M. VIERENGEL.

WINDOW ENVELOP MACHINE.

APPLICATION FILED APR. 11, 1912.

1,234,512.

Patented July 24, 1917.

9 SHEETS—SHEET 1.

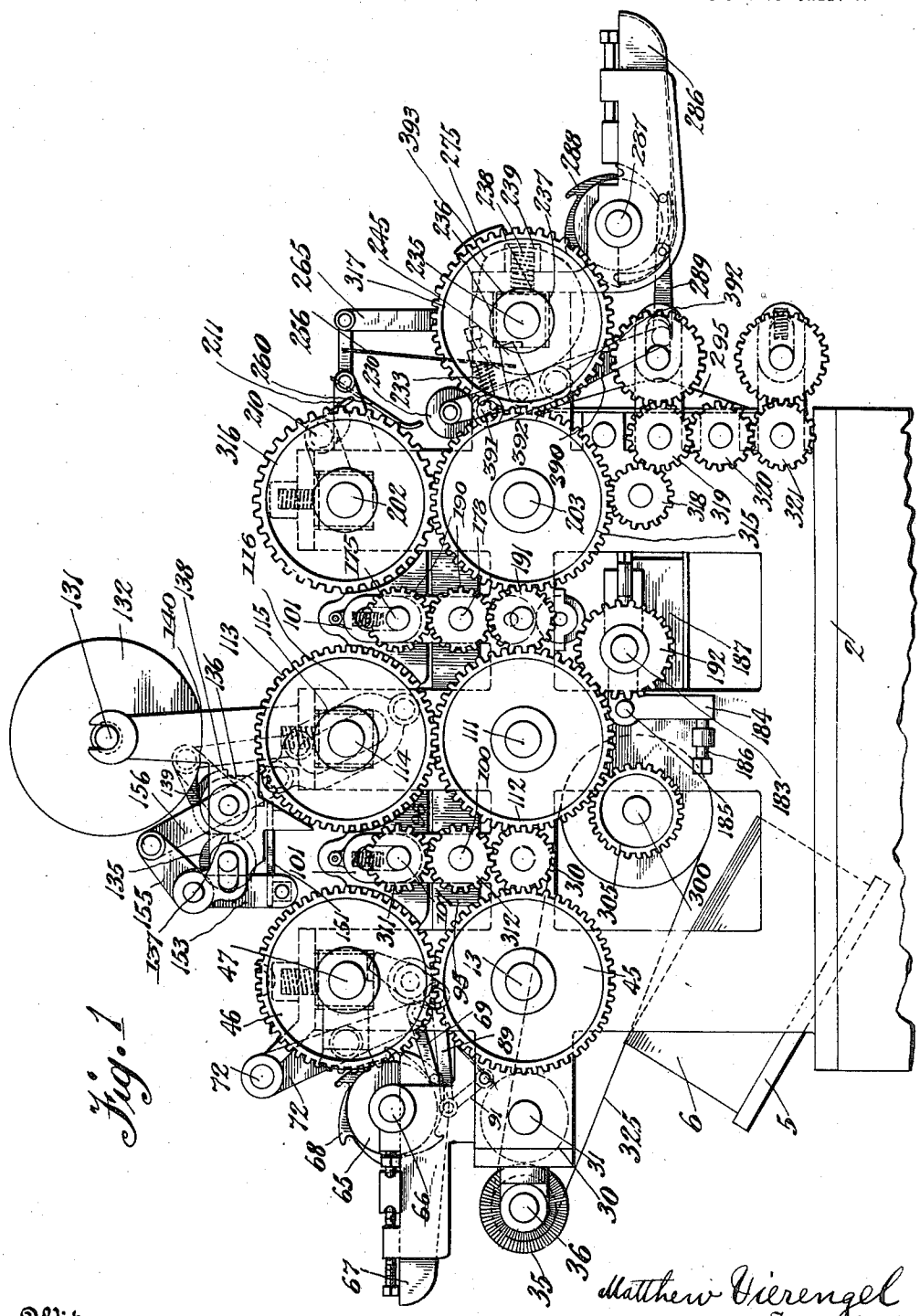


Fig. 1

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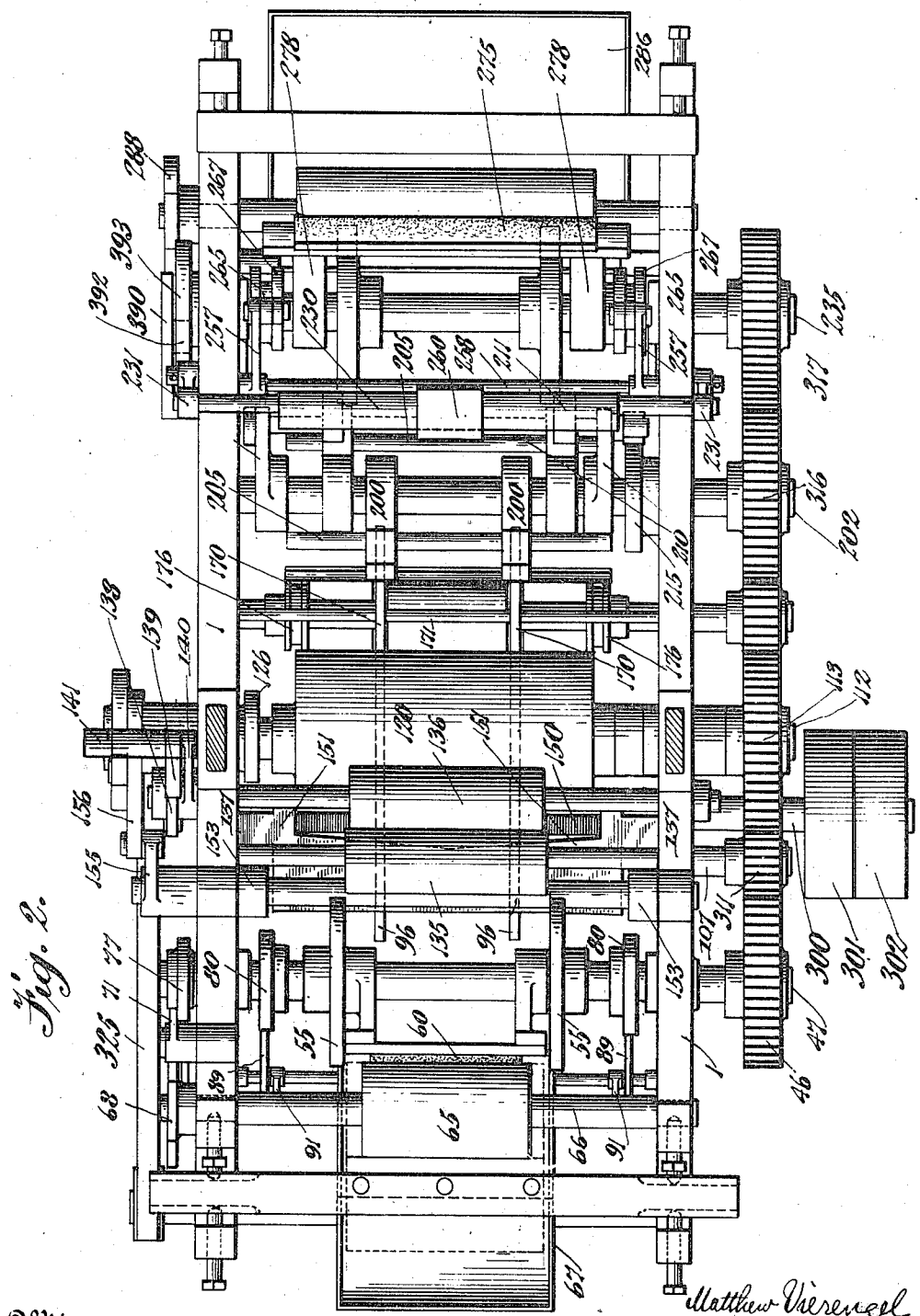


Fig. 2.

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9 SHEETS SHEET 3.

Fig. 3.

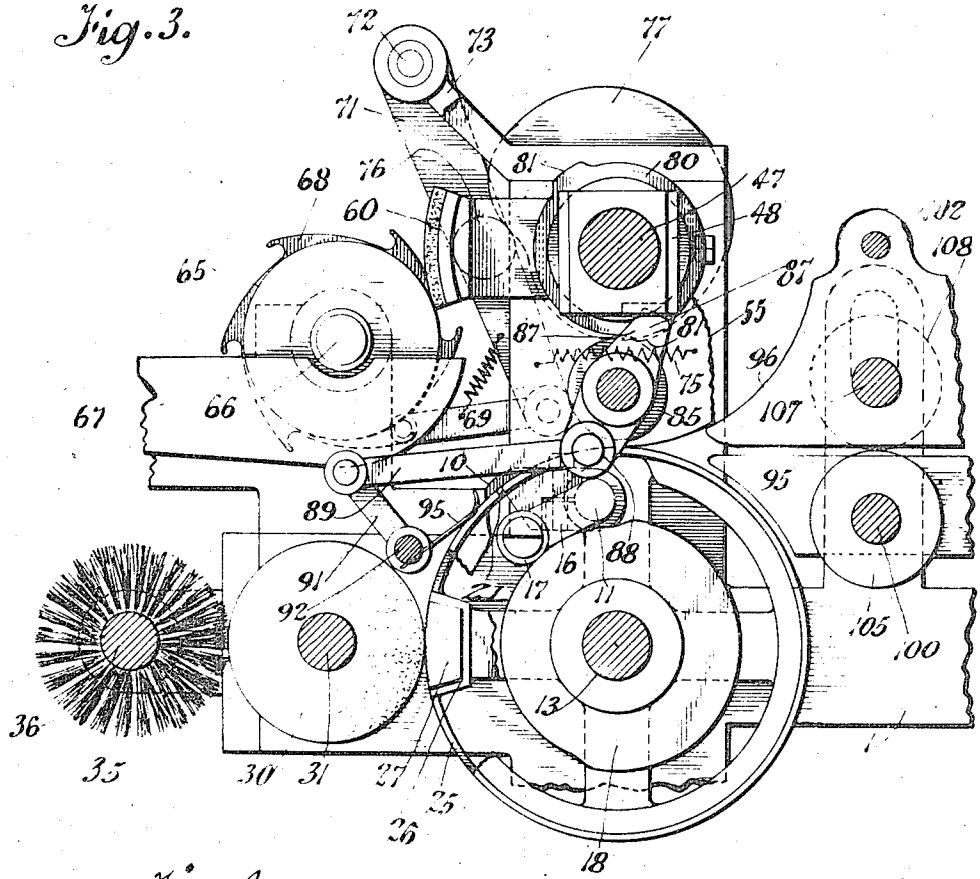


Fig. 4.

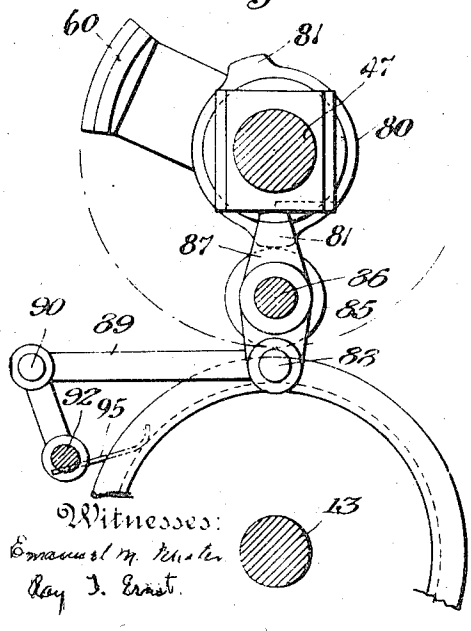
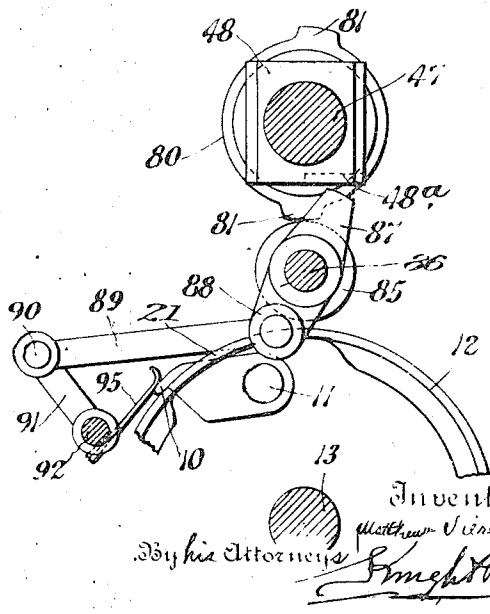


Fig. 5.



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9 SHEETS—SHEET 4.

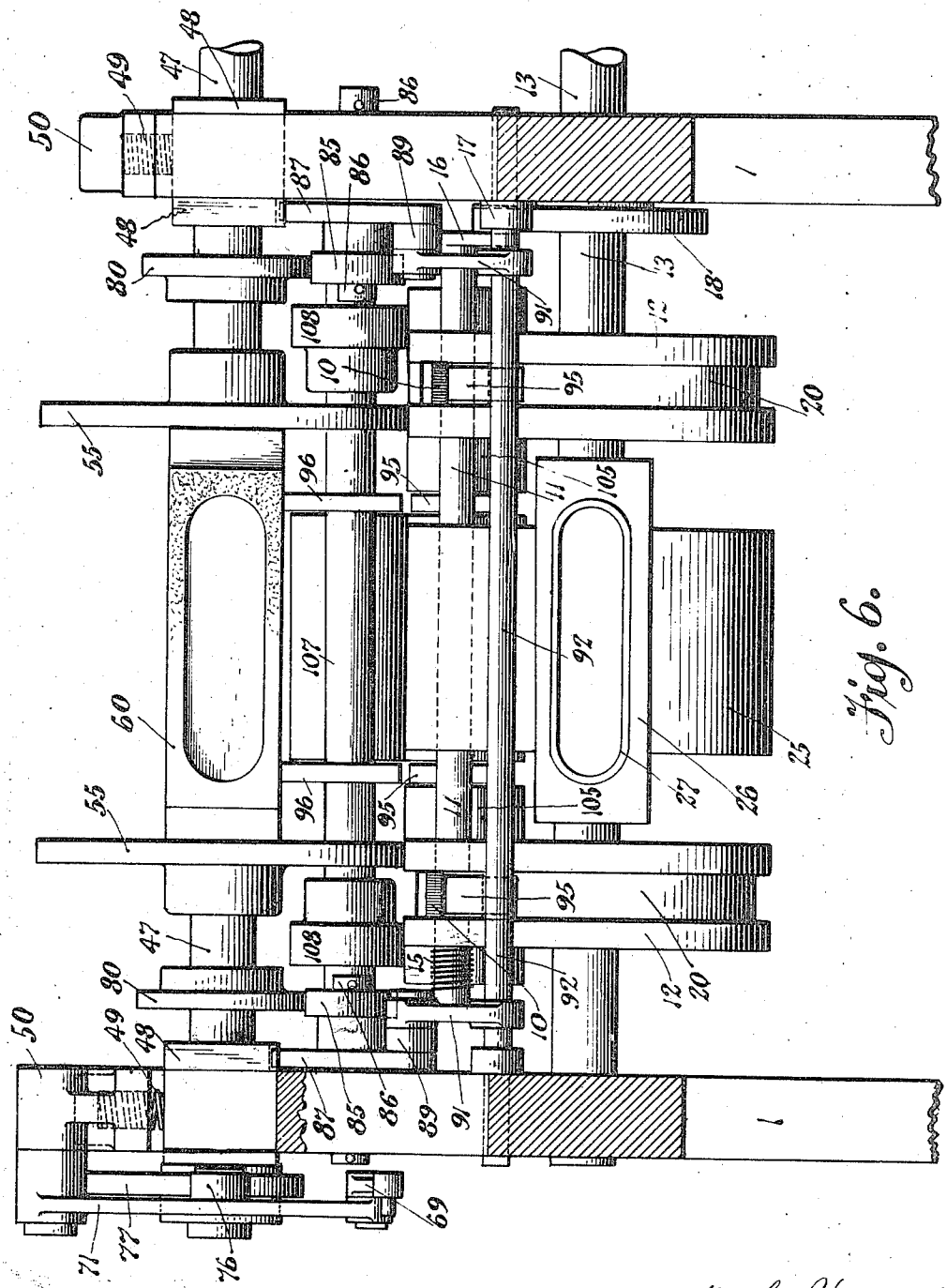


Fig. 6.

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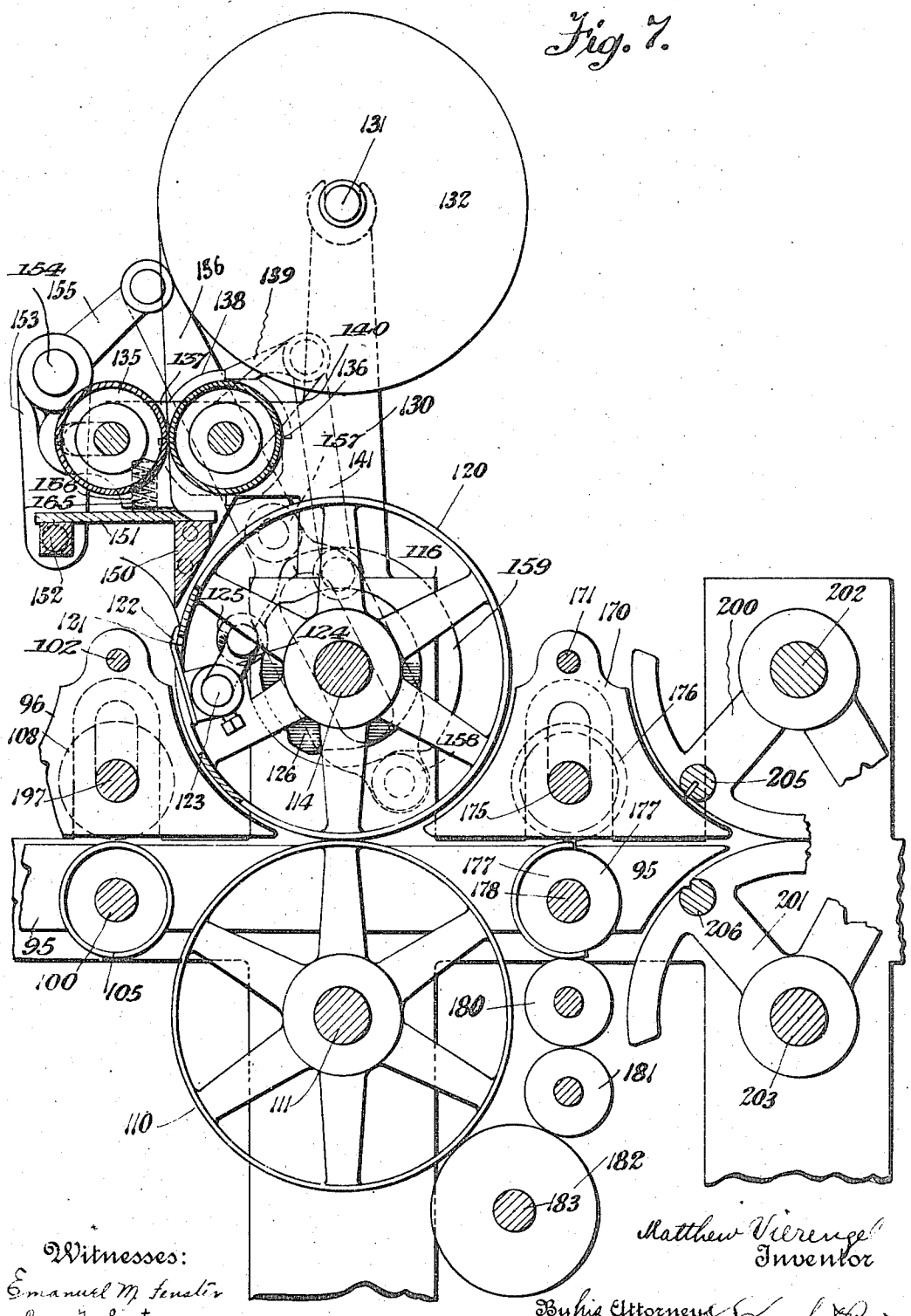
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9 SHEETS—SHEET 5.

Fig. 7.



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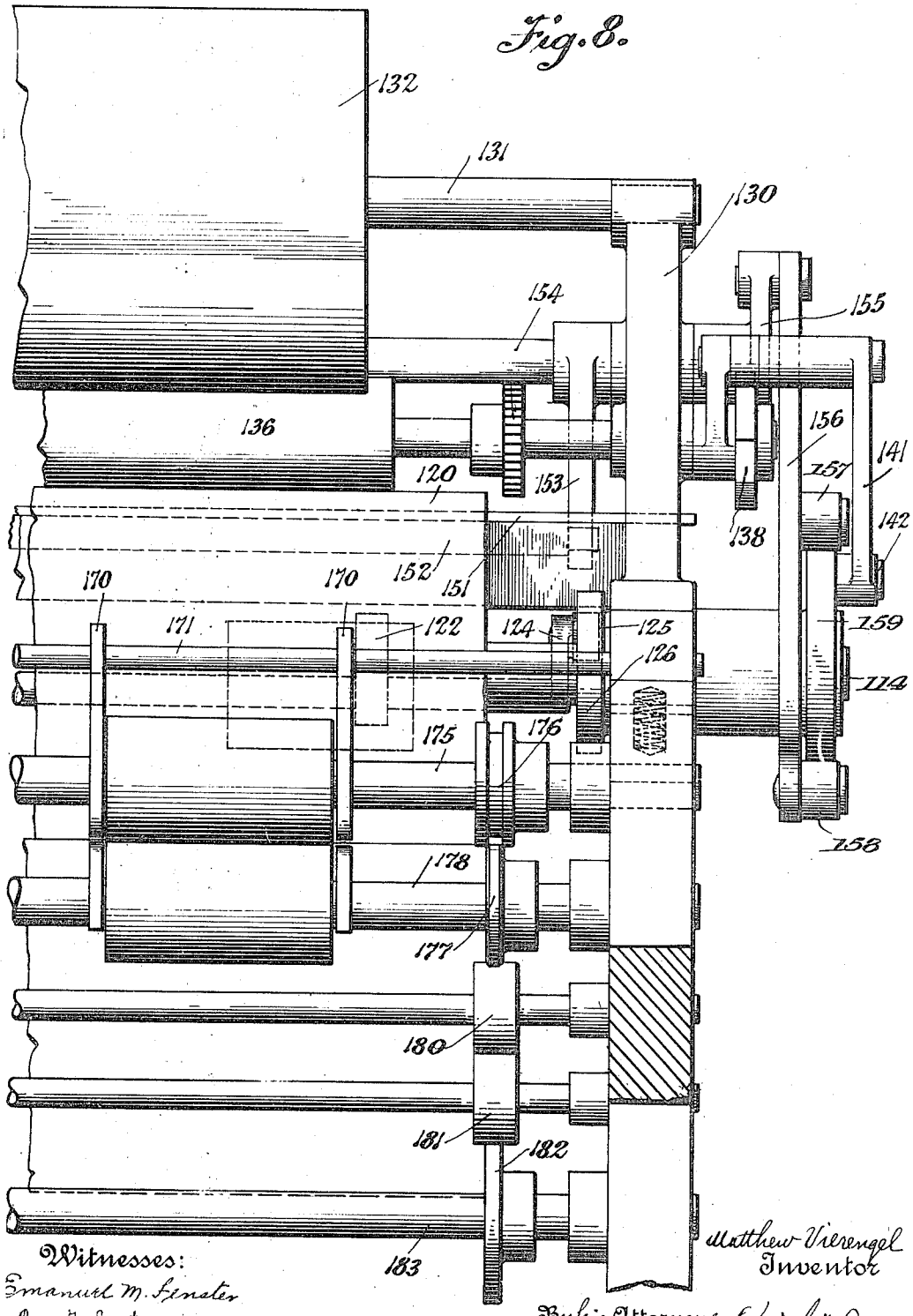
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9 SHEETS—SHEET 6.

Fig. 8.



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WINDOW ENVELOP MACHINE.

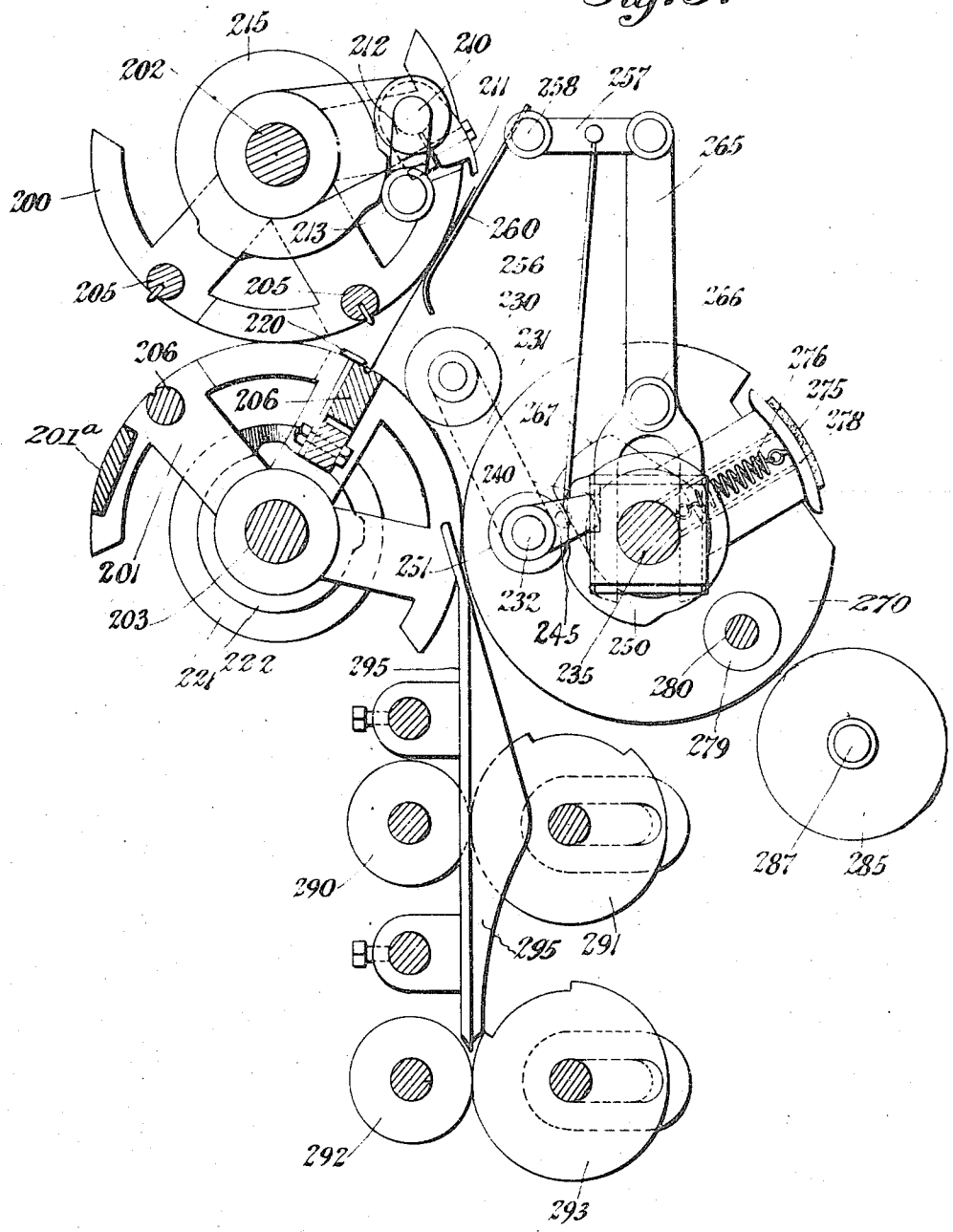
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1,234,512.

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9 SHEETS SHEET 7.

Fig. 9.



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WINDOW ENVELOP MACHINE.

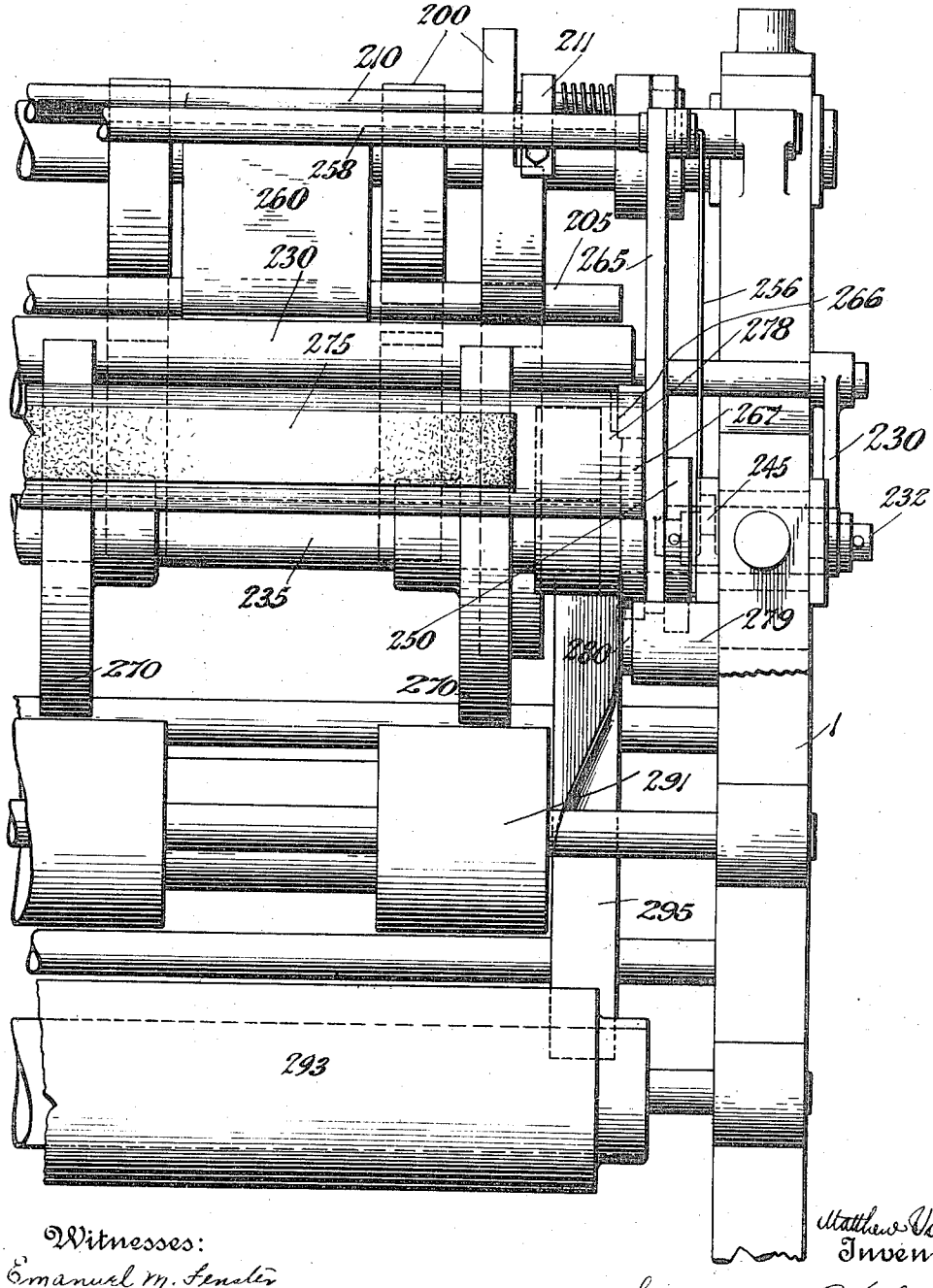
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9 SHEETS—SHEET 8.

Fig. 10.



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9 SHEETS—SHEET 9.

Fig. 12.

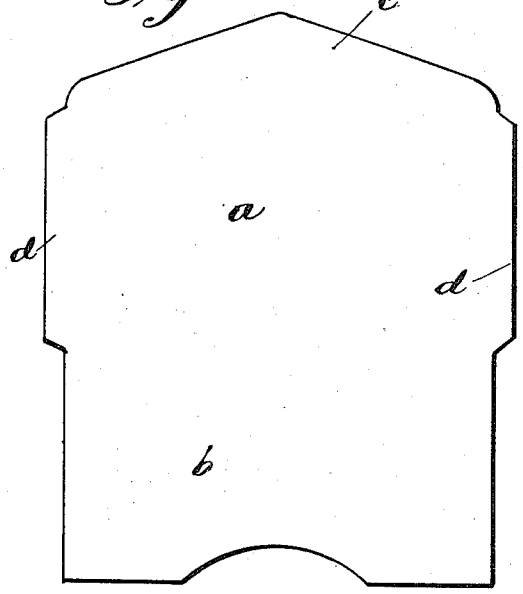


Fig. 13.

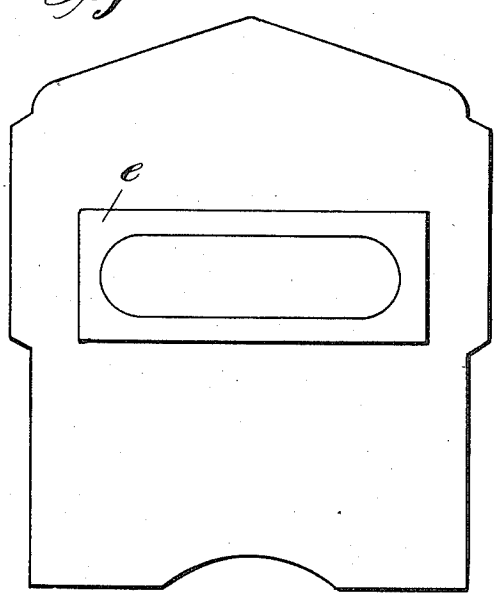


Fig. 14.

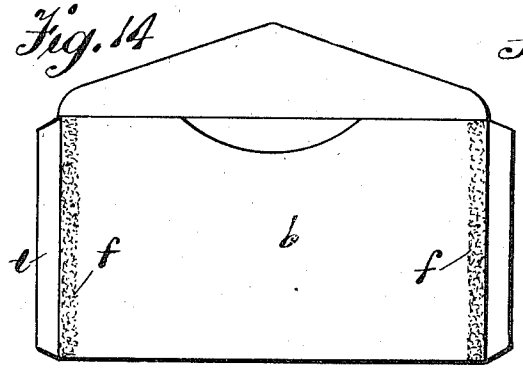


Fig. 15.

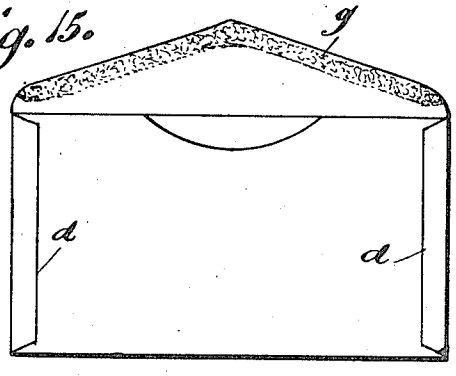
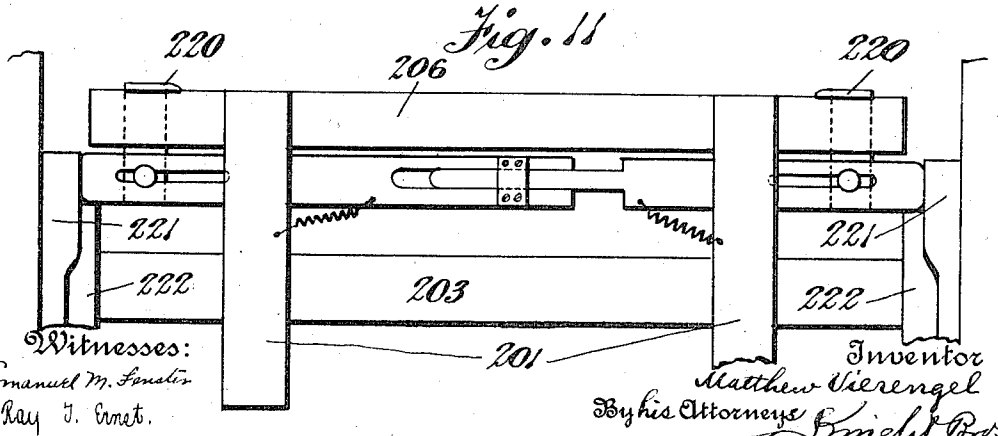


Fig. 11.



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UNITED STATES PATENT OFFICE.

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WINDOW-ENVELOP MACHINE.

1,234,512. Specification of Letters Patent.. Patented July 24, 1917.

Application filed April 11, 1912. Serial No. 690,118.

To all whom it may concern:

Be it known that I, MATTHEW VIERENGEL, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Window-Envelop Machines, of which the following is a full and clear specification.

The object of the present invention is to produce an improved and simplified machine for manufacturing window envelops from previously prepared outlined blanks or sheets.

The improved machine is of the rotary type in which the successive blanks or sheets are passed through a plurality of coöperating rotating members designed to successively cut the window openings in the blanks, apply paste around the window openings, cut off lengths of patch material from a roll and apply them to the pasted surfaces around the window openings, apply lines of paste on the side edges of the bottom flaps, impart the transverse creases for the bottom flaps and sealing flaps, fold said bottom flaps upon their creasing lines against the body of the blank, fold inwardly and seal the side flaps and apply paste to the sealing flaps.

The invention includes novel features of construction in the several mechanisms for accomplishing the above noted steps in the formation of envelops and in addition provides automatic tripping or throw-out mechanism for some of the pasting devices so as to prevent the operation of said pasting devices in the absence of a blank or sheet.

In order that my invention may be fully understood I will first describe the same with reference to the accompanying drawings and afterward point out the novelty more particularly in the annexed claims.

In said drawings

Figure 1 is a side elevation of an envelop machine embodying my invention.

Fig. 2 is a plan view of the same.

Fig. 3 is an enlarged detail, vertical, longitudinal, sectional elevation of a part of the machine showing the means for cutting window envelops in blanks, the pasting device for the window patches and the automatic sheet actuated tripping device for controlling the operation of the pasting device.

Figs. 4 and 5 are detail views illustrating the operation of the automatic paster tripping device.

Fig. 6 is a detail, vertical, transverse sectional view showing in front elevation the mechanism illustrated in Fig. 3.

Fig. 7 is a view similar to Fig. 3 illustrating the central section of the machine embodying the window patch feeding and applying devices and the end flap pasting devices.

Fig. 8 is a detail, vertical, transverse, sectional view illustrating the mechanism of Fig. 7.

Fig. 9 is a vertical longitudinal sectional view illustrating the final end of the machine for imparting the transverse fold creases, pasting the sealing flap, and folding in the end flaps and completing the envelop.

Fig. 10 is a detail rear elevation of parts of the mechanism shown in Fig. 9.

Fig. 11 is a detail view illustrating the side gripper mechanism upon the creasing cylinder by which the transverse folds are made.

Figs. 12, 13, 14 and 15 are detail views illustrating the successive steps in the formation of envelops by my improved machine.

Any suitable form of framework may be provided for properly supporting the coöperating parts of the improved machine. In the accompanying drawings I have shown the main side frames 1, mounted upon a base 2 which may be mounted in any suitable manner. In the base frame 2 I provide a table or platform 5 for supporting a stack of outlined blanks or sheets indicated at 6. By the expression "outlined blanks" I refer to blanks which are cut to the proper external shape for forming the desired envelop but which have not had the window openings cut into them.

I propose to employ any suitable automatic sheet separating and feeding mechanism to operate upon the stack of blanks or sheets 6 for taking successive blanks or sheets from the pile and feeding them to the improved envelop machine.

Each blank or sheet separated from the pile of sheets is first taken by a pair of grippers 10 mounted upon a shaft 11 journaled in the wheels or pulleys 12 which are secured to a transverse shaft 13 suitably journaled

in the side frames of the machine. The gripper shaft 11 is acted upon by a torsion spring 15 surrounding the shaft adjacent to one end and having its ends attached respectively to the shaft 11 and one of the wheels or pulleys 12. This spring 15 gives the grippers 10 a closing tendency. At opposite ends the shaft 11 carries rock arms 16 provided with anti-friction rollers 17 which operate in peripheral contact with cams 18 secured to the side frames 1. The shaft 13 of the gripper cylinder passes through and rotates in the cams 18.

Each of the wheels or pulleys 12 which constitute a skeleton gripper cylinder is formed with an annular groove 20 which extends about five-sixths of the circumference of the wheel or pulley. The remaining surface of the wheels or pulleys 12 is unbroken except by the openings 21 through which the grippers 10 operate. This arrangement provides grip surfaces against which grippers 10 grip the leading edges of the succeeding blanks or sheets.

Mounted upon the shaft 13 between the wheels or pulleys 12 of the gripper cylinder, I provide a cylinder section 25 formed in one side with a recess 26 to receive the die 27 of any suitable construction for cutting window openings in the successive blanks. In the form of die shown there is an oval shaped cutting member having a milled or roughened cutting edge. Coöperating with the die 27 is a rubber roller 30 mounted upon shaft 31 suitably journaled in the side frames 1 of the machine and operated by its peripheral engagement with the pulley section 25 of the sectional gripper cylinder. The passage of blanks between the roller 30 and die member 27 cuts the window openings in the blank.

A rotary brush 35 is mounted upon a shaft 36 suitably journaled in the side frames and operated by belt gearing with any rotating part of the machine. This brush 35 rotates in peripheral contact with the rubber cylinder 30 so as to remove from the cylinder the waste material which is cut from the envelop blanks.

The shaft 13 of the sectional gripper cylinder carries at one end a large gear 45 which meshes with and drives a similar gear 46 keyed to a transverse shaft 47 mounted in vertically adjustable bearing boxes 48 which are supported in guide ways in the side frames 1 of the machine. These bearing boxes 48 are engaged above by tension springs 49 held in place by suitable cap plates 50 attached to the side frames. Shaft 47 carries between its ends the disk wheels or pulleys 55 which operate in peripheral engagement with the gripper wheels or pulleys 12. Mounted between the wheels or pulleys 55 is a pasting segment 60 of the proper size and shape to fit around the window opening which has been cut into the blank or sheet. This pasting segment 60 engages once in each revolution with a paste applying roll 65 which is mounted upon a shaft 66 journaled at its ends in suitable brackets carried by the main frame and operating in a paste trough or fountain 67 which is adjustably supported in the usual manner upon the machine frame. The paste distributing roller 65 has secured to its shaft at one end a large ratchet wheel 68 with which engages a dog or pawl 69 pivoted at the lower end 70 of the lever 71 pivotally mounted at 72 to a bracket 73. A spring 74 connects dog 69 with lever 71 and a second spring 75 connects lever 71 with the main frame of the machine. Between its ends, this lever 71 carries an anti-friction roller 76 which operates in peripheral contact with a cam 77 secured to the end of shaft 47. By this means the paste roller 65 is given a gradual step by step movement in the paste trough, it making one step in each revolution of the shaft 47. This slow changing movement of the paste roller 65 is important in that it moves sufficiently to present a new film of paste to the paste segment 60 every time it comes around but is not moved sufficiently to unnecessarily agitate the paste in the fountain which would injure the strength of the paste by creating bubbles.

It will be understood from the above description that the successive blanks or sheets are carried by the gripper cylinder from the pile 6 to effect the cutting of the window openings and to place the blanks between the coöperating wheels 12 and 55 where a film of paste is imparted to the blank by the segment 60 pressing down upon the blank around the window opening while it is supported upon the central pulley 25. If by chance the gripper cylinder has failed to take a blank or sheet from the pile 6, the pasting segment 60 would, if uncontrolled, apply its paste to the surface of the pulley 25 so that the succeeding blank or sheet would stick to the pulley 25 and the machine would soon become inoperative. To obviate this objectionable result, I have provided an automatic sheet actuated tripping device for separating the pasting segment 60 and pulley 25 in the absence of a sheet. This mechanism will now be described.

The shaft 47 carries adjacent to its bearing boxes 48 two cams 80 each of which is formed with short diametrically opposite high portions 81 for the purpose which will presently appear. These cams 80 operate in peripheral contact with rollers 85 journaled upon pins 86 projecting inwardly from the side frames 1 of the machine. Freely journaled upon each of the pins 86 is a heavy tripping lever 87 resting directly beneath one of the vertically adjustable journal boxes 48. Each of the journal boxes 48 has

a recess 48ª cut in its lower face for one half its width to free it from engagement with the lever 87 during the normal operation of the machine. Each of these levers 87 has pivotally connected to its lower end at 88 a link 89 pivoted at 90 to an upwardly extending rock arm 91 secured to a rock shaft 92. This rock shaft 92 supports both of the rock arms 91 and is freely journaled at its ends in suitable bearings carried by the side frames 1. The rock shaft 92 extends transversely of the machine and carries in the vertical planes of the annular grooves 20 of gripper pulleys 12, the light feeler fingers 95 which in the absence of a sheet project into said grooves 20 but in the presence of the sheet rest lightly upon the sheet as it is carried forward by the gripping cylinder. The connected tripping levers 87 and feeler fingers 95 are moved by gravity into the position shown in Fig. 4 when permitted to do so by the absence of a sheet.

From this described tripper mechanism it will be understood that while a blank is being properly forwarded by the gripper cylinder the feeler fingers 95, resting upon the moving sheet, will hold the tripper levers 87 in the position shown in Figs. 3 and 5 of the drawings, so that the pasting mechanism will operate. If, however, the grippers have failed to take a sheet from the pile the connected tripping levers 87 and feeler fingers 95 will gravitate into the position shown in Fig. 4 of the drawings, the feeler fingers entering the grooves 20 of wheels 12 and the tripper levers 87 moving into vertical position beneath the bearing boxes 48 so as to support the paste segment 60 out of contact with the pulley 25. It will be understood that the cams 80 intermittently raise the shaft 47 (twice in each revolution) to permit the operation of the tripper mechanism. As the grippers 10 pass beneath the detector fingers 95 the tripping levers 87 will be moved into the position shown in Fig. 5, the shaft 47 and parts carried thereby being at this moment raised by the cams 80. If a sheet is in position beneath the grippers, the detector fingers 95 will rest upon the sheet and hold the levers 87 in their released position so that as the high portions of cams 80 pass the rollers 85, the shaft 47 and parts carried by it, will be lowered into operative position. If, on the other hand, the grippers are not carrying a sheet forward the fingers 95 will drop from the grippers 10 into the annular grooves 20 and allow the tripping levers 87 to move into vertical position as shown in Fig. 4 with the result that the shaft 47 will be held in raised position so that the pasting segment 60 cannot engage the surface of wheel 25. After the parts have been held in this tripped position and a succeeding sheet is brought around in proper position the elevation of the shaft 47 and boxes 48 by cams 80 will permit the release of the tripping levers 87 under the action of the grippers 10.

The grippers 10 carry the sheet until it is firmly engaged at its side edges between the gripper wheels or pulleys 12 and the wheels or disks 55 at which point the stationary cams 18 raise the grippers and permit the blank or sheet to pass horizontally between the lower guide plates 95 and the upper guide plates 96. The lower guide plates 95 are supported upon the transverse shafts 100 and 178 suitably journaled in brackets 101 projecting up from side frames 1, while the upper guide plates 96 are hung upon a rod 102 supported in the upper ends of the brackets of the side frames. The shaft 100 carries under feed rolls 105 over which the successive blanks or sheets pass. The brackets 101 are vertically slotted to receive the vertically yielding bearings for transfer shaft 107 carrying upper feed rollers 108 which are designed to engage the upper surface of the blanks or sheets outside of the film of paste applied around the window openings. 110 is a lower feed cylinder mounted upon a shaft 111 journaled in the side frames of the machine provided at one end with a large gear 112 which meshes with a similar gear 113 carried by the outer end of a shaft 114 journaled in bearing boxes 115 which are mounted to yield vertically in the central brackets 116 of the side frames. This shaft 114 carries a gripper cylinder 120 having a recess 121 in its periphery through which operates a gripper 122 mounted upon gripper shaft 123 journaled in the cylinder 120. This gripper shaft 123 carries a rock arm 124 having an anti-friction roller 125 operating upon the periphery of a stationary cam 126 so shaped and arranged with reference to the gripper mechanism that the gripper will be opened and closed in time to take a section of patch material from the feeding and cutting devices presently to be described and convey it downwardly and position it upon the pasted surface of the blank as the latter passes between the cylinders 110 and 120.

Bracket arms 130 extend up from the central brackets 116 and support in their upper ends a short shaft 131 upon which is carried the continuous roll 132 of transparent patch material. The transparent paper from roll 132 passes downwardly between two coöperating feed rollers 135 and 136, journaled in suitable brackets 137. The shaft of the feed roller 136 carries a ratchet wheel 138 with which engages a dog or pawl 139 pivoted to a rock arm 140 which is journaled upon the shaft of the feed roller 136. This arm 140 is connected through link 141 with a crank stud 142 carried by a cam presently to be referred to which rotates with

the gripper cylinder 120. The result of this construction is the intermittent feed of the tape or web of transparent paper.

The web of paper passing the feed rollers 135 and 136 is led downwardly over the vertical face of a stationary cutter block 150 which is supported between the brackets 137 above referred to. Operating upon the horizontal or upper face of this cutter block 150 is a reciprocating cutting knife 151 extending the whole width of the machine and having a concave cutting edge as indicated in Fig. 2 of the drawings. This cutting blade 151 is mounted upon a square bar 152 which is journaled at its ends in the downwardly extending arms 153 which are secured to a transverse rock shaft 154 mounted in suitable bearings. A rock arm 155 is connected with rock shaft 154 and a pitman 156 is connected with the rock arm 155 and formed with a lower yoked end which guides upon the shaft 114 and carries anti-friction rollers 157 and 158, which operate upon opposite sides of the cam 159 secured to one end of shaft 114 and rotating with the cylinder 120. For this reason the knife 151 is given an intermittent reciprocating motion for severing a length of patch material from the web which has been fed downwardly by the feed rolls 135 and 136.

To hold the knife blade 151 in effective cutting relation to the lower cutting block 150 I provide springs 165 in pockets 166 of the bracket frame 137, so that said springs will press the knife blade 151 down.

The construction and operation of the parts just described is such that as each length of patch material is fed downwardly and cut off by the knife mechanism, it will be taken by the gripper 122 and as the cylinder 120 rotates, will be positioned upon the pasted surface of the blank around the window opening so that as the blank and patch material pass between the cylinders 110 and 120 the transparent patch will be pasted upon the blank. When the patched blank leaves the bight of rollers 110 and 120 it passes onwardly over the under guide plates 95 and beneath the suspended guides 170 hung from a rod 171 in the same manner as above described with reference to guide plates 96. Supported upon a transverse shaft 175 are the circumferentially grooved upper feed rollers 176 with which coöperate the under paste applying rollers 177 mounted upon a transverse shaft 178 beneath the plane of feed of blanks. These paste applying rollers 177 have approximately one half of their periphery raised or of greater diameter than the remaining half of the rollers and of proper extent to apply lines of paste along the edges of the under surface of the back flap of the envelop blank. The high portions of paste rollers 177 receive paste from the intermediate rollers 180 and 181 which take paste from the fountain disk rollers 182 which are mounted upon a shaft 183 journaled in the adjustable right angled bars 184 pivotally mounted at 185 upon the machine frame and held in the desired adjusted position by means of screws 186 threaded through bosses upon the machine frame. 187 is a paste fountain into which the distributing disk rolls 183 project to take up sufficient paste to transfer it to the rollers 180 and 181 and to paste applying rollers 177. The coöperating rollers 176 and 177 have intermeshing gears 190 upon their shafts, the latter of which is driven by an intermediate gear 191 meshing with and driven by the gear 112 upon shaft 111. The gear 112 also meshes with and drives a gear 192 upon the shaft 183. The paste rollers 177 operate in the grooves of feed rollers 176, as shown in Figs. 7 and 8 When a blank passes between them lines of paste are applied, and when a blank is missing the rollers run free and no paste is smeared upon the feed rollers 176.

It will be understood that the parts described, excepting the gears, are duplicated at opposite sides of the machine so as to apply lines of paste to both side edges of the bottom flap of the blank.

The blank next passes into the control of a pair of segmental creasing cylinders 200 and 201 mounted upon the upper and lower transverse shafts 202 and 203. These segmental creasing cylinders are constructed substantially as set forth in my Patent No. 1,000,057 dated August 8th, 1911, for improvements in envelop machines. The upper cylinder 200 carries the transverse creasing bars 205 which coöperate with the recessed bars 206 upon the lower cylinder 201 to impart to the advancing patched blank the main transverse creases for the top and bottom folds of the envelop.

The upper cylinder 200 carries a gripper shaft 210 provided with gripper fingers 211 and a controlling rock arm 212 having anti-friction roller 213 which operates upon a stationary cam 215. As the leading edge of the blank reaches the cylinders 200 and 201, the grippers 211 close upon the blank and carry it forward between the said cylinders while the two transverse creases are imparted to the blank. The lower cylinder 201 is provided with the edge grippers 220 operating upon one of the creasing bars 206. These grippers 220 are preferably constructed to move both radially and longitudinally of the cylinder under the control of suitable stationary end cams 221 and 222 illustrated in Fig. 11 of the drawings and fully described in my above named patent.

Immediately after the blank receives its transverse crease by the operation of the forward creasing bars 205 and 206 the side grippers 220 take hold of the blank at its

opposite edges just in rear of the first transverse crease which will form the bottom of the completed envelop, the leading edge of the blank or rear flap of the envelop being at the moment carried upwardly by the cylinder 200. As the grippers 220 of the lower creasing and gripping cylinder 201 move downwardly with the sheet gripped in rear of the bottom crease as explained, the blank is carried beneath a pressure roller 230 mounted in arms 231 journaled upon a stationary shaft 232 and pressed toward the sectional cylinder 201 by suitable springs 233. The moment the blank is grasped by the edge grippers 220, it is released by the grippers 211 so that the end flap will be free to be folded over the main portion of the blank by action of the pressure roller 230.

235 is a transverse shaft journaled in yielding bearing boxes 236 lying in horizontal guide ways 237 formed in the side frames of the machine and retained in their inner position by means of springs 238 confined by caps 239. These bearing boxes 236 are formed with cut out recesses 240 in which normally rest the trip arms 245 journaled upon the stationary shaft 232. Cams 250 are secured to the shaft 235 in position to operate upon anti-friction rollers 251 journaled upon the stationary shaft 232 so as to intermittently move the shaft 235 and parts carried thereby outwardly and permit the trip levers 245 to engage the journal boxes 236 for holding said parts in their displaced position in the event of the absence of a blank from the machine. The trip levers 245 are connected by rods 256 with rock arms 257 connected to a rock shaft 258 journaled in suitable bearings in the side frames of the machine and carrying sheet detecting fingers 260 which project downwardly adjacent to the surface of the upper creasing cylinder 200 in position to engage a blank below the grippers 211 and between sections of said cylinder to indicate the presence or absence of a blank. If at the proper moment there is no blank held by the grippers 211, the fingers 260 will pass inwardly between sections of the cylinder 200 rocking the shaft 258 and lowering the trip levers 245 behind the high portions of journal boxes 236, the cams 250 at this moment being in engagement with rollers 251 to cause the boxes to move outwardly and permit this operation. If, on the other hand, a blank is in proper position at the moment of operation of cams 250 the fingers 260 will rest upon the blank and support the trip levers 245 until the cam 250 has passed the rollers 251. For resetting the mechanism after the absence of a sheet has been detected in the manner explained, I provide a yoke-shaped link or pitman 265 which is pivoted to the rock arm 257 and straddles the shaft 235 at its lower end and is provided with an anti-friction roller 266 which is intermittently engaged by a cam 267 mounted upon shaft 235. This cam 267 operates immediately after the cam 250 begins to operate so as to move the sheet detecting fingers and connected parts into inactive position for resetting the mechanism once in each revolution of the shaft 235.

The shaft 235 carries a sectional feed cylinder and a paste applying segment for pasting the sealing flap of the envelop. 270 are the feed wheels or pulleys which coöperate with the segmental portions of the creasing and gripper cylinders 201. Mounted between these wheels 270 is a pasting segment 275 which rotates with the cylinder and is movable radially thereof. Springs 276 connect the pasting segment with the shaft 235 and curved cam ribs 278 are arranged at opposite ends of the pasting segment in position to engage anti-friction rollers 279 mounted upon studs 280 projecting inwardly from the side frames of the machine. When the cam edges 278 of the pasting segment engage the rollers 279, the pasting segment is thrown outwardly into peripheral engagement with a paste supplying roller 285 which operates in the paste trough 286 mounted in the usual way upon the machine frame. This paste roller 285 is mounted upon the shaft 287 provided with a ratchet wheel 288 which is intermittently engaged by a dog or pawl 289, pivoted to the lower end of a lever 390 which is journaled at 391 and carries an anti-friction roller 392 which operates upon the periphery of a cam 393 carried by the shaft 235.

After receiving a supply of paste from the roller 285 pasting segment 275 is brought around in engagement with the sealing flap of the envelop as it is supported upon surface 201ª between the wheels 270 and the creasing cylinder 201, the edge grippers 220 in the meantime having released their hold upon the blank. If the blank detecting device has operated because of the absence of a blank, the pasting device will be held out of contact with the creasing cylinder 201 as it passes in the manner above explained.

The folded blank passes from the wheels 270 and creasing cylinder 201 to the control of the coöperating feed rollers 290 and 291 which pass the blank through the laterally adjustable side folding flanges 295 which fold over the end flaps upon the pasted surfaces at the side edges of the back of the folded blank. From the side folding flanges 295, the envelop passes between the final pressure rollers 292 and 293 which press the sealed end flaps against the body of the envelop. The rollers 291 and 293 are mounted in spring pressed bearings and have portions of their periphery cut away to escape the pasted surface of the sealing flap as it passes.

300 is the main driving shaft of the machine suitably journaled in the side frames 1, and provided at one end with fixed and loose pulleys 301 and 302. The power shaft 300 carries a gear 305 which meshes with and drives the gear 112 upon the shaft 111 above referred to. This gear 112 meshes with and drives an intermediate gear 310 journaled upon one of the side frames and gearing with and driving the gear 45 above referred to, upon the shaft 13. This gear 310 also meshes with and drives the intermeshing gears 311 and 312 upon the shafts 100 and 107, respectively.

The side seam pasting devices are operated as above described, the gear 191 of said mechanism meshing with the large gear 315 upon shaft 203. This gear 315 meshes with and drives the similar gears 316 and 317 mounted respectively upon the shafts 202 and 235 above referred to. The gear 315 also drives a train of gears 318, 319, 320 and 321 for operating the final set of feeding and pressure rollers 290, 291, 292 and 293.

The brush roller 35 upon shaft 36 is driven by a sprocket chain or belt 325 operating upon sprocket wheels or pulleys mounted respectively upon the power shaft 300 and brush shaft 36.

Referring to Figs. 12, 13, 14 and 15, it will be observed that the outlined blanks from which envelops are made with my improved machine are substantially as shown in Fig. 12 in which the main body *a* is formed with a main back flap *b*, a sealing flap *c* and two end or side flaps *d*. This is the form of blank fed into the machine by some suitable form of automatic feeding machine such for instance as illustrated in my Patent No. 1,000,058. The described blank has the window opening cut into it and the surface around the opening pasted to receive the patch of transparent material shown in Fig. 13 at *e*. The patched blank is then passed over the side seam pasting devices which impart lines of paste on the under face of the end flap *b* as shown at *f*, *f* in Fig. 14, this figure showing the blank after it has been creased and folded upon its bottom creasing line. The once folded blank is then passed through the pasting device which applies the paste to the sealing flap as shown at *g* in Fig. 15, and from this pasting device the once folded blank is passed through the side seam folding flanges which complete the envelop. The envelops are delivered in the form shown in Fig. 15 with the sealing flaps open or extended, the flap having however, been creased upon its folding line as above explained. It is the intention to pass the completed envelops into a drying machine after which the sealing flaps are closed down in the usual manner.

The several rotating members of the improved envelop machine are made up of parts or sections which are relatively adjustable to adapt the machine for making envelops of various sizes. This adjustable feature is well known in the art.

Aside from the general construction and arrangement of my improved rotary envelop machine, the main features of novelty reside in the automatic sheet controlled tripping mechanism for throwing the pasting devices out of action in the absence of a sheet.

What I claim is:

1. In an envelop machine, the combination of blank feeding means, a rotary paste applying device, a shaft carrying said paste applying device, movable bearings for said shaft, means for periodically shifting said bearings toward and away from the path of blanks, trip arms arranged to engage said bearings and hold them in shifted position away from the path of blanks, blank detecting members controlling said trip arms, and means for periodically shifting said trip arms and blank detecting members.

2. In an envelop machine, the combination of blank feeding means, a rotary paste applying device, a shaft carrying said paste applying device, movable bearings for said shaft, means for shifting said bearings inwardly and outwardly toward and away from the path of the blanks, trip arms mounted adjacent to said bearings, and adapted to engage and support said bearings in their shifted position away from the path of blanks, a rock shaft journaled adjacent to the path of blanks, detecting fingers mounted upon said rock shaft and projecting into the path of blanks, and means connecting said rock shaft with said trip arms for controlling the position of said trip arms.

3. In an envelop machine, the combination of suitable blank feeding means, with a rotary paste applying device, a shaft carrying said paste applying device, bearings for said shaft movable inwardly and outwardly toward and away from the path of blanks, cams carried by said shaft, fixed bearing members engaged by said cams, trip arms arranged to engage said shaft bearings for holding them in their shifted position away from the path of blanks, and blank detecting fingers suitably connected with said trip arms for controlling their operation.

4. In an envelop machine, the combination of a circumferentially grooved blank feeding cylinder mounted in stationary bearings, a rotary pasting device mounted in movable bearings adjacent to said feeding cylinder, means for moving said pasting device toward and away from said feeding cylinder, trip arms holding said pasting device in its shifted position away from said

feed cylinder, blank detecting fingers operating in the grooves of said feeding cylinder and means connecting said detecting fingers with said trip arms.

5. In an envelop machine, the combination of a blank feeding gripper cylinder mounted in stationary bearings, a paste applying cylinder mounted in bearings movable toward and away from said gripper cylinder, trip arms pivotally mounted between said cylinders in position to engage the bearings of said paste applying cylinder, cams carried by said paste applying cylinder, and friction rollers mounted upon stationary bearings, in position to be engaged by said cams for shifting said paste applying cylinder away from said gripper cylinder, blank detecting fingers supported adjacent to said gripper cylinder and devices connecting said detecting fingers with said trip arms.

6. In an envelop machine, the combination of a blank feeding cylinder mounted in stationary bearings, with a feeding and pasting cylinder mounted in movable bearings, a pasting device carried by said pasting cylinder, means for moving said pasting cylinder toward and away from said feeding cylinder, blank controlled tripping devices adapted to hold said pasting cylinder in its shifted position away from said feeding cylinder, a paste fountain, a paste distributing roller operating in said fountain in position to peripherally engage the pasting device, a ratchet wheel secured to said paste distributing roller, a reciprocating dog or pawl engaging said ratchet wheel and a cam rotating with said pasting device and operating said pawl or dog to shift the position of said paste distributing roller once for every revolution of the pasting device.

7. In an envelop machine, the combination of a blank feeding cylinder mounted in stationary bearings, a paste applying cylinder mounted in bearings movable toward and away from said feeding cylinder, trip arms pivotally mounted between said cylinders in position to engage the bearings of said paste applying cylinder, means for shifting said paste applying cylinder away from said feeding cylinder, blank detecting fingers supported adjacent to said feeding cylinder and connected with said trip arms, and means for periodically and positively shifting said connected detecting fingers and trip arms.

8. In an envelop machine, the combination of a blank feeding cylinder mounted in stationary bearings, a paste applying device mounted in bearings movable toward and away from said feeding cylinder, trip arms pivotally mounted in position to engage the bearings of said paste applying device, means for shifting said paste applying device away from said feeding cylinder, a rock shaft, blank detecting fingers mounted upon said rock shaft and supported thereby adjacent to said feeding cylinder, means connecting said rock shaft with said trip arms and means upon said feeding cylinder for periodically shifting said connected detecting fingers and trip arms.

9. In an envelop machine, the combination of a circumferentially grooved blank feeding cylinder mounted in stationary bearings, a paste applying device mounted in bearings movable toward and away from said feeding cylinder, trip arms pivotally mounted in position to engage the bearings of said paste applying device, means for shifting said paste applying device away from said feeding cylinder, pivotally mounted blank detecting fingers operating in the circumferential grooves of said feeding cylinder and adapted to ride upon a blank carried by said cylinder, means connecting said detecting fingers with said trip arms and means upon the cylinder for periodically shifting said connected detecting fingers and trip arms.

10. In an envelop machine, the combination of a blank feeding cylinder mounted in stationary bearings, a paste applying cylinder mounted in bearings movable toward and away from said feeding cylinder, blank controlled tripping means for holding said paste applying cylinder in its shifted position away from said feeding cylinder, a pasting device movably mounted upon said paste applying cylinder, a paste distributing roller supported adjacent to said paste applying cylinder and means for periodically moving said paste applying device outwardly upon its supporting cylinder, to cause it to come in contact with the paste distributing roller.

11. In an envelop machine, the combination of a blank feeding cylinder mounted in stationary bearings, a paste applying cylinder mounted in bearings movable toward and away from said feeding cylinder, blank controlled tripping means for holding said paste applying cylinder in its shifted position away from said feeding cylinder, a paste applying segment movable radially upon said paste applying cylinder, and formed with flanges at its end, stationary projections supported in the path of said end flanges of the pasting segment adapted to periodically engage therewith for moving the segment outwardly upon its supporting cylinder, and a paste distributing roller supported adjacent to said paste applying cylinder in position to engage said pasting segment when it is in its outer position.

12. In an envelop machine, the combination of a blank feeding cylinder, a cutting die carried by said cylinder, a roller cooperating with said cutting die for cutting openings in blanks, paste applying means

coöperating with said cylinder for applying paste to the surface of blanks around said openings, means controlled by the presence or absence of blanks for controlling said paste applying means, means for applying transparent patches to said pasted surfaces and means for forming envelops from said patched blanks.

13. In an envelop machine, the combination of a blank feeding cylinder, a cutting die carried by said cylinder, a roller coöperating with said cutting die for cutting openings in blanks, a rotating brush operating in peripheral engagement with said roller, means for applying paste to the surface of blanks around said openings, means for applying transparent patches to said pasted surfaces and means for forming envelops from said patched blanks.

14. In a window envelop machine, the combination with means for moving a succession of independent envelop blanks having window openings therein, and means for applying separated patches; of means for causing the operation of said patch applying means to apply the separated patches to the moving envelop blanks in registration with and covering the window openings therein.

15. In a window envelop machine, the combination with means for applying paste to window envelop blanks, and suitable envelop forming mechanism; of means for moving a succession of independent envelop blanks having window openings therein from said paste applying means to said envelop forming mechanism, means for applying separated patches, and means for causing the operation of said patch applying means to apply the patches to the moving envelop blanks in registration with and covering the window openings therein.

16. In a window envelop machine, the combination of a blank feeding cylinder provided with blank engaging grippers, window cutting means coöperating with said cylinder, blank pasting means coöperating with said cylinder for applying paste around the window openings of blanks upon said cylinder, means for applying patches to said pasted blanks and means for completing envelops from said blanks.

17. In an envelop machine, the combination of means for cutting window openings in blanks, means for applying paste to the surface of said blanks around the window openings, means for applying patches upon said pasted surfaces over said window openings, means for applying lines of paste upon the opposite edges of the bottom flap of the blanks, means for forming top and bottom fold creases in the blanks, means for folding the bottom flap upon its crease line, means for folding inwardly the side flaps and sealing them to the pasted edges of the bottom flap, and means for applying paste to the sealing flap.

18. In a window envelop machine, the combination of continuously operating means for feeding blanks, means for cutting window openings in said moving blanks, means for applying paste to said moving blanks around said window openings, a pair of coöperating cylinders through which said pasted window blanks are passed, and means for feeding separated sections of patch material to said cylinders, whereby patches are applied to the pasted surfaces over the window openings of said blanks.

19. In a window envelop machine, the combination of continuously operating means for feeding blanks, means for cutting window openings in said moving blanks, means for applying paste to said moving blanks around said window openings, a pair of coöperating patch applying cylinders through which said pasted window blanks are passed, means for feeding a strip of patch material toward said cylinders, a cutting device between said strip feeding means and said cylinders for severing patches from said strip, and means for positioning said severed patches upon the pasted blanks between said cylinders, whereby patches are applied to said blanks over the window openings.

20. In an envelop machine, the combination of means for feeding blanks, means for cutting window openings in said blanks, means for applying paste to said blanks around said window openings and patch applying means including a gripper cylinder, devices for feeding a strip of patch material to said gripper cylinder, and a cutting device between said feeding devices and said cylinder for severing patches from said strip.

21. In an envelop machine, the combination of means for feeding blanks, means for cutting window openings, in said blanks, means for applying paste to said blanks around said window openings and patch applying means including a gripper cylinder, devices for feeding a strip of patch material to said gripper cylinder and patch severing means including a stationary cutter bar supported adjacent to said gripper cylinder, a reciprocating knife operating upon said stationary cutter bar, and cam operated means for reciprocating said knife.

22. In an envelop machine, the combination of means for feeding blanks, means for cutting window openings in said blanks, means for applying paste to said blanks around said window openings and patch applying means including a gripper cylinder, devices for feeding a strip of patch material to said gripper cylinder and patch severing means including a stationary cutter bar supported adjacent to said gripper

cylinder, a reciprocating knife operating upon said stationary cutter bar, springs holding said knife in engagement with said cutter bar, a rock shaft having rock arms which pivotally connect with said reciprocating knife and cam operating mechanism for said rock shaft.

23. In an envelop machine, the combination of means for feeding blanks, means for applying lines of paste to the outer surface of the bottom flap of said blanks, a pair of coöperating creasing cylinders, blank engaging grippers mounted upon each of said cylinders, a pressure roller coöperating with one of said cylinders, operating mechanism for said cylinders and grippers to cause the grippers upon one cylinder to engage the leading edge of the bottom flap of a blank and carry it away from the other cylinder, while the grippers of the other cylinder engage the blank in rear of its creasing line to cause the bottom flap to be folded on said creasing line against the body of the blank and the folded blank carried under the pressure roller, and means for folding in and sealing the side flaps upon said lines of paste to complete the envelops from said blank.

MATTHEW VIERENGEL.

Witnesses:
WM. A. COURTLAND,
WM. E. KNIGHT.