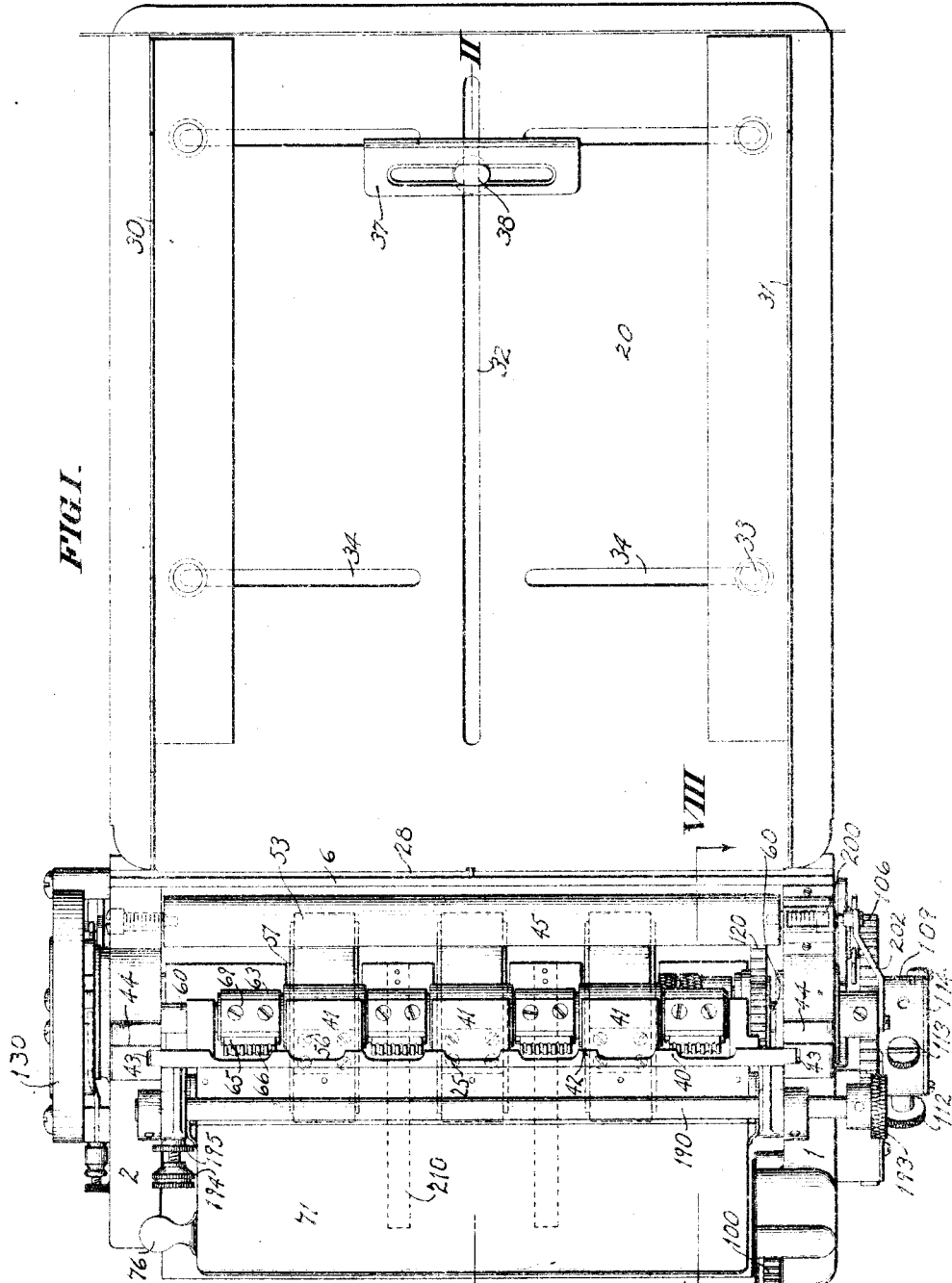


S. A. NEIDICH.
 AUTOMATIC PAPER FEED.
 APPLICATION FILED SEPT. 14, 1912.

1,122,793.

Patented Dec. 29, 1914.

6 SHEETS—SHEET 1.



WITNESSES:

Justin W. Macklin
Brennan West

INVENTOR:

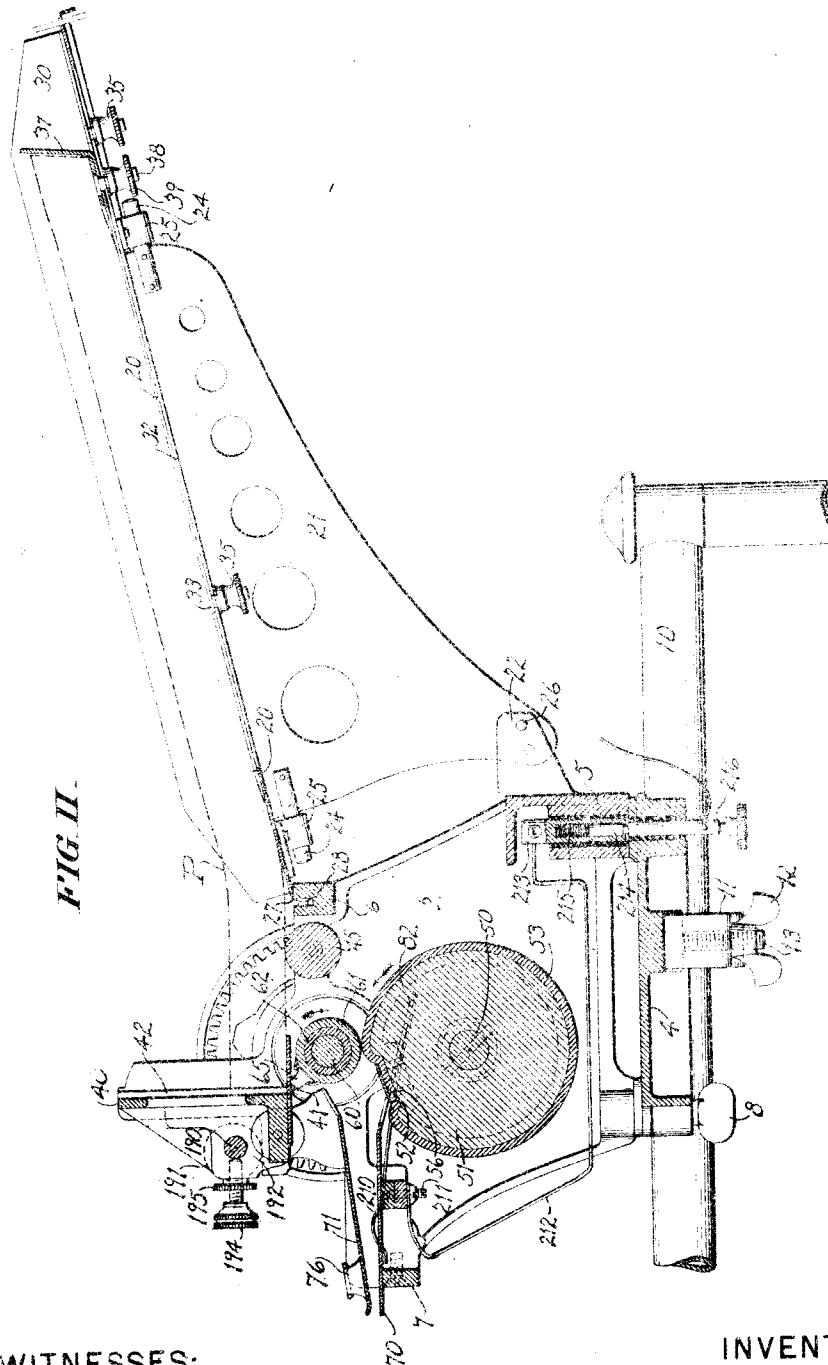
Samuel A. Neidich
 By *Albert H. Bates*
 Attorney

S. A. NEIDICH.
 AUTOMATIC PAPER FEED.
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Patented Dec. 29, 1914.

6 SHEETS-SHEET 2.

1,122,793.



WITNESSES:

Justus & W. M. Acklin
Perman & West

INVENTOR:

Samuel A. Neidich
By Albert H. Bates
Attorney.

S. A. NEIDICH.
AUTOMATIC PAPER FEED.
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6 SHEETS-SHEET 3.

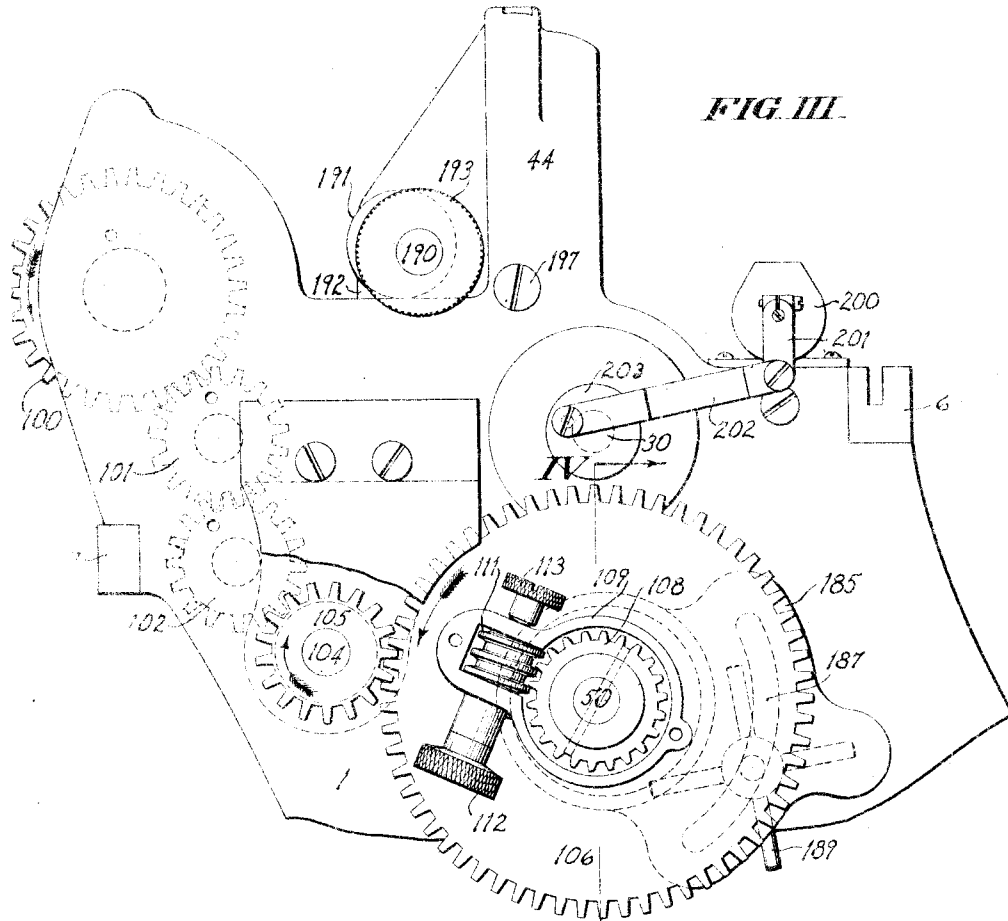


FIG. III.

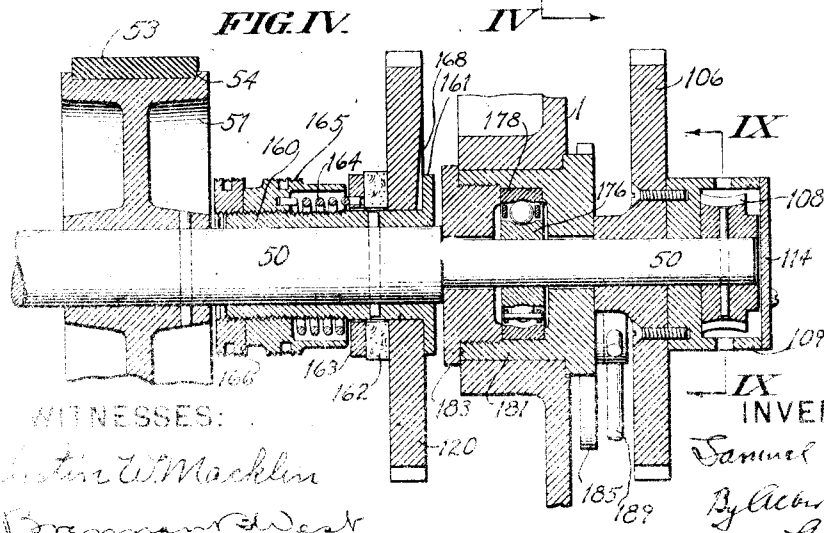


FIG. IV.

IV →

IX ←

INVENTOR:

Samuel A. Neidich,
By Albert H. Davis,
Attorney.

WITNESSES:

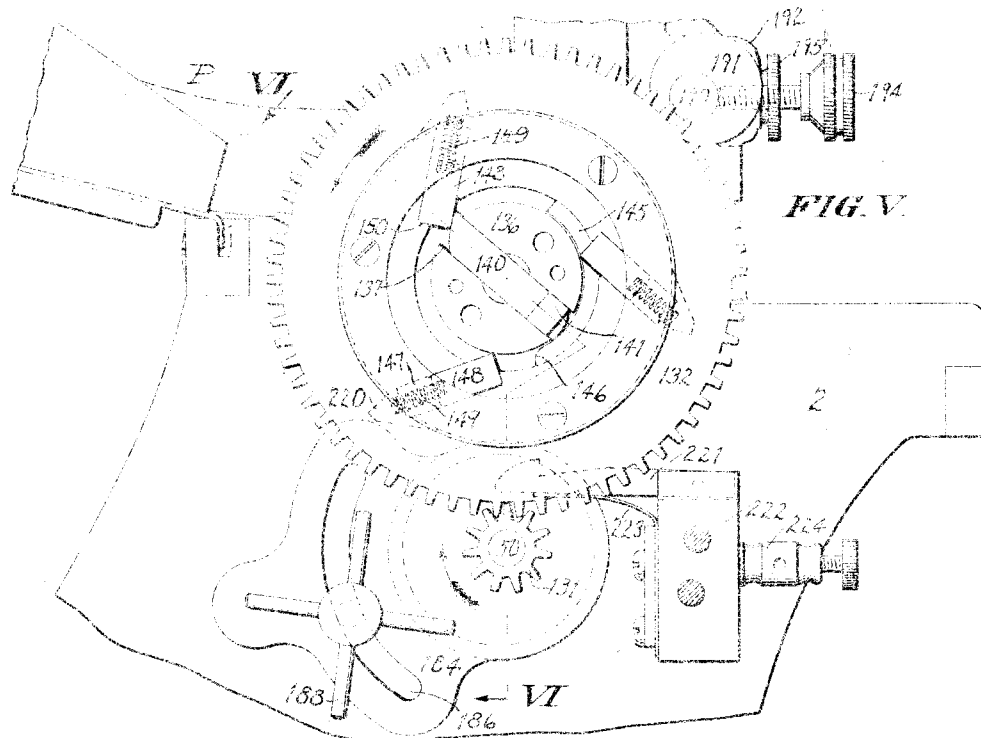
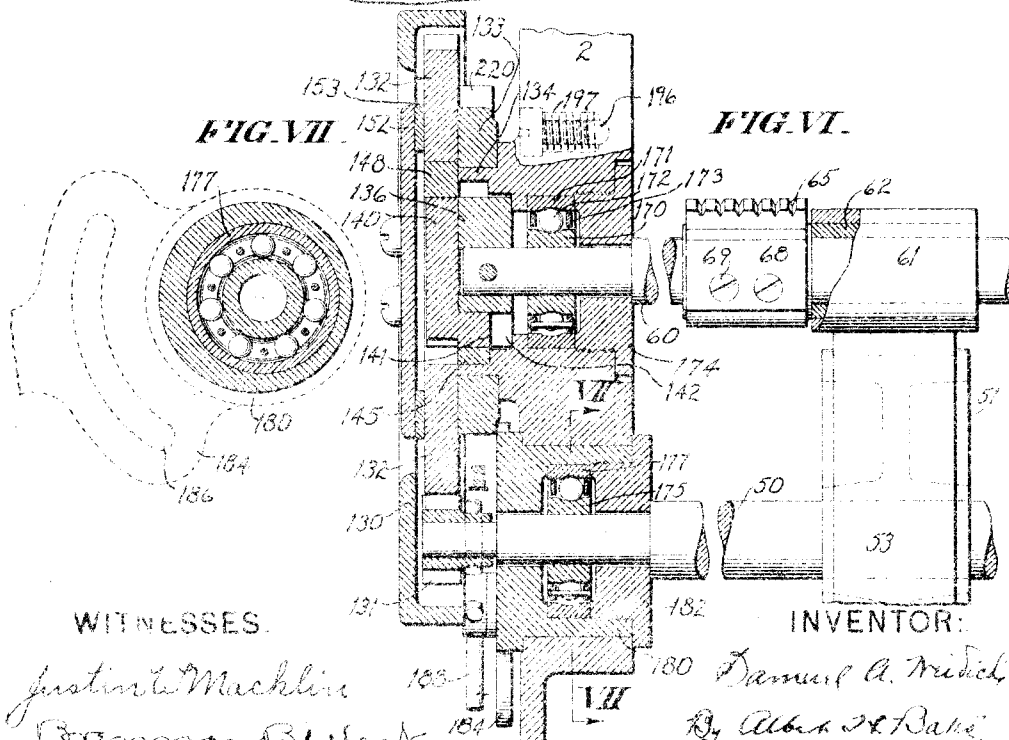
Justin W. Macklin
Brennan & West

1,122,793.

S. A. NEIDICH.
AUTOMATIC PAPER FEED.
APPLICATION FILED SEPT. 14, 1912.

Patented Dec. 29, 1914.

3 SHEETS-SHEET 4.



WITNESSES.

Justin L. Macklin
Brennan B. West

INVENTOR:

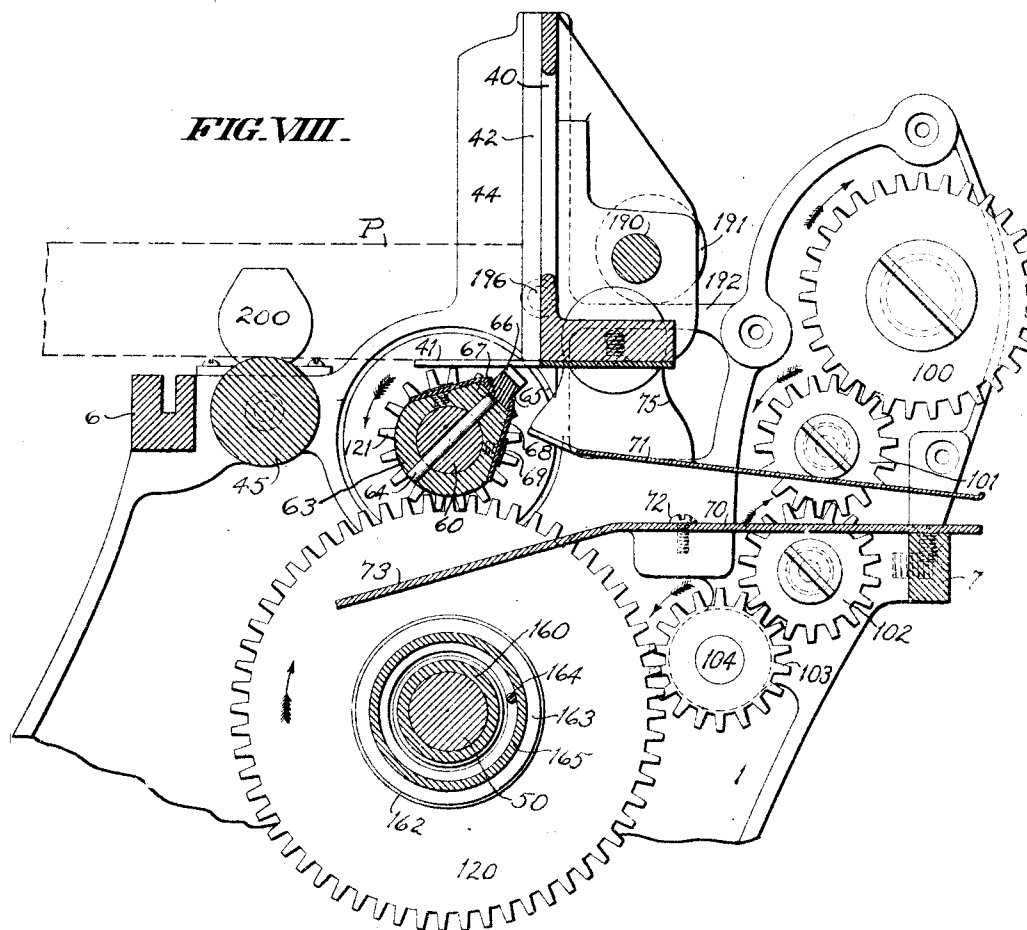
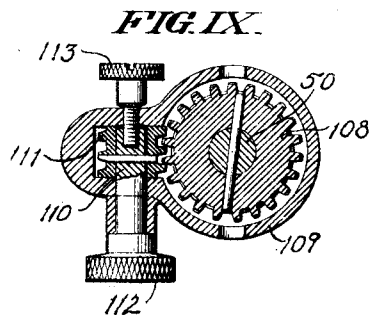
Samuel A. Neidich
By Albert H. Baker,
Attorney.

1,122,793.

S. A. NEIDICH.
AUTOMATIC PAPER FEED.
APPLICATION FILED SEPT. 14, 1912.

Patented Dec. 29, 1914.

6 SHEETS—SHEET 5.



WITNESSES:

Justin W. Macklin
Brennan West

INVENTOR:

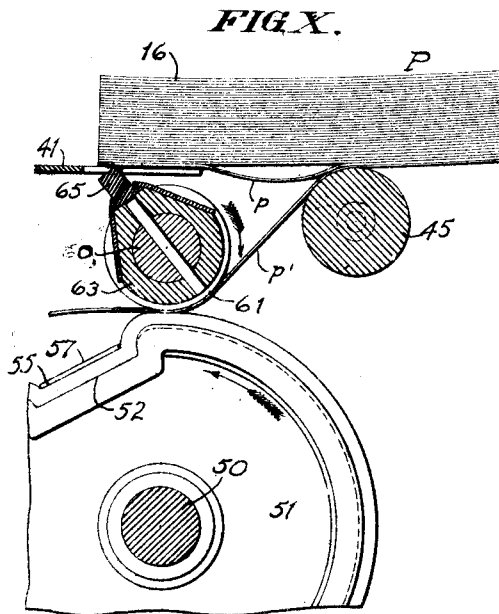
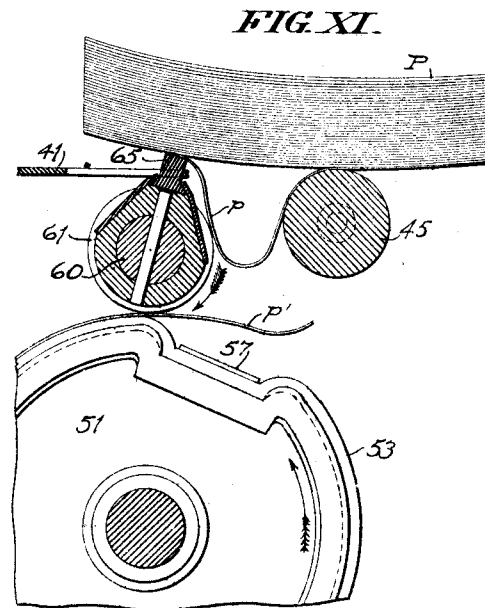
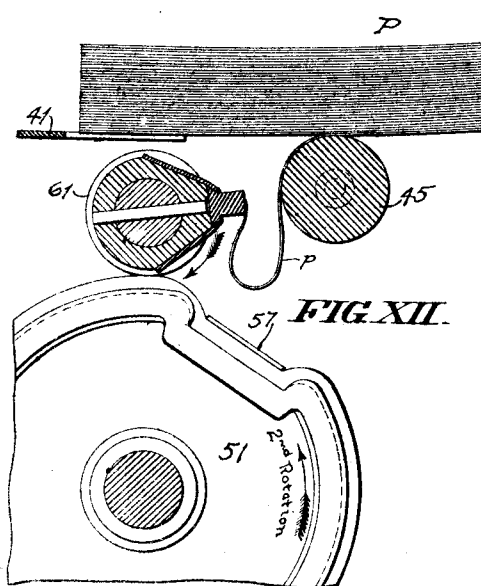
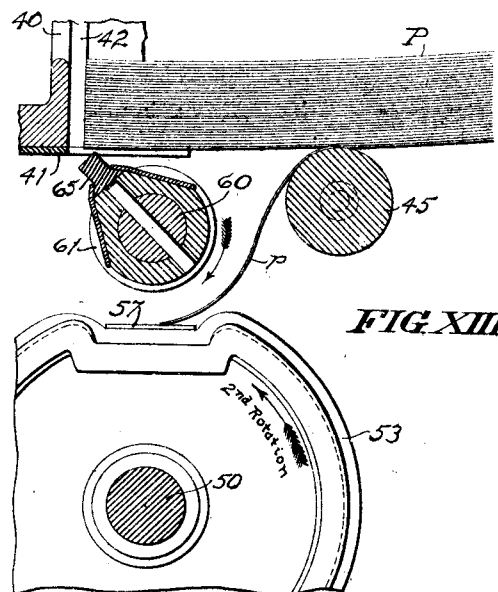
Samuel A. Neidich
By Albert H. Baker,
Attorney

S. A. NEIDICH.
 AUTOMATIC PAPER FEED.
 APPLICATION FILED SEPT. 14, 1912.

1,122,793.

Patented Dec. 29, 1914.

6 SHEETS—SHEET 6.



WITNESSES:

Justin W. Macklin
 Foreman & West

INVENTOR:

Samuel A. Neidich,
 By Albert H. Baker,
 Attorney.

UNITED STATES PATENT OFFICE.

SAMUEL ABRAHIMS NEIDICH, OF BURLINGTON, NEW JERSEY, ASSIGNOR TO THE AMERICAN MULTIGRAPH COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

AUTOMATIC PAPER-FEED.

1,122,793.

Specification of Letters Patent.

Patented Dec. 29, 1914.

Application filed September 14, 1912. Serial No. 720,400.

To all whom it may concern:

Be it known that I, SAMUEL A. NEIDICH, a citizen of the United States, residing at Burlington, in the county of Burlington and State of New Jersey, have invented a certain new and useful Improvement in Automatic Paper-Feed, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The general object of this invention is to provide simple and effective mechanism for feeding sheets of paper with rapidity and certainty. In accomplishing this I provide a number of novel cooperating mechanisms and features of operation, the principal ones of which may be briefly outlined, as follows:

First: A dislodging mechanism for the forward portions of successive sheets which acts slowly during its engagement with the paper and thereafter has a quick return for the next engagement, whereby the speed of wiping the paper from its pile is decreased (giving certainty to the withdrawing action) without delaying the operation of the feeding mechanism as a whole.

Second: The employment of a recessed feed roller which acts on the dislodged sheet to advance it, but has its recess receiving the forward end of a sheet while the rear portion is still held by the pile so that a variable interval is allowed before its engagement so that the advancement of the paper is governed according to the position of the pile and is independent of the speed of dislodgment. This insures accuracy of registration. The feed roller acts on the bottom sheet dislodged from the pile and serves to advance this sheet while the dislodging mechanism is acting on the next sheet. By continually working on two sheets in this manner great speed is attained.

A third feature is the making of the dislodger in the form of revolving fingers mounted on a shaft which carries counter-pressure rolls for the feed roller mentioned. This contributes to the simplicity and compactness of the mechanism.

A fourth feature consists of the mechanism I have devised for giving the comparatively slow rotary movement to the shaft carrying the wiping fingers during the engagement of these fingers and a rapid movement for the rest of the rotation.

A fifth feature relates to simple and effective adjustments for papers of different weights, stiffness, etc., and the arrangements enabling convenient access to the various parts, and their convenient replacement or repair.

A sixth feature is an automatic control-ling device throwing the mechanism out of action in case two or more sheets be fed at once, thus preventing any undesirable action in the machine which receives the fed sheets.

Other features contributing to the general efficiency of the mechanism will be referred to in connection with a description of a convenient embodiment of my invention shown in the drawings hereof and hereinafter described. It should be premised, however, that I do not intend to limit myself to such type of embodiment, as I claim to have discovered a new principle and invented new means for feeding paper sheets, and intend to claim the same with all the breadth allowed by law. The specific embodiment shown in the drawings, however, has been devised by me and is accordingly specifically included within my invention.

In the drawings Figure I is a plan of a convenient form of my paper feeding mechanism. Fig. II is a vertical section of such mechanism, as indicated by the line II—II on Fig. I. Fig. III is an enlarged side elevation of a portion of the mechanism looking in the same direction as Fig. II. Fig. IV is a vertical section along the feed roller shaft as indicated by the line IV—IV in Fig. III. Fig. V is a portion of a side elevation from the opposite side of the machine to that shown in Fig. III. Fig. VI is a substantially vertical section through the feed roller shaft and the dislodging finger shaft and their driving mechanism is indicated by the offset line VI—VI on Fig. V. Fig. VII is a detail illustrating the adjustable bearing for the feed roller shaft, this view being a vertical section on the line VII—VII of Fig. VI. Fig. VIII is a vertical section through the feeding mechanism as indicated by the line VIII—VIII of Fig. I. Fig. IX is a detail illustrating the adjustment of the driving gear on the feed roller shaft, as indicated by the line IX—IX on Fig. IV. Figs. X to XIII inclusive are diagrams, in the nature of vertical sections,

illustrating the action of the dislodging fingers and feeding roller.

In the particular embodiment of my automatic feeding mechanism shown in the drawings, the frame which supports the various parts consists of a pair of vertical end plates 1 and 2 and cross members connecting them, of which four are shown, namely: the bottom plate 4 and the cross bars 5, 6 and 7. The cross bars are permanently secured to the end plates while the bottom plate is rigidly secured thereto in practice but easily removable to allow access to the interior. This removable fastening is shown as provided by thumb screws 8 screwing through the bottom plate into the end plates.

The frame is designed to rest on a suitable support, as, for example, a stand which may carry the printing machine or other device with which the feeding mechanism cooperates. In Fig. II is illustrated a tubular metal stand for this purpose, which has a pair of parallel top bars 10. In such case the bottom plate 4 is formed with bottom recesses to seat on such top bars. To clamp the feeding mechanism in desired position on the stand, I provide the clamping bars 11, which may be drawn tightly against the under side of the top bars of the stand by thumb nuts 12 screwing onto the threaded studs 13 carried by the base plate.

Figs. I and II show suitable means, mounted on the frame described, for supporting a pile of paper in an approximately horizontal position, and my feeding mechanism is designed to act on the bottom sheet of such pile and dislodge it from the pile and feed it to any subsequently acting mechanism, as desired. The paper support consists of an inclined but approximately horizontal plate 20 supported by brackets 21, which project from the under side of the plate and are connected at their lower ends with ears 22 on the cross bar 5.

For convenience in shipping and storing, the brackets 21 are preferably plates hinged to the plate 20, this being accomplished by providing the bracket plates with projecting gudgeons 24, which occupy eyes 25 secured on the under side to the plate 20. At their lower portions the bracket plates may have openings adapted to receive pins 26 projecting from the ears 22. The forward edge of the plate is turned downwardly, as at 27, and is adapted to occupy a groove 28 in the frame cross bar 6. The spring of the parts allows this down-turned edge to be put into the groove and the brackets to be put on the pins 26, after which they remain rigidly in place.

The paper support 20 has a pair of side guides 30 and 31 which stand vertically above the plate and have lateral flanges on the top surface of the plate. These guides are held in adjusted position laterally by

flat headed screw bolts 33 passing through the horizontal flange of the guide and through slots 34 in the top plate and having thumb nuts 35 below the top plate. An end guide is provided for the paper consisting of the upright piece 37, having a flange lying along the top surface of the plate and held by a bolt 38, which has a thumb nut 39. This bolt operates through a longitudinal slot 32 in the plate 20.

The guides described locate the sides and rear end of the pile of paper. The forward end of such pile (shown in dotted lines in Fig. II, and indicated by P) abuts a vertical stop plate 40 and rests upon a plate 41 projecting horizontally from the bottom of the stop plate toward the supporting plate 20. The face of the stop plate 40 has ribs 42 which the forward edge of the paper engages, thus reducing the friction. The plate 41 is notched, thus providing a set of fingers between which the wiping devices, hereinafter described, act. The vertical plate 40 stands in ways 43 in upward portions 44 of the frame plates 1 and 2, and is adjustable therein by means hereinafter described.

Directly in front of the frame bar 6 is an idle roller 45 carried by the frame. The pile of paper designated rests on the fingers 41, the roller 45 and the plate 20. It is guided in front by the ribs 42 and at the rear by the stop plate 37 and at the two sides by the guides 30 and 31. It is to be understood that the side guides and rear guide are adjusted in position according to the size of paper, so that the block of paper is definitely located in position.

My mechanism provides wiping fingers which act rearwardly between the notches of the supporting plate 41 and shove the forward portion of the bottom sheet rearwardly so that it buckles down between such fingers and the roller 45. Then, this sheet is acted upon by feed rollers and counter rollers which grasp it between them and feed it forward, and while such forward feeding is going on, the wiping fingers having returned rapidly to normal position, act rearwardly on the next sheet to gradually buckle it into position for the feed rollers to receive it as soon as the preceding sheet clears them. This wiping and feeding mechanism, which constitutes an important part of the present invention will now be described.

Referring first to Figs. I and II, there will be seen two shafts 50 and 60 located one over the other and extending transversely between the frame plates 1 and 2, in which they are mounted. If desired, each shaft may be mounted at its ends in ball bearings, and means may be provided for adjusting some of such bearings to mutually position the shafts. Such is the form here shown, which will be described hereinafter.

rigidly secured on the shaft 50 are a series of wheels 51, each having in its periphery a recess 52. Secured about the periphery of this shaft is an elastic facing 53, preferably of soft rubber. This may conveniently be made by a ring of elastic cementing about the wheel and seating in a shallow peripheral groove 54 (Fig. IV) formed and passed into the recess, and there held and clamped by a plate 55 in the recess secured by screws 56 to the body of the wheel. The plate 55 is thin and extends beyond its recess designed to fit the periphery of the fixed wheel or feed roller. This recess forms no important feature of the invention described.

Directly over the wheels 51 are metal sleeves 57 (preferably provided with hardened bearings) loosely mounted on the shaft 50, and carrying on their periphery the respective feed rollers 58. On this shaft 50 between the successive rollers 58 are wiping fingers, each of which consists of a body 63 (Figs. I and VIII for example) surrounding the shaft and pinned to it by a pin 64, and a wiping strip 65 secured at one side of the body. This strip is shown as a piece of soft rubber having the notched edge 66 and the projecting base 67 and is secured to the body by overhanging plates 68 held to the body by screws 69.

From what has been above described, it will be seen that, if the shafts 50 and 60 are rotated in the direction of arrows in Fig. 11, the bottom sheet of paper will be dislodged from the pile P at its forward end by the wiping fingers 63. This forward end will then pass downwardly in a buckle between the shaft 60 and the roller 55 so that its forward edge can pass between the rollers 61 and the soft periphery 53 of the feed roller 51 and be fed forwardly by these rollers along the guide plate 70 and beneath the overhanging guide plate 71 and may then be delivered to any suitable machine, as desired. The guide plate 70 is secured to the cross bar 7 and at 72 (Fig. VIII) to a frame plate 73, and has rearwardly projecting fingers 73 extending between the wheels 51.

To obtain an effective and certain dislodgment of the paper by the wiping fingers, it is necessary that they act comparatively slowly while in contact with the paper. After being dislodged, however, the paper may be fed by the feed rollers 51 and 61 rapidly. In order to allow the necessary slow wiping action without retarding the speed of delivery, I have devised the feature of giving the wiping members a differential speed of rotation, so that they operate slowly during the active portion of their movement and then have a rapid movement in completing their rotation, and all the while the feed rollers have a uniform,

comparatively, high speed of rotation. This differential speed is one of the important features of this invention. The particular mechanism by which I accomplish it, it may be noted, has been invented by me and is included in this application, but I do not intend to limit myself to this or any particular means for effecting this operation.

I find that less than one third of a rotation gives sufficient contact of the wiping fingers with the paper. And, therefore, I prefer to give the wiping fingers their slow movement for a little less than a third of a rotation, the remainder of the rotation being given with great rapidity,—for example, at a speed about twenty times as fast as the slow movement; that is to say, at a rate to return the finger idly in about one tenth of the time of their active movement. It is evident, therefore, that by confining the slow movement to a little less than a third of a rotation, I may make the complete rotation approximately three times as fast as would be possible for a uniform rotation having the same wiping speed, or conversely, I may wipe the paper approximately three times as slowly as would result from a uniform speed of rotation and have the same speed of delivery.

The wiping fingers and feed roller are mutually timed, so that, when the wiping fingers turn down the forward portion of the bottom sheet, the extreme front edge passes into the recess in the feed roller while the rear portion of the sheet is held by the pile of paper above it. The paper remains in this position during a short interval until the shoulder of the feed roller following the recess comes into coaction with the cooperating or counter roller. This shoulder pinches the paper at a definite distance from its forward end, irrespective of the distance it is projected into the recess. That is to say, the paper can not be engaged for feeding by the rollers 51 and 61 until the cylindrical periphery of the roller 51 comes into the coaction with the roller 61 and it is therefore immaterial what exact position the recess occupies when the forward edge of the paper comes into it.

The paper being always gripped at a definite point thereof by a definite point on the feed roller, it results that the position of the fed sheet depends on its position in the pile and is independent of the speed of operation, and accordingly very accurate registration is possible. If an increase or decrease in speed results in the wiping fingers throwing the paper down into the recess in various positions thereof, this causes no interference with the registration or the uniformity of the feed, for the paper stands idly in the recess during the variable interval until the main periphery of the feed roller comes into action.

The dislodging and feeding operation is illustrated in the diagrams, Figs. X to XIII, it being understood that the feed roller makes two rotations for each complete revolution of the wiping fingers.

Fig. X shows wiping fingers beginning to act on a sheet *p* which is at the bottom of the pile at the forward end or is next to the bottom sheet of the main portion of the pile, for, while this is going on a sheet *p'*, previously dislodged, is being fed from the bottom of the pile between the rollers 51 and 61.

Fig. XI shows the operation after the shaft 60 has turned the fingers 65 through substantially half of their wiping movement, the forward part of the pile being lifted by the fingers 65 acting through the notches in the plate 41, and the sheet *p* being buckled downwardly between the roller 45 and the fingers. During this movement, the sheet *p'* has been fed by the rollers 51 and 61 into the grasp of the printing mechanism or intermediate advancing rolls (not shown) which take care of the sheet before the recess 57 reaches the counter roller.

Fig. XII shows the parts just after the wiping fingers completed their slow movement and have started on their quick return. This quick return starts just after the fingers clear the bottom of the pile and it operates to carry downwardly the forward end of the sheet, as the recess 57 is approaching on the second rotation of the feed roller. Before this the sheet *p'* has passed beyond the grasp of the feed rollers.

Fig. XIII shows the position of the parts after the wiping fingers have completed their quick return and are ready to start on the next slow action. During this quick movement the forward end of the dislodged sheet is turned down into the recess of the feed roller, presented on the second rotation of that roller. The forward end of the paper, when dislodged, will always occupy a definite position, because the rear portion of that sheet remains held on the bottom of the pile. Though the position of the recess relative to this forward end may vary with the speed of operation, as above explained, the paper is not drawn from the pile until the shoulder of the rubber tire 53 at the rear of the recess engages the paper, clamping it between the feed roller and the roller 61 and thereby feeding it.

It should be noted that the two rotations of the feed rollers, allowed for each sheet, enable sheets of greater length than the periphery of the feed rollers to be fed. When, at the completion of the first rotation, the recess in the feed roller comes opposite the counter roller 61, the paper has been fed sufficiently so that it may be grasped by the subsequently acting printing press, or other mechanism, which takes care of the feed at this point. Then, before the next

rotation is completed, the sheet has passed clear of the feed roller and the latter is free to act on the next sheet.

I will now describe the mechanism by which I give the desired movement to the wiping fingers and feed rollers. On the inner face of the frame plate 1 is a main gear 100 which is designed to mesh with a suitable driving member (not shown) as, for example, with a gear on one of the drums of a rotary printing machine. This gear 100 meshes with an idler 101 (Figs. 3 and 8) which meshes with another idler 102, each on studs carried by the frame plate, and the idler 102 meshes with a gear 103 on a shaft 104 mounted in the frame plate. On the outer end of this shaft 104 is a pinion 105 meshing with a large gear 106, which is rigidly connected during operation (though adjustably, as hereinafter described) to the shaft 50. Accordingly, whenever the printing press is rotated, the shaft 50 is rotated at a corresponding speed. It is to be understood that the diameter of the feeding rollers 51 is the pitch diameter of the gear 106, so that the feeding action of these rollers is that of the printing mechanism, or other mechanism, which receives the paper.

To adjustably connect the gear 106 with the shaft 50, enabling the correct positioning of the feed rollers 51 I secure on the shaft 50, at its end, a worm wheel 108 (Figs. 3 and 4) which lies within a housing 109 secured on the outer face of the gear 106. Mounted in this housing is a rotatable shaft 110 (Fig. 1X) having a worm 111 meshing with the worm wheel. On the other end of the shaft is a knurled head 112 by which it may be turned. A set screw 113 may be employed to jam the worm shaft, preventing any looseness. A cap 114 over the housing protects the parts.

The mechanism just described enables correct positioning of the feed rollers to effect proper registration. The entire positioning may be effected by this adjustment, since the worm may turn the worm wheel and shaft completely around, but it is simpler to make an approximate adjustment by sliding the whole feeding apparatus away from the printing mechanism, thereby disengaging the gear 100, and then approximately positioning the feed rollers, and giving the close adjustment by the worm and worm wheel described.

Rotationally held on the shaft 50 on the inner side of the frame plate 1 is a gear 120, which I have shown as of the same size as the gear 106. This gear 120 meshes with a pinion 121 rigid on the shaft 60. As shown, the gear 120 is something over three times the pitch diameter of the pinion 121, wherefore the angular velocity of the shaft 60 is approximately three times that of the feed rollers. This provides for the high speed

portion of the revolution of the wiping fingers. To provide for the slow speed operation I introduce other gearing which holds back the fingers, enabling the gear 120 to slip on its bearing.

The mechanism which retards the movement of the wiping fingers is mounted on the outer side of the frame plate 2 and is normally covered by a gear casing 130 (Fig. 1). Within this casing is a small pinion 131 (Figs. V and VI) on the end of the shaft 60, and this pinion meshes with a large gear 132 mounted coaxially with the shaft 60. The pinion 131 is shown as having a pitch diameter one-sixth that of the gear 132. Therefore, if the gear 132 be locked to the shaft 60 it will prevent that shaft rotating faster than one-sixth as fast as the shaft 60, and during such locking the gear 120 will slip on its bearing, or rather, the bearing will slip within the gear.

The gear 132 has formed on its inner face a hub 133, which bears on an annular bearing 134 projecting from the side of the frame plate 2. Rigidly secured on the end of the shaft 60 is a round head 135 which lies some distance within the stationary sleeve 141. This head has a diametric notch 137 in it, and in this notch is a sliding trigger 140 having near one end an inwardly extending lug 141. This lug is adapted to co-act with an arcuate cam 145 within the sleeve 141, and such engagement projects the other end of the trigger correspondingly beyond the periphery of the head 135. Set into tangential recesses 147 in the body of the gear 132 are a series of dogs 148 (three being shown). Each dog is pressed inwardly of the gear (outwardly of the recess) by a spring 149 in the recess, such movement of the dog being stopped by its engaging the shoulder 150 of the gear. 132 indicates a plate covering the trigger mechanism described and being secured to the outer face of the gear 132, clearance being allowed by the distance ring 153.

From the mechanism above described, it will be seen that when the lug 141 is in engagement with the cam 145, the trigger stands forced outwardly at its engaging end, wherefore it is in position to be engaged by any of the dogs 148. Now, the wiping fingers are so positioned on the shaft 60 that, as they come into active position the dog 148 of the trigger rides up on the inclined end 146 of the cam 145 and the trigger is thereby forced radially in the opposite direction and thus meets the projecting face of a pawl 148. This blocks independent movement between the finger shaft 60 and the gear 132 and prevents the finger shaft rotating faster than this gear. Accordingly, the gear 120, which is tending to drive the finger shaft faster, simply slips

on its bearing and the finger shaft continues to rotate at the speed of the gear 132 (that is one-sixth the speed of the feed rollers) during the time the dog is in engagement with the cam. As shown, this is for nearly one-third of a revolution, and during this time the feed rollers make nearly two complete revolutions. Now, as the trigger 140 reaches the end of the cam 145 and passes off of it, the head 135 becomes free from the restraining influence of the gear 132, and the finger shaft is free to make the remainder of its revolution at the speed attempted to be given by the gear 120, that is at a peripheral speed equal to that of the feed rollers.

In the specific embodiment of the drawings, the parts are proportioned, so that the wiping finger shaft moves through its slow portion (something less than a third revolution) while the feed rollers are having about one and four-fifths rotation, and during the remaining one-fifth of the rotation the wiping fingers have their rapid movement and make the remainder of their revolution. This may be accomplished by providing the pinion 131 with eleven teeth and the gear 132 with sixty-six teeth and the pinion 121 with seventeen teeth and the gear 120 with sixty teeth, and arranging the cam 145, together with the clearance, to be the equivalent of five seventeenths of a rotation.

With the proportions given, the wiping fingers move through five-seventeenths of their revolution, for five of the pinion teeth) at the slow speed, while the feed roller has turned substantially one and four-fifths rotations, or carried the gear 132 around twenty of its sixty-six teeth. Then, during the remaining one-fifth rotation of the feed roller which corresponds to twelve teeth of the sixty teeth gear 120, the remaining twelve teeth of the pinion 121 pass and complete the revolution.

To provide the necessary friction between the gear 120 and the shaft 50, I prefer to mount around the shaft a compression spring adjusted by a nut. A preferred construction of this is shown in Figs. IV and VIII. There the gear 120 is loose on a sleeve 160, which is rigid on the shaft 50. This sleeve has a head 161 on one side of the gear. On the other side of the gear is preferably a leather or other elastic washer 162 and then a metal washer 163. Connected with this leather washer is a helical compression spring 164 contained within a cup 165 which has a screw threaded engagement with a threaded exterior on the sleeve 160. The rotation of this cup compresses or relieves the spring to vary the frictional pressure on the gear, as desired. 166 indicates a jamb nut for the cup. The jamb nut and cup are shown as having a knurled exterior

by which they may be conveniently turned. A radial groove 168 on the side of the gear 120 provides for oiling.

I have spoken of the shafts 50 and 60 being mounted in ball bearings. The bearing at one end of the shaft 50 is shown in Fig. IV, and the bearing for the other end in Fig. VI. The latter figure shows also one of the bearings for the shaft 60, and there is a similar bearing at the other end. Each bearing for the shaft 60 consists of a ring 170 on the shaft, forming one member of the ball race, a surrounding ring 171 forming the other member, and balls 172 between the rings positioned by a suitable retainer 173. The ring 171 seats in an annular recess in the frame 2 and is held in place by a plug 174 screwing into such recess.

The ball bearing rings, balls and retainers for the bearings of the shaft 50 are similar to those for the shaft 60. Inner members 175 and 176 are mounted on the end portions of the shaft 50; the outer rings 177 and 178, however, do not seat in frame recesses, but in recesses in bushings 180 and 181 (Figs. VI and IV) which are journaled in the respective frame members eccentrically of the shafts. Plugs 182 and 183, similar to the plug 174, holds the bearing in place in the respective bushing. The respective bushings are provided with wings 184 and 185 which have through them arcual slots 186 and 187, whereby they may be clamped in adjusted position to the frame plates 2 and 1 respectively by clamping finger nuts 188 and 189. The adjustment of the eccentric bushings described enables the adjustment of the feed rollers relative to the counter rollers for different sizes or weights or grades of paper, as well as to get accurate alinement between the feed rollers and counter rollers.

To adjust the dislodging mechanism for different weights of paper or other varying conditions thereof, I provide mechanism for raising or lowering the plate 41 which supports the forward edge of the pile of paper. It is obvious that the higher this plate the less wiping action the fingers have on the paper and the lower the plate the greater is the wiping action. The plate, with its frame 40, has a tendency to drop by gravity to its lowermost position as it slides freely in the ways 43 in the frame portions 44. Its bottom position is determined by the engagement of a pair of eccentrics 191 mounted on a shaft 190 journaled in the stop block with ledges 192 on the frame plates. The turning of the shaft 190 turns the eccentrics and allows the stop frame to rise or fall. A knurled head 193 on the shaft furnishes convenient means for turning it, while a suitable set screw 194 may lock it and a jam nut 195 may lock the set screw.

As my feeding mechanism is usually coupled with some other machine, it is desirable

to provide means for running the feeding mechanism without feeding paper, as this avoids uncoupling the machines when it is desired to adjust or independently run the printing mechanism or other coupled machine. I provide this very simply by mechanism which, whenever desired, may sustain the front frame 40 at an elevation so that the bottom of the pile of paper is above the path of the wiping fingers. This mechanism, as shown, consists of a pair of spring detents 196 which are mounted in the frame of the machine and project into the ways 43 and frictionally engage the ends of the stop plate when in position. By simply raising the stop plate by hand the detents spring in beneath it and hold it elevated with the paper idle until it is desired to proceed with the feeding, when the frame is simply shoved down by hand to normal position. The detents may each consist of a small spherical plunger backed by a spring contained in a bushing 197 (Fig. VI).

The plate 71 which stands over the plate 70 and provides a chute for the fed sheets is preferably movable to allow access to the feed roller and parts in advance thereof, in case there should be any clogging of the paper. I accomplish this by hinging this plate to the movable stop frame 40. The plate has ears 75 which rise from its edges and surround laterally extending studs carried by the stop frame below the shaft 190. Suitable spring detents (not shown) tend to hold this plate in its active position, or allow it to be turned up when not in use. A lip 76 on the end of the plate furnishes convenient means for turning it. The stop plate 40, with the ledge 41 and plate 71 may be removed entirely by a sufficient upward pull applied to the stop plate, thus allowing access to the dislodging and feed mechanism whenever desired.

The drawings show at 200 a revolution counter having an oscillating arm 201 connected by a link 202 with the crank 203 on the end of the shaft 60. This enables a convenient record to be kept of the number of sheets fed.

Though practice has demonstrated that my feeding mechanism is very certain, resulting in the regular feeding of but one sheet at a time, I consider it desirable to provide throw-out mechanism to stop the feeding operation in case two sheets are fed at once, since the feeding of two sheets results in a wasted sheet, in disturbing the count, and in throwing an unduly heavy impression on the printing mechanism. Inasmuch as my mechanism is designed to be geared with a printing press, I provide the actual stopping mechanism on that press but I connect it electrically with the automatic feed mechanism. The result is that when an electric connection is made by the auto-

mastic feed mechanism, from the branching of two sheets, a magnetic switch (not shown) acts on the printing mechanism to throw down the plate and then render it idle. The magnetic switch will be of the form shown in my prior application No. 581,201, filed September 28, 1910, or may be of any other character, as will be readily understood. The contacts by which it is thrown into action to prevent clogging will now be described.

210, in Fig. II, indicates one or more very light springs (two being shown) which are carried by the plate 70 and project upwardly through openings in it. These springs are sufficiently strong so that they can support one sheet of paper, but two sheets resting on them press them down materially. In such downward movement, the springs contact with stop points 211 adjustably and insulatingly carried on the under side of the plate 70. Accordingly, to provide for the initiation of the electro-magnetic throw-out for overfeed, it is only necessary to make the members 210 one terminal of the controlling circuit and the members 211 the other terminal, and adjust the position of the points 211 with reference to the weight of the paper, so that two sheets will depress at least one of the springs into engagement with its point while one sheet will not. As the members 211 come at inconvenient points for attaching an outside wire I secure to them a conductor 212 which is connected with a plug 213 insulatingly carried in the cross member 5. This plug carries an inner plug 214 compressed by a spring 215 against a binding post 216 insulatingly carried in the base plate 1. The electric connection to the springs 210 may be made through the frame of the machine with which they are connected.

To prevent loss of battery, I make the connection to the frame periodically for a short time during which the paper engages the spring 214. For this purpose I have provided a lug 217 on the hub of the roller 14, (Fig. 1 and 11), and this lug has a cam 218 in section, by means of the frame of the machine, with the spring 215. The lug at the proper time engages an arm 219 pivoted to an insulating block 220 and resting on a spring 221, which is electrically connected to the binding post 224. Now, if a line from the binding post 224 leads through a battery and the electro-magnetic switch to the binding post 216, the electro-magnetic control will be established. A suitable hand switch is preferably included in the circuit, by which the latter may be held open whenever desired. This prevents loss of battery, for example, when the front frame 40 is raised and the machine run idly, as heretofore explained.

It will be apparent from the above description that my mechanism acts with great rapidity and certainty to remove and feed sheets from the bottom of the pile. The weight of the pile of paper above a certain minimum is immaterial to the operation, so that blocks of paper may be placed on top of the pile which is being fed, without stopping the feeding operation. Accordingly, the operation may go on continuously. The slow movement of the wiping roller, combined with the quick return, gives the certainty of dislodgment of sheets without delaying the operation. The characteristic of the mechanism whereby a feed forward one sheet while another is being dislodged also contributes to the certainty. Thus, according to the feed roller to allow a small interval before its engagement gives accuracy in registration. By providing for two rotations of the feed roller for each sheet dislodged I reduce the size of the rollers for a given maximum length of sheet, which may be fed.

The adjustments of the machine are very simple and easily made for sheets of various sizes, thicknesses and other varying conditions of paper. After the roller is placed for the block of paper to be fed, the roller is adjusted according to the line of the sheets, it is only necessary to adjust the position of the feed rollers to the center of the paper, and the position of the lower finger relative to the printing fingers, and to adjust the electric terminal of the overfeed spring to the position at the frame side, which clamp the machine around the edge of the feed roller shaft exactly. The rollers to be quickly and accurately adjusted for different thicknesses of paper. Thus, the shaft mounted in the side plate and carrying the rollers is turned until the fingers dislodge the sheets properly and is then locked by its set screw. To move the paper stops in being delivered by the mechanism, the barbed up of the front guide plate provides for this.

The machine has a fast feed, and is very certain in dislodging one sheet, and one sheet only, for each rotation of the wiping shaft. There is no electrically actuated provided tubes, and of any possible dislodgment of two or more sheets at a time.

The cheapness and ease of repairment of the wiping fingers should also be noted. These are inexpensive, small pieces of rubber and the simple loosening of the screws which hold the clamping plates of the fingers allows worn fingers to be removed and new ones put in place. The removal of the side plate furnishes convenient access to the wiping finger shaft for this or other purposes.

The simplicity and compactness of my mechanism should also be noted. Placing

the counter rollers on the same shaft with the wiping fingers simplifies the construction and economizes space and lets the wiping fingers deliver the buckled portion of the sheet directly to the feed rollers. The wiping fingers and feed rollers and their shafts may be mounted in small compass beneath the forward ends of a pile of paper, and are thus out of the way. This disposition of parts adapts the machine for very convenient embodiment in a small device for use in conjunction with an office printing press, if desired.

Having thus described my invention, what I claim is:

1. The combination of a support for a block of paper, a rotary wiping device having a series of separated fingers, means for giving said wiping device a comparatively slow movement during the active portion of its rotation and a quick movement during the remainder of the rotation, whereby a portion of a sheet is dislodged from the block of paper, and means for advancing such dislodged sheet comprising a feed roller and coacting roller sections individually mounted between the separated fingers.

2. The combination of means for supporting a pile of paper, a rotary wiping device having a series of separated fingers, means for causing the same to have a portion of a rotation comparatively slow while in engagement with the bottom sheet, to buckle such sheet downwardly, means for then giving the wiping device a quick motion to return it to active position, and advancing rollers to receive the forward end of the sheet when buckled downwardly, one of said rollers being made in sections interposed between the wiping fingers.

3. The combination, with a series of movable wiping fingers adapted to act on paper to be dislodged, means for giving them a slow movement during their engaging action and a quick return following such engagement, a series of paper-supporting members between which said fingers act, and two coacting series of feed rolls, having their units interposed between the spaces in which the wiping fingers act.

4. The combination, with a series of revolvable wiping fingers, means for giving them a slow movement during the active portion of their rotation and a quick return for the balance of the rotation, a series of supporting members for the front portion of the pile of paper, between which said fingers act, spaced feed rolls on the same axis with the wiping fingers and placed opposite the supporting members, and means coacting with said spaced rolls.

5. The combination, with means for supporting a block of paper, of a wiping device comprising a series of fingers adapted to act comparatively slowly on a sheet of

the block to dislodge it, two series of rolls, one of which is interspersed with the fingers, for engaging and advancing such dislodged sheet, and means for rapidly returning the wiping device to active position to engage a subsequent sheet while the previously dislodged sheet is being fed by the advancing means.

6. The combination, with means for supporting a pile of paper, of a rotary wiping device adapted to act slowly on the bottom sheet of the pile near its end to buckle it downwardly, rotary feeding devices comprising rolls mounted coaxially with the wiping device and coacting rolls to engage the end of such buckled sheet, and advance the sheet, and means for rapidly returning the rotary wiper to active position to engage a subsequent sheet while the previously dislodged sheet is being fed by the feeding devices.

7. The combination, with a paper support, of a wiping device, mechanism for causing it to act on the bottom sheet of a pile on the support and shove the forward portion of the sheet rearwardly to dislodge the bottom sheet, and a feed roller having a recess into which the forward portion of the dislodged sheet is delivered by the wiping device.

8. The combination, with means for supporting a pile of paper, of a rotatable wiping device acting on the under side of the pile to shove its forward position rearwardly, means for moving said wiping device slowly while in engagement with the paper and then giving it a quick return, a recessed feed roller into which the wiping device delivers the forward edge of the dislodged sheet, and a counter roller coacting therewith to advance the dislodged sheet.

9. The combination, with means for supporting a pile of paper, a rotary wiping finger, mechanism for giving the same a slow movement while in engagement with the paper and a quick movement for the rest of the rotation, a uniformly rotated feed roller adapted to act on the dislodged sheet, and a contacting roller mounted coaxially with the wiping finger and adapted to be uniformly rotated.

10. The combination, with means for supporting a pile of paper, rotary wiping fingers adapted to act on the bottom sheet of the pile, mechanism for giving such fingers a slow movement while in engagement with the paper and a quick return, a uniformly rotated feed roller and a uniformly rotated counter roller adapted to receive between them the sheet dislodged by the wiping finger, the counter roller being made in sections interspersed with the wiping fingers.

11. The combination of means for supporting a pile of paper, a rotary wiping de-

vice, a supporting roller at the rear thereof, means for giving said wiping device a comparatively slow movement in engagement with the paper and toward the said roller to buckle a sheet between them, means for giving the wiping device a quick rotation after the sheet has buckled, a uniformly rotated feed roller adapted to act on the dislodged sheet, and a uniformly rotated counter roller coaxial of the wiping device.

12. The combination of means for supporting a pile of paper, a rotary device comprising separated fingers, means for giving said wiping device a comparatively slow movement in engagement with the paper to buckle a sheet from the pile, means for giving the wiping device a quick rotation after the sheet has buckled, and a uniformly rotated feed roller making a plurality of rotations to one rotation of the wiping device, and sectional counter rollers interspersed with the fingers and driven by frictional coaction with the feed roller.

13. The combination of means for supporting an approximately horizontal pile of paper, a rotary shaft having wiping fingers below said pile near the forward edge, means for rotating said shaft to cause the fingers to wipe the bottom sheet rearwardly, a roller at the rear of the wiping shaft, whereby a sheet buckles between them, a feed roller below the wiping shaft having a recess into which the forward edge of the sheet is adapted to be fed by such buckling, and a counter roller cooperating with the feed roller.

14. The combination of means for supporting a pile of paper, a rotatable wiping shaft beneath the pile near the forward end and having a series of wiping fingers to engage the bottom sheet, supporting ledges for the pile near the forward end between the wiping fingers, a roller at the rear of the wiping shaft, a feed roller below the wiping shaft, and counter rollers on the wiping shaft.

15. The combination of a support for the paper, a rotary wiping device adapted to act on a sheet of paper on the support, means for giving the wiping device a slow active movement and a quick return, a feed roller, and a counter roller therefor mounted coaxially with the wiping device and rotatable independently thereof.

16. The combination, with a support for paper, of a rotary shaft, a series of wiping fingers thereon, a series of idle rollers between the wiping fingers and rotatable independently thereof, and a series of feed rollers cooperating with the idle rollers.

17. The combination, with a support for a pile of paper, of a rotary shaft, a series of wiping fingers thereon, a series of idle rollers between the wiping fingers, and a series of feed rollers cooperating with the

idle rollers, the feed rollers having recesses in their peripheries into which the forward end of dislodged sheets of paper may be directed by the wiping fingers.

18. The combination, with a rotary shaft, of a series of wiping fingers thereon, separated ledges adapted to support the forward portion of the pile of paper engaged by the wiping fingers, the fingers operating between the ledges and lifting that end of the pile, a rotary feeding device and counter rollers therefor located between the wiping fingers.

19. The combination of a shaft, a series of wiping fingers rigid thereon, a series of loose rollers between the fingers, a parallel shaft, a series of feed wheels rigid thereon coacting with the loose rollers, mechanism for rotating said shafts, and means for supporting a block of paper in position to be acted on by the wiping fingers, whereby a sheet may be dislodged and thereby pass into the grasp of the feed wheels and their cooperating rollers.

20. The combination, with a series of rotary wiping fingers, of a roller parallel therewith, a series of ledges located between the paths of the fingers, said ledges and said roller being adapted to support the forward portion of a pile of paper, the wiping fingers acting to raise such portion and buckle the bottom sheet as they move toward said roller, loose rollers surrounding the shaft between the fingers, and feed rollers contacting with the loose rollers and mounting on an axis parallel therewith.

21. The combination of means for supporting a pile of paper, a shaft having a wiping finger adapted to engage the sheets of said pile as the shaft is rotated, a feed roller, a roller section on the wiper shaft frictionally engaging the feed roller, means positively rotating the feed roller at a comparatively high rotative speed, driving means adapted to turn the wiper shaft at a comparatively slow speed while the wiper is in contact with the paper, and driving means adapted to turn the wiper shaft at a rapid speed after the wiper clears the paper, said two driving means comprising two sets of gearing with a shaft, one having a clutch connection and the other a slip device.

22. The combination of a support for a pile of paper, a series of rotary wiping fingers adapted to engage the bottom sheet of the pile, a series of feed rollers, counter rollers therefor between the wiping fingers and independently rotatable, and means for giving said fingers a comparatively slow rotation while they are in engagement with the paper in the pile and thereafter giving them a quick return.

23. The combination of a support for a pile of paper, a series of rotary wiping fingers adapted to engage the bottom sheet

- of the pile, a series of feed rollers, counter rollers therefor rotatable independently of the wiping fingers, means for giving said fingers a comparatively slow rotation while they are in engagement with the paper in the pile and thereafter giving them a quick return, and means for giving the feed rollers a uniform speed of rotation faster than the slow movement of the wiping fingers.
24. The combination of a rotary wiping shaft having a series of separated fingers, rollers surrounding the shaft between the fingers and rotatable independently of them, feed rollers cooperating with the rollers first mentioned, and means for giving the shaft a portion of the rotation at a slow speed and the balance of its rotation at a quick speed.
25. The combination, with means for supporting a pile of paper, of a rotary wiping shaft having a series of separated fingers, rollers surrounding the shaft between the fingers and rotatable independently of them, feed rollers cooperating with the rollers first mentioned, means for giving the shaft a portion of the rotation at a slow speed and the balance of its rotation at a quick speed, and means for giving the feed roller a uniform rotation at a speed to make a plurality of rotations while the wiping finger shaft is making one rotation.
26. The combination, with means for supporting a block of paper, of a rotary wiping shaft having a series of separated wiping fingers, rollers surrounding the shaft between the fingers, a roller feeding device cooperating with the rollers first mentioned, means for giving the shaft a portion of the rotation at a slow speed and the balance of its rotation at a quick speed in the direction to carry the fingers rearwardly when engaging the paper, said feeding device having a recess in its periphery positioned to be approaching the wiping finger shaft when the wiping fingers change from their slow to their quick movement.
27. The combination of means for supporting a pile of paper, a series of rotary wiping fingers, means for giving them a slow movement while in engagement with the bottom sheet of the pile and then a quick movement for the rest of the rotation, a paper-supporting roller parallel with the axis of the wiping fingers and at the rear thereof, a series of feed rollers below the axis of rotation of the wiping fingers, and counter rollers for the feed rollers mounted about said axis.
28. The combination, with a rotatable shaft, of a series of wiping fingers thereon, means for giving said shaft a portion of a rotation at a slow speed and the balance of said rotation at a quick speed, a series of separated paper supports positioned between the paths of said wiping fingers, a paper supporting roller at the rear of the shaft of the wiping fingers and parallel therewith, counter rollers between the wiping fingers, and feed rollers contacting with the counter rollers.
29. The combination, with means for supporting the rear portion of a pile of paper, of a rotatable shaft, a series of wiping fingers thereon, means for giving said shaft a portion of a rotation at a slow speed with the fingers engaging the bottom sheet of the pile and the balance of said rotation at a quick speed, a series of separated supports for the forward portion of the pile positioned between the paths of said wiping fingers, a paper supporting roller at the rear of the shaft of the wiping fingers and parallel therewith, counter rollers between the wiping fingers, contacting feed rollers below the counter rollers, and means for adjusting said supports up or down for varying conditions of paper.
30. The combination, with a rotatable shaft, of a series of wiping fingers thereon, means for giving said shaft a portion of a rotation at a slow speed and the balance of said rotation at a quick speed, a shaft parallel with the wiping shaft, a series of feed rollers thereon, and counter rollers on the shaft first mentioned between the wiping fingers and contacting with the feed rollers, said feed rollers having elastic peripheries and said counter rollers having hard peripheries.
31. The combination of a support for a pile of paper consisting of a stationary supporting plate, an adjustable series of ledges, an upright stop at the front of the ledges, a supporting roller at the rear of the ledges, a series of wiping fingers rotatably mounted on a shaft beneath the ledges, said fingers being adapted to act rearwardly on the bottom sheet between the ledges, a shaft below the wiping finger shaft, a series of feed rollers thereon spaced apart, counter rollers loose on the wiping finger shaft coacting with the feed rollers, each feed roller having a recess in its periphery.
32. The combination of a support for a pile of paper consisting of a supporting plate, a series of ledges, an upright stop at the front of the ledges, a series of wiping fingers rotatably mounted on a shaft beneath the ledges, said fingers being adapted to act rearwardly on the bottom sheet between the ledges, a shaft below the wiping finger shaft, a series of feed rollers thereon spaced apart, counter rollers loose on the wiping finger shaft coacting with the feed rollers, each feed roller having a recess in its periphery, and mechanism for continuously rotating the feed rollers at a uniform speed and for continuously rotating the wiping fingers at a differential speed to give them a slow movement while in engagement with the paper and then a quick return, the

feed rollers making a plurality of rotations for each complete rotation of the wiping fingers.

33. In a paper feeding device, the combination, with a holder for a stack of sheets, of a series of rotary wipers, a series of interposed counter pressure rollers on the same axes, feed rollers coacting with the counter pressure rollers, means for rotating the feed rollers and counter pressure rollers at a constant speed, and means for driving the wipers at two different speeds.

34. In a paper feeding device, the combination, with a holder for a stack of sheets, of a series of wipers and a series of counter pressure rollers mounted on a common axis, mechanism to drive said wipers and rollers at different speeds, the wipers having a surface of resilient material to engage the bottom sheet in the stack, and feed rollers coacting with the counter pressure rollers.

35. In a paper feeding device, the combination, with a holder for a stack of sheets, of a series of wiping fingers and counter pressure rollers having a common axis which is stationary with respect to said holder, mechanism for continuously rotating at a constant speed the counter pressure rollers, and mechanism for rotating the wiping fingers at two different speeds.

36. In a paper feeding device, the combination, with a holder for a stack of sheets, of two rotary elements having a common axis, one being a wiping finger and the other a counter pressure roller, means for continuously maintaining said axis stationary with respect to the holder, and mechanism arranged to drive said elements at different speeds, said wiping fingers being arranged to engage the endmost sheet in the stack.

37. The combination, of a wiping device, a shaft carrying the same, a feed roller, a shaft carrying the feed roller, gearing between said shafts having a slip connection, additional gearing at a different speed ratio between said shafts, and means for automatically connecting and disconnecting said additional gearing.

38. The combination of a wiping shaft, a feed roller shaft, meshing gears on the two shafts having a slip connection, other meshing gears of a different speed ratio adapted to connect said shafts, mechanism for controlling said connection including a movable trigger on one of the shafts, a stationary arcual cam adapted to hold said trigger in active position for a portion only of a rotation, and a dog on one of the gears which said trigger may engage.

39. The combination of a paper support, a pair of shafts mounted one above the other and both below said support, a series of wiping fingers rigidly carried by the upper shaft, a series of rollers loosely carried

on said shaft between the wiping fingers, a series of feed rollers rigid with the lower shaft and adapted to contact with the rollers on the upper shaft, a gear on the lower shaft, a gear on the upper shaft meshing therewith, one of said gears having a frictional slip, two other gears coaxial with said shafts respectively, one of the last mentioned gears being rigid with its shaft and the other free from its shaft, a trigger for locking the last mentioned gear to its shaft, and a stationary cam for controlling said trigger.

40. The combination, with a paper support, of a shaft, a series of wiping fingers on the shaft, a second shaft parallel with the shaft first mentioned, feed rollers on said second shaft, counter rollers on the first shaft between the wiping fingers coacting with the feed rollers, a pinion rigid on the first shaft, a gear surrounding the second shaft, an adjustable spring for establishing a frictional slip between said gear and its shaft, a pinion on said second shaft, a gear coaxial with the first shaft meshing with said pinion, a series of inwardly projecting dogs carried by said last mentioned gear, a head rigid on the first shaft and having a groove, a trigger slidable in said groove and adapted to be moved to engage and lock with any of said dogs, and a stationary arcual cam adapted to shove said trigger into active position and hold it for a portion of a rotation.

41. The combination, with means for supporting a pile of paper, of a series of wiping fingers for dislodging the bottom sheets thereof, a series of feed rollers, counter rollers coacting therewith, each feed roller having a rubber tire with a recess into which the wiping finger may deliver the edge of the sheet, and rollers loosely surrounding the wiping shaft between the fingers thereof and adapted to contact with the tire of the feed rollers except at the recess.

42. The combination, with a frame having slide ways, of a stop plate slidable therein and carrying a supporting ledge for supporting the forward end of a pile of paper, a shaft mounted in the stop plate, a pair of eccentrics on the shaft adapted to engage portions of the frame and thereby support the stop plate in adjusting position, means for locking the eccentric shaft, and a wiping device adapted to act on the bottom sheet of the pile supported by such ledge.

43. The combination, with means for supporting a portion of a pile of paper, of a front plate having a projecting ledge for supporting a pile at its forward end, said front plate being removably mounted in the frame of the machine, a wiping device adapted to act on the bottom sheet of the pile resting on the support and ledge, and

a guide plate in front of the wiping device hinged to the removable front plate.

44. The combination of a rotatable shaft having wiping fingers, a front plate for a pile of paper, a series of ledges carried by the front plate and projecting beneath the pile between the path of the fingers and supporting the pile, a feed roller below the wiping shaft, a counter roller therefor loosely surrounding the wiping shaft, bottom and top guide plates in front of the line of contact between the feed roller and counter roller, said top guide plate being mounted on and removable with the front plate.

45. The combination, with dislodging and advancing rollers, of a frame carrying the same and having a cross bar with a groove, a paper supporting plate having a downturned front edge adapted to occupy said groove, supporting brackets for said plate hinged to it, and means for holding the lower ends of said brackets on the lower portion of the frame.

46. The combination of means for supporting a block of paper, wiping fingers adapted to act on the paper near the forward edge and move the forward portion of the sheet rearwardly to buckle it, and a feed roller having a recess into which the forward end of the sheet is adapted to be fed by such buckling while the rear portion of the sheet is held with the block of paper.

47. The combination, with means for supporting a block of paper, of a rotary wiping device adapted to act on the block near the advance edge, means for rotating said device to cause it to dislodge the advance portion of a sheet while the remainder of the sheet is retained with the block of paper, a feed roller and a counter roller adapted to feed the dislodged sheet, said feed roller having a recess into which the advance edge of the sheet is passed, and means for completing the rotation of the wiping device to act on a subsequent sheet while the previous sheet still partially in the block of paper is being advanced by the feed roller and counter roller.

48. The combination of means for supporting a pile of paper, a rotary shaft having wiping fingers adapted to act rearwardly on a sheet which is at the bottom near the forward portion of the pile whereby the forward portion of such sheet is buckled downwardly while the rear portion is held by the super-incumbent weight of the pile, a feed roller, and a counter roller for advancing such dislodged sheet, said feed roller having a recess adapted to receive the forward edge of the dislodged sheet whereby the registration is dependent

upon the position of the pile rather than the speed of rotation of the feeding device.

49. The combination, with a support for a pile of paper, of a rotary wiping shaft having fingers adapted to act on the bottom sheet near the forward edge thereof to buckle it rearwardly while the rear portion of the sheet is held by the super-incumbent weight of the pile, a feed roller having a notch into which the forward edge of the paper may pass while the rear portion is held in the pile, a counter roller coacting with the feed roller, and means for giving the feed roller a uniform speed of rotation and the wiping finger shaft a differential speed.

50. The combination of means for supporting a block of paper, means for dislodging the forward portion of a sheet therefrom, and a feed roller having a recess into which the forward end of the dislodged sheet is adapted to be fed while the rear portion of the sheet is held with the block of paper.

51. The combination of means for supporting a block of paper, means for dislodging paper therefrom, a feed roller having a recess into which the end of the dislodged sheet is fed, and a counter roller coacting with the feed roller.

52. The combination of a support for a block of superposed sheets, a rotary wiping device consisting of separated fingers adapted to engage the under side of the bottom-most sheet, means for giving said wiping device a comparatively slow movement during the active portion of its rotation and a quick movement during the remainder of the rotation to dislodge a portion of the bottom sheet and carry the same downwardly beneath the wiping device, a feed roller below the wiping device, and counter rollers interspersed between the wiping fingers and coacting with the feed roller.

53. The combination of a support for a block of sheets, a rotary shaft, a series of wiping fingers rigid thereon, a series of rollers loose on the shaft interspersed with the fingers, a feed roller with which the rollers first mentioned coact, means for driving the feed roller and thereby frictionally drive the rollers coacting therewith, and means for giving said shaft a slow motion for a portion of a rotation and a rapid motion for the rest of the rotation.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

SAMUEL ABRAHIMS NEIDICH.

Witnesses:

CHAS. J. SIMONS,
W. W. RITTER.