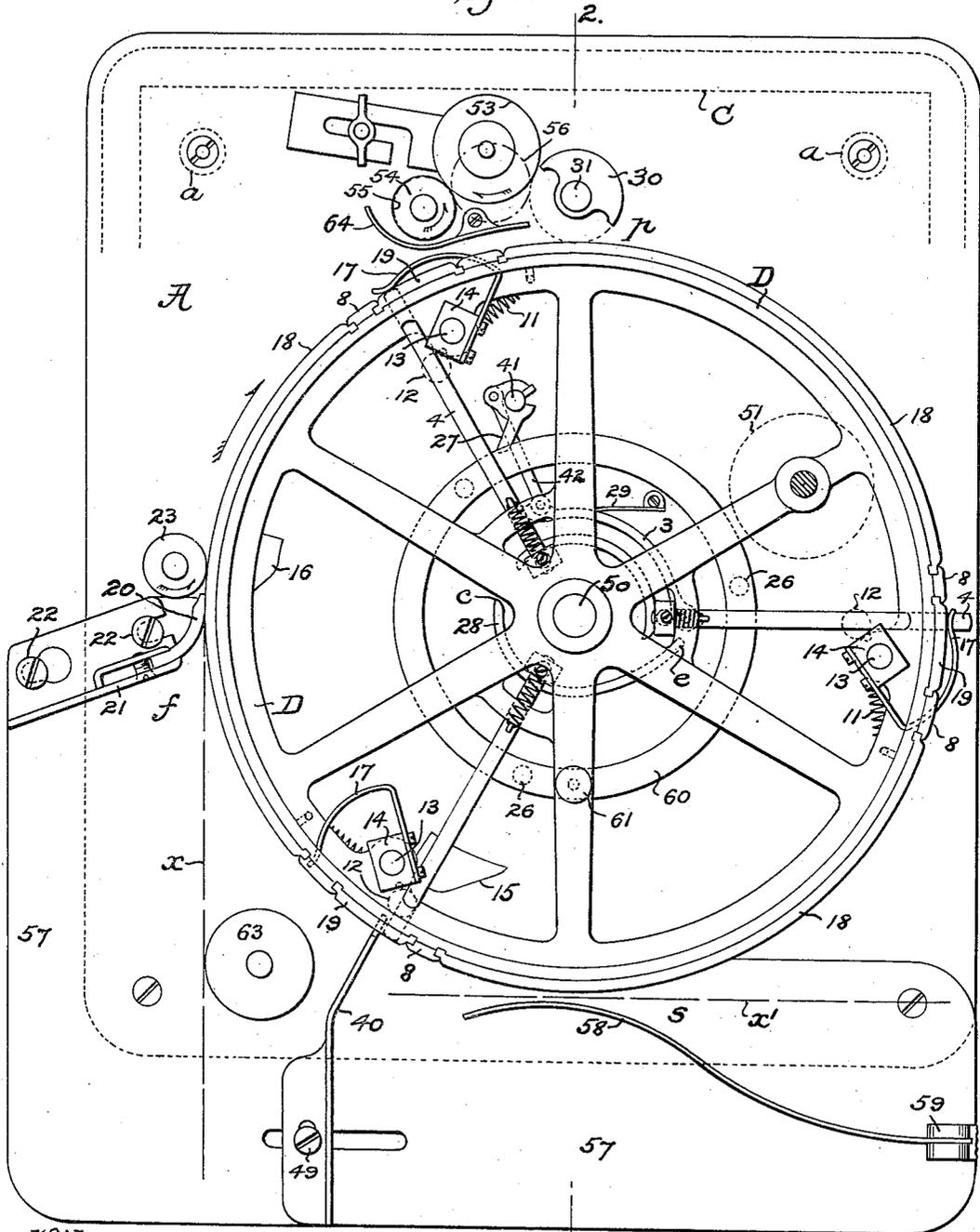


F. G. JAHN.
PRINTING MECHANISM.
APPLICATION FILED OCT. 11, 1906.

Fig. 1.



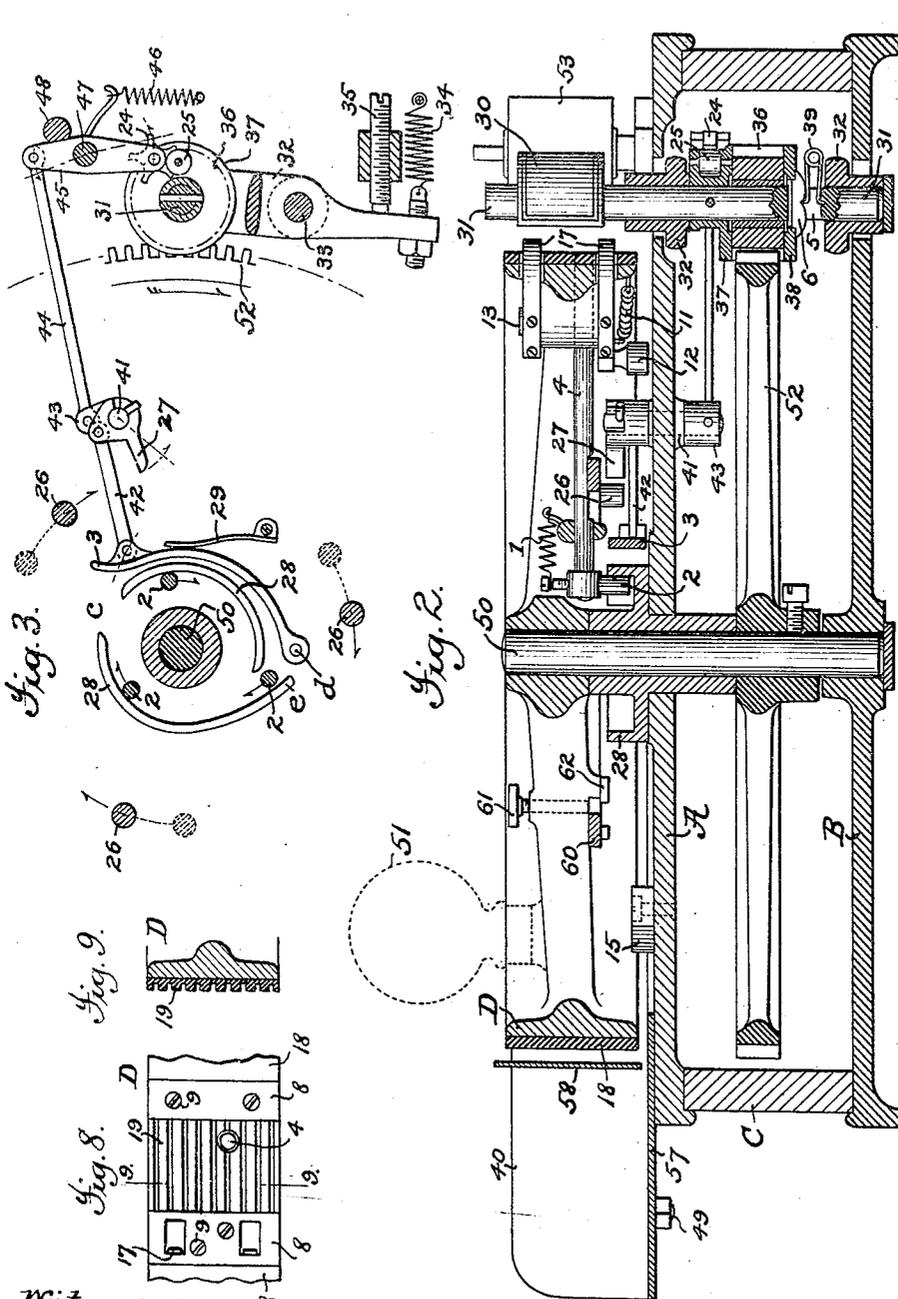
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Fig. 4.

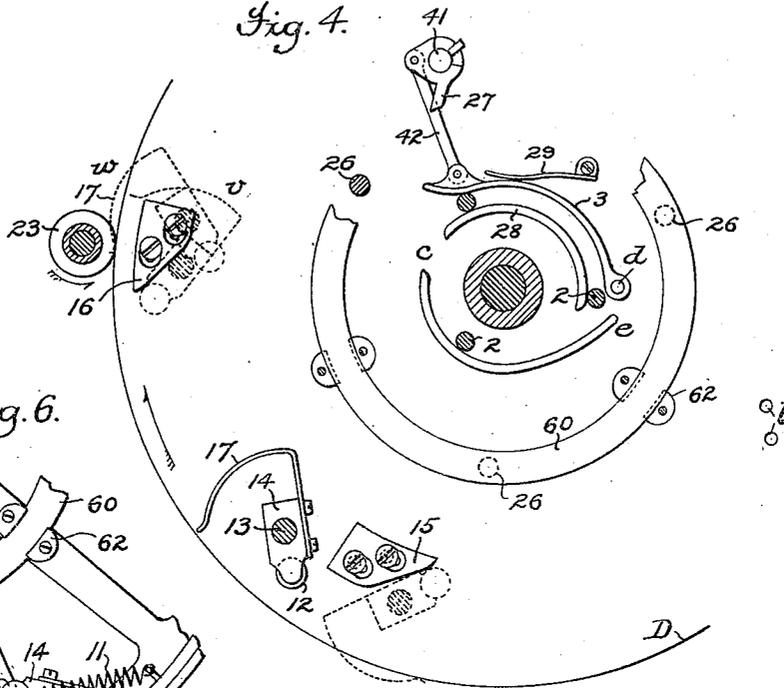


Fig. 6.

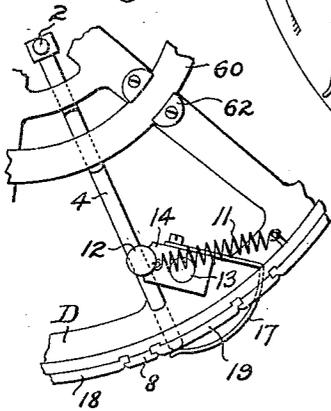


Fig. 5.

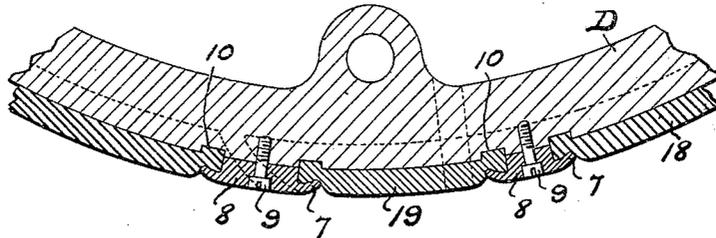
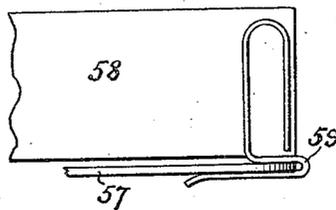


Fig. 7.



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UNITED STATES PATENT OFFICE.

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PRINTING MECHANISM.

No. 869,783.

Specification of Letters Patent.

Patented Oct. 29, 1907.

Application filed October 11, 1906. Serial No. 338,359.

To all whom it may concern:

Be it known that I, FREDERICK G. JAHN, a citizen of the United States, residing at the city of New York, borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Printing Mechanism, of which the following is a specification.

The present invention relates generally to printing machines and more particularly to that class wherein the presence of the article to be printed governs the actual coöperation of the printing instrumentalities.

It has for its object to simplify the mechanism of such machines and thereby render them capable of being operated and cared for by inexperienced persons; to provide a carrier for the article being operated upon which in itself forms one member of the feeding, the printing, and the stacking devices whereby the article to be printed is taken from its feed position, through the printing position and delivered at the stacking position without transferring control thereof; to render it possible in an article controlled printing mechanism to define and vary the point at which the printing shall occur, and furthermore to render all the operations automatic and positive of action.

To these ends the improvements consist in the novel construction and arrangement of parts hereinafter more particularly pointed out and described having reference to the accompanying drawings which illustrate a practical embodiment thereof.

In said drawings: Figure 1, is a plan view of the improved machine. Fig. 2, is a vertical central section taken substantially on the line 2, 2 of Fig. 1, the carrier, however, being moved ahead somewhat to bring certain of the parts carried thereby into the plane of the section. Figs. 3 and 4 are diagrammatic horizontal sections showing more fully parts only partially seen in Fig. 1 and others entirely hidden in that view. Fig. 5, is an enlarged horizontal section of a portion of the circumference of the carrier. Fig. 6, is an underside view of a portion of the carrier. Fig. 7, is an elevation of the laterally movable supporting plate at the stacking position. Fig. 8, is a face elevation of a portion of the carrier, and Fig. 9, is a cross section on the line 9, 9, thereof. Fig. 10, is a diagrammatic plan of a modified construction.

The various operating parts of the improved machine are supported by a table A and a base B connected to the table by a plurality of tie-bars *a* with the space between the table and base inclosed by a casing C of wood, the whole of rectangular box shape adapted to rest on a bench or table or to be secured to a suitable stand.

The machine consists in the main of a horizontally rotating carrier or wheel D serving as a means for feeding and carrying the articles to be operated upon, such

as slips or sheets of paper, from their feed or supply position *f*, around and to the printing position *p*, and thence to the delivering or stacking position *s*; so that the single instrumentality serves as a means of successively feeding sheets individually from a stack or bunch, as the impression member for supporting the sheet during the operation of printing and as a carrier for delivering the printed sheet. At the feeding position the carrier coöperates with a separator or wiper 20 that is fixed relatively to the movements of the carrier and serves to prevent the feed of more than one particle or sheet at a time. It also coöperates at the printing position with a printing roll or die 30, the carrier and roll forming a printing couple by which the article or sheet is printed; and at the delivering position with an end stop or stripper 40 adapted either to stop the further onward movement of the printed sheets and reassemble them in an orderly stack or bunch for removal or to insure their removal from the carrier for subsequent collection or further manipulation. The carrier D is secured to the upper end of a vertical spindle 50 having bearings in the machine table and base and may be provided with an operating handle 51, serving as one convenient means of rotating it and through it other operating parts of the machine, as by means of a toothed wheel 52 secured to said spindle.

To adapt the carrier to serve at once as a feeding means and as an impression member, the rim or circumferential surface thereof carries a superimposed feed surface 19 preferably of soft rubber or such other material as will in meeting an article or sheet free to move and coming into frictional surface contact therewith at the feed position *f* cause such article or sheet to move onward with it; the wiper 20 serving simply to arrest the onward movement of all articles or sheets save the one in direct contact with said feed surface. The carrier rim also carries an impression surface 18, of comparatively hard rubber or similar material which will preserve a smooth surface so that it will be incapable of removing an article or sheet from the feed position against the dragging or hold back action of said wiper 20, and yet will present a sufficiently yielding bed to the printing roll or die during the printing operation as will preserve the face of the type or other characters from injury. The feed surface 19 and impression surface 18 extend across the width or face of the carrier, the feed surface being of comparatively small circumferential area and only sufficient to provide a surface that will insure the feed of a sheet each time it passes the feed position *f*, while the impression surface is circumferentially longer so that the sheet may be printed at most any desired point along or throughout its length. The carrier in the present representation of the invention is of a diameter suited to provide three distinct associated feed and impres-

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sion surfaces, so that as shown each rotation of the carrier will result in the individual feeding, printing and delivery of three successive articles or sheets. Of course these feed and impression surfaces may be increased or diminished according to the size of carrier employed or the length of article to be handled. A convenient mode of securing these surfaces to the rim of the carrier is best seen in Fig. 5, where the adjacent ends of the two surfaces 19, 18 are clamped to the carrier by the overlapping and slightly undercut flanges 7, of a transverse securing plate 8 held in place by one or more screws 9. Additional security, against displacement of the feed and impression surfaces may be had by providing transverse grooves 10, in the rim immediately underlying the ends of said surfaces so that the flanges of the securing plate will bend the material into said grooves as well as become embedded therein. The securing plates 8, provide a metal surface interposed between the feed and impression surfaces to break the continuity of said two surfaces and to present a smooth or non-feed surface which forms a marked functional contrast over the feed surface so that the danger of improperly feeding succeeding articles is avoided. The feed surface or surfaces 19, may be circumferentially or longitudinally grooved, as indicated in Figs. 8 and 9. Such grooving has been found in practice to increase the efficiency of the feed.

As an adjunct to each feed surface of the carrier there is provided a gripper 17 arranged and caused to operate to clamp and hold the leading end of the article or sheet being fed by said feed surface to said surface and the carrier shortly after it has passed beyond the separator or wiper 20, so that the sheet is positively carried onward by the carrier until it is released and allowed to rest at the delivery position. These grippers are mounted in the carrier and are timely operated by a closing cam 16 located just in advance of the feed position *f*, and by an opening or releasing cam 15 located at the delivery or stacking position *s*. The grippers 17 may obviously be of any desired construction; as shown, however, each gripper consists of a pair of suitably curved spring blades which pass through curved slots in the carrier and are secured to hubs 14 carried by a rock pin 13 that is mounted in a bearing located on the carrier between the gripper blades. One of the hubs carries a cam roll 12 in position to meet and ride along the inclined surface of each of the cams 16, 15, as seen in Fig. 4. The closing and opening movements of the gripper is had against a spring 11, see Fig. 6, one end of which is connected to the carrier rim and the other to a pin on the gripper hub and which is so located as to complete the closing and opening throw of the gripper as its cam-roll collides with the respective cams and to hold it in said moved positions. The inherent spring of the gripper blades permits them to yield in grasping articles of varying or uneven thickness while also caused to grasp under the tension of the gripper spring 11. Each of the cams 15, 16 is secured to the top face of the machine table by suitable screws which pass through slots in the cams to permit a slight adjustment in their positions to obtain accuracy in time of gripper movement. The position of the opening or releasing cam 15, representing in effect the delivery or stacking member of the machine, may, however, be wholly changed and moved backward toward the print-

ing position *p*, so as to cause a much earlier delivery of the printed product. Such changed position is indicated by the two screw holes *b*, in Fig. 4. The end stop 40 or equivalent abutment, needed in practice to insure the orderly stacking of the printed product, will of course be changed in position to coincide with any change in position of the gripper opening cam 15.

The separator or wiper 20, see Fig. 1, is provided by a flexible strip of rubber or other suitable material arranged so that its free end constantly bears with a proper amount of friction against the surface of the rotating carrier *D*. As shown, it is carried by a support 21, that is inclined to the feed and is removably fixed to the machine table or table plate 57, by screws 22, which pass through slots in the support to permit a slight adjustment of the wiper with respect to the surface of the carrier to vary the degree of pressure exerted by the free end of the wiper against the carrier. This particular form of wiper with a feed carrier is, however, the subject matter of another pending application filed by me on or about April 14, 1906, Serial No. 311645, and may obviously be replaced by any other device suited to insure the feed of individual pieces of matter from a stack or pile and may be wholly omitted where each piece of matter is individually and otherwise presented to the carrier so as to be grasped by the gripper thereof.

In advance of the wiper there is mounted a roller 23, arranged to bear against the surface of the carrier to aid in holding the pieces of matter to the carrier; such roller being grooved as represented in Fig. 4, to permit the movement of the ends of the gripper blades to their grasping position as early as possible after the head of the piece of matter emerges past the wiper, so that the feeding function of the rubber surface 19 may terminate early in the rotation of the carrier beyond the feeding position and thus reduce the necessary circumferential area of said feed surface. This roller 23, is shown as rotated by frictional contact with the carrier, but it obviously may be positively driven if desired.

The printing roll or die 30, is suitably mounted on a spindle 31, that is supported in bearings provided in a rock frame 32, which has limited motion on a pivot 33, see Fig. 3, carried by the machine base and table. The die and rock frame may yield with respect to the surface of the carrier against the tension of a printing pressure spring 34; and the inner position of the die is determined by an adjusting screw stop 35, bearing against the rock frame in opposition to the spring.

The die spindle 31, Fig. 2, carries a freely rotatable toothed pinion 36, in mesh with the teeth of the gear wheel 52, on the carrier spindle 51. This pinion is preferably formed of raw hide or other like material and is mounted between a flanged head 37, fast to the spindle and a disk 38, which is longitudinally movable on the spindle, but rotatable therewith. The flanged head, pinion and disk are held in close frictional contact by means of a suitable spring 39, projecting into a slot 5, cut in the spindle with one end bearing against the disk through the interposition of a slideable key 6, in said slot and the other end against one wall of the slot, with the result that the die is rotated by means of a frictional connection between the pinion 36 and the spindle 31. While this construction is exceedingly simple and effective it is obvious that other modes of rotating the die may be employed. Such or equivalent

lent driving connection between the driver and the die, permits, in the present and preferred embodiment of the invention, the die to be normally restrained from rotation as by a movable abutment 24, and a stop 25, which in this instance is carried by the flanged head 37, notwithstanding the rotations of the carrier. And means are provided by which said abutment may be moved at the proper time to permit the rotation of the die, such movement being governed by the presence of the article to be operated upon in manner to be described.

The carrier is provided with one or more contact studs 26, equal in number to the associated feed and impression surfaces of the carrier, which studs are arranged to successively meet and rock an arm 27, suitably connected to move the abutment 24, away from the die stop 25. In the preferred construction the arm 27 normally occupies a position in the path of each of the studs 26, so that the die will be released and allowed to rotate at regular intervals. To render the contact stud or studs incapable of causing a movement of the abutment should no article or sheet be carried by the carrier, as by a failure in the feed or from other causes, article operated means are provided for controlling the relative positions of the contact stud and the arm 27. In the preferred embodiment of the invention as shown, these means, without thereby limiting the scope of the invention thereto, are arranged to control the position of the arm, in that said arm 27, is removed or rocked idly out of the path of movement of the contact stud in the absence of the article so that such stud 26, will pass without having caused any operation of the printing roll or die. These article operated means consist of a contact piece or pin 4, which if an article or sheet be absent will, at the proper moment, automatically move out of its normal position to engage a lever 3, connected to move the arm 27 in advance of the possible contact of the stud 26 therewith. On the other hand, if there be a sheet present the pin will be prevented from movement by contact of the sheet therewith so that the arm 27 will remain in position to be subsequently moved by the contact stud. The contact piece 4, one for each feed surface provided by the carrier, consists of a radially movable pin mounted in bearings in the carrier D, having at its inner end a roll or stud 2 for engagement with a flange or guard 28 fixed to the machine table adjacent the bearing for the carrier, with the outer end of said pin exposed at the circumference of the carrier so that at the critical moment when it is necessary to control the position of the arm 27 with respect to the contact stud 26 the presence of the article or sheet on the carrier in overlying the pin will hold it in its normal or non-protruding position so that the lever 3 is not met by the roll 2 of the pin with the result that the arm 27 remains in position to be moved by the contact therewith of the stud 26 and the die is rotated at the proper moment. If, however, the article or sheet be not on the carrier the pin 4 is free to protrude beyond the circumference thereof under the tension of a suitable spring 1, so that the roll 2 is brought to a position to move the lever 3 and thereby rock the arm 27 out of the path of movement of the contact stud 26 with the result that the die remains at rest and no printing occurs on the unoccupied impression surface.

The flange or cam 28, against the inner surface of

which the roll 2 of the pin 4 normally travels, is in the main concentric with the axis of rotation of the carrier, but is shaped or cut away at a point *c* coincident or thereabouts with the feed position of the carrier, so that said roll, if there be no sheet on the carrier to hinder the radial movement of the pin will, under the tension of the spring 1, pass outward from the flange 28 so as to travel on its outer surface and meet the curved end of the lever 3, to rock it, see Fig. 4 and thereby move the arm 27. The flange 28 is also shaped at another point *e* to meet the outwardly moved roll 2 and guide it back to the inner side of the flange thereby withdrawing the protruding end of the pin 4. The lever 3 is pivoted at *d* to the machine table and is curved to form a path concentric with the flange 28 when said lever has been moved by the contact of the roll 2 therewith so that said lever shall be held thereby in its moved position for a definite length of time, that is to say until the contact stud 26 shall have had time to pass idly beyond the arm 27 without having moved it. The lever 3 is moved outwardly by the onward travel of the roll 2 against the pressure of a suitable spring 29, and when said roll has traveled to the end or contacting portion of the lever, said spring will act to return the lever to its normal position at the same time returning the arm 27 to its position in the path of travel of the succeeding contact stud 26. Should a sheet be taken by the carrier, the roll 2, by reason of its pin 4 being prevented from radial movement by contact with the overlying sheet, will pass the opening in the flange 28 and continue to travel around against the inner side of said flange thereby transmitting no movement to the lever 3 and arm 27, so that the die will rotate at the proper time and print the sheet. Continuing its travel around the inner side of the flange 28 the roll will pass the other opening therein (made for the return of the roll at the point *e*) without affecting the position of the pin 4 for the reason that the sheet is still on the carrier and confines it to its inner position. Between the travel of the roll 2 from the point *e* to the point *c*, the sheet will have been delivered so that said roll will be free to move outward at the point *c* should no sheet be taken by the carrier at the feed position.

The arm 27 is carried at the outer end of a rock pin 41 that is mounted in bearings in the machine table, and is connected to be moved by the lever 3, as by a link 42. The arm 27 has slight play on said rock-pin to allow the lever 3 to move the arm out of the path of movement of the contact stud when no printing is to occur without having moved said rock-pin. The inner end of the rock-pin carries fast thereto a second arm 43 that is connected by a link 44 to the lever 45 carrying the abutment 24, for the die stop 25, so that when the arm 27 is moved by the contact stud 26 the abutment-carrying lever will be rocked against the pull of a suitable spring 46 to release the die and allow it to rotate. As soon as the contact stud leaves the arm 27 the parts immediately return to their normal positions with the abutment 24 ready to meet the stop 25 upon the completion of a single rotation of the die and restrain its further movement for the time being, and at the same time the arm 27 will have been returned ready to meet a succeeding contact stud to effect another printing movement of the die.

The abutment 24 is of star-wheel shape rotatively

mounted in the lever to present a plurality of bearing faces to the stop and thereby distributing the wear thereon; and the lever 45 is mounted on a pivot stud 47 in its normal and active position being defined by a stop 48. The frictional driving of the die and the restraining abutment are similar in construction and operation to that set forth in my pending application before mentioned.

The printing roll or die 30 may be inked in any proper manner, as by a felt ink roll 53 which instead of being rotated by its frictional contact with the die is rotated by its frictional contact with a positively rotated roll 54, said roll having a gear 55 fast to its spindle which receives motion from the die spindle gear 36 through an intermediate 56 as indicated by dotted lines in Fig. 1. The passing sheet on the carrier may be prevented from contact with the inking devices by suitable guard 64.

At the delivery or stacking position *s*, the onward travel of the reassembled articles upon the release of the grippers in passing the releasing cam 15 is stopped by the end stop 40 which is shown adjustably mounted by the provision of slots and a screw 49 to the table plate 57 which in this instance forms an extension of the surface of the machine table at the stacking position for the reception of the reassembled articles. This plate may be continued around to the feed position to serve as a support for the articles in position to be fed to or taken by the carrier. At the stacking position the reassembled articles may be supported vertically by a plate 58 in the form of a spring carried by a support 59 laterally movable along the edge of the table plate, see Fig. 7.

In order to adapt the machine to print at any predetermined point on the article carried by the carrier, the contact stud or studs 26 is or are adjustable on the carrier so that it or they may be set to meet and move the arm 27 either earlier or later in the presentation of the article or sheet to the printing roll or die 30. For this purpose the studs 26 are carried by a ring 60 that is supported in guides 62 on the carrier so as to be capable of a rotative movement in said guides independent of the carrier so position the studs at a point with respect to the head of the sheet that will cause the timely operation of the arm 27 to bring the impression of the die on the sheet at the desired place. After adjustment of the ring it may be secured in place by a thumb screw 61 as seen in Fig. 2. In the position of the contact studs 26, shown in Figs. 3 and 4, the printing will occur near the leading end or head of the sheet, so that to change the point of printing on the sheet the ring will be adjusted backwardly so as to bring the studs say in the position indicated by the dotted lines in Fig. 3 which will delay the printing until the head of the sheet has passed some distance beyond the printing roll or die.

In operating the machine, the articles or sheets to be printed are presented singly or, by preference, in bulk at the feed position *f*, resting on their longitudinal edges at a tangent to the carrier surface and at the left hand side thereof immediately in rear of the separator or wiper 20 with the forward surface of the innermost article against the surface of the carrier *D* as indicated by the single dotted line *x*, in Fig. 1, and otherwise supported vertically by a somewhat distant roller

63. On rotation being imparted to the carrier the feed surface 19, thereof first arriving at the feed position will contact with the innermost sheet and drag it along under the wiper 20, which is actively holding back the rest of the sheets, and thence under the roll 23. The gripper which had passed the feeding position in its open position *v*, Fig. 4, is immediately thrown by the closing cam 16 to its closed position *w* gripping the leading end of the sheet so that the sheet is positively carried onward with the carrier to the point of discharge. In gripping the sheet to the carrier the sheet overlays the end of the radially movable pin 4 so that its roll 2 is prevented from passing out through the opening *c* in the flange 28 and will continue to travel around on the innerside of said flange until it again arrives at said opening when the presence of a sheet or its absence will determine whether the pin remains within the flange or passes outward through the opening *c*. A sheet being present in this instance and the pin 4 remaining in its inward position, the arm 27 consequently remains projecting across the path of movement of the contact stud 26, as indicated in Fig. 3, so that during the continued rotation of the carrier the stud will meet and rock the arm in the direction of the arrow thereon and thereby through the connections heretofore described remove the abutment 24 from the stop 25 to permit the printing roll 30 to rotate. The release of the printing roll will have taken place (as the parts are shown as adjusted) shortly after the carrier with its gripper has moved the sheet so that its head or leading end is about to pass the printing position so that the impress of the roll will take place near the head of that sheet, and in any event, no matter how the contact stud may have been previously located or adjusted, while the impression surface 18 of the carrier with the sheet is passing that position. The printing roll having acted, the carrier with the printed sheet continues moving toward the delivery or stacking position whereupon the gripper which had been closed to grasp the sheet adjacent the feed position and has continued its hold on that sheet will now be opened to release the sheet by its cam roll 12 meeting the releasing cam 15 as indicated by the dotted lines, Fig. 4, and will leave the sheet at a tangent to the carrier surface as indicated by the dotted line *x'*, Fig. 1, on the table plate 57 with its leading end adjacent the end stop 40 and supported in its vertical position by the spring plate 58. In delivering the printed sheet the gripper moves with the head of the sheet positively behind those previously delivered and leaves it at rest without interference therefrom. These several actions and operations of the parts will be repeated with the case of each associated feed surface, gripper and impression surface with which the carrier may be provided so long as an article or sheet shall be taken by the carrier. Should, however, the carrier fail to take a sheet from the feeding position, the gripper will close down as before, but shortly after doing so, the roll 2 arriving at the opening *c* in the flange 28 and the pin 4 in the absence of a sheet being now free to move radially outward, will move through said opening under the pressure of the spring 1, and in the continued movement of the carrier will strike the curved end of the lever 3 as in Fig. 4, and rock that lever outwardly and thereby move the arm 27, idly out of the path of

movement of the contact stud 26, so that said stud will pass the arm without having caused the release of the printing roll. The roll 2 of the pin 4 will continue to travel on the outside of the flange 28 with the outer end 5 of the pin 4 protruding beyond the periphery of the carrier as indicated at the right of Fig. 1, until said roll meets the portion *e* of said flange and is thereby guided to the innerside of that flange whereupon the protruding end of the pin is withdrawn and held withdrawn until the next opportunity to protrude arises by reason of the absence of a sheet. These several actions and operations of the parts will be repeated whenever a sheet fails to be taken by the carrier.

It is to be stated that the opening *c* in the flange 28 is so located with respect to the feed position that the pin 4 is held positively from protrusion by the flange until after the end of the pin has passed beyond the point at which a sheet is or may be taken by the carrier, so that the sheet when on the carrier simply prevents the protrusion of the pin while its roll 2 is passing the opening *c* and hence is relieved of the additional duty of positively moving it from a protruding position when being taken by the carrier. It will be noticed, also, that the point of protrusion of the pin 4 is adjacent to the grasping point of the grippers upon the sheet held to the carrier so that there is little strain against the sheet in holding the pin from protrusion at the time of the roll 2 passing the opening *c*, thereby rendering immaterial the character or quality of the material handled by the machine.

In the modified structure shown in Fig. 10 the carrier *D*¹ is provided with the feed and impression surfaces 191, 181 similar to those before described and connected to the carrier by flanged securing plates 81, 82; the impression surfaces occupying only a portion of the circumferential area of the carrier. The feed position *f*¹ and the delivery position *s*¹ are arranged nearer the printing position and the carrier is adapted to take two articles or sheets at each revolution instead of three as before. The printing roll or die 30, its restraining devices and their mode of operation are the same. The article engaging devices consist of a rock arm 142 pivoted to the carrier and carrying at one end a contact roll 261 with its other end 141 arranged to be engaged by the overlying article or in the absence of the article to project beyond the periphery of the carrier under the pull of a spring 111. When a sheet is taken by the feed surface the rock-arm is moved so that its contact roll 261 is in position to strike and move the arm 271 which in this instance is fast to the rock pin 41 to thereby rock the abutment lever 45 as before. If, however, a sheet be not taken by the carrier, the rock arm 142 will not be moved, its sheet engaging end will protrude beyond the surface of the carrier after passing the separator wiper 20 and the contact roll 261 will lie in its outer position and escape the arm 271 and no printing will occur. To change the position of printing on the sheet so that the printing roll 30 will act earlier or nearer the head of the sheet, the contact roll 261 is movably mounted in a slot 143 in the rock-arm 142, its position being adjusted by means of a wing-nut 144. The travel of the sheet taken by the carrier from the feed position *f*¹ may be aided by the interposition of one or more feed bands 233 that are stretched around grooved rollers 231 and 232 which bands also

act to hold the sheet on the carrier. And the untimely protrusion of the sheet engaging end 141 of the rock arm may be prevented by a fixed guard 281 in position to engage the contact roll. At the end of the guard, however, the rock arm will be moved under the pull of its spring 111, to protrude its end 141 as indicated by the dotted lines and thereby project the leading end of the sheet outward from the carrier so that it will be guided outward by the delivery guide 401. This mode of delivering the sheet may be aided by a rotated roll 234, indicated by dotted lines. The articles may be supported at the feed position by a plurality of idle rolls 631.

While the carrier and printing roll are shown of comparatively short widthwise dimensions, such as may be suited to print formal indorsements or other matter on the backs of checks and the like, it is obvious that the machine is not limited thereto. Neither are the improvements restricted to the proportionate sizes of the carrier and printing roll shown, as it is obvious they may be changed as required by the character of the articles to be handled by the machine and as will suit the printing requirements and the quantity of matter to be printed. All the bearings for the several spindles of the machine are located below the plane of travel of the articles so that the use of overhanging bearings is avoided and the machines not restricted to handle articles under a given width.

It is apparent that the improvements are susceptible of various modifications and that they are adapted to other uses than mere printing; and further, while it is preferred to employ the horizontal form of machine shown with vertically arranged spindles, the machine with but slight mechanical change is adapted to be turned on one of its sides so that the spindles become horizontal and the articles instead of traveling on their longitudinal edges travel horizontally on their broad faces. So far as the article controlled elements of the present invention are concerned, it is obvious that the sheets or other pieces of matter may be presented thereto in any suitable manner.

What is claimed is:

1. A printing couple, the impression member of which comprises a continuous surfaced rotary carrier in the periphery of which is inset a fixedly mounted frictional feed surface, and a gripper carried by said carrier for gripping the piece taken by said feed surface to the carrier. 110
2. A printing couple, the impression member of which consists of a continuous surfaced rotary carrier in the periphery of which is inset a fixedly mounted frictional feed surface, a gripper carried by said carrier for gripping the piece taken by said feed surface to the carrier, and a coacting wiper of adhesive material preventing said feed surface from taking more than one piece at a time. 115
3. A printing couple, the impression member of which consists of a rotary carrier in the periphery of which is inset a frictional feed surface, the printing member of which is normally at rest, a means on the carrier movable with respect thereto and controlled by the presence of the article to be printed for causing the timely movement of the printing member. 120
4. A printing couple, the printing member of which is normally at rest, the impression member of which consists of a rotary carrier, means on the carrier movable with respect thereto and controlled by the presence of the article thereon, and a connection with said means and with the printing member for causing the timely cooperation of said two members. 130
5. A carrier provided with a frictional feed surface and an impression surface, a wiper coacting with the feed sur- 135

- face and bearing against the carrier, a gripper for holding the piece to the carrier taken by the feed surface, means for operating the gripper and a printing roll coacting with the impression surface.
- 5 6. A carrier provided with a frictional feed surface and an impression surface, a wiper coacting with the feed surface and bearing against the carrier, a roll in advance of the wiper bearing against the carrier and a normally at rest printing roll coacting with the impression surface.
- 10 7. A carrier provided with a frictional feed surface and an impression surface, a wiper coacting with the feed surface and bearing against the carrier, a roll in advance of the wiper also bearing against the carrier, a gripper for holding the piece to the carrier taken by the feed surface, means for operating the gripper, and a printing roll coacting with the impression surface.
- 15 8. The combination of a rotatable printing member normally at rest, a rotary impression member, and means on the impression member and rotative therewith adapted to be engaged and moved relative to said impression member by the article to be printed for controlling the rotative cooperation of the two members.
- 20 9. The combination of a rotary printing couple one member whereof is normally at rest, and an article controlled device mounted on and rotatable with the other member and adapted to be engaged and moved relative to said other member by the article to be printed for determining the rotative cooperation of both members.
- 25 10. The combination of a rotary printing couple, vibratory means for controlling the printing movement of the printing member thereof and mounted independent of said couple, and an article controlled device mounted on and rotative with the impression member and movable relative to said member by the engagement therewith of the article to be printed for determining the movement of said vibratory means.
- 30 11. The combination of a printing member normally at rest, an impression member, contact pieces one of which is carried by the impression member for causing the cooperation of the two members and means carried by the impression member and adapted to be engaged by the article to be printed for controlling the coaction of said contact pieces.
- 40 12. The combination of a printing member normally at rest, an impression member, an arm and connections mounted independent of said members for controlling the coaction of said two members, a contact carried by the impression member, and article engaged means on the impression member for controlling the engagement of the arm and contact.
- 50 13. The combination of a printing couple, an abutment for controlling the movement of the printing member thereof and having a contact engaging-piece, means for carrying the article to be printed and having a contact for engaging said engaging-piece, and an article controlled device on the carrying means for determining the engagement of the contact and engaging piece.
- 55 14. The combination of a printing member normally at rest, an impression member, an abutment controlling the cooperation of said two members, an arm for moving said abutment, a contact on the impression member for engag-

- ing said arm, and an article engaged means on the impression member for controlling the position of said arm with respect to said contact.
- 65 15. The combination of a printing member normally at rest, an impression member, an arm and connections for controlling the coaction of said two members, an adjustably mounted contact carried by the impression member, and an article engaged means on the impression member for controlling the engagement of the arm and contact.
- 70 16. The combination of a printing member normally at rest, an impression member, an arm and connections for controlling the coaction of said two members, a traveling contact for engaging said arm, and a traveling article-engaged means for controlling the engagement of the arm and contact.
- 75 17. The combination of a printing member normally at rest, an impression member, an arm and connections for controlling the coaction of said two members, a plurality of contacts carried by the impression member, and a plurality of article engaged means on the impression member for controlling the engagement of the arm and contacts.
- 80 18. The combination of a printing member, an impression member, an arm and connections for controlling the coaction of said two members, a plurality of contacts carried by the impression member, means for simultaneously adjusting said contacts, and a plurality of article engaged means on the impression member for controlling the engagement of the arm and contacts.
- 85 19. The combination of a printing member, an impression member, an arm and connections for controlling the coaction of said two members, a contact carried by the impression member for engaging said arm, an article engaged means, and a lever connected to move said arm by contact therewith of said means when no article is present.
- 90 20. The combination of a printing member normally at rest, an impression member, an arm and connections for controlling the coaction of said two members, a contact carried by the impression member for engaging said arm, an article engaged means for controlling the engagement of the arm and contact and an interrupted guard governing the movement of said means independent of the article.
- 95 21. The combination of a printing member normally at rest, a sheet carrier serving also as the impression member and having a gripper to grasp the sheet to the carrier, sheet controlled means on the carrier for determining the operation of the printing member, a delivery plate for the printed sheet and a gripper releasing device adjacent said plate.
- 100 22. The combination with a printing member normally at rest and an impression member, of means for causing the printing operation when an article is present and means traveling with the impression member for rendering said first named means inoperative when no article is present.
- 105 110 115

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses, this 10th day of October 1906.

FREDERICK G. JAIN.

Witnesses:

GEO. H. GRAHAM,
S. EDGAR DYE.