

C. DE LUKACSEVICS.
 ROTARY ENVELOP MACHINE.
 APPLICATION FILED NOV. 2, 1906.

979,775.

Patented Dec. 27, 1910.

6 SHEETS—SHEET 1.

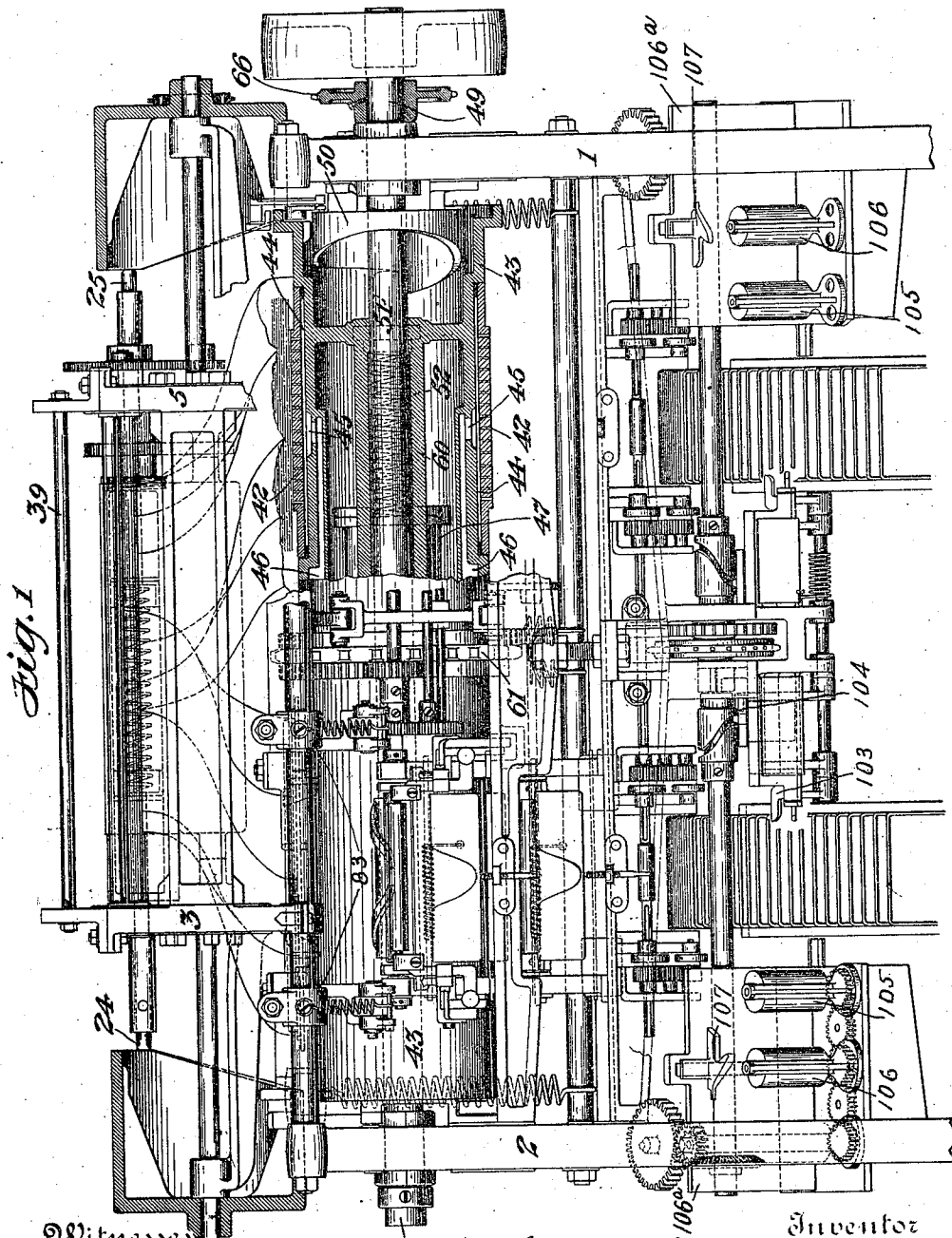


Fig. 1

Witnesses
 Tho. H. Brown.
 Wm. A. Brown.

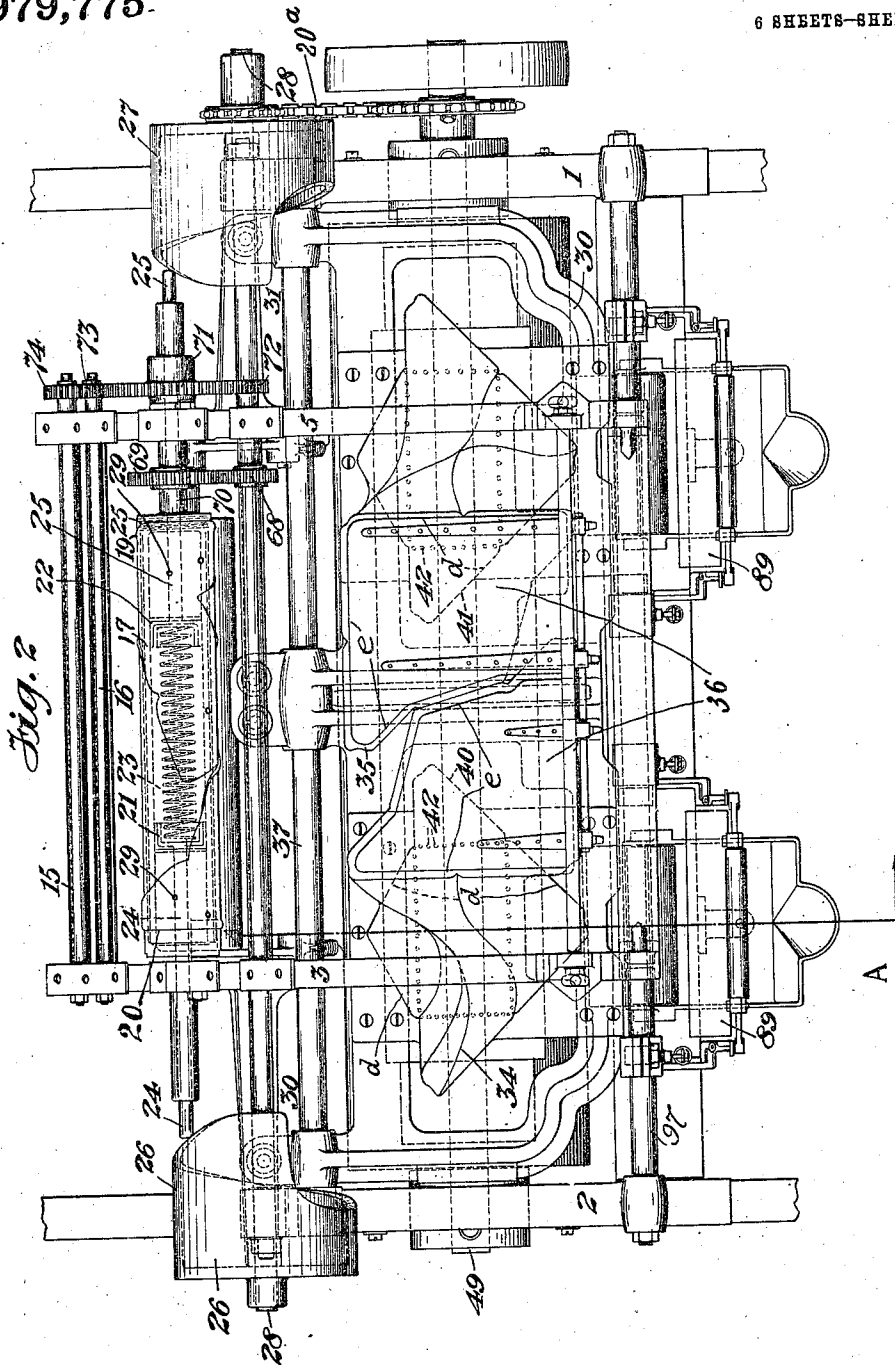
Inventor
 Charles de Lukacsevics
 By his Attorney
 George H. Stockton

C. DE LUKACSEVICS.
 ROTARY ENVELOP MACHINE.
 APPLICATION FILED NOV. 2, 1905.

Patented Dec. 27, 1910.

6 SHEETS-SHEET 2.

979,775.



WITNESSES:

Thos. H. Brown

Wm. A. Brown

INVENTOR

C. De Lukacsevics

BY

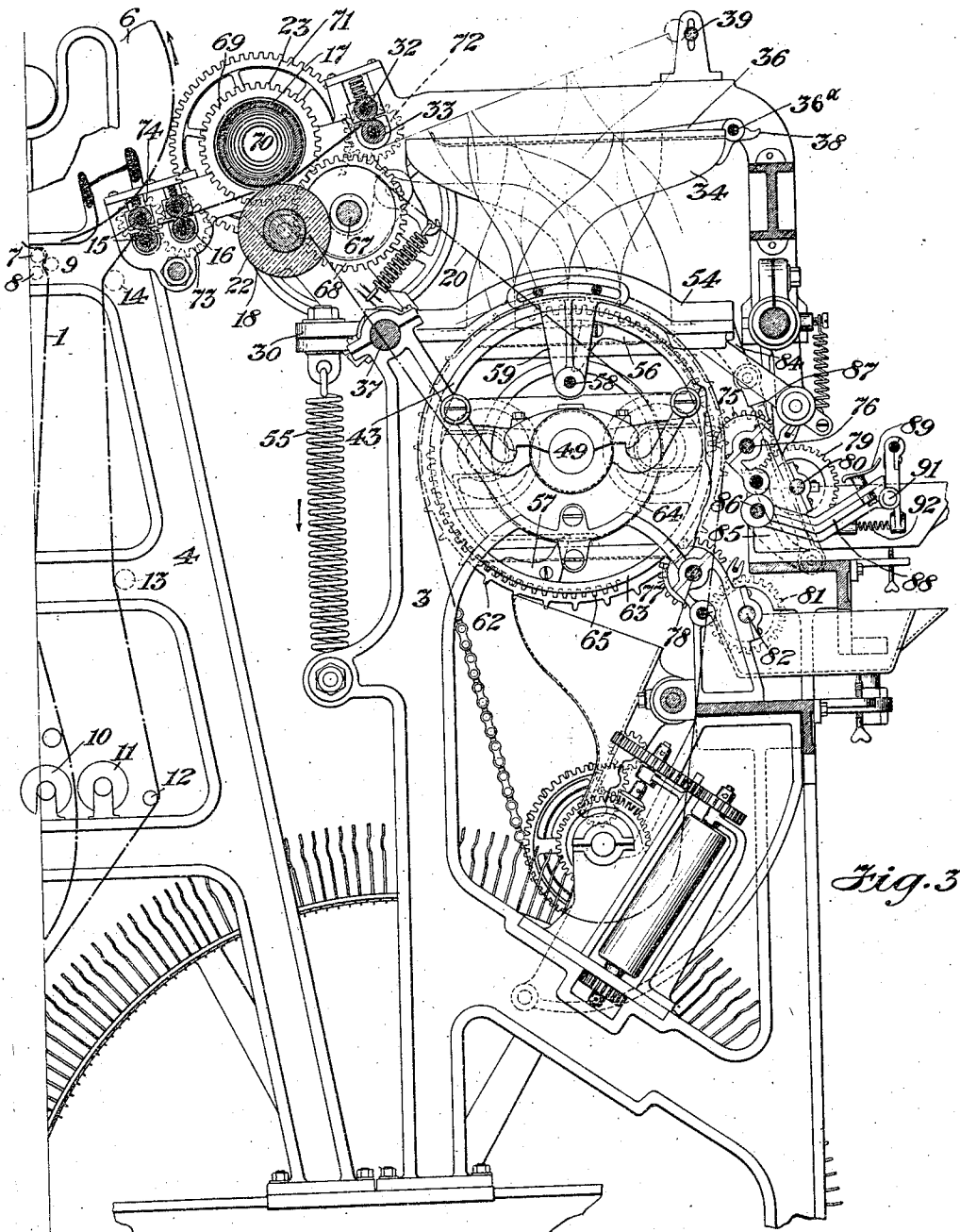
George H. Sloat ATTORNEY

C. DE LUKACSEVICS.
 ROTARY ENVELOP MACHINE.
 APPLICATION FILED NOV. 2, 1905.

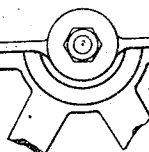
Patented Dec. 27, 1910.

6 SHEETS—SHEET 3.

979,775.



Witnesses
 Thos. H. Brown
 Wm. A. Bram.



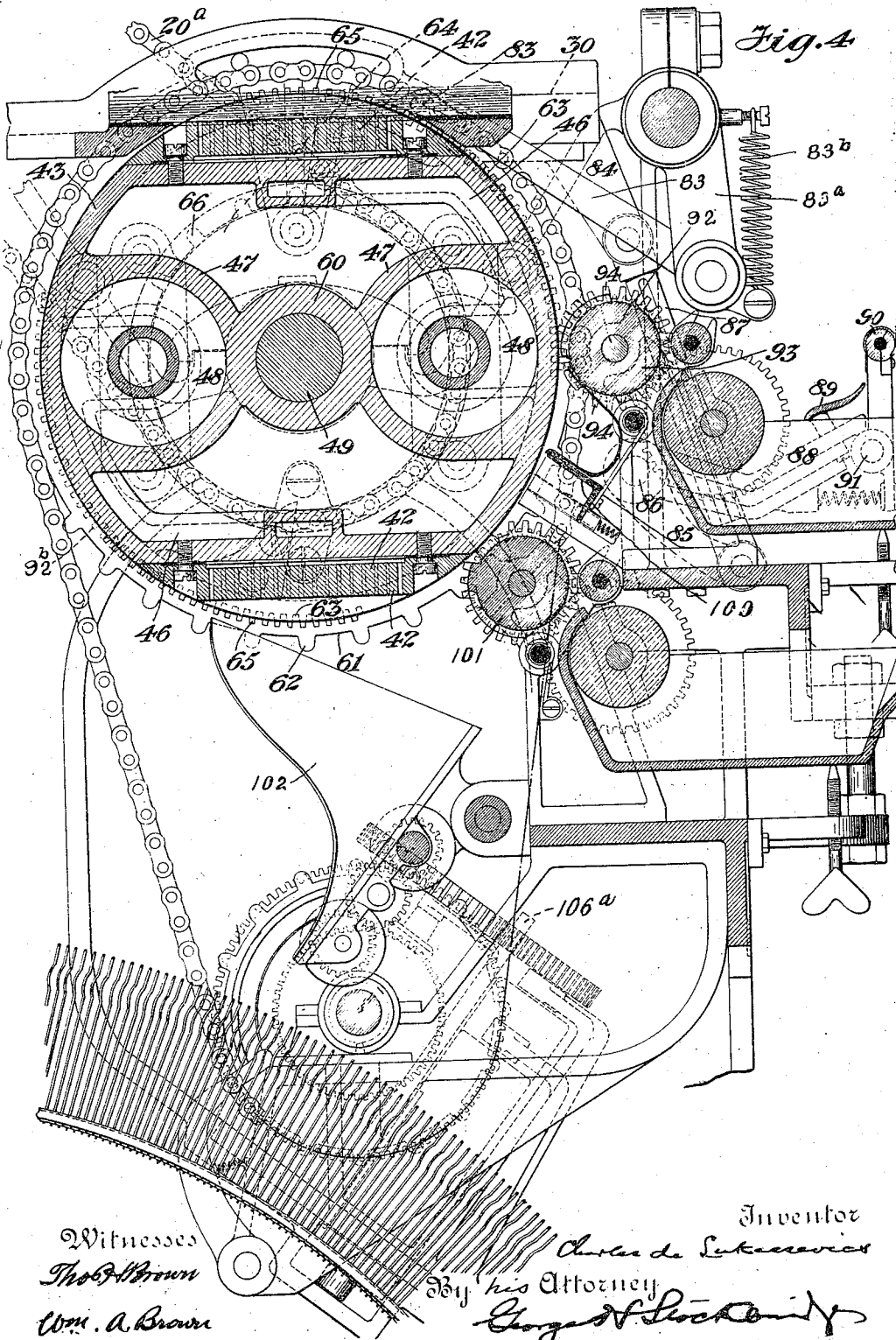
Inventor
 Charles de Lukacsevics
 By his Attorney
 George H. Stockbridge

C. DE LUKACSEVICS.
 ROTARY ENVELOP MACHINE.
 APPLICATION FILED NOV. 2, 1906.

Patented Dec. 27, 1910.

6 SHEETS-SHEET 4.

979,775.



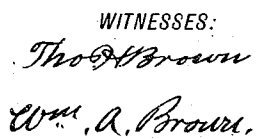
Witnesses
 Thos. A. Brown
 Wm. A. Brown

Inventor
 Charles de Lukacsevics
 By his Attorney
 George H. Lockman

979,775.

Patented Dec. 27, 1910.

6 SHEETS--SHEET 5.



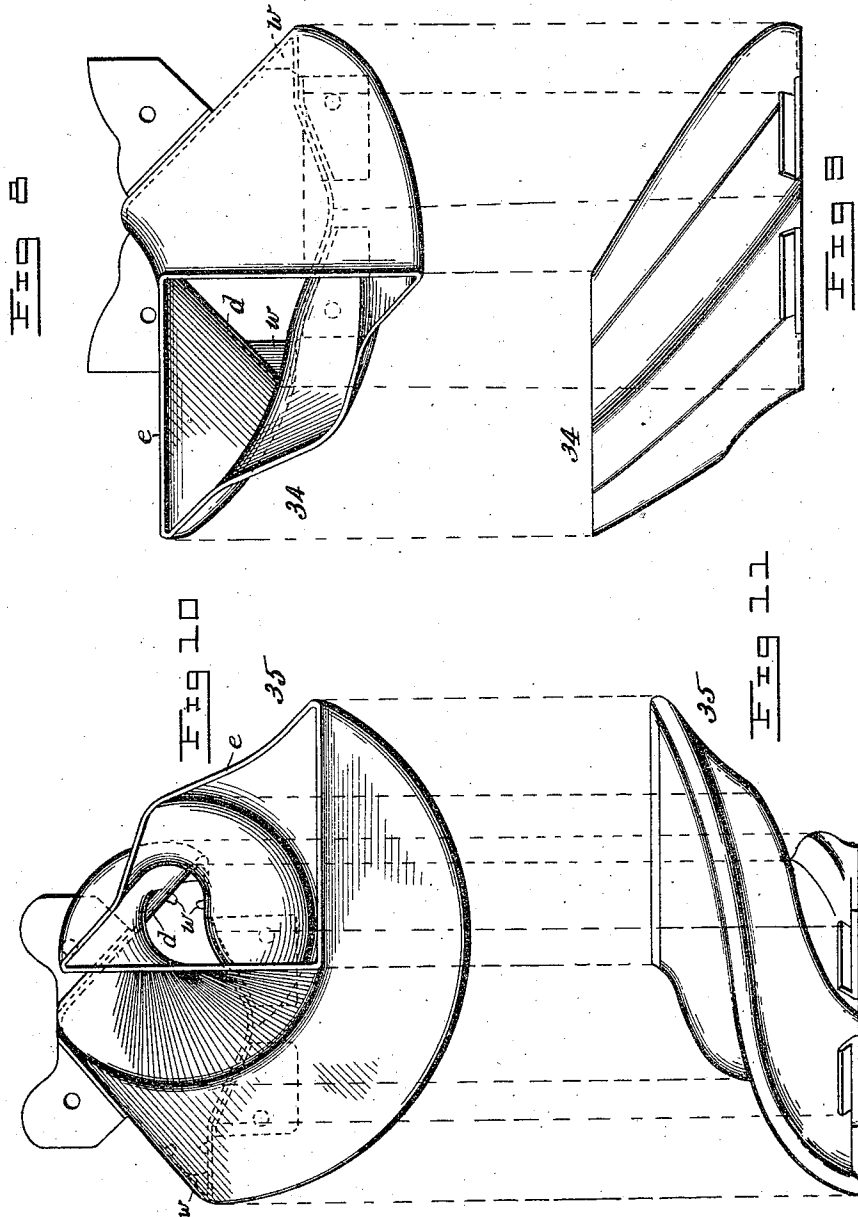
INVENTOR
Charles de Lukaciewicz
BY
George H. Swatcamp ATTORNEY

C. DE LUKACSEVICS.
 ROTARY ENVELOP MACHINE.
 APPLICATION FILED NOV. 2, 1905.

979,775.

Patented Dec. 27, 1910.

6 SHEETS—SHEET 6.



Inventor
 Charles de Lukacsevics

Witnesses
 H. C. Polnicke
 J. B. Darrow

By George H. Stockbridge
 his Attorney

UNITED STATES PATENT OFFICE.

CHARLES DE LUKACSEVICS, OF NEW YORK, N. Y., ASSIGNOR TO WILLIAM L. LEWIS,
GEORGE C. MOXON, AND GEORGE W. MORGAN, JR., OF NEW YORK, N. Y.

ROTARY ENVELOP-MACHINE.

979,775.

Specification of Letters Patent. Patented Dec. 27, 1910.

Application filed November 2, 1905. Serial No. 285,563.

To all whom it may concern:

Be it known that I, CHARLES DE LUKACSEVICS, a citizen of the United States, and resident of New York, county of New York, State of New York, have invented certain new and useful Improvements in Rotary Envelop-Machines, of which the following is a specification.

In Letters Patent of the United States No. 945,181 issued to me January 4, 1910 I have shown and described a rotary envelop making machine having certain novel features which are fully set forth in the application referred to. The said machine is adapted to receive and feed envelop blanks and deliver completed envelops fully gummed, folded and ready for use.

One of the main features of the present invention is an improvement whereby the blanks themselves are manufactured by the machine and afterward carried forward to completion so that it is only necessary to feed in at one end of the machine a roll of paper, whereupon the machine cuts the roll into blanks and through a series of intermediate steps produces a completed envelop as in the case of the other machine described.

The specific embodiment of the invention described herein is what may be called a duplex or double machine, a single paper cutting mechanism operating to cut simultaneously two blanks from the roll of paper, and these blanks being fed one to one folding mechanism on one side of the machine, and one to another folding mechanism on the other side of the machine. By thus giving the machine a duplex construction a more economical use of the paper results, by reason of the fact that the blanks can be so cut from the roll as to avoid excessive waste. In other words, the knives are so placed with respect to each other, that in cutting two blanks at the same time there is less waste than would be the case if one blank be cut at a time. Of course, there is also the further advantage that a duplex machine gives twice the output in the same time that a single machine would give.

The invention is fully illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the machine; Fig. 2 is a plan; Fig. 3 is an end elevation; Fig. 4 is a section along the line A—A in Fig. 2; Figs. 5, 6 and 7 are details

of a cylinder forming one of the main features of the invention; Figs. 8 and 9 are plan and elevation, respectively, of one of the boxes or chutes receiving the blanks from the paper cutting mechanism; and Figs. 10 and 11 are similar views of the other of the boxes or chutes for receiving the blanks from the paper cutting mechanism.

In the apparatus herein described, the frame is made up of standards, 1 and 2, supported on a suitable base and intermediate frame pieces, 3, 4 and 5, as shown in Figs. 1, 2 and 3 and supports both cutting and folding mechanism.

The sheet or ribbon from which the envelop blanks are to be cut is mounted upon a roller, 6, adapted to rotate in the direction of the arrow and the ribbon is delivered therefrom so as to pass between rollers, 7, 8 and 9, by means of which the sheet or ribbon is straightened and made ready for the printing operation which takes place between rollers, 10 and 11, (see Fig. 3). Beyond the printing rollers the sheet or ribbon passes around an idler (not shown) and is brought back past guide rods or rollers, 12, 80 13 and 14, beyond which the sheet or ribbon passes between gripping and feeding rollers, 15 and 16, as shown. These feed rollers carry the ribbon between the cutting roller 17 and the cylinder, 18, the latter serving as a backing for the knives on the roller 17 during the cutting operation.

It will be understood that the printing rollers 10 and 11 may be dispensed with in case nothing more than a plain envelop is desired as the product of the machine. If, however, the envelop is to contain printing or any sort of design these rollers may be utilized for impressing such printing or design upon the paper at the proper point. There is nothing unusual in the construction of these printing rollers and the details are not shown for that reason.

The cutting devices on the roller 17 are arranged to form envelop blanks, the roller being preferably long enough to provide two knives, each having the outline of an envelop blank.

As has heretofore been said, by providing two knives on roll 17, each having the outline of an envelop blank, it is possible to position these knives so that there is little waste of the paper. Reference to Fig. 2 will

show this fact clearly, the outline of the knives being shown on the roll 17, and the outline of the blanks as delivered from the knives being shown by the tops of boxes 34 and 35, presently to be described, which receive the blanks from the cutting roll. It will be observed that the blanks are cut with the top lapels toward each other, and are so placed relative to each other that they together form a substantially rectangular area. It is well known that when paper is cut by an instrument of this sort, that is to say, a continuous knife inclosing the object cut out, the paper will adhere to the inside of the knife and be carried with it in case the knife moves either in a rotary direction or in a single plane. Accordingly, the envelop blanks cut out by the knives on the roller 17 will adhere to the roller until such time as they are loosened by some mechanical force. The knives referred to are indicated at 19 and 20 in Fig. 2.

Within the roller 17 are pistons, 21, 22, normally connected by a spiral spring, 23. Piston rods, 24, 25, are connected to the respective pistons 21 and 22 and these piston rods extend outward through the ends of the roller and come into operative relation with cams 26 and 27 mounted on a shaft, 28, and partaking of the rotation thereof.

It will be seen that there are openings, 29, 29, in the roller 17 within the cutting edges of the knives 19 and 20. By means of these openings, taken in connection with the other apparatus just now described, the envelop blanks which have been cut by the knives can be blown off, as will be readily understood. For example, it will be seen that the cams, 26 and 27, operate upon piston rods 24 and 25, respectively, and press them inward, thereby compressing the spring 23 until the cams are carried to such a position that the piston rods rest against the points 30 and 31 on the respective cams. When the cams are moved a little farther, the piston rods are released, whereupon the spring 23 pushes the pistons outward causing a sudden blowing off upon the envelop blanks and disengaging them as already described. The blanks are then caught up by the feed rollers, 32 and 33, and afterward dropped into boxes or chutes, 34 and 35, whence they pass to the folding and guiding devices, as will be explained hereinafter. These boxes 34 and 35, shown in detail in Figs. 8 and 9, and 10 and 11, respectively, are each spiral in shape and of the same horizontal cross-section. This horizontal section is exactly the shape of the envelop blank cut by the roll 17, the blanks, therefore, which are delivered to chutes 34 and 35, being accurately positioned and guided by the walls of the chute. In practice these chutes are made of wrought copper, hammered into shape and having

very smooth internal walls, so that there is little or no friction tending to clog the chutes. Both of these chutes 34 and 35 are secured to a frame 54, which is clamped to a shaft 37 journaled in the frame-pieces 3 and 5 of the machine. The frame carrying the boxes is held in the position shown in dotted lines Fig. 3 by a spring 55 attached to frame piece 3 and extension 30 of frame 54, as shown in Fig. 3. An adjustable extension 59 of the frame-piece 54 projects over the end of the main cylinder 43 carried by the shaft 49 of the folding mechanism, and carries a pin 58 adapted to be engaged at intervals by cams 56 and 57 mounted on the end of the cylinder 43. Upon engagement of the pin 58 by cam 56 the frame 54 is moved downward from its dotted line position to its full line position, as shown in Fig. 3, against the tension of spring 55. In its upper or dotted line position the mouths of the boxes 34 and 35 are in a plane parallel to that of the blanks as delivered from rollers 32 and 33, which take the blanks from the cutting roller 17. In the lower position of the frame 54, shown in full lines in Fig. 3, the boxes rest with their lower ends in close proximity to the surface of cylinder 43 in such a manner that the lowermost blanks in the boxes may be caught by the cylinder and carried forward to be folded as will be hereinafter described. These boxes 34 and 35 have a two-fold purpose, the one to deliver the blanks to the cylinder 43 in the proper position for the folding operation, and the other to serve as a receptacle for the blanks. To the first end, the left hand box of Fig. 2, that is, 34, is a spiral of only one quarter turn, the blanks delivered to the box 34 from the roller 17 being in such position that they require only a one-quarter turn to change them from the full line position, as indicated by the upper end of the chute 34, to the dotted line position indicating the delivery end of the chute 34. The blank delivered to the chute 35, however, requires three quarters of the complete turn in order to place it in the same position. The chute 35 is therefore formed as a spiral of three-quarters of a turn. This is plainly shown in Fig. 2, and in Figs. 8 to 11, inclusive. In Figs. 8 to 11 the entrance ends of the chutes have been marked *e*, while the delivery ends of the chutes have been marked *d*. To the end of making the chutes serve as receptacles for the blanks, the delivery ends *d* are provided with a plurality of thin metal webs or projections *w* in each of several of their corners. These serve to catch the corners of the blanks and keep them from dropping from the chute during the motion of the frame 54. They do not, however, prevent a blank being caught by the cylinder 43, and removed from the chute. When the ma-

chine is in full operation the chutes or boxes 34 and 35 are full, or nearly full, of envelop blanks, they being fed spirally downward from the entrance end of the chute as the blanks are removed one by one from the delivery end. To prevent the topmost blanks becoming disarranged, or blown from the top of the chute when the frame 54 is moving downwardly, as it does rapidly at one period of its movement, a cover 36 is provided for the boxes, being hinged to their respective edges at 36^a on the side away from the delivery rollers 32 and 33. Extensions 38 are provided on these covers and adapted when the frame 54 is in its raised position to engage projections 39 from the frame of the machine, and raise the covers to allow the reception of the blanks. Immediately the frame begins to fall, however, the covers close down upon the boxes, as shown in Fig. 3.

When the blanks are in the position indicated by the dotted lines 40 and 41, they rest over perforated plates, 42, on cylinders, 43. The bottoms of the plates 42 communicate with chambers, 44, which in turn communicate by means of openings, 45, with chambers, 46, connected with the cylinders, 47, of pumps, 48, inside the cylinder 43. The said cylinder 43 is mounted on driving shaft, 49, and on the frame and around the shaft are mounted cams, 50, 50, one of which is shown clearly in Fig. 1, and the other of which (not shown) appears in the corresponding position near the opposite end of the said shaft. Each of the cams 50 is arranged in operative relation with the piston rod, 51, of a pair of pumps, 48, 48, the arrangement being such that when one of the piston rods is pushed in by the cam the other is in its outermost position, both pistons being under the influence of springs, 52, 52, as shown in Fig. 5.

On each of the piston rods is a piston, 53, which plays back and forth in the cylinder under the influence of the cam 50 on the one hand and the spring 52 on the other.

As in my previous application already referred to, the action of one of the pumps is to cause a suction effect upon the lowermost envelop blank making it adhere to the plate 42, while the action of the same pump at the opposite end of the excursion of the piston is to expel the completed envelop from the cylinder owing to the fact that at this point the piston has moved inward and interrupted the suction. This action is duplicated by the other pump of the same pair at appropriate times, as will be readily understood. The other pair of pumps perform the same operation upon the other set of envelop blanks in the second box or compartment, this being the case whenever the machine is arranged for dupli-

cate sets of envelop blanks as illustrated in the present instance.

After the cylinder 43 has been turned one-half a revolution, the second set of plates 42, 42 comes into position at the top of the cylinder and the described operations are repeated. Meanwhile, the pumps will have done their work of causing one set of envelop blanks to adhere to the uppermost set of plates 42 while the other set of pumps will have expelled the blanks from the plates 42 which were previously uppermost, but which are now at their lowermost position.

The blank cutting and feeding mechanism is operated from the main driving shaft 49 which operates the drum or cylinder 43 through the medium of a hub, 60, secured to the said shaft and also secured to the cylinders of the pumps 48, 48. These cylinders being connected to the interior of the drum as shown in Fig. 4. This drum 43 is secured to a gear-wheel, 61, having sprocket teeth, 62. On the same shaft 49 are secured gear-wheels, 63 and 64, the former having intermittent gear-teeth, 65, and the latter having sprocket teeth, 66, with which the chain 20^a engages whereby the motion is transmitted to a shaft 67 carrying a pinion, 68. This pinion engages with a corresponding gear-wheel, 69, on shaft, 70, carrying the drum or cylinder 17; and on this last named shaft is a gear-wheel, 71, engaging with a pinion, 72, carrying a roller 33 and wheel 71 also engages with a pinion, 73, on the shaft which carries the roller 16. This last named pinion 73 engages with a pinion, 74, on a shaft carrying one of the rollers 15.

Now the gear-wheel 63 engages through its intermittent gear-teeth with the following set of devices (see Fig. 3): First it engages with a pinion, 75, on a shaft 76; and then with a pinion, 77, on a shaft, 78. The pinion 75 engages with a gear-wheel, 79, on a shaft, 80, while the pinion 77 engages with a gear-wheel, 81, on a shaft, 82. In this way it will be seen that all the shafts named are operated from the single driving shaft 49.

The folding operation, which is practically the same as that described in my U. S. Patent No. 945,181, Jan. 4, 1910, will now be briefly described in order to enable the operation of the machine as a whole to be understood. When an envelop blank has been drawn down around the cylinder 43 by the suction devices within the cylinder, it rests upon one of the beds 42. Just as this is done the pin 58 slides from the end of the cam 56, shown in Fig. 3, and allows the frame 54 to raise the boxes 34 and 35 from the cylinder 43, so that the cylinder can proceed freely with the blank. Rotation is in a clockwise direction. The blank is first engaged by the end flap-turning devices 83, which are pivoted to an arm 83^a and held in an operative position upon the surface of

the cylinder 43 by a spring 83^b. They are next engaged by the roller 90 and lapel of the guide 89, which have at this time been moved about their pivotal point 86 by the upward movement of frame 54, just mentioned. It will be noted that the frame 54 has an extension 84, connected by link 87 to arm 85, fastened to shaft 86, and carrying the frame 88, on which the lapel guide 38 and end flap roller 90 are mounted. The roller 90 folds the end flaps flat down on the body of the blank, and in conjunction with the lapel guide 89 holds the blank to the cylinder 43 during the folding operation, which next takes place.

92 is the gumming roller, which is operated by a gear wheel 75, engaged intermittently by the teeth 92^b of a gear on shaft 49 as the cylinder 43 revolves. This engagement takes place just as the blank passes to the roller, and the gumming operation is performed as it passes, the bottom lapel being gummed at this time. Passing the gumming roller, the bottom lapel is engaged by the folding device 100, see Fig. 4, and folded down upon the end flaps. Immediately below the folding device 100 is a second gumming roller 101, operated in the same manner as the gumming roller 92, and serving at the proper time, as a blank is passed from the folding device 100, to gum the upper lapel. This completes the operations on the blank while held by the cylinder 43. Immediately after leaving the gumming roller 101, the blank is expelled from the bed 42 by the operation of the suction devices by the proper cams as previously described. The blank thus expelled falls into the chute 102, which directs it to the drying wheel 103, which consists of a wheel the periphery of which is provided with a plurality of vanes 104 spaced apart and between which the nearly completed envelop is adapted to rest. This wheel is rotated by suitable mechanism not necessary to be described here, the envelops being carried with it for a length of time suitable to permit the drying of the gum on the unfolded upper lapel. At a suitable point in the rotation of this wheel, when the drying is complete, the blank is removed from the wheel by means of a reciprocating device 103 operated by suitably driven cams 104, being shoved out and caught between rollers 105 and 106 and folding plate 106^a (see Fig. 1), the top lapel being turned by the member 107 mounted on plate 106^a and flatly folded by the roller 106. The complete envelop is discharged from the rollers 105 and 106, and is caught in the receptacle provided for that purpose.

It will be seen that I have provided an exceedingly simple, compact and efficient machine for making envelops. Although I have described the operation of my invention with respect to only one half of my du-

plex machine, it will be evident from a glance at the drawings that the operation is the same on both sides of the machine, completed envelops being discharged from each side into a suitable receptacle. In Fig. 1 this may be seen most clearly.

While I have described my invention with reference to the best forms now known to me, I desire to have it understood that I am not limited to this specific embodiment, and that many changes may be made in this embodiment without departing from the spirit of my invention. I desire to cover all such modifications in the claims annexed hereto.

I claim as my invention:—

1. In a rotary envelop machine, means for supplying a sheet or ribbon of paper or other envelop material, in combination with means for cutting envelop blanks, and means for forming the said blanks into completed envelops, such means comprising a rotating cylinder having pneumatic means to maintain the blanks in position thereon during the forming operation.

2. In a rotary envelop machine, a source of supply for a sheet or ribbon of paper or other envelop material, means for feeding the said sheet or ribbon, means for cutting the said sheet or ribbon into envelop blanks, a chute down which said blanks are moved by gravity for receiving the blanks as they are cut, and placing them in a position for the folding operation to commence, and means for transforming the said envelop blanks into completed envelops.

3. In a rotary envelop machine, a source of supply for an envelop sheet or ribbon, means for cutting the said sheet or ribbon into envelop blanks, and means for gumming and folding said blanks so as to form completed envelops, such means comprising a rotary drum, and pneumatic means carried thereby for causing the blanks to adhere thereto.

4. In a rotary envelop machine, means for cutting envelop blanks and supplying them to the machine, pneumatic means for causing said blanks to adhere to a rotary part of said machine for a time, and for expelling said blanks from said part at the end of that time, mechanism for forming said blanks into completed or finished envelops during said time, and means for feeding said blanks from said supply means to said rotary part of the machine.

5. In a rotary envelop machine, a source of supply for a ribbon of paper or other envelop material, means for cutting said material into envelop blanks during the feeding process, pneumatic means for causing said blanks to adhere to a moving part of the machine for a time, and for expelling said blanks from said part at the end of said time, forming mechanism for the forming of the blanks into finished envelops dur-

ing said time, and means for feeding the cut blanks from said cutting mechanism to said moving part of the machine.

6. In a rotary envelop machine, a source of supply for a ribbon of paper or other envelop material, means for cutting said material into envelop blanks during the feeding process, pneumatic means for causing said blanks to adhere to a moving part of the machine for a time, and for expelling said blanks from the moving part at the end of that time, mechanism for forming said blanks into completed or finished envelops during said time, and means for feeding the cut blanks from said cutting mechanism to said moving part of the machine, said means including pneumatic means for expelling said blanks from the cutting mechanism at the proper moment.

7. In a rotary envelop machine, a rotary cutter adapted to cut an envelop blank, and retain the same during a portion of its revolution, pneumatic means for expelling the said blank at the proper moment, and means for feeding and receiving the said blank after expulsion, and means for forming the same into a finished envelop.

8. In a rotary envelop machine, a rotary cutter adapted to cut an envelop blank, and retain the same during a portion of the revolution, means for expelling the said blank at the proper moment, and means for feeding and receiving the said blank after expulsion, such receiving means consisting of a box having an adjustable cover.

9. In a rotary envelop machine, a rotary cutter adapted to cut an envelop blank, and retain the same during a portion of the revolution, means for expelling the said blank at the proper moment, and means for feeding and receiving the said blank after expulsion, such receiving means consisting of a box having an adjustable cover, and means for opening and closing the said cover at the appropriate intervals.

10. In a rotary envelop machine, a rotary cutter adapted to cut an envelop blank, and retain the same during a portion of the revolution, means for expelling the said blank at the proper moment, means for feeding and receiving the said blank after expulsion, such means receiving means consisting of a box having an adjustable cover, a tail piece on the said cover, and means for bringing the tail piece into coöperation with a rod or catch for lifting the cover at appropriate intervals.

11. In a rotary envelop machine, a box for receiving envelop blanks, a cover for the

said box, means for intermittently feeding envelop blanks into the said box, and means for intermittently lifting and restoring the cover.

12. In a rotary envelop machine, a box for receiving envelop blanks, a cover for the said box, means for intermittently feeding envelop blanks into the said box, and means for intermittently lifting and restoring the cover, such means consisting of a spring adapted to raise the cover when unobstructed in its action, a lug connected with the cover and a rotating cam coöperating at intervals with the said lug and acting in opposition to the force of the spring.

13. In an envelop machine, means for cutting envelop blanks and a box for receiving the said blanks, the said box having its bottom displaced with relation to the top and being adapted to permit the descent of the envelop blanks under gravity to the bottom of the box.

14. In an envelop machine, means for cutting envelop blanks and a box for receiving the said blanks, the said box having its bottom displaced with relation to the top and being adapted to permit the descent of the envelop blanks under gravity to the bottom of the box, in combination with a cylinder carrying a perforated plate arranged under the bottom of the box, a chamber under the said cylinder and suction devices connected with the said chamber.

15. A machine of the character described, a supply for envelop blanks, a forming mechanism for forming blanks into finished envelops, and means for feeding the blanks from the supply to the forming mechanism comprising a chute down which the blanks pass, the cross section of which chute is approximately of the same contour as the contour of the blanks.

16. A machine of the character described, means for supplying envelop blanks in a certain angular position, forming mechanism for finishing envelops from the blanks adapted to receive the blanks in another position, and means for transferring the blanks from the supply to the forming mechanism comprising a chute in which the angular position of the blanks is changed as they move through it.

Signed at New York, in the county of New York, and State of New York, this 31st day of October, A. D. 1905.

CHARLES DE LUKACSEVICS.

Witnesses:

THOS. H. BROWN,
GEORGE H. STOCKBRIDGE.