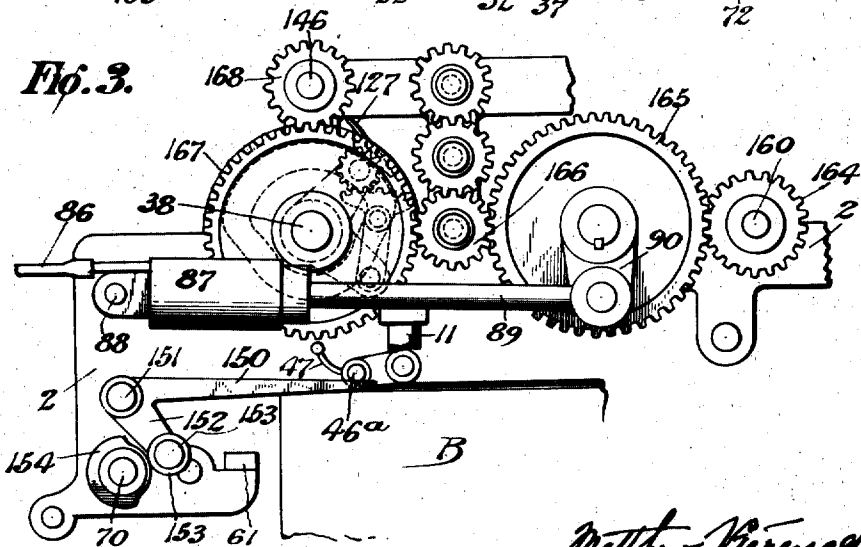
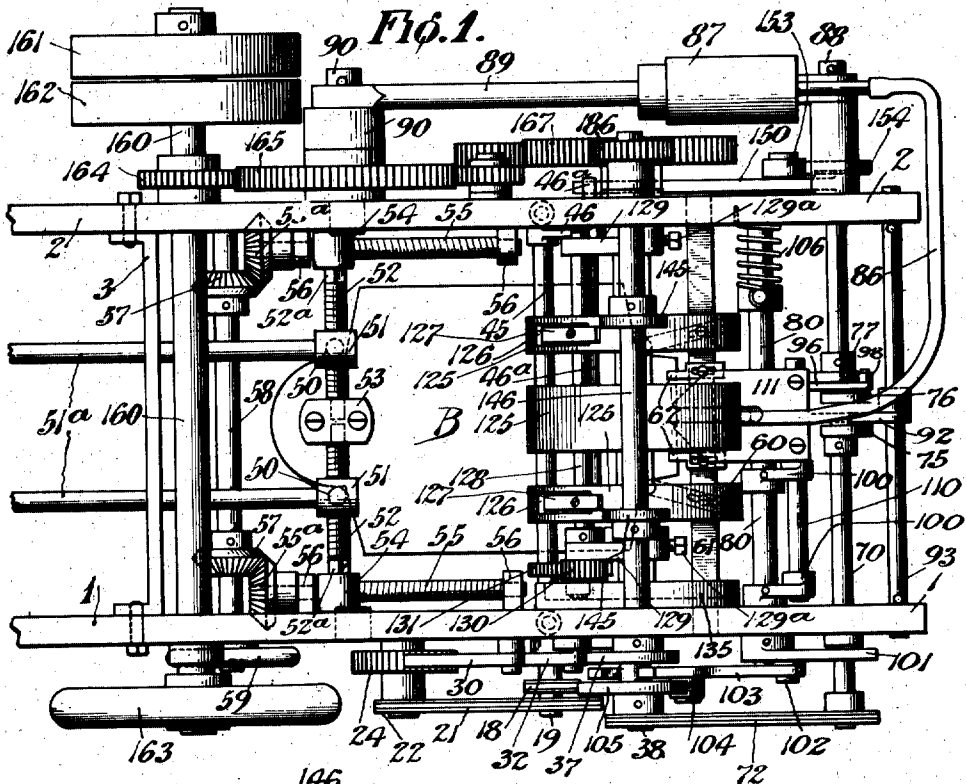


M. VIERENGEL.  
 PAPER FEEDING MACHINE.  
 APPLICATION FILED OCT. 11, 1910.

1,000,058.

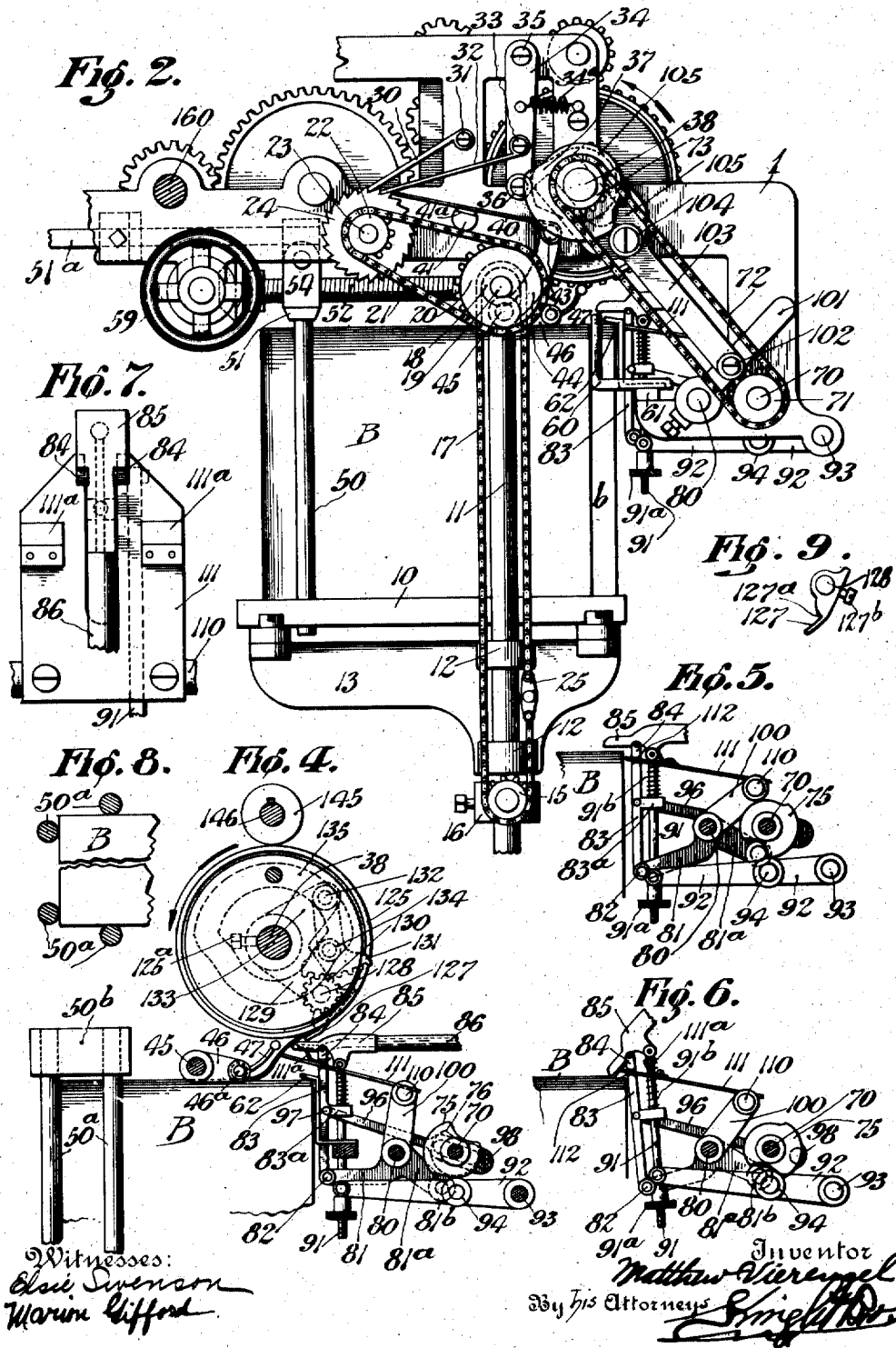
Patented Aug. 8, 1911.

2 SHEETS—SHEET 1.



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# UNITED STATES PATENT OFFICE.

MATTHEW VIERENGEL, OF BROOKLYN, NEW YORK.

## PAPER-FEEDING MACHINE.

1,000,058.

Specification of Letters Patent.

Patented Aug. 8, 1911.

Original application filed April 27, 1910, Serial No. 557,879. Divided and this application filed October 11, 1910. Serial No. 586,488.

To all whom it may concern:

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

The present application is a division of my original application Serial No. 557,879, filed April 27th, 1910, for improvements in envelop machines.

The present invention relates to improvements in machines for separating sheets of paper from an adjustably supported pile and feeding them successively to a printing press, folding machine, envelop machine or other machine arranged to operate upon the paper sheets, and the main object of the present invention is to provide a simple, effective and compact feeding machine which will occupy a minimum amount of floor space and be capable of rapidly and accurately separating and feeding sheets of paper from a pile.

In carrying out this object, the sheet separating devices comprise a pneumatic device and cooperating mechanical devices for segregating one edge of a sheet from the adjustably supported pile, and the feeding off devices comprise a gripper cylinder supported above the separating devices in position to take the raised edge of a sheet and pull the sheet from the pile at one end and deliver it in reversed position to any suitable sheet receiving or conveying devices arranged above the pile. With this compact arrangement, the separated sheets are delivered from the pile into a position approximately within the limits of the vertical planes outlining the pile, in readiness for direct introduction into the printing press, envelop machine, or other machine which is to operate upon the sheets. The machine which is to receive the sheets from the automatic feeder can, therefore, be directly coupled up to the feeder much more compactly than with those forms of feeders having conveyer frames extending horizontally beyond the pile of the feeder.

In order that the 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 plan view

of my improved paper feeding machine. Fig. 2 is a side elevation of the same. Fig. 3 is a side elevation of the machine taken from the opposite side to that shown in Fig. 2. Fig. 4 is a detail vertical longitudinal sectional view illustrating the operation of the sheet separating and delivery devices. Figs. 5 and 6 are similar views of the same mechanism illustrating shifted positions of parts. Fig. 7 is an enlarged detail plan view of the pneumatic separator and sheet segregating plate, and Fig. 8 is a detail view illustrating the arrangement of sheet piling guides shown in Fig. 4. Fig. 9 is a detail view of a feed-off gripper.

My improvements in sheet separating and feeding machines forming the subject of the present application are shown and described in my above-named original application as part of an envelop machine, but I would have it understood at the outset that my present improvements are not limited in their application to that particular kind of machine but may be applied with equal advantage to other forms of machines which operate upon sheets of paper. I would also have it understood that the mounting of the feeding machine in inclined position as shown in my original application is immaterial to the operation of the machine, since the machine may be mounted in upright position with the top of the pile presented in a horizontal plane as shown in the accompanying drawings.

The improved feeding machine may be built upon any suitable framework capable of properly supporting the operative parts hereinafter described. As shown, the machine frame includes the two main side frames indicated by reference numerals 1 and 2, which are suitably braced by transverse bars, tie rods and shafts which will be referred to specifically only when necessary to point out some particular feature.

11, 11, are two rigid side bars or guides mounted in and depending from the side frames 1 and 2. These bars 11 are shown in vertical position but they may be inclined if desired to better suit the coupling up of the feeder to a particular press or other machine to which sheets are to be fed.

10 is the pile supporting table.

13 is the table supporting frame formed with laterally projecting guide rings or lugs 12 which embrace and slide upon the guide bars 11. The table 10 resting upon frame

13 supports the pile of sheets B in proper position for the operation of the separating and feeding devices.

Adjacent to the lower end of each guide bar 11 is adjustably secured a block 16 upon which is freely journaled a small sprocket wheel 15. Suitably journaled in side frames 1 and 2 is a transverse shaft 19 carrying sprocket wheels 18 which are supported in the same vertical planes as sprocket wheels 15. Endless sprocket chains 17 pass around sprocket wheels 15 and 18 for the purpose which will presently appear. The shaft 19 also carries a large sprocket wheel 20 which is driven by a sprocket chain 21 passing around a small sprocket wheel 22 fixed to a ratchet wheel 24 journaled upon a stud 23. The shaft 19 extends from side to side of the machine and the parts 15, 16, 17 and 18 are duplicated at the opposite side of the machine. The sprocket chains 17 have secured to each of them a block 25 pivoted to one of the sides of frame 13 of the table 10, so that the gradual upward movement of table 10 is accomplished by the movement of sprocket chains 17. A gravity pawl 30 journaled at 31 rests constantly in engagement with the ratchet wheel 24 to prevent retrograde movement. An actuating pawl 32 is pivoted at 33 upon a lever 34 journaled to the side frame at 35 and carrying at its lower end an anti-friction roller 36 operating in peripheral contact with a cam 37 keyed to the cylinder shaft 38 extending from side to side of the machine frame and driven in the manner hereinafter explained. A spring 34<sup>a</sup> connects the lever 34 with the frame to yieldingly hold the lever against cam 37. The actuating pawl 32 rests upon a controlling plate 40 which is supported by a pin 41 just above the ratchet wheel 24 and movable forwardly and backwardly thereover. The pin 41 is rotatably mounted in the side frame and is formed with a flattened or cut out face 41<sup>a</sup> to allow plate 40 to drop to a lower position. By turning the pin or support 41 on the frame the action of plate 40 can be adjusted to regulate the feeding stroke of pawl 32. When the rounded part of the pin or support 41 is turned into engagement with the controlling plate 40, said plate 40 will engage the actuating pawl 32 and move it up into engagement with the gravity pawl 30 for raising said pawl 30 and supporting both pawls out of engagement with the ratchet. This controlling plate 40 is pivoted at 43 to the upper end of a rock arm 44 keyed to a shaft 45 journaled in stationary bars 11 and extending transversely above the top of the pile of blanks. Secured to shaft 45 are the forwardly presented gage arms 46 which are designed to rest upon the top blank of the pile. These gage arms are connected by a cross bar 46<sup>a</sup> and have upwardly curved fingers 47 against which the forward

portions of the blanks are bent upwardly by the separating mechanism in the manner presently to be explained. From this construction of pile elevating mechanism, it will be observed that when the pile is at the proper height for the operation of the separating and feeding devices, the controlling plate 40 will support the actuating pawl 32 out of engagement with the ratchet wheel 24. When the top surface of the pile falls below the required height, the downward movement of gage arms 46 will lower the rock arm 44 and move the controlling plate 40 forwardly to permit the actuating pawl 32 to engage a tooth of ratchet wheel 24 on its next rearward stroke under the action of cam 37 to impart a lifting impulse to the sprocket chains 17.

The pile of sheets B mounted upon the table 10 is supported at its rear by the vertical piling gage rods 50 mounted at their upper ends in the blocks 51 threaded upon the right and left hand screws 52 journaled at their inner ends in the bracket bearing 53 and at their outer ends in the bearing blocks 54 which are threaded upon the longitudinal adjusting screws 55 journaled in brackets 56 secured to the inner faces of the side frames 1 and 2. Each of the transverse adjusting screws 52 is provided with a squared section 52<sup>a</sup> by which it can be rotated to adjust the gage rods 50 transversely of the machine. Projecting rearwardly from each of the blocks 51 is a guide rod 51<sup>a</sup> which passes freely through a guide slot formed in the transverse-brace bar 3 of the machine frame, the purpose of said guide rods 51<sup>a</sup> being to retain the piling gage rods 50 in engagement with the pile of sheets. Each longitudinal screw 55 has secured to its rear end a bevel gear 55<sup>a</sup> which meshes with a similar bevel gear 57 secured to a transverse shaft 58 suitably journaled in the machine frame and provided with a hand wheel 59 by which it is rotated for simultaneously rotating the screws 55 for adjusting the piling gages 50 longitudinally of the machine.

When the feeding machine is operating upon sheets in the form of envelop blanks as shown in Fig. 1 of the drawings, it will be observed that two piling gage rods 50 supported in the angle between the top flap and side flaps of the blank, will be sufficient for holding the pile in proper alinement from the rear. When operating upon square sheets or blanks, however, as illustrated in Figs. 4 and 8 of the drawings, it is necessary to provide two piling gage rods at each side of the rear of the pile of sheets. This can be conveniently accomplished by mounting two gage rods 50<sup>a</sup> in a single block 50<sup>b</sup> as shown in Fig. 4, the supporting block 50<sup>b</sup> being designed to be mounted upon the transverse adjusting screw 52 above described. With this arrangement, the gage

rods 50<sup>a</sup> will contact with the vertical sides of the pile of sheets B as shown in Fig. 8, one rod of each connected pair being arranged at the side of the pile, and the other rod of each pair being at the rear of the pile. These gage rods 50 or 50<sup>a</sup> operate in slots formed in the table 10. It will be clear that the slots will have to be arranged to suit the adjusted position of the piling gage rods. The drawings do not illustrate the slots in the table.

The sides 1 and 2 at the front of the machine overhang the automatic sheet separating devices, and the operative parts of said devices are mounted thereon. Vertical guide fingers 60 extend from a frame bar 61 in position to engage the angular recesses *b* of blanks B. Angular pile holding fingers 62 engage the top of the pile of blanks at opposite sides of the projections forming the bottom flap of the envelop. The engagement of the pile with said fingers 62 is maintained by the pile elevating mechanism.

Extending transversely of the machine at its forward end is a cam shaft 70 suitably journaled in the machine side frames and carrying at one end a sprocket wheel 71 over which operates a sprocket chain 72 driven by a sprocket wheel 73 keyed to the shaft 38 above referred to. By this means the cam shaft 70 is constantly rotated. The shaft 70 carries three cams 75, 76 and 77 for operating the blank separating devices in the manner which will now be explained. A rock shaft 80 is suitably journaled in the side frames of the machine parallel with the cam shaft 70 and a rock arm 81 extends forwardly and downwardly from the shaft 80 in the central longitudinal plane of the machine and has pivotally connected at 82 an upwardly extending arm 83 formed with a bifurcated upper end 84 in which is pivotally mounted a suction finger 85. The arm 81 journaled upon shaft 80 is formed integral with or otherwise rigidly connected with an oppositely extending arm 81<sup>a</sup> carrying in its free end an anti-friction roller 81<sup>b</sup> which operates in peripheral engagement with the cam 76 above referred to. The suction finger 85 is hollowed out and formed with a blank engaging suction cup in its under face in a manner well understood in this art and the tubular structure of said suction finger 85 is connected with a flexible hose 86 extending to an ordinary suction pump 87 pivotally mounted upon the frame at 88 and provided with an actuating piston rod 89 connected with a crank 90 driven by any suitable part of the machine. The suction finger 85 is pivotally mounted upon the upper end of a rod 91 which extends through an opening in frame bar 61 and has threaded upon its lower end an adjustable thumb nut 91<sup>a</sup> which is engaged by the forward end of a lever 92 mounted upon rock shaft 93

journaled in side frames 1 and 2 and carrying an anti-friction roller 94 operating upon the cam 75 above referred to. A spring 91<sup>b</sup> is confined upon rod 91 between suction finger 85 and lug 83<sup>a</sup> of arm 83 for the purpose of moving rod 91 upwardly and rocking the suction finger 85 when it engages a sheet. A link or pitman 96 is pivoted at 97 to the arm 83 and extends forwardly to the shaft 70 on which it is guided. This pitman 96 carries an anti-friction roller 98 operating upon the cam 77 above referred to. The rock shaft 80 has rigidly secured to it the upwardly projecting arms 100 and 101 arranged at an angle to each other. The arm 101 has pivoted to it at 102 a pitman 103 extending rearwardly to the shaft 38 upon which it is guided, and carrying an anti-friction roller 104 operating in peripheral contact with a cam 105 keyed to said shaft 38. A torsion spring 106 connecting shaft 80 with the machine frame causes pitman 103 to closely follow the movements of said actuating cam 105. There are two or more upwardly presented arms 100 upon the rock shaft 80 between the side frames of the machine, and journaled in the upper ends of said arms 100 is a shaft 110 having secured to it in the central longitudinal plane of the machine the bifurcated separating plate 111. The two parts of the separating plate 111 operate in the grooves 112 cut in the opposite edges of the arm 83 of the suction separating finger and are guided thereby in their movements inwardly and outwardly over the pile and are carried by the arm 83 when said arm is elevated and lowered. The separating plate 111 is formed with upwardly inclined portions 111<sup>a</sup> to form with the main part of the plate angular notches to engage the front edge of a blank for raising it from the pile, and moving it backward and upward into position to be taken by the cylinder grippers. Referring briefly to the operation of this automatic sheet separating mechanism, it will be observed that the cams 75, 76 and 77 cause the suction separating finger 85 to successively assume the positions illustrated in Figs. 5, 6 and 4. While the suction finger is performing these movements, the separating finger 111 is moved from the position shown in Fig. 5 to the position shown in Fig. 4, the final rearward movement under the action of cam 105 and spring 106 causing the separating finger to engage the edge of the blank and force it rearwardly to the position shown in Fig. 4, that is, curved up against the guide fingers 47. The partly separated sheet is held in this position until taken by the gripper mechanism which will now be described.

To facilitate the removal of sheets from the pile after their front edges have been segregated from the pile by the mechanism

above described, I prefer to raise the arms 46 and fingers 47 away from the pile immediately after the grippers have closed upon the leading edge of the sheet. To accomplish this, the cross bar 46<sup>a</sup> is extended beyond one of the arms 46 to provide a lug beneath which is presented a long rock arm 150 mounted on a rock shaft 151 carrying rock arms 152 having anti-friction rollers 153 operating in peripheral contact with a cam 154 mounted upon the cam shaft 70. This cam 154 is so timed in its operation that the arms 46 will be raised at the moment the gripper cylinder starts to pull the top sheet from the pile.

Journalled in the machine side frames above the pile of sheets in the automatic feeding mechanism just described, is the transverse cylinder shaft 38 above referred to. The shaft 38 has secured to it a plurality of transversely adjustable wheels or pulleys 125 constituting a sectional feed cylinder. The wheels or pulleys 125 are adjustably secured to shaft 38 by any suitable means such as set screws 125<sup>a</sup> shown in dotted lines in Fig. 4. Two of said wheels or cylinder sections 125 are formed with gripper slots or openings 126 through which project the curved gripper fingers 127, adjustably mounted upon a rock shaft 128 by means of set screws 127<sup>b</sup>. The shaft 128 is journalled in arms 129 which are adjustably secured to shaft 38, by any suitable means such as set screws 129<sup>a</sup> shown in Fig. 1. This gripper shaft 128 carries a small gear wheel 130 in constant mesh with a gear segment 131 journalled at 132 upon an arm 133 also secured to shaft 38. The gear segment also carries an antifricition roller 134 which runs in the cam groove of a stationary cam 135 secured to the side frame of the machine and through which the shaft 38 extends. The arms 129 can be adjusted independently around the shaft 38 within certain limits to properly register the sheet upon the gripper cylinder, that is, to cause the sheet to assume proper position with its longitudinal axis parallel with the direction of travel. The grippers 127 are also adjustable transversely of the machine upon their shaft 128 by means such as set screws 127<sup>b</sup>, and the cylinder sections 125 are similarly adjustable transversely of the machine upon their shaft 38 to adapt the machine to the feed of sheets of different sizes. The pair of gripper fingers 127 project rearwardly with reference to the direction of travel of the cylinder sections 125, and each finger is formed with a curved gaging face 127<sup>a</sup> which engages the edge of the sheet and crowds it backwardly in the closing movement so as to accurately register the sheet in the bite of the grippers. In the position shown in Fig. 4 of the drawings, the gripper fingers 127 are just about to close upon the raised edge

of a sheet, which is held in position for the engagement of the gripper fingers by the separating plate 111. Immediately after the position shown, the grippers close upon the blank and as the sectional gripper cylinder rotates in the direction indicated by the arrow, the sheet is drawn from the top of the pile and carried upwardly and delivered beneath the small frictional feed rollers 145 keyed to a shaft 146. The rollers 145 engage the sheet against the rotating gripper cylinder 125, and when the sheet is properly engaged by the rollers 145, the cam 135 releases the grippers 127 from the sheet and permits the sheet to be stripped from cylinder 125 by any suitable means (not shown) and fed onto a conveyer frame or other receiving mechanism of the machine to which the sheets are to be supplied for further operation. I have not shown in the accompanying drawings, the means for handling the sheet after it leaves the bite of the feed rollers 145 and gripper cylinders 125. In my above named original application Serial No. 557,879, the sheets or blanks pass at this point to the endless conveyer belt of an envelop machine. In other forms of machines, the successive sheets may be conveyed to the front gages of a printing press or of a folding machine. These various forms of mechanisms for transferring sheets from the automatic feeder proper to the machine which is to operate upon the sheets are well known in the art and will be understood without further explanation, since the present invention does not relate to the mechanism which operates upon the sheets after they are properly separated from the pile and delivered successively to the required point.

160 is the main power shaft of the machine provided with fast and loose pulleys 161 and 162 and with a fly wheel 163. This power shaft 160 has a driving pinion 164 which meshes with a large gear 165 journalled on a stud projecting from side frame 2 of the machine. This gear 165 meshes with and drives an intermediate gear 166 which in turn drives a larger gear 167 keyed to the end of the shaft 38 of the gripper cylinder. The shaft 146 carrying feed rollers 145 is driven by a gear 168 meshing with gear 167.

The described gearing for operating the parts of my feeding machine is taken from the application of the machine to an envelop machine, but it will be understood that the means shown and described for driving the parts are not essential to the present invention.

One of the important features of my improved automatic sheet separating and feeding machine is the arrangement by which the mechanism can be very compactly combined with a press or other machine to which sheets are to be supplied. The delivery mechanism of the improved machine is

mounted directly above the forward edge of the pile of sheets, upon which edge the sheet separating devices also operate, so that the sheets are successively pulled from the top of the pile and delivered in a higher plane in reversed position within the vertical limits of the original pile. With this arrangement, the space required for receiving sheets from the feeder and for imparting any final positioning or registering movement is located above the same floor space that is occupied by the pile of sheets. This arrangement does away with the floor space usually required for such conveying frames and adjusting devices. With the improved arrangement, the press or other machine can be located in close proximity to the rear face of the pile of sheets.

The improved separating devices form a very effective and rapidly operating mechanism for separating the sheets from the pile. The rocking motion of the pneumatic separating finger while in engagement with the front edge of a sheet causes an abrupt upward bend in the edge of the sheet which minimizes the chance of two sheets being moved from the pile at the same time. The means whereby the separated edge of the sheet is bent upward against the curved fingers resting on the top of the pile, insures an accurate register of the leading edge of a sheet in the grippers of the delivery cylinder so that the successive sheets are carried from the pile in uniform relation to the mechanism to which they are to be delivered, and the necessity for subsequent registering of the sheets is reduced to a minimum.

What I claim is:

1. In a paper feeding machine, the combination of an adjustable pile support, and separating means mounted adjacent to one edge of the pile of sheets upon said support, adapted to separate a sheet from the pile at its edge and raise the separated edge from the pile, of a rotary delivery cylinder provided with sheet engaging grippers mounted above said separating means, and adapted to engage the raised edge of a sheet and pull the sheet from the pile, and means for relatively adjusting said grippers circumferentially of the cylinder.

2. In a paper feeding machine, the combination of an automatically adjustable pile support, an arm resting upon the top of the pile, a separating device adapted to engage a sheet at one edge and bend the raised edge of the sheet upwardly against said arm, a delivery cylinder provided with sheet engaging grippers mounted above said separating device and adapted to engage a raised edge of a sheet and pull the sheet from the pile, and means for automatically and intermittently raising said arm out of contact with the top of the pile.

3. In a paper feeding machine, the com-

ination of an adjustable pile support, a gage arm resting normally upon the top of the pile upon said support, a separating device adapted to raise one edge of a sheet from the pile and bend the sheet upwardly against said gage arm, delivery mechanism adapted to engage the raised edge of a sheet and remove the sheet from the pile, a rock arm engaging said gage arm, and a cam actuating said rock arm for automatically and intermittently raising said gage arm out of contact with the top of the pile.

4. In a paper feeding machine, the combination of a pile support, a rotary delivery cylinder, grippers mounted upon said cylinder and formed with sheet engaging fingers and sheet registering faces adjacent to said engaging fingers, means for relatively adjusting said grippers circumferentially of the cylinder, means for presenting the leading edges of successive sheets into position to be taken by said cylinder grippers, and means for opening and closing said grippers.

5. In a paper feeding machine, the combination of a pile support, a rotary delivery cylinder, grippers journaled upon said cylinder and formed with sheet engaging fingers and curved registering faces adjacent to said engaging fingers, means for relatively adjusting said grippers circumferentially of the cylinder, separating means adapted to raise the leading edges of successive sheets from the pile and present them into position to be taken by said cylinder grippers, and means for opening and closing said grippers.

6. In a paper feeding machine, the combination of a pile support, a rotary gripper cylinder, a gripper bar mounted upon said cylinder, grippers carried by said bar and formed with registering faces, means for relatively adjusting the bearings of the gripper bar circumferentially of the cylinder, means for presenting the leading edge of successive sheets into position to be taken by said cylinder grippers, and means for opening and closing said grippers.

7. In a paper feeding machine, the combination of a pile support, a sheet conveying rotary gripper cylinder, independently adjustable shaft bearings mounted upon said cylinder and adjustable circumferentially thereof, a gripper shaft journaled in said bearings and carrying sheet engaging grippers formed with registering faces, separating means for raising and presenting the leading edge of successive sheets into position to be taken by said cylinder grippers, and means for opening and closing said grippers.

8. In a paper feeding machine, the combination of a pile support, a sheet reversing rotary gripper cylinder mounted above said pile support and formed of independently adjustable wheel sections capable of transverse and circumferential adjustment, ad-

justably mounted grippers upon said cylinder, means beneath said cylinder for presenting the leading edges of successive sheets into position to be taken by said cylinder grippers, and means for opening and closing said grippers.

9. In a paper feeding machine, the combination of a pile support, a rotary gripper cylinder formed of independently adjustable wheel sections capable of transverse and circumferential adjustment, adjustably mounted grippers upon said sectional cylinder, separating means for raising and presenting the leading edges of successive sheets into position to be taken by said cylinder grippers, and means for opening and closing said grippers.

10. In a paper feeding machine, the combination of a pile support, and suitable sheet delivery mechanism, with an arm engaging the top of a pile of sheets, a sheet separating device comprising a sheet engaging finger adapted to take hold of the edge of a sheet and raise it upwardly, and a separating plate adapted to move inwardly into engagement with the raised edge of the sheet and move it away from the engaging finger and bend it upwardly against said arm.

11. In a paper feeding machine, the combination of an automatically adjustable pile support, and suitable sheet delivery mechanism, with an arm engaging the top of a pile of sheets, and a sheet separating device comprising a sheet engaging finger adapted to take hold of the edge of a sheet and rock upon the pile to bend the edge of the sheet upwardly at an abrupt angle, and a separating plate adapted to move inwardly into engagement with the raised edge of the sheet and move it away from the engaging finger and bend it upwardly against said arm.

12. In a paper feeding machine, the combination of a pile support, a delivery cylinder mounted upon said support and provided with sheet engaging grippers, an arm engaging the top of a pile of sheets upon said support, and a sheet separating device comprising a sheet engaging finger adapted to take hold of the edge of a sheet and raise it upwardly, and a supporting plate adapted to move inwardly above the pile and engage the raised edge of the sheet and move it away from the engaging finger up against said arm into position to be taken by said gripper cylinder.

13. In a paper feeding machine, the combination of a support for a pile of sheets, and means for separating and feeding sheets from the pile upon said support, with screws extending longitudinally of the machine, means for rotating said longitudinal screws, blocks threaded upon said longitudinal screws, right and left transverse screws journaled in said blocks, means for rotating said transverse screws, and piling gage rods

adjustably supported by said transverse screws.

14. In a paper feeding machine, the combination of a support for a pile of sheets, and means for separating and feeding sheets from the pile upon said support, with screws extending longitudinally of the machine, means for rotating said longitudinal screws, longitudinally movable blocks threaded upon said longitudinal screws, right and left transverse screws journaled in said longitudinally movable blocks, means for rotating said transverse screws, transversely adjustable blocks upon said transverse screws, piling gage rods depending from said transversely adjustable blocks in position to engage a pile of sheets upon said support, and guide rods extending from said transversely adjustable blocks and engaging a part of the machine frame to hold said piling gage rods in operative position.

15. In a paper feeding machine, the combination of a support for a pile of sheets, and means for separating and feeding sheets from the pile upon said support, with screws extending longitudinally of the machine, means for rotating said longitudinal screws, blocks threaded upon said longitudinal screws, right and left transverse screws journaled in said blocks, means for rotating said transverse screws, piling gage rods threaded upon and supported by said transverse screws, guide rods extending from said piling gage rods, and a transverse frame bar formed with a guide slot into which said guide arms project to hold said piling gage rods in operative position.

16. In a paper feeding machine, the combination of a support for a pile of sheets, elevating mechanism for said support including a ratchet wheel and an actuating pawl, means for operating said pawl, a gage arm normally resting upon the top of the pile of sheets carried by said support, a rock shaft supporting said gage arm, a rock arm projecting from said rock shaft, a controlling plate pivotally mounted upon said rock arm and supported beneath said actuating pawl to control its operation in accordance with the height of the top of the pile, suitable sheet delivery mechanism, and a sheet separating device adapted to engage the edge of a sheet and bend it upwardly against said gage arm in position to be taken by said delivery mechanism.

17. In a paper feeding machine, the combination of a support for a pile of sheets, elevating mechanism for said support including a ratchet wheel and an actuating pawl, means for operating said pawl, a gage arm normally resting upon the top of the pile of sheets carried by said support, a rock shaft supporting said gage arm, a rock arm projecting from said rock shaft, a controlling plate pivotally mounted upon said

rock arm and supported beneath said actuating pawl to control its operation in accordance with the height of the top of the pile, an adjustable support mounted beneath said controlling plate to regulate its position, suitable sheet delivery mechanism, and a sheet separating device adapted to engage the edge of a sheet and bend it upwardly against said gage arm in position to be taken by said delivery mechanism.

18. In a paper feeding machine, the combination of a support for a pile of sheets, elevating mechanism for said support including a ratchet wheel and an actuating pawl, means for operating said actuating pawl, a check pawl engaging said ratchet wheel and located above said actuating pawl, a gage arm normally resting upon the top of the pile of sheets carried by said support, a rock shaft supporting said gage arm, a rock arm projecting from said rock shaft, a controlling plate pivotally mounted upon said rock arm and supported beneath said actuating pawl to control its operation in accordance with the height of the top of the pile, an adjustable support mounted beneath said controlling plate to regulate its position and adapted to raise the plate into engagement with said actuating pawl to cause said actuating pawl to engage said check pawl, whereby both pawls may be disengaged from the ratchet wheel to permit the free operation of the pile support in either direction, suitable sheet delivery mechanism, and a sheet separating device adapted to engage the edge of a sheet and bend it upwardly against said gage arm in position to be taken by said delivery mechanism.

19. In a paper feeding machine, the combination of an adjustable support for a pile of sheets, and suitable sheet delivery mechanism, with a pneumatic separating finger supported above one edge of the pile of sheets, means for rocking said separating finger while it is in engagement with the top sheet of a pile, means for raising and lowering said finger with relation to the pile, a sheet separating plate cooperating with said pneumatic separating finger, and means for moving said separating plate inwardly and outwardly above the pile to engage the edge of a sheet raised by said separating finger and move it into position to be taken by said delivery mechanism.

20. In a paper feeding machine, the combination of an adjustable support for a pile of sheets, with a pneumatic separating finger supported above one edge of the pile of sheets, means for rocking said separating finger while in engagement with the top sheet of a pile, means for raising and lower-

ing said finger with relation to the pile, a sheet separating plate cooperating with said pneumatic separating finger, means for moving said separating plate inwardly and outwardly above the pile substantially as set forth, and a gage arm resting upon the pile against which a sheet is bent upwardly by said separating plate.

21. In a paper feeding machine, the combination of an adjustable support for a pile of sheets, with a pneumatic separating finger supported above one edge of the pile of sheets, means for rocking said separating finger while in engagement with the top sheet of a pile, means for raising and lowering said finger with relation to the pile, a sheet separating plate formed with sheet engaging notches, cooperating with said pneumatic separating finger, and means for moving said separating plate inwardly and outwardly above the pile substantially as set forth.

22. In a paper feeding machine, the combination of an adjustable support for a pile of sheets, with a pneumatic separating finger, a vertically movable arm upon which said separating finger is pivotally mounted, a rock arm upon which said vertically movable arm is pivoted, means for rocking said separating finger upon its supporting arm, a separating plate having sliding engagement with said vertically movable arm, means for moving said separating plate inwardly and outwardly above the pile, and means for rocking said rock arm.

23. In a paper feeding machine, the combination of an adjustable support for a pile of sheets, with a sheet separating mechanism including a pneumatic separating finger, two rods or arms pivotally connected with said separating finger for supporting and operating it, independently operated rock arms engaging said rods or arms, and a separating plate engaging one of said rods or arms and adapted to be moved inwardly and outwardly over the pile of sheets.

24. In a paper feeding machine, the combination of an adjustably mounted support for a pile of sheets, with a pneumatic separating finger 85, rods 83 and 91 pivotally connected with said separating finger, rock arm 81 connected with rod 83, rock arm 92 engaging rod 91, means for rocking rod 83 upon its supporting rock arm 81, a rock arm 100, and a separating plate 111 mounted upon arm 100 having sliding engagement with rod 83.

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Witnesses:

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