a portion of the work during the reciprocation of said knife.

9. In an apparatus for making envelopes, means for feeding a sheet of material to a pasting roller, means for applying a succession of pairs of relatively narrow, slightly spaced strips of adhesive transversely of said material, means for applying a second sheet of material to the pasted surface of the first sheet, means for cutting said sheets between the strips of each pair, and means for adjusting said strips relatively to said cutting means.

10. In apparatus of the kind described, means for feeding a web, means for intermittently cutting said web, and means for adjusting said web with respect to said cutting means longitudinally of said web.

11. In apparatus of the kind described, web feeding means, web tensioning means spaced from said web feeding means, and means for adjusting the length of web between said feeding means and said tensioning means.

12. In apparatus for making envelopes, means for feeding a web, means for applying adhesive to said web, means for applying a second web to the adhesive containing surface of said first web, and means for regulating the degree of overlap of said webs.

In testimony whereof I have signed my name to this specification this 10th day of June, 1930.

EUGENE CONTI.