

June 19, 1956

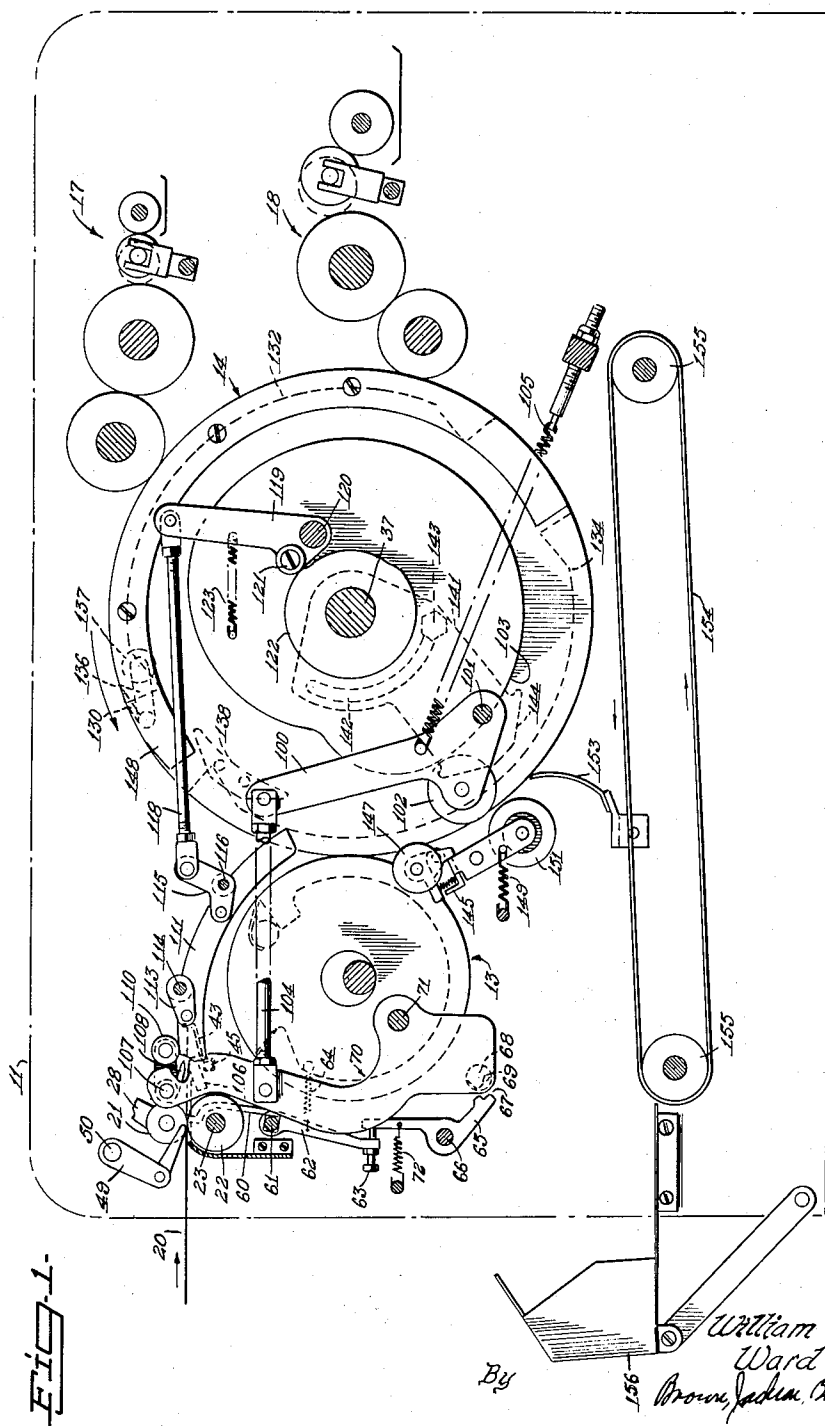
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2,750,882

SHEET FEEDING MEANS FOR DUAL PURPOSE DUPLICATOR

Filed Jan. 21, 1953

5 Sheets-Sheet 1



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SHEET FEEDING MEANS FOR DUAL PURPOSE DUPLICATOR

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5 Sheets-Sheet 2

Fig. 2.

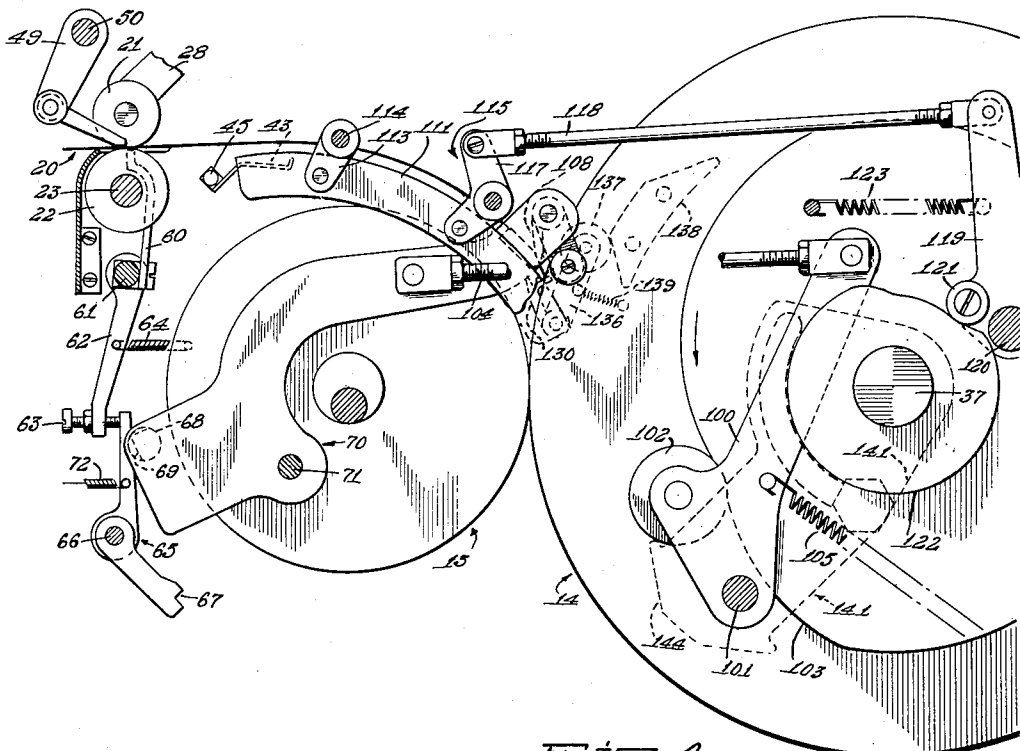


Fig. 3.

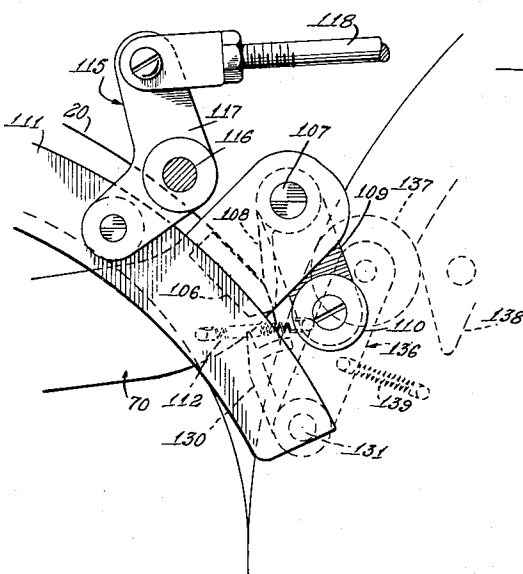
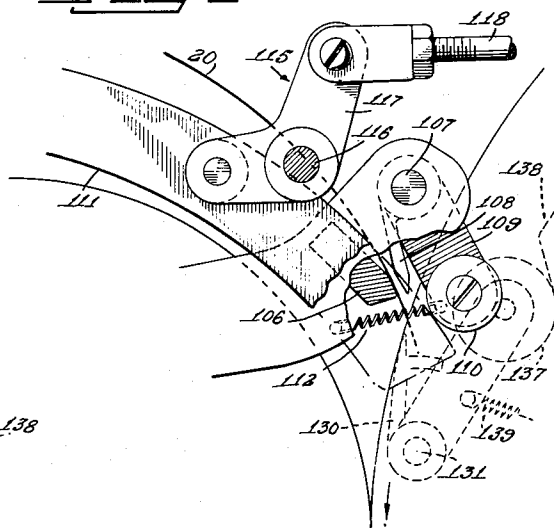


Fig. 4.



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5 Sheets-Sheet 3

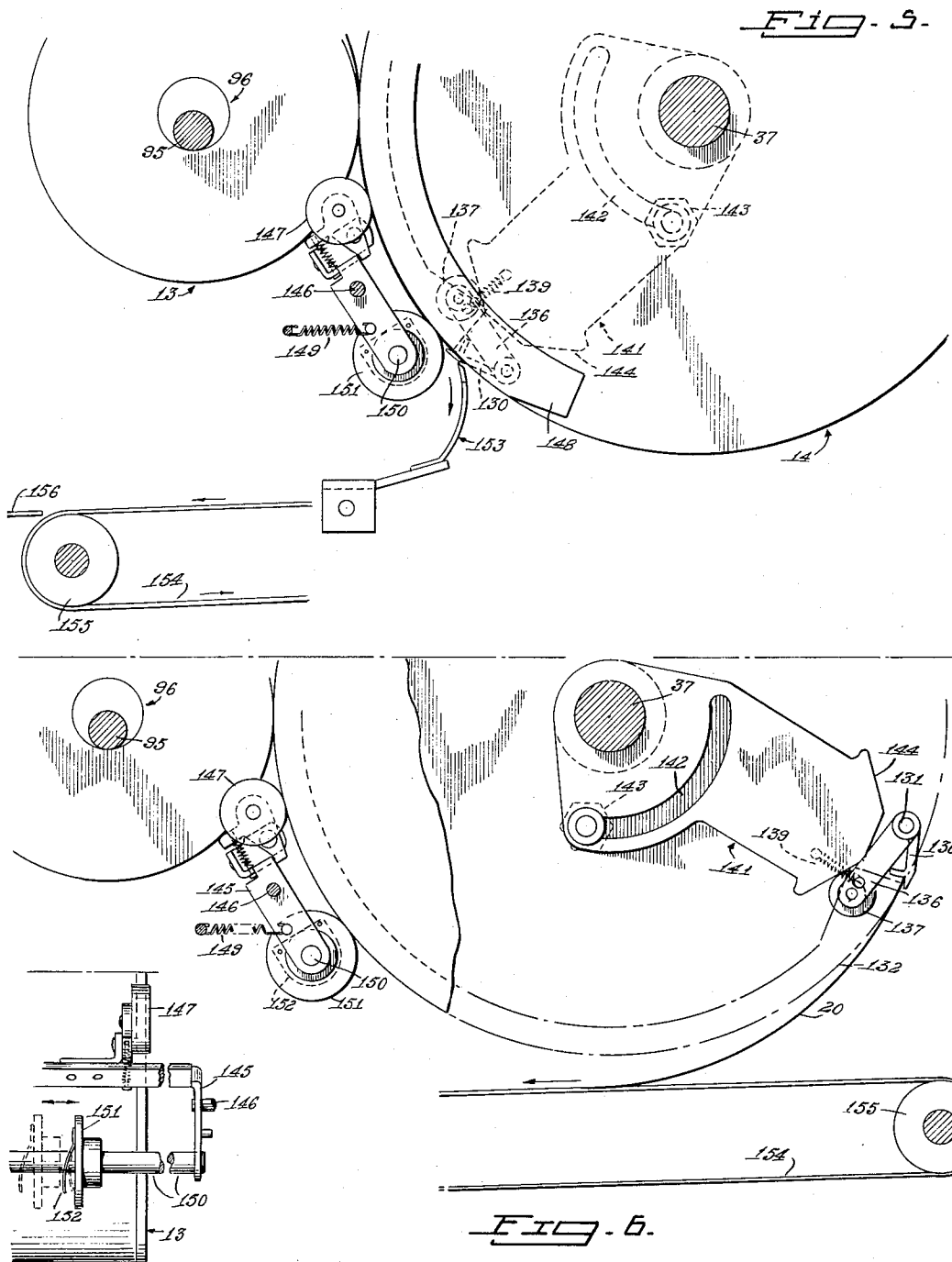


FIG. 7.

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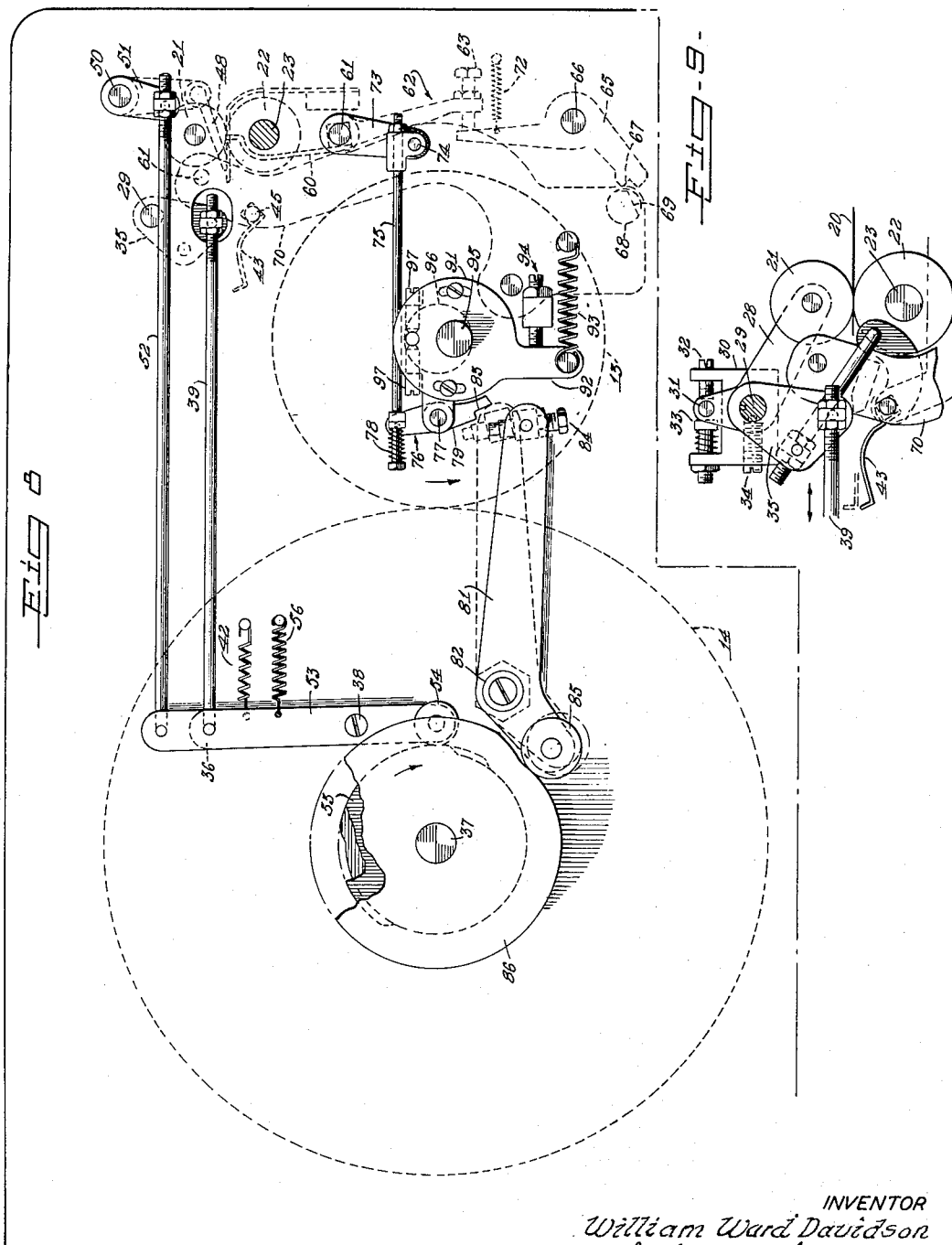
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SHEET FEEDING MEANS FOR DUAL PURPOSE DUPLICATOR

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5 Sheets-Sheet 4



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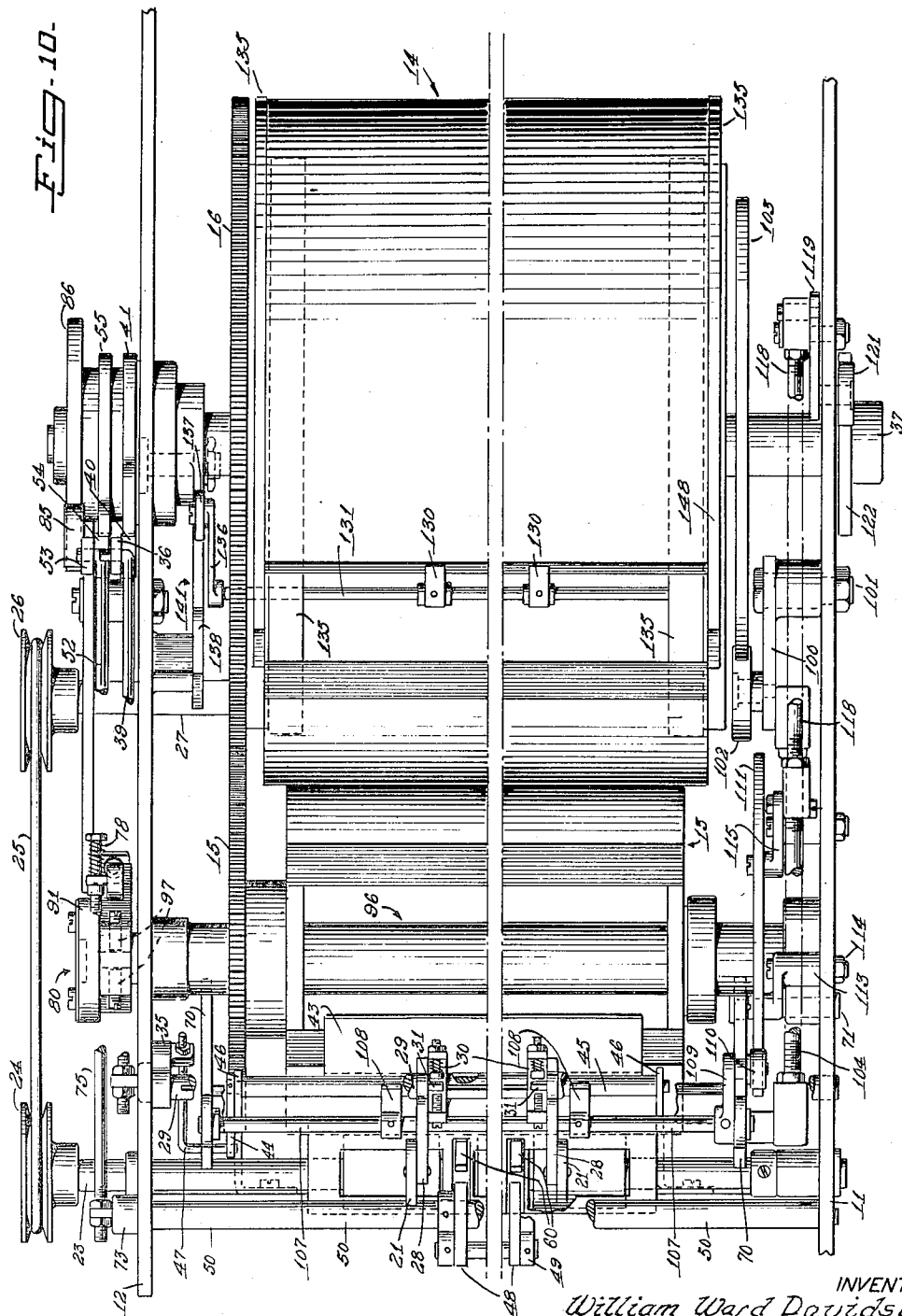
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SHEET FEEDING MEANS FOR DUAL PURPOSE DUPLICATOR

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5 Sheets-Sheet 5



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SHEET FEEDING MEANS FOR DUAL PURPOSE DUPLICATOR

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Application January 21, 1953, Serial No. 332,430

20 Claims. (Cl. 101—232)

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My present invention relates generally to a dual purpose duplicator capable of performing both direct and offset printing. When used for direct printing, raised type and the so-called letter press process is ordinarily employed and for offset printing the lithographic process is preferred.

More particularly, my invention concerns improvements in the dual purpose class of duplicators and specifically relates to a new and improved style of feeding mechanism organized and related to the other elements of the press in a manner to give a unique and improved mode of operation to a press of this class. In general, the press of my present invention discards the old conventional employment of three printing cylinders and resorts to the use of two cylinders, one being larger than the other and preferably having a diameter that is twice that of the smaller cylinder. The larger cylinder or drum is conveniently provided with removable plate and platen segments and the smaller cylinder carries a blanket surface. In offset printing a plate is mounted on the plate segment of the larger cylinder and arranged so that during one-half of the revolution of the large cylinder an image is imprinted on the blanket cylinder which is then transferred during the next half revolution of the large cylinder to the sheet being printed. For direct printing according to the letter press process, the platen segment of the large cylinder is removed and in its place a direct printing letter press segment is substituted. The plate segment of the large cylinder is not then used, but need not be removed from the machine and if a hard platen surface is required such may be substituted for the blanket of the smaller cylinder, although this latter conversion is normally unnecessary.

In feeding paper to a press of this character, the practice heretofore generally has embodied power driven roller members arranged to feed paper until the same is registered against end stops. The registered paper is then engaged by gripper members acting in timed coordination with the cylinders of the press and arranged to advance the paper to the bite of the cylinders. The provision of such power driven roller members and the associated register stop members has, in the past, been such that easy access to the smaller or blanket cylinder has been substantially prevented. The outstanding improvement and advancement in my present machine over prior known devices of this character resides primarily in the new and improved means and arrangements of elements utilized for feeding paper to the press. For such purposes I employ a preliminary feeding and stop mechanism designed to register paper accurately prior to its being engaged by an arcuately movable translation gripper mechanism designed to carry the paper from its indexed position against the stop mechanism across a substantially circumferential portion of the blanket cylinder for its eventual engagement by gripper means associated with the plate-platen cylinder of the press. Such an arrangement of elements permits easy access to the smaller or blanket cylinder when paper

is not being fed to the mechanism and thereby marks an improved advancement in the art.

A further improvement in my present machine over prior known devices of this character, resides in the arrangement of certain elements thereof whereby action of the translation gripper mechanism is stopped when paper is not fed to the preliminary feeding and stop mechanisms, thus permitting free access to the blanket cylinder, uninterrupted by movement of mechanism thereover, when there has been a failure in paper feed.

A still further improvement in my present machine resides in the utilization of a gripping means for engaging sheet paper fed by a preliminary feed mechanism into registration against a preliminary stop means and the transfer of such paper so engaged at the stop means to additional gripper means associated with the rotating plate-platen cylinder of the press.

Of additional importance and improvement in my present printing press, is the provision of a mechanism designed to accelerate the movement of the paper and the translation gripper mechanism whereby the paper may be accelerated from an at rest position at the preliminary stop means to substantially the speed of the rotating plate-platen cylinder at its point of discharge thereto so that there is a smooth and efficient delivery of paper to gripper mechanism associated with the rotating plate-platen cylinder. This feature eliminates the need for interrupting the rotational movement of the plate-platen cylinder to effect delivery of paper thereto.

A still further improvement is found in my present machine by providing a sensing operation designed to determine whether or not a paper sheet has been properly advanced for subsequent engagement by the translation gripper mechanism. This improvement is accomplished by a sensing member and associated elements so related to the bite of the two main cylinders of the press that easy access to a substantially circumferential portion of the blanket cylinder is maintained. The arrangement is further such that the sensing member, so arranged, upon detecting the absence of a sheet of paper at the preliminary stop mechanism, cooperates with other members of the press for preventing the movement of the translation gripper mechanism and for throwing the blanket and plate-platen cylinders out of engagement, as is necessary when a sheet of paper is misfed in order to prevent offset onto the platen member of the press.

The main object of my present invention is to provide a new and improved lithographic offset duplicator, or a dual purpose duplicator, in which mechanism is employed to give a two stage feeding advancement of paper prior to engagement by grippers of the printing couple of the press and to do so in such a way that substantial circumferential areas of the two cylinders are easily accessible and free of any interference from overlying mechanisms when paper is not fed thereto.

Another object of my present invention is to provide a mechanism in a dual purpose duplicator or lithographic offset press, arranged to translate paper from a stationary position, accelerate the same to substantially the surface speed of a rotating plate-platen cylinder and to deliver the paper at such speed to a gripper mechanism associated with the rotating printing couple of the press.

A still further object of my present invention is to provide a new and improved dual purpose duplicator in which preliminary and secondary feeding means are provided and arranged for sequential operation in timed relation to the printing couple of the press whereby an improved printing operation, marked by its accuracy of registration of the paper to the printing couple, is accomplished.

The above and further objects and features of my present invention will be recognized by one skilled in the art

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from the following detailed description thereof and with reference to the accompanying drawings wherein a preferred embodiment of my new press is illustrated.

In the drawings:

Figure 1 is a side elevational view, with parts thereof shown in cross section, demonstrating the features and arrangement of the major elements of my new and improved duplicating press;

Figure 2 is an enlarged side elevational view of a portion of the press illustrated in Figure 1 showing, in particular, the features of the printing couple and the relation thereto of the translation gripper mechanism and the mode of feeding paper to the grippers associated with the plate-platen cylinder of the press;

Figures 3 and 4 are enlarged detailed partial side elevational views of the printing couple of the press, showing the progressive advance of paper as it is fed to the paper grippers associated with the plate-platen cylinder;

Figure 5 is an enlarged partial side elevational view of the printing couple of the press, illustrating the features of a paper gripper release and stripper mechanisms which serve to take the printed copies from the printing couple according to the practice of an offset printing process;

Figure 6 is an enlarged partial side elevational view, similar to Figure 5, illustrating the arrangement of the paper gripper and release mechanisms arranged according to the practices of the letter press printing process;

Figure 7 is a detail partial front elevational view of the arrangement of elements utilized for a paper guide roller mechanism;

Figure 8 is a side elevational view, similar to Figure 1 of the drawings, but illustrating the arrangement of press mechanisms as seen from the opposite side illustrated in Figure 1 and particularly demonstrating the features of the paper sensing mechanism and its association with the printing couple of the press;

Figure 9 is an enlarged detail view in side elevation of the mechanism controlling and adjusting the preliminary paper feed means; and

Figure 10 is a top plan view of the duplicating press of my present invention.

The duplicating printing press of my invention, as illustrated in the drawings, includes a pair of ground engaging, side frame plates 11 and 12 between which are rotatably mounted a horizontal blanket cylinder 13 and a plate-platen cylinder 14, the latter being substantially twice the diameter of the blanket cylinder 13. Further the axes of the two cylinders are parallel and lie substantially in a common horizontal plane. The two cylinders are driven by means of intermeshing power driven gears 15 and 16 according to conventional practice. Conventional inking and dampening systems, indicated generally by numerals 17 and 18 are also provided adjacent the plate-platen cylinder for inking the plate thereon in a familiar manner.

Preliminary sheet feed means

As will be recognized from Figure 1 of the drawings, sheets of paper, such as sheet 20, illustrated in the upper left hand corner of Figure 1, are fed initially to the press between two upper feed rollers, 21, 21 and one lower feed roller 22. The lower feed roller 22 is mounted on a horizontal shaft 23, rotatably journaled at its ends in the side frame plates 11 and 12 of the press. Shaft 23, as shown in particular in Figure 10 of the drawings, is power driven by means of a sheave wheel 24 mounted at the left hand end thereof, which in turn has driving connection, through belt means 25, with a driven sheave wheel 26 which is powered by a motor (not illustrated). The upper feed rollers 21 serve as tension rollers and such are each mounted for rotation at the lower end of an associated lever member 28 fixed at its upper end to a horizontal shaft member 29 rotatably held by the side frame plates 11 and 12. Each lever 28 is further arranged to pivot or swing with shaft 29 by means of an associated yoke

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member 30 fixed to shaft 29 and having adjustable means for engaging a pin member 31 projecting outwardly from the upper end of lever 28 (see Figures 9 and 10).

The adjusting means referred to on yoke 30, comprises an adjusting screw 32 and a spring loaded plunger 33 suitably spaced endwise for receiving the projecting pin member 31 therebetween. A set screw 34 also is utilized to adjustably position yoke member 30 on shaft 29, as shown in detail in Figure 9 of the drawings. It further will be understood that the spacing between the spring loaded plunger 33 and adjusting screw 32 serves to regulate the arc of motion of the lever 28 carrying each tension roller 21 according to rocking actuation of shaft 29.

In order to impart rocking motion to shaft 29, a link crank 35 is keyed or otherwise fixed to the left hand end of shaft 29 (see Figures 9 and 10). A cam drive lever 36 for actuating link 35 is pivotally connected to the left hand frame plate 12, adjacent shaft 37 carrying the plate-platen cylinder 14, by means of a pivot connector 38. Driving connection between lever 36 and link crank 35 is accomplished by an intermediate connecting rod 39, as shown clearly in Figure 8 of the drawings. Lever 36 further carries a cam roller 40 at its lower end for engagement with the camming edge or surface of cam member 41 fixed to the plate-platen cylinder shaft 37 outside of frame plate 12 so that rotational motion of the cam member 41 in response to rotation of the plate-platen cylinder 14 will cause a pivotal rocking movement of link 35 and lever 36. Resilient engagement between the cam roller 40 and cam 41 is maintained by means of a spring member 42 connected between the drive lever 36 and the left hand frame plate member 12.

With such an arrangement it will be appreciated that the tension feed rollers 21 will be alternately rocked into and out of engagement with the sheet of paper 20, as it is fed to the press by the power driven feed roller 22, such occurring in timed relation to the printing couple of the press. Also the tensioning of rollers 21 may be adjusted to vary their spacing from the power driven feed roller 22 to accommodate papers of different weights and thicknesses. In this regard taking up on the adjusting screws 32 will serve to raise roller members 21 and vice versa. Adjustment of the spring loaded plungers 33 is also provided for this same purpose. However, the tension or weight of the idler rollers 21 against the paper, as it is being fed across the lower power driven feed roller 22, ordinarily is sufficient to move the paper to register against a preliminary stop member 43. In this regard it may be stated that the primary purpose of the timed action of the link crank or lever 35 on shaft 29 is in fact more important from the standpoint of raising and lowering the stop member 43 than for causing the arcuate raising and lowering of the tension feed rollers 21. To swing the stop member 43 out of the way, and thus permit the advance of the paper to translation gripper mechanism which will be described later herein, a lever 44 (see Figure 9) is secured to a shaft member 45 carried adjacently parallel to shaft 29 between two angle frame bracket members 46, 46. Lever 44, in turn, is connected to the link crank 35 by means of a rod member 47. The stop member 43 is also carried on shaft member 45 so that the movement of the stop member takes place in timed relation to the printing couple of the press and in response to the cam actuated motion of drive lever 36 and link crank 35.

Sheet detectors

To provide means for determining or detecting the presence of a sheet of paper being fed between the feed rollers 21 and 22, I have resorted to fingers 48, 48 pivotally supported at the lower ends of link members 49 and adapted to translate slidingly over the upper surface of a sheet of paper 20 being fed by the feed rollers (see Figures 1 and 2). Link members 49 in turn are fixed to a shaft member 50 rotatably journaled between the

side frame plates 11 and 12 for rocking movement. In order to provide sliding movement of the detector fingers 48 from left to right, as illustrated in Figures 1 and 2 of the drawings, a crank lever 51 is secured to the left hand end of shaft 50. Crank lever 51 in turn is connected by means of a connecting rod 52 to the upper end of a cam drive lever 53 positioned outwardly of cam drive lever 36 on the left hand side of the press. Drive lever 53 is pivoted intermediate its ends on the pivot member 38 which is employed in the pivotal mounting of drive lever 36, as heretofore described. A cam roller 54 is carried rotatably at the lower end of drive lever 53 for rolling engagement with an actuating plate cam member 55 mounted or fixed to the plate-platen shaft 37. A spring member 56 is arranged between drive lever 53 and the left hand frame plate 12 to resiliently bias roller member 54 into engagement with the camming surface of cam member 55, all in a manner similar to the cam actuated linkage means utilized in actuating the tension feed roller 21 and the paper stop means 43 as described above.

With such an arrangement it will be appreciated that the sliding movement of the pivotally mounted detector fingers 48 takes place in timed relation to the printing couple of the press, similar to the arrangement employed in the actuation of the feed rollers 21 and sheet stop means 43.

So long as paper is being fed to the press, the detector fingers 48 will continue to slide on the surface of the paper from left to right as illustrated in Figure 1 of the drawings. Under this circumstance the movement of the detector fingers 48 is an idle one. However, if there is no paper present to support the pivotally movable detector fingers 48 during their movement from left to right or right to left the detector fingers will swing downwardly to initiate a feed lock-up mechanism arranged to prevent the operation of a translation gripper mechanism and to actuate a mechanism arranged to separate the blanket and plate-platen cylinders of the press.

Feed lock-up means

As stated heretofore, in the absence of a sheet of paper beneath the detector fingers 48, mechanism is set up or actuated to prevent the initiation of a translation gripper means for carrying the paper into gripper means associated with the printing couple. To accomplish this function a pair of arm members 60, 60 are fixed to a horizontal shaft member 61 rotatably mounted between side frame plates 11 and 12 and positioned in underlying parallelism with shaft 23 which supports rollers 22. The upper ends of arms 60 are suitably formed to clear roller shaft 23, as illustrated in Figure 1 of the drawings. Also mounted on shaft 61 and intermediate the two arm members 60, is a depending lever member 62 carrying an adjusting screw 63 at its lower end. A spring member 64 is interconnected between lever 62 and the framing of the press to bias the adjusting screw 63 into engagement with the upper end of a bell crank lever 65 pivoted on a horizontal shaft member 66. The lower arm of the bell crank lever 65 is provided with a latch finger 67 comprising a cutout notched portion at the lower end thereof, substantially as illustrated in Figure 2 of the drawings. Latch finger 67 is adapted to engage a tie rod 68 and specifically a planar surface 69 on tie rod 68. Tie rod 68 is disposed between a pair of paper gripper translation feed levers 70, 70 mounted outwardly of the ends of blanket cylinder 13 and pivoted on the side frame members 11 and 12 by pivot means 71 whereby the same are adapted to rock about a common horizontal pivotal axis disposed intermediate their ends and offset beneath the central axis of the blanket cylinder 13 (see Figure 2). A spring member 72 is connected to the upper arm of the bell crank lever 65 to bias the same into engagement with adjusting screw 63 and in opposition to biasing force of spring member 64 connected to lever member 62. Now, as the detector fingers 48 fall downwardly in the absence of a sheet of

paper therebeneath to engage the upper ends of arm members 60, shaft member 61 will rock or rotate in a clockwise direction, as viewed in Figures 1 and 2 of the drawings, and the bell crank lever 65 will swing inwardly toward the blanket cylinder 13 to present the latch fingers 67 thereof to the notched out planar portion 69 of tie rod 68, thus preventing arcuate actuation of the translation feed levers 70 toward the printing couple of the press. The necessity of this function will be more clearly understood from description which will appear later herein, but briefly it may be stated that the translation feed levers 70 carry paper grippers at their upper ends capable of gripping paper fed to stop member 43 for translating the same to gripper members associated with the plate-platen cylinder 14 of the press. Therefore, it will be appreciated that the locking of the translation feed levers 70 against arcuate movement by means of the linkage hereabove described, is essential to the satisfactory functioning of my press when a sheet of paper is not fed between the feed rollers and indexed against the feed stop means 43.

Printing couple separator

As stated hereabove, along with the locking-up of the translation feed mechanism, as hereabove described, there simultaneously occurs the initiation of a mechanism capable of separating the blanket and plate-platen cylinders of the press, as will now be described.

Observing Figure 8, it will be seen that mechanism is illustrated therein which serves to separate the printing couple when sheet detectors or sensing fingers 48 engage arms 60, as described hereabove. To this end a link lever member 73 is mounted to the left hand end of shaft 61 outwardly of the left hand frame plate 12. Lever 73 is provided with a pivot connector 74 which receives one end of a connecting rod 75. The other end of connecting rod 75 is joined for sliding movement to a pivot link or lever 76 pivoted intermediate its ends on pivot 77. A compression spring member 78 is mounted at the end of connecting rod 75 beyond its sliding connection with the upper end of pivot link 76. The pivot 77 which mounts pivot link 76 is received in an ear extension 79 associated with an eccentric throw-out mechanism, indicated generally by numeral 80. The lower end of pivot link or lever 76 is adapted to engage one end of a bell crank lever arm 81 pivoted at 82 on the left hand side plate member 12 of the press. It further will be noted that the lower end of pivot link 76 is fitted with a notched end portion 83 adapted particularly to engage an adjusting screw 84 fitted to the right hand end of the bell crank lever arm 81, as viewed in Figure 8 of the drawings. The opposite end of bell crank lever 81 carries a cam roller 85 adapted to engage the cam periphery or camming face of a cam plate member 86 mounted on the plate-platen cylinder shaft 37. It will be recognized from the arrangement of the parts above described, that whenever the detector fingers 48 engage the upper end of the arm members 60, the lower end of the pivot link 76 will be thrown to engage adjusting screw 84 so that the eccentric mechanism 80 will be actuated. In this regard the spring member 78 at the left hand end of the connecting rod 75 permits free movement of lever 76 during the operation of eccentric throw-out mechanism 80.

Eccentric throw-out mechanism

The eccentric throw-out mechanism 80 comprises a throw-out collar member 91 having a depending arm portion 92 to which a return spring 93 is attached for urging the collar 91 counterclockwise as viewed in Figure 8. Adjusting screw means 94 is provided to engage the arm portion 92 of the collar member in regulating the tensioning of return spring 93.

Basically the throw-out collar is arranged to receive one of two trunnion portions 95 extending from opposite ends of the main support shaft 96 upon which the blanket

cylinder 13 is rotatably mounted. It particularly will be noted that the trunnion extensions 95 are eccentrically related with respect to the longitudinal axis of the shaft 96. Collar 91 is rigidly attached or connected to the one trunnion portion 95 related therewith, as by key and key-way means or the like (not shown), so that rotation of the throw-out collar rotates the main shaft 96 and throws the blanket cylinder toward or away from the plate-platen cylinder. Means for adjusting the positioning of collar 91 relative to the eccentric trunnion portion related therewith, includes adjusting screw means 97, 97.

In operation the eccentric throw-out mechanism is arranged to operate in response to the locking action of the sensing or detector fingers 48 with lever arms 60 and attendant linkage as described heretofore, which will occur only if a sheet of paper 20 has not been fed to the gripper fingers of the translation gripper mechanism, which will be described presently.

Under such a circumstance and just prior to the lockup of the sensing fingers and arms 60, the radially outermost portion of cam plate member 86, which is mounted on the plate-platen cylinder shaft 37, will engage the roller 85 on lever arm 81 to move the latter arm counterclockwise, as viewed in Figure 8. This movement of lever 81 serves to move the adjusting screw 84 attached thereto in position for engagement by the notched end of the pivot lever 76 associated by linkage means with the lever arms 60. At the same time the pivot lever 76 will be thrown clockwise by the intervening engagement of the sensing fingers 48 and arms 60. This lockup between the lever arm 81 and the eccentric throw-out mechanism 80, causes collar 91 of the latter mechanism to rotate in a clockwise direction, as viewed in Figure 8, and carry the attached trunnion 95 and shaft 96 therewith, thus separating the smaller blanket cylinder 13 from the larger plate-platen cylinder 14.

Return of the two cylinders to contacting engagement occurs under the urging of the now tensioned return spring 93 connected to collar member 91 so that when the pivot lever 76 disengages with the cam actuated lever arm 81 according to the rotation of cam plate 86, spring means 93 will rotate the collar 91 to its Figure 8 position.

The throw-out effected by the actuation of the eccentric throw-out mechanism 80 occurs shortly before the platen segment of cylinder 14 reaches the line of contact with the blanket cylinder 13. The throw-out of the two cylinders will be maintained for a full revolution of the plate-platen cylinder and until the lever arm 81 is disengaged from the pivot link 76. If in the meantime the preliminary feeding mechanism has registered a sheet of paper 20 against the stop means 43, the detector or sensing fingers will not again engage lever arms 60 and the two cylinders of the press will be returned to contacting relationship in time for engaging a sheet of paper fed thereto by the translation gripper mechanism, as will now be related.

Translation gripper mechanism

As was mentioned heretofore, after paper 20 is fed through the feed rollers 21 and 22 into registration against stop member 43, such paper is then in position to be advanced to the printing couple of the press. It further will be observed from Figure 1, that when the paper is positioned against the stop member 43, the leading edge thereof is disposed some distance from the bite between the blanket and plate-platen cylinders of the press and that some means is essential for translating the paper from its stop position to some manner of gripping mechanism furnished by the plate-platen cylinder. Additionally it is essential that the paper be accelerated from its at rest condition at stop 43 to substantially the speed of the rotating plate-platen cylinder by the time it leaves the translating mechanism so that there will be a smooth transfer of the paper from the translating mechanism to the printing couple.

The major portion of this mechanism, herein termed the "translation gripper mechanism," is concerned with the translation feed levers 70, 70 which are pivotally mounted, as mentioned heretofore, on members 71 connected to the side plates 11 and 12 of the press and located adjacent the rotational axis of the blanket cylinder. Actuation of the translation feed lever 70, 70 is carried out by means of a crank arm member 100 pivotally connected to the right hand frame member 11 by means of a pivot connector 101 (see Figures 2 and 10). Crank arm 100 also carries, at one end, a rotatable cam roller 102 adapted to engage the camming surface of cam plate 103 carried by or fixed to the right hand end of the main shaft 37 which supports the plate-platen cylinder 14. It further will be observed that the crank 100 is substantially a bell crank with the roller member 102 being supported laterally of its pivot axis provided by pivot connector 101. The upper end of arm 100 is also pivotally joined to a connecting rod 104, extending to the right hand one of the two translation feed levers 70, which is connected pivotally to such lever 70 intermediate its ends. A spring member 105 is secured between the arm 100 and the right hand side plate member 11 of the press to resiliently hold the cam roller 103 on the camming surface or edge of cam member 103, mounted at one end of the plate-platen cylinder shaft 37. In this regard, it will be noted that cam 103 is suitably shaped to provide the needed acceleration of the translation feed levers 70, 70 so that there is a smooth delivery of paper to the grippers of the printing couple, the paper moving at substantially the same speed as the rotating plate-platen cylinder at the instant of delivery and transfer from the translation gripper mechanism. Thus driving connection is established between the translation feed levers 70, 70 and the plate-platen cylinder 14 of the press so that arcuate motion of the translation feed levers takes place in timed relation to the printing couple of the press.

Means for gripping the paper in response to rocking actuation of the translation feed levers 77 includes a gripper bar 106 disposed between the upper ends of the two translation feed levers 70, 70, and radially outward of the blanket cylinder 13. This gripper bar is disposed in stationary relationship or is rigidly fixed to the upper ends of the translation feed levers so as to provide a firm surface for gripping the paper as it is carried by the translation feed levers, which will be recognized presently. A tie rod 107 is likewise disposed between the upper ends of the translation feed levers 70, 70 and rotatably secured thereto radially outward of gripper bar 106. On this rotatably journaled tie rod 107 are mounted a pair of gripper fingers 108, as shown clearly in Figures 3, 4 and 10 of the drawings. Fingers 108 are adapted to cooperate with the stationary gripper bar 106 to grasp the paper 20 adjacent its leading edge during the translation function of the feeding operation. Cooperating with the gripper fingers 108 is a roller arm 109 carrying a roller member 110 at its outer end and designed to impart arcuate movement to fingers 108. As will be recognized from an inspection of Figure 10 of the drawings in particular, roller arm 109 is disposed at the right hand end of tie rod 107 and in a position to permit rolling movement of the roller 110 thereon along a camming surface of an arcuate roller track member 111. Spring member 112 is utilized between roller arm 109 and the right hand translation feed lever 70 to bias roller member 108 against the camming edge of roller track 111. Roller track 111 in turn is pivotally supported by a goose neck pivot lever 113 attached by pivot connector 114 to the right hand side frame plate 11 of the press. This pivotal mounting of the roller track permits limited arcuate movement thereof up and down, for a purpose which will be apparent presently. Also associated with the roller track 111 is a bell crank lever 115 pivotally connected intermediate its ends to frame plate 11 by a pivot connector 116. The lower arm of the bell crank lever 115

is pivotally joined to the arcuate shaped roller track member 111 and the upper arm 117 thereof is pivotally joined to a connecting rod 118 leading to the upper end of a bell crank cam lever 119 pivoted on the right hand frame plate 11 by pivot connector 120. Immediately adjacent pivot connector 120 of the cam lever 119 and disposed laterally therefrom is a cam roller 121 adapted to engage a camming edge of cam plate 122 carried on shaft member 37 of the plate-platen cylinder; cam 122 and roller 121 being disposed outwardly of the right hand frame plate 11 of the press, as shown clearly in Figure 10 of the drawings. A spring member 123 is provided for holding the cam roller 121 against the camming edge of cam member 122; spring 123 being fastened between the frame plate member 11 and the upper end of cam lever 119, as illustrated in particular in Figure 2 of the drawings.

With the arrangement of cams and linkages as described immediately hereabove, it will be appreciated that rocking or arcuate action of the translation feed levers 70 takes place in response to the time relation of the printing couple of the press with the vertical rocking action of the arcuate cam track member 111 serving to raise and lower crank arm 109 associated with the tie rod 107 which carries gripper fingers 108, so that the latter alternately grab and release paper 20 registered against stop 43. It further will be appreciated that the downward movement of cam track 111 is such as to permit closing of the gripper fingers 108 against gripper bar 106 when the translation feed levers 70, 70 are disposed in their forward position immediately adjacent stop member 43, thereby to engage the sheet of paper 20 registered against stop 43. As the translation feed levers 70, 70 reach their rearwardmost arcuate position the cam member 121 causes a second raising of cam plate 111 to move the gripper fingers 108 away from gripper bar 106 thereby to condition the paper for engagement by gripper means carried by the plate-platen cylinder; the paper moving at substantially equal speed with the plate-platen cylinder when it is released by fingers 108.

Plate-platen cylinder gripping mechanism

Means associated with plate-platen cylinder 14 for engaging paper 20 carried thereto by means of the translation gripper mechanism described above, include movable gripper fingers 130 mounted on a rod member 131 disposed in a gap or space intermediate a platen segment 132 and a plate segment 134 forming the cylindrical exterior of the plate-platen cylinder 14, as seen in Figure 10 of the drawings. Rod member 131 is further journaled in end plates 135, 135 of the plate-platen cylinder 14 for rotation in response to rocking actuation of a roller lever 136 secured to the left hand end thereof. Roller lever 136 further carries a roller member 137 at its outer end for engaging a stationary cam member 138 secured to the left hand side frame plate 12. A spring member 139 is utilized between roller lever 136 and the left hand end plate 135 of the plate-platen cylinder to resiliently bias the roller member 137 toward the cam 138. Gripper fingers 130, supporting rod 131, roller lever 136 and cam roller 137 are carried in a circular path by the rotation of the plate-platen cylinder 14 so that the cam roller 137 engages cam member 138 periodically and in timed relation to the printing couple of the press. Cam member 138, of course, is secured to the left hand frame plate 12 of the press, as shown in Figures 1, 2, 3 and 10 of the drawings, in a position to cause an opening or an upper arcuate motion of the gripper fingers 130 as the same reach a position opposite gripper fingers 108 of the translation gripper mechanism (see Figure 3). Upward motion of the curved roller track member 111 at this time causes opening movement or release of the gripper fingers 108 from gripper bar 106 of the translation gripper mechanism thereby permitting gripper fingers 130 of the cylinder gripper mechanism to engage the leading edge of a sheet of paper 20. Continued rotation of the plate-platen cylinder

in the direction as indicated in Figure 2 (counterclockwise) will then cause gripper fingers 130 to close down on paper 20 and grip the same against the leading edge of the platen segment 132. The opening of the cylinder gripper mechanism and the release of the paper by the translation gripper mechanism is illustrated in detail in sequential operation in Figures 3 and 4 of the drawings. It will be appreciated that with this arrangement the paper is securely held by the gripper mechanism associated with the plate-platen cylinder and carried through the printing couple for imprinting with a desired copy until released from the plate-platen cylinder by a stripper and delivery mechanism.

Cylinder gripper release, stripper and delivery mechanisms

Means for disengaging the cylinder gripper mechanism and, in particular, for releasing gripper fingers 130 from the imprinted paper on the plate-platen cylinder, comprises an arcuately adjustable cam arm 141 mounted on the shaft 37 carrying plate-platen cylinder 14. As illustrated in Figure 10 of the drawings, cam member 141 is located at the left hand end of the plate-platen cylinder and is provided, as illustrated in Figures 5 and 6 of the drawings, with an arcuate slot 142 for locking engagement by an adjusting bolt means 143 whereby cam arm 141 may be positioned selectively in its Figure 5 or Figure 6 positions to accomplish release of the imprinted paper from the plate-platen cylinder in accordance with offset and letter press printing processes, as will be amplified presently herein.

From a study of Figures 5 and 6 of the drawings, it will be recognized that the arcuately adjustable cam arm 141 is provided with a trapezoidal shaped camming surface 144 at its outer end adapted to engage roller member 137 associated with the cylinder gripper fingers 130. It further will be understood that engagement of roller 137 with the trapezoidal camming surface 144 causes an opening movement of the gripper fingers 130 of the cylinder gripper mechanism thereby to perfect a release of the engaged paper. When the cam arm 141 is positioned, as illustrated in Figure 5 of the drawings, release of the printed sheet 20 will occur with the ink side up and beneath the bite of the press cylinders according to the offset printing process for engagement by a paper holding means adapted to hold the paper until the same is stripped from the plate-platen cylinder.

The paper holding means, as illustrated in particular in Figure 7 of the drawings, comprises a U-shaped holding bracket 145 mounted on short trunnion shafts 146, 146 which are rotatably journaled in the side frame plates 11 and 12 of the press. A spring biased cam roller 147 is mounted adjacent the right hand end of the U-shaped bracket 145 for engagement with the camming edge of cam plate 148 secured to the right hand end of the plate-platen cylinder 14, as illustrated in Figure 1 of the drawings. Also from Figure 1, it will be recognized that cam member 148 comprises a segmental plate of an arcuate shape positioned adjacent the outer periphery of the platen portion of cylinder 14. Rotational movement of plate-platen cylinder 14 causes an engagement between roller member 147 and the cam plate 148 thereby to swing the lower end of pivotally mounted U-shaped bracket 145 toward the surface of the platen segment of cylinder 14 for engaging the printed surface of the paper sheet 20. A spring member 149 is secured between the U-shaped bracket 145 and the right hand end plate 11 of the press to normally bias the bracket 145 toward the surface of the plate-platen cylinder to oppose its arcuate movement away from the platen segment 132 brought about by engagement of the roller member 147 with cam plate 148. A shaft member 150 is disposed intermediate the lower ends of the arm portions of the U-shaped bracket 145 for supporting paper contact rollers 151 which are mounted for adjustable movement on shaft 151 by means of cantilever mounting springs 152, as shown in particular in Figure 7 of the drawings. The contact rollers 151, of

course, are adapted to engage the paper to hold the same against the platen segment until the same is engaged by a curved portion of a paper stripper 153.

Stripper 153 is disposed beneath the blanket and plate-platen cylinders substantially in vertical line with their point of tangential engagement, as illustrated in Figure 5 of the drawings in particular. After the paper has been stripped from the plate-platen cylinder 14 by the stripper 153 the same is delivered to a delivery belt 154 supported on conveyor rollers 155. When the offset process is being utilized in accordance with the positioning of the cylinder gripper release cam 141, as illustrated in Figure 5, the printed sheet is delivered to the delivery belt 154 with its inked side up.

When the cylinder gripper release cam 141 is positioned as shown in Figure 6 of the drawings, as used in the letter press printing process, the paper is released from the cylinder gripper fingers 130 at a point on the rearward side of the plate-platen cylinder so that again its inked side will be up. Also, when the letter press printing process is being utilized the stripper mechanism 153 is normally removed so that when paper is released from the plate-platen cylinder by engagement of roller 137 with the gripper finger release cam 141 the printed sheet will be delivered to delivery belt 154 in the manner illustrated in Figure 6.

The conveyor 154, as illustrated, may comprise a somewhat conventional style supported by the spaced conveyor rollers 155 and provided with a catch chute 156 at its delivery end for gathering the printed sheets.

Thus it will be recognized that I have herein described a new and improved dual purpose duplicator adapted for the printing of both letter press and offset copy. It further will be appreciated that the utilization of a two step feeding system employing namely, the preliminary feeding means and the translation gripper means permits a greater elapsed time for the purpose of accurately registering and aligning the paper prior to its introduction to the gripper mechanism associated with the plate-platen cylinder of the press. This novel arrangement results in improved printing operation for a duplicator of the class described. It further will be noted that the functional relation of the several elements of the press are related in timed sequential relation to the rotational motivation of the printing couple of the press thereby to bring about a synchronously integrated feeding, printing and discharge operation according to preferred practice.

It will also be appreciated and understood that while I have herein described and associated my new and improved dual purpose duplicator as related to a preferred embodiment of its features, that numerous changes, modifications and substitutions of equivalents may be made in the specific embodiment of my invention herein described without departing from its spirit and scope. Therefore, I do not wish to be limited to the particular illustrative embodiment of my invention herein disclosed except as may appear in the following appended claims.

I claim:

1. A printing press of the class described, comprising, a printing couple of two cylinders, one of which is approximately twice the diameter of the other, the larger of said two cylinders carrying semi-cylindrical plate and platen surface segments and the smaller of said two cylinders having a blanket surface; means mounting said two cylinders on substantially coplanar, parallel axes, paper gripper means associated with the larger of said two cylinders, feed stop means mounted adjacent the smaller of said two cylinders, preliminary feed means arranged to feed paper partially about said smaller cylinder and registering against said stop means, and pivotally movable translation gripper means constructed and arranged to grip paper fed against said stop means and arcuately transfer the same outwardly of the periphery of said smaller cylinder to said paper gripper means of said

larger cylinder at substantially the bite of said printing couple.

2. A printing press, comprising, a pair of cylinders forming a printing couple, one of the cylinders being approximately twice the diameter of the other and having an image forming surface, the other cylinder having a blanket surface; paper gripper means on said one cylinder for carrying paper through the printing couple, stop means disposed adjacent said other cylinder and in lateral spaced relation with the bite between said cylinders, preliminary feed rollers arranged to feed paper to be printed partially across said other cylinder and against said stop means, and translation gripper means movable substantially radially about said other cylinder and adapted to carry paper from said stop means along an arcuate path, to a position between said two cylinders and present a leading edge thereof to said paper gripper means substantially at the bite of said printing couple.

3. A printing press of the class described, comprising, a pair of cylinders forming a printing couple and supported on parallel spaced, coplanar, horizontal axes, roller feed means arranged to translate paper in a horizontal plane partially across and within the diametrical limits of one of said cylinders, stop means constructed and arranged to interrupt the horizontal translation of said paper at a position above said one cylinder, paper gripper means mounted inwardly of the cylindrical surface of the other of said cylinders, and pivotally movable translation means arranged to engage said paper at said stop means and transfer the same substantially radially outward of the peripheral limits of said one cylinder to the gripper means of said other cylinder for delivery thereto at substantially the bite of the printing couple.

4. A printing press of the class described, comprising, a pair of cylinders forming a printing couple, means rotatably supporting said cylinders on coplanar axes in surface contacting relation, preliminary feed means constructed and arranged to translate paper partially across one of said cylinders and in a plane of spaced parallelism to the axis of said one cylinder, stop means constructed and arranged to interrupt the translation of said paper in timed relation to the rotation of said two cylinders and to arrest the same intermediate the diametric limits of said one cylinder, paper gripper means carried by the other of said cylinders, and pivotally movable translation gripper means constructed and arranged to engage said paper at said stop means and carry the same arcuately therefrom across said one cylinder toward the bite between said two cylinders until a leading edge of the paper reaches a position disposed inwardly of the cylindrical surface of said other cylinder whereat such is engaged by said gripper means carried by the latter cylinder for travel through the bite of the printing couple.

5. A printing press of the class described, comprising, a pair of cylinders mounted in tangential contact on spaced coplanar horizontal axes, means for rotatably driving said cylinders, feed means for translating paper horizontally above one of said cylinders, stop means constructed and arranged to interrupt the movement of said paper intermediate the diametric limits of said one cylinder, paper gripper means associated with said other cylinder for engaging paper fed thereto for the purpose of carrying the same through the bite of said two cylinders, pivotal translation gripper means constructed and arranged to deliver paper along an arcuate path outwardly of said one cylinder and from said stop means downwardly to the said gripper means carried by said other cylinder at substantially the bite of said two cylinders, and sensing fingers means arranged to detect the presence of paper fed to said stop means and to cause the separation of said cylinders and the immobilization of said translation gripper means in the absence of paper at said stop means.

6. A printing press of the class described, comprising, a pair of cylinders mounted in tangential contact on

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spaced coplanar axes lying in substantially a horizontal plane, means for rotatably driving said cylinders, feed means for translating paper horizontally partially over one of said cylinders, stop means constructed and arranged to interrupt the movement of said paper intermediate the diametric limits of said one cylinder, sensing finger means arranged to detect the presence of paper at said stop means, a cylinder throw-out mechanism actuated by said sensing finger means for separating said cylinders in the event paper is not fed to said stop means, paper gripper means carried on said other cylinder for engaging paper fed thereto, translation gripper means constructed and arranged to deliver paper along an arcuate path outwardly of the periphery of said one cylinder from said stop means to the gripper means carried by said other cylinder, and means operated by said sensing finger means for halting the operation of said translation gripper means when said finger means detects the absence of paper at said stop means.

7. A printing press of the class described, comprising, a pair of cylinders mounted in tangential contact on spaced axes lying in substantially a horizontal plane, means for rotatably driving said cylinders, feed means for translating paper horizontally above one of said cylinders, stop means constructed and arranged to interrupt the translating movement of said paper intermediate the diametric limits of said one cylinder put outwardly thereof, sensing finger means arranged to detect the presence of paper fed to said stop means, cylinder throw-out mechanism associated with said one cylinder and constructed and arranged for activation by said sensing finger means to separate said two cylinders in the event paper is not fed to said stop means by said feed means, cam means operable in timed relation to the rotation of said cylinders for activating said sensing finger means, gripper means associated with said other cylinder for engaging paper fed thereto and arranged to carry paper through the bite of said cylinders, translation gripper means arcuately movable between said stop means and a point intersecting the circumference of said other cylinder substantially at the bite of said two cylinders for transferring paper to said gripper means on said other cylinder, and means operated by said sensing finger means for the deactivating of said translation gripper means simultaneously with the separation of said two cylinders.

8. A printing press of the class described, comprising, a pair of cylinders mounted in tangential contact on spaced axes lying in substantially a horizontal plane, means for rotatably driving said cylinders, feed means for translating paper horizontally over one of said cylinders, stop means constructed and arranged to stop the movement of said paper intermediate the diametric limits of said one cylinder and outwardly thereof, sensing finger means constructed and arranged to detect the presence and absence of paper fed to said stop means, eccentric means related with said one cylinder for separating the printing couple of the press, linkage means interconnecting said sensing finger means and said eccentric means for operating said eccentric means to separate the printing couple in the event paper is not fed to said stop means in timed relation to the rotation of said cylinders, paper gripper means associated with said other cylinder for engaging paper fed thereto and for carrying the same through the bite of said two cylinders, a pair of arcuately movable arm members disposed adjacent opposite ends of said one cylinder, for arcuate movement about a common axis, and carrying gripping fingers intermediate their arcuately movable ends for transferring paper outwardly of the periphery of said one cylinder from said stop means to said paper gripper means at substantially the bite of said two cylinders.

9. A printing press of the class described, comprising, a pair of cylinders forming the printing couple of the

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press and mounted for rotation on horizontal, coplanar, parallel spaced axes, feed means arranged to translate paper horizontally above one of said cylinders, periodically actuated stop means arranged to interrupt the feeding of said paper and halt its translation intermediate the diametric limits of said one cylinder, paper grippers carried by said other cylinder for engaging paper fed thereto to carry the same through the printing couple of the press, cam means arranged to cause the periodic release of said paper from said paper grippers, adjusting means for selectively positioning said cam means on opposite sides of the rotational axis of said other cylinder thereby to effect release of said paper from said paper grippers on either side of the rotational axis of said other cylinder as selected, and an arcuately movable translation gripper mechanism constructed and arranged to transfer paper from said stop means to said paper grippers in timed relation to the rotation of said two cylinders.

10. A printing press of the class described, comprising, a pair of cylinders forming the printing couple of the press and mounted for rotation on horizontal, coplanar, parallel spaced axes, feed means adapted to translate paper horizontally across one of said cylinders and thereabove, periodically actuated stop means arranged to stop said paper intermediate the diametric limits of said one cylinder, sensing finger means constructed and arranged to detect the presence of paper at said stop means, eccentric cylinder throw-out means operatively related to said sensing finger means and constructed and arranged to throw said one cylinder laterally away from said other cylinder upon the failure of said feed means to deliver paper to said stop means in timed relation to the rotation of said two cylinders, paper grippers associated with said other cylinder for engaging paper and carrying the same through the printing couple, cam means constructed and arranged to cause the periodic release of said paper from said paper gripper, adjusting means for adjustably positioning said cam means relative to the rotational path of said paper grippers, as dictated by the rotation of said other cylinder, whereby the release of said paper from said grippers may occur on either side of the rotational axis of said other cylinder as desired, and an arcuately movable translation gripper mechanism constructed and arranged to transfer paper arcuately from said stop means to said paper grippers and release said paper at a point above the line of contact of said two cylinders in timed relation to the rotation of the printing couple.

11. A dual purpose duplicator of the class described for printing offset and direct copy, comprising, a pair of horizontally disposed, coplanar, tangentially contacting cylinders forming the printing couple of the press, one of said cylinders being substantially twice the diameter of the other and carrying plate and platen surface segments, paper grippers disposed inwardly of the surface of said one cylinder and intermediate adjacent ends of said plate and platen segments thereon, means for opening and closing said paper grippers just prior to the line of tangential contact of said two cylinders, stop means disposed adjacently above the other of said two cylinders and arranged to interrupt the horizontal passage of paper above said other cylinder in timed relation to the rotation of said two cylinders, and a pair of arcuately movable arms carrying translation gripper mechanism therebetween constructed and arranged to engage paper at said stop means, carry the same arcuately about said other cylinder and deliver the same to the paper grippers on said one cylinder at substantially said line of tangential contact and in timed relation with the rotational movements of said two cylinders.

12. A dual purpose duplicator of the class described for printing offset and direct copy, comprising, a pair of horizontally disposed, tangentially contacting cylinders forming the printing couple of the press, one of said cylinders being substantially twice the diameter of

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the other and carrying semi-cylindrical plate and platen surface segments, gripper means disposed inwardly of the exterior surface of said one cylinder and intermediate adjacent ends of said plate and platen segments thereof, cam means arranged to effect the opening and closing of said gripper means just prior to the line of tangential contact of said two cylinders, stop means disposed adjacent the other of said two cylinders and constructed and arranged to interrupt the passage of paper across said other cylinder in timed relation to the rotation of said two cylinders, translation gripper mechanism constructed and arranged to engage paper at said stop means and deliver the same to the gripper means on said one cylinder, release of said paper from said translation mechanism occurring at a point disposed inwardly of the surface of said one cylinder and intermediate the adjacent ends of said plate and platen segments; and an arcuately adjustable gripper release mechanism having cam means disposed adjacent the circumference of said one cylinder; arcuate adjustment of said gripper release means permitting said cam means thereof to engage said gripper means on said one cylinder for selectively releasing paper on opposite sides of the rotational axis of said one cylinder, as desired.

13. A dual purpose duplicating press for printing offset and letter press copy, comprising, a pair of horizontal cylinders disposed in tangential contact, drive means for rotatably moving said two cylinders simultaneously, feed means for translating paper horizontally across one of said cylinders in timed relation to the rotation of said two cylinders, stop means adjacent said one cylinder arranged to receive paper from said feed means, detector finger means constructed and arranged to detect the presence of paper at said stop means, a cylinder throw-out mechanism constructed and arranged to separate said two cylinders laterally in response to engagement with said detector fingers upon the failure of said feed means to deliver paper to said stop means, gripper means on said other cylinder constructed and arranged to open and close in response to the rotation of two cylinders and at a point just prior to the line of contact of said two cylinders, translation means arranged to pick up paper at said stop means and arcuately transfer the same to said gripper means in timed relation to the opening of the latter, and gripper release mechanism comprising an arcuately adjustable cam arm arranged to engage said gripper means at points below the point of contact of said two cylinders and selectively on opposite sides of a vertical plane passing through the rotational axis of said other cylinder thereby to open said gripper means and effect the discharge of printed copy on opposite sides of said vertical plane as desired.

14. A dual purpose duplicator of the class described for printing offset and letter press copy, comprising, a pair of cylinders forming the printing couple of the duplicator, said cylinders being mounted in tangential surface contact on spaced axes being substantially in an horizontal plane, means for rotatably driving said cylinders simultaneously, feed means positioned above one of said cylinders for translating paper horizontally partially over the latter, stop finger means adjacent said one cylinder adapted to interrupt the feeding of paper by said feed means, cam means driven by the other of said cylinders for actuating said stop means in timed relation to the printing couple's motivation, sensing finger means arranged to reciprocate in contact with one surface of said paper as it is fed to said stop means by said feed means, additional cam means driving said sensing finger means in timed relation to the motivation of said printing couple, eccentric throw-out mechanism operatively related with the axis of said other cylinder, linkage means interrelating said throw-out and sensing finger means whereby said sensing finger means will activate said throw-out means to separate said printing couple laterally upon the failure of said feed means to deliver paper to

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said stop means, gripper means carried by said other cylinder and arranged to grip paper fed thereto adjacent the line of contact of said two cylinders, arcuately movable translation gripper means reciprocally movable about an horizontal axis adjacent and parallel to the rotational axis of said one cylinder and constructed and arranged to transfer paper arcuately outward of said one cylinder from said stop means to said gripper means on said other cylinder, cam means activated by the rotation of said other cylinder for operating said translation gripper means in timed relation to the rotation motivation of said printing couple, an additional linkage means operated by said sensing means for deactivating said translation gripper means when said cylinders are separated by said throw-out means.

15. In a printing press of the class described, a pair of cylinders disposed on coplanar horizontal axes and forming the printing couple of the press, means for feeding paper substantially horizontally above one of said cylinders and partially thereacross, gripper means carried by the other of said cylinders, periodically actuated stop means arranged to halt the translation of said paper intermediate the diametrical limits of said one cylinder, and arcuately movable translation gripper means pivotal about a horizontal axis and arranged to reciprocate periodically along an arcuate path substantially radially outward of said cylinder in timed relation to the rotational motion of the printing couple of the press; such translation gripper means serving to carry paper from said stop means to said first named gripper means and deliver paper thereto substantially at the bite of the printing couple.

16. In a printing press of the class described, a pair of cylinders disposed on spaced axes lying substantially in a horizontal plane and forming the printing couple of the press, paper imprinting means carried by one of said cylinders, feeder means for translating paper substantially horizontally over one of said two cylinders, stop means constructed and arranged to halt the translation of said paper at a point intermediate the diametrical limits of said one cylinder, gripper means carried by the other of said cylinders, translation gripper means constructed and arranged to reciprocate periodically along an arcuate path radially outward of said one cylinder and in timed relation to the printing couple of the press for transferring paper from said stop means to said first named gripper means, eccentric throw-out means associated with said one cylinder and adapted, when actuated, to separate laterally the printing couple of the press, sensing finger means constructed and arranged to detect the presence of paper fed to said stop means and upon the failure of said feed means to deliver paper to said stop means, in timed relation to the printing couple of the press, to activate said eccentric means for separating the printing couple of the press, and additional means activated by said sensing finger means to interrupt movement of said translation gripper means toward said other cylinder when said cylinders are separated.

17. A printing press comprising a pair of cylinders forming a printing couple and supported on parallel spaced, substantially coplanar horizontal axes, feed means for translating paper partially over one of said cylinders, stop means arranged to interrupt the feeding movement of said paper over said one cylinder, paper gripper means carried by the other of said cylinders, and translation gripper means pivotally moveable about a horizontal axis and outwardly of said one cylinder; said translation gripper means arranged to engage said paper at said stop means and carry the same arcuately about said one cylinder to the moving paper gripper means carried by said other cylinder.

18. A printing press comprising a pair of cylinders forming a printing couple and supported on parallel spaced, substantially coplanar horizontal axes; feed means

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for translating paper partially over one of said cylinders, stop means arranged to interrupt the feeding movement of said paper above said one cylinder, paper gripper means carried by the other of said cylinders, translation gripper means pivoted on a horizontal axis and arranged to engage said paper at said stop means and arcuately transfer the same substantially radially about said one cylinder and downwardly along a path intersecting said other cylinder for engagement by said paper gripper means carried by said other cylinder, drive means associated with said translation gripper means for accelerating the same from a stop position at said stop means to a speed substantially equivalent to the surface speed of said other cylinder whereby delivery of said paper to said other cylinder is non-interrupted at its point of transfer to said other cylinder and means for halting the operation of said translation gripper means and for separating said two cylinders upon the failure of said feed means to register a sheet of paper against said stop means.

19. A printing press comprising a pair of cylinders of unequal diameter forming a printing couple, said cylinders being supported on parallel spaced substantially coplanar horizontal axes, feed means arranged to translate paper partially over one of said cylinders, stop means arranged to interrupt the feeding movement of said paper and register the same above said one cylinder, paper gripper means carried by the other of said cylinders, translation gripper means comprising arms pivoted at one end and carrying a gripper means between their other ends arranged to engage paper at said stop means and transfer the same substantially radially outwardly of said one cylinder to said paper gripper means carried by said other cylinder, at a position located substantially at the bite of the printing couple, cam drive means associated

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with said translation gripper means constructed and arranged to accelerate said translation gripper means from an at rest condition at said stop means to a condition of uniform velocity with said other cylinder at the point of delivery and transfer of paper to said paper gripper means, and sensing finger means, operable upon the failure of said feed means to deliver paper to said stop means, for separating said cylinders and arresting transfer action of said translation gripper means.

20. A printing press comprising a pair of cylinders forming a printing couple and supported on parallel spaced coplanar axes, feed means for translating paper in a plane partially across one of said cylinders, stop means arranged to arrest such translation movement of the paper at a point located substantially mid-way of the diameter of the said one cylinder, paper gripper means carried by the other of said cylinders, and translation gripper means comprising arms moveable about a fixed axis paralleling the axes of said cylinders and carrying gripper means therebetween arranged to engage said paper at said stop means and transfer the same outwardly of the periphery of said one cylinder to a position between said two cylinders for engagement by said paper gripper means carried by said other cylinder.

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