

Dec. 23, 1952

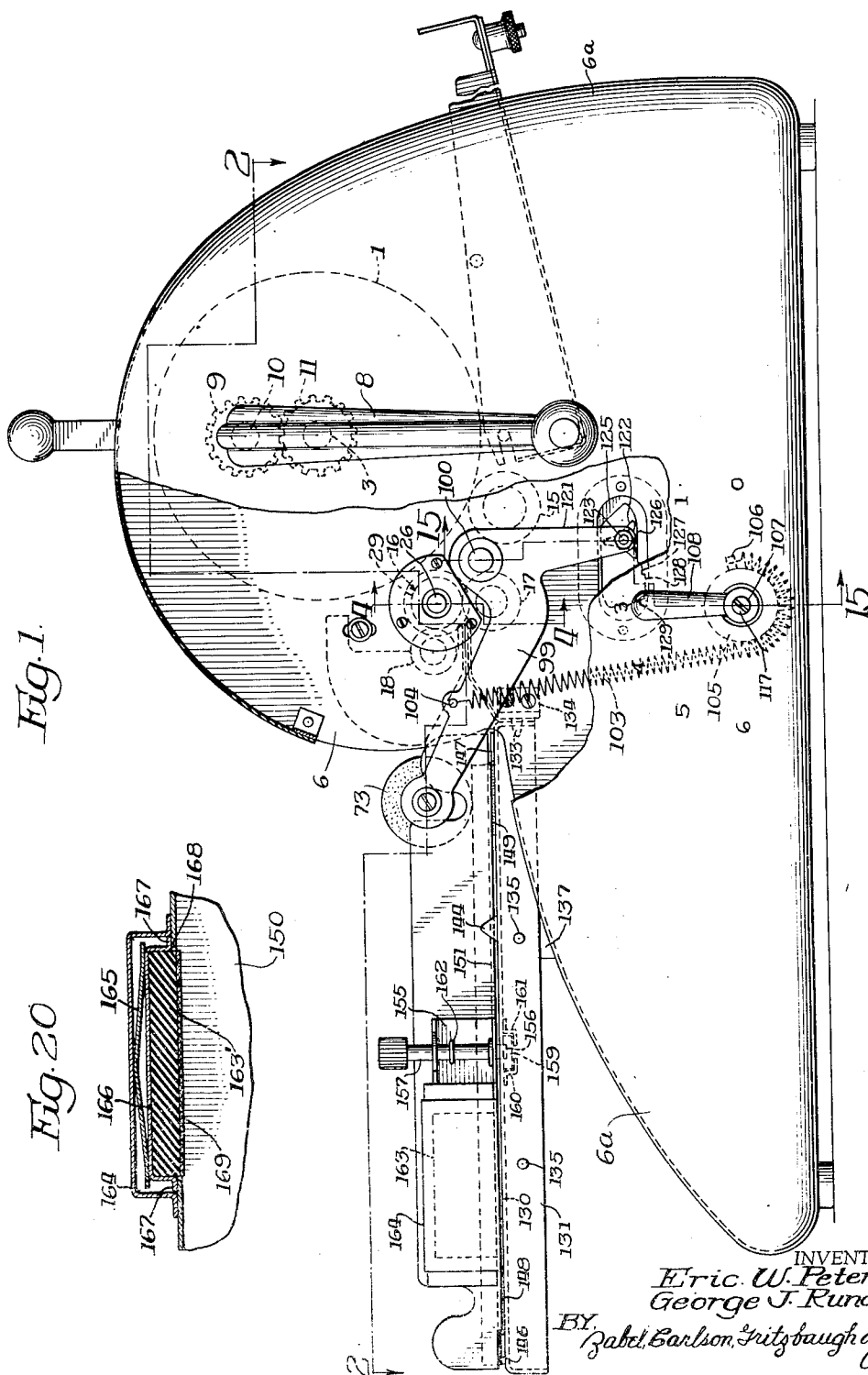
E. W. PETERSON ET AL

2,622,518

SHEET FEEDING MEANS FOR DUPLICATING MACHINES

Filed Jan. 18, 1945

5 Sheets-Sheet 1



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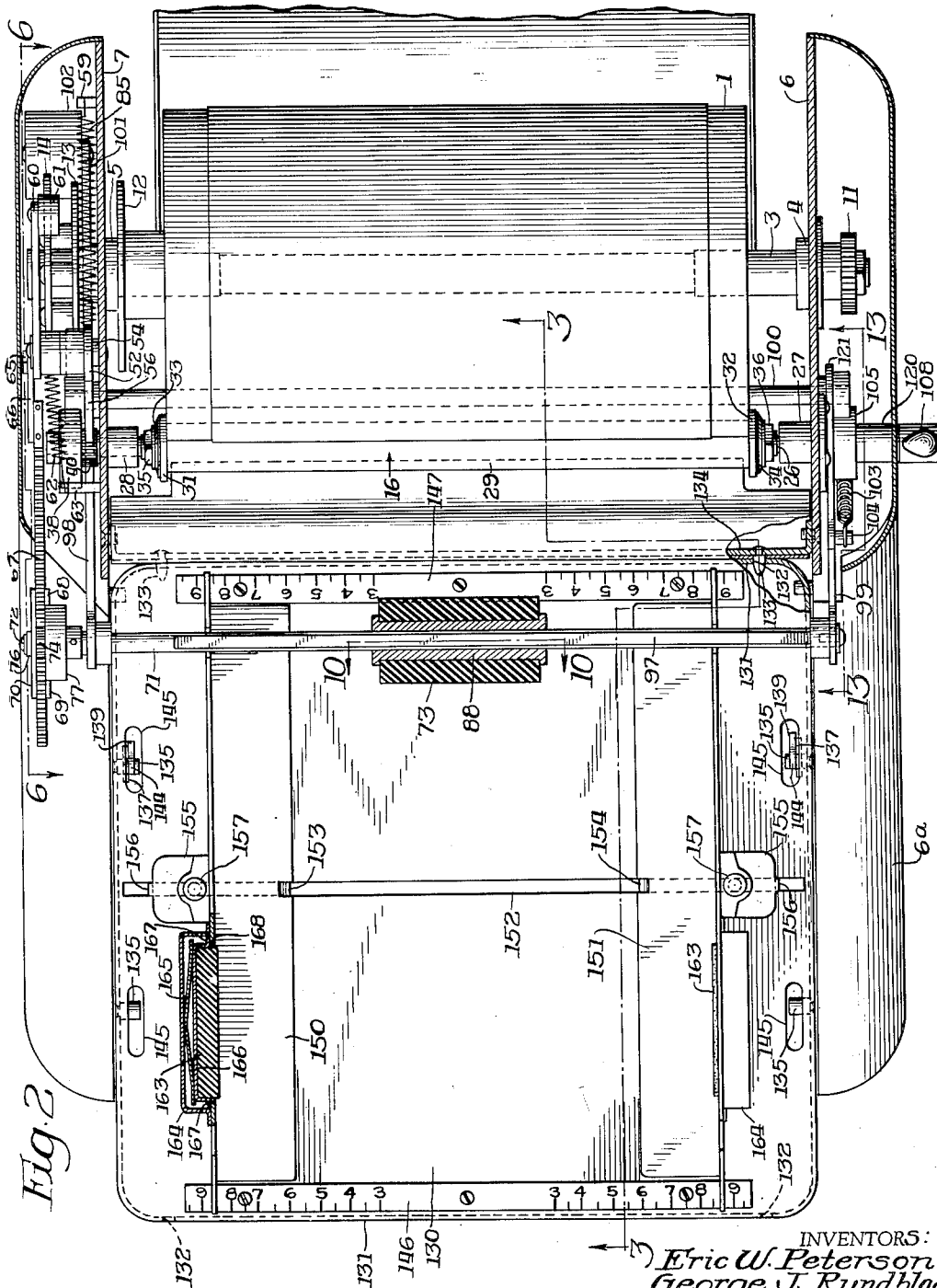
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SHEET FEEDING MEANS FOR DUPLICATING MACHINES

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5 Sheets-Sheet 2



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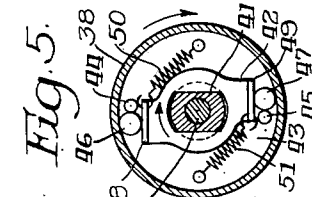
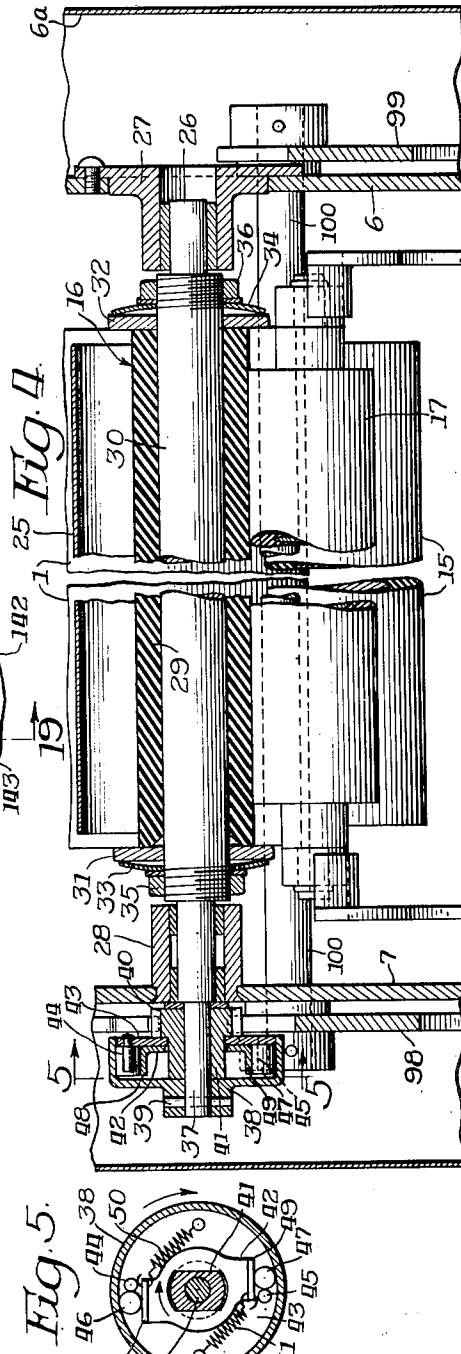
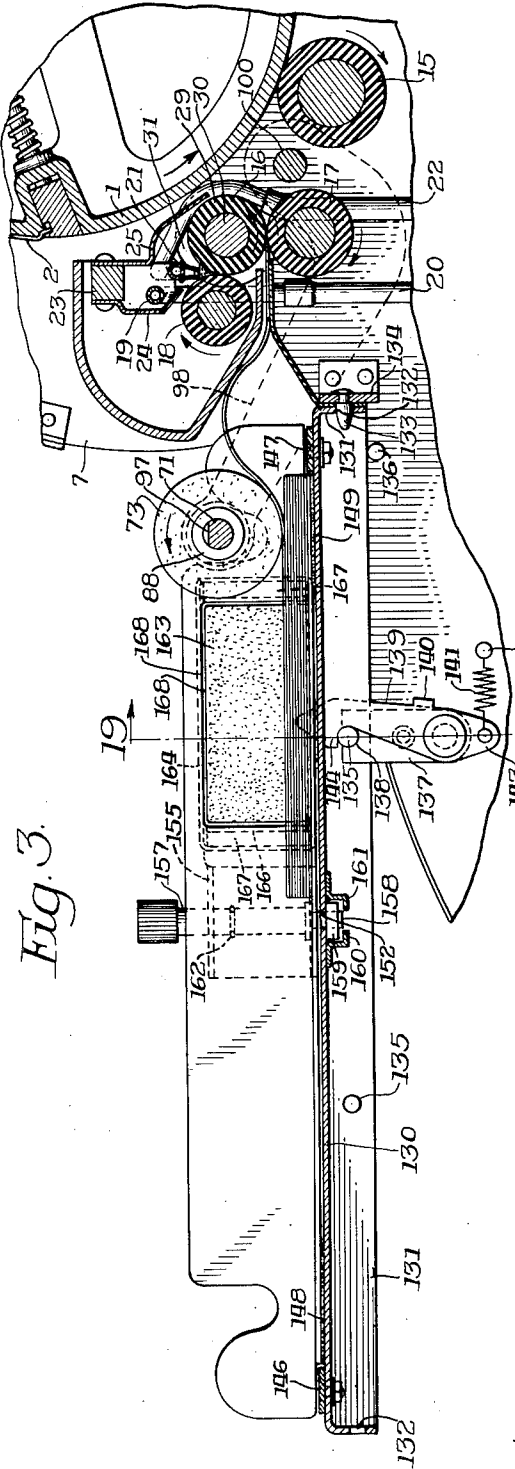
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SHEET FEEDING MEANS FOR DUPLICATING MACHINES

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5 Sheets-Sheet 3



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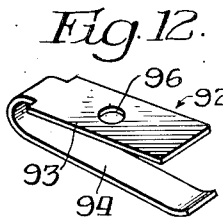
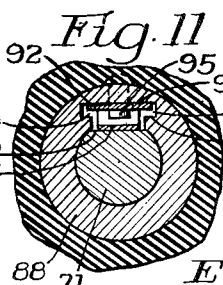
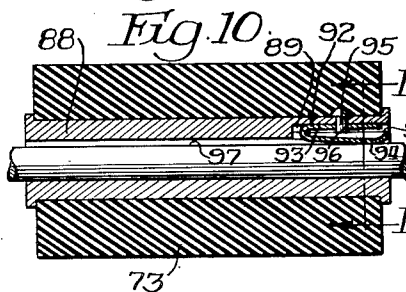
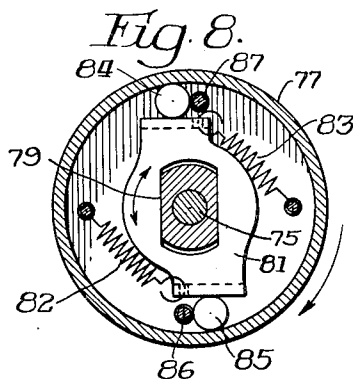
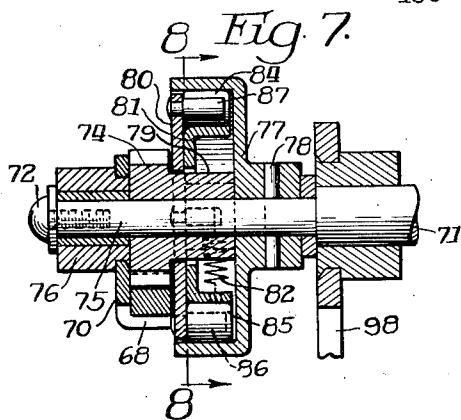
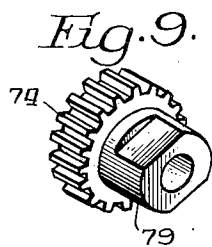
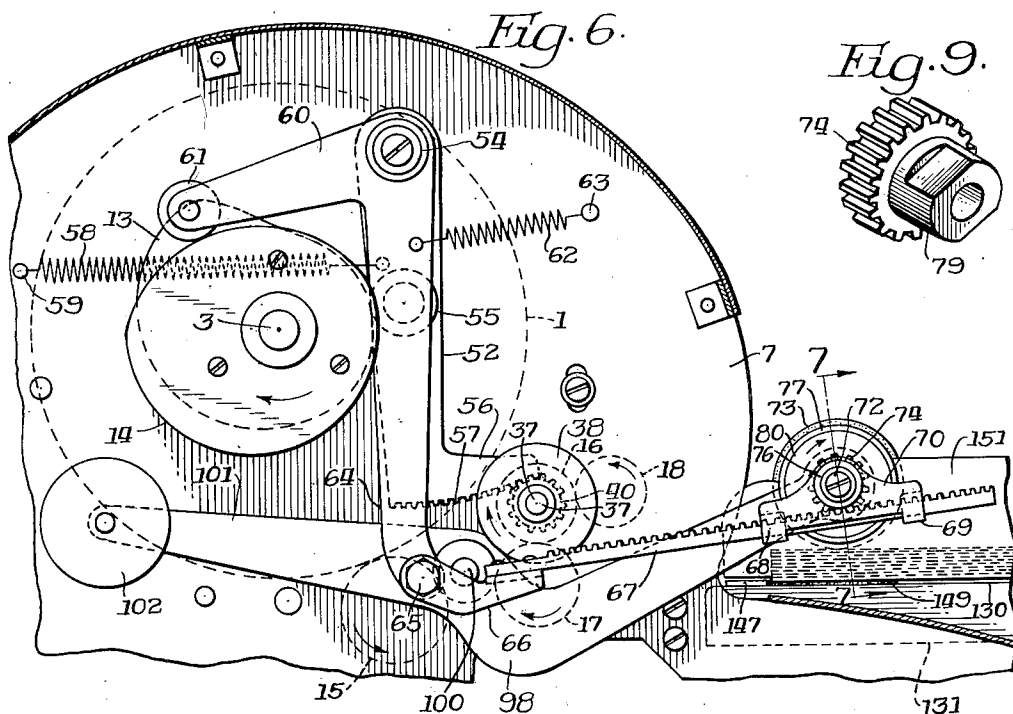
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SHEET FEEDING MEANS FOR DUPLICATING MACHINES

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5 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,622,518

SHEET FEEDING MEANS FOR DUPLICATING MACHINES

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Application January 18, 1945, Serial No. 573,412

6 Claims. (Cl. 101—132.5)

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The present invention relates to duplicating apparatus and it is particularly directed to the copy sheet feeding mechanism by which sheets are supplied to the drum upon which the master sheet is located in timed relation to the rotation of the drum. Our invention is particularly applicable to the so-called liquid process duplicating machines wherein the master copy is prepared in mirror script with an ink which may be dissolved and transferred to a copy sheet by the application of a thin film of solvent to the copy sheet and the subsequent pressing of the copy sheet against the master sheet.

It is the principal purpose of this invention to provide a novel combination between the drive means for the drum, the combined feeding and moistening rollers and a feeding device adapted to feed sheets from a stack on the feed tray to the combined feeding and moistening rollers. Heretofore in this art it has been customary to couple the drum to the feed and moistening rollers by some sort of intermediate drive coupling whereby the rollers were given a dwell period during a portion of the rotating cycle of the drum and were then geared directly to the drum for rotation. Separate means has been provided for automatically feeding sheets from a stack in the feed tray to the combined feeding and moistening rollers. The feeding and moistening rollers are so driven that after a sheet is engaged with them they start slowly and are gradually brought up to a surface speed equal to that of the drum.

In accordance with our invention we have provided a sheet feeding means in combination with the drum driving mechanism wherein the sheet feeding is sequential from the feed roller that engages the stacked sheets on the feed tray to the drum and platen roller, each feeding section operating only so long as is necessary to engage the advancing sheet with the next feeding section.

Our invention contemplates also a novel feed tray construction cooperating with the mechanism just described whereby the feed tray readily adapts itself to long or short sheet feeding either manual or automatic by the simple expedient of turning the tray around. Other improvements are made in the sheet feeding mechanism, particularly in the tray construction for providing proper side guide control which is so important in connection with automatic feeding devices.

The nature and advantages of our invention will appear more fully from the following description and the accompanying drawings where-

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in a preferred form of our invention is shown. It should be understood, however, that the drawings and description are not to be taken as limiting the invention except insofar as it is limited by the claims.

In the drawings:

Figure 1 is a view in side elevation of a duplicating machine embodying our invention, certain parts of the decorative cover of the machine being broken away to illustrate the interior construction;

Figure 2 is a plan sectional view taken on the line 2—2 of Figure 1;

Figure 3 is a sectional view taken on the line 3—3 of Figure 2;

Figure 4 is a fragmentary sectional view taken on the line 4—4 of Figure 1;

Figure 5 is a sectional view taken on the line 5—5 of Figure 4;

Figure 6 is a fragmentary sectional view taken on the line 6—6 of Figure 2;

Figure 7 is a fragmentary sectional view taken on the line 7—7 of Figure 6;

Figure 8 is a sectional view taken on the line 8—8 of Figure 7;

Figure 9 is a perspective view of a drive pinion used in the mechanism shown in Figures 6 to 8 inclusive;

Figure 10 is a sectional view taken on the line 10—10 of Figure 2;

Figure 11 is a sectional view taken on the line 11—11 of Figure 10;

Figure 12 is a perspective view of a spring clip that is used in the construction shown in Figures 10 and 11;

Figure 13 is a fragmentary sectional view taken on the line 13—13 of Figure 2 illustrating the parts in a changed position from that shown in Figure 1;

Figure 14 is a fragmentary detail view of a part of the mechanism shown in Figure 13 illustrating a further change in position;

Figure 15 is a sectional view taken on the line 15—15 of Figure 1;

Figures 16, 17 and 18 are fragmentary sectional views taken on the lines 16—16, 17—17 and 18—18 respectively of Figure 15;

Figure 19 is a sectional view taken on the line 19—19 of Figure 3; and

Figure 20 is a fragmentary sectional view of a modified pad for the side guides.

Referring now to the drawing: The present invention is embodied in a duplicating machine of the liquid process type having a duplicating drum 1 provided with master sheet gripping

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means 2 thereon. The duplicating drum is supported on a drive shaft 3 which is journaled in bearings 4 and 5 that are mounted in two side frames 6 and 7. The shaft 3 is hand driven as shown by a hand crank 8 which is secured to a drive pinion 9 that is mounted on a shaft 10 carried by the side frame 6. The pinion 9 meshes with a pinion 11 that is fixed to the shaft 3 on the outside of the side frame 6.

At the end of the shaft 3 opposite the pinion 11 the shaft is provided with a plurality of cams 12, 13 and 14. The cam 12 operates a pumping mechanism which is not shown herein since it forms no part of the invention. For the details of this mechanism see the co-pending application of George J. Rundblad, Serial No. 573,413, filed January 18, 1945, for "Liquid Process Duplicating Machine." The cams 13 and 14 however, are utilized to drive the sheet feeding mechanism by which the copy sheets are fed to the drum 1. The details of this mechanism will be described more fully hereinafter.

A platen roller 15 is engaged with the drum 1 for pressing copy sheets against it. This roller is mounted in the manner shown in the co-pending application referred to above. Combined feeding and moistening rollers 16 and 17 are carried by the side frames 6 and 7 and a spreader roller 18 is also carried by the side frames. Liquid is fed to the trough between the rollers 16 and 18 by a supply tube 19 which receives its liquid through a flexible conduit 20. The pumping mechanism above referred to likewise has a suction tube 21 that withdraws excess liquid from the trough between the rollers 16 and 18, the suction being supplied through a flexible conduit 22 and the pumping mechanism referred to before. The tubes 19 and 21 are supported from a bar 23 that is carried by the side frames 6 and 7. This bar also carries suitable splash shields 24 and 25. It is believed that the foregoing explanation is sufficient for the purposes of this application to show the operation of the moistening mechanism. For further details concerning this construction reference is made to the co-pending application identified above.

Referring now to Figures 2, 4, 5 and 6 in particular and the details of the associated figures therewith the mechanism for driving the rollers 16 and 17 will be described. The roller 16 drives the roller 17 by frictional engagement. The detailed mounting of the roller 16 is illustrated in Figure 4. A shaft 26 is journaled at its opposite ends and two bearing members 27 and 28 that are carried by the side frames 6 and 7 respectively. The roller comprises a sleeve portion 29 of rubber upon a core 30. The core 30 is threaded at its opposite ends for mounting two end seal discs 31 and 32 with spring washers 33 and 34 which press the discs 31 and 32 yieldingly against the end faces of the rollers 16 and 18. The washers 33 and 34 are held under proper tension by two nuts 35 and 36.

The end of the shaft 26 that projects through the bearing 28 is reduced in diameter as indicated at 37. It has a housing member 38 of a one-way drive clutch secured thereto by a pin 39. A pinion 40 is rotatably mounted on the reduced part 37 of the shaft 26 and has a flattened hub portion 41. The hub portion 41 extends into the housing 38 and it receives a stamping 42 which has the shape shown in Figure 5. There is another stamping 43 which is circular and which fits in the housing 38 in such fashion as to close the open end thereof, although there is no direct connection between

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the stamping 43 and the housing 38. The stamping 43 however, does carry two pins 44 and 45 which holds two free rollers 46 and 47 between the housing wall and two flanges 48 and 49 on the stamping 42. The flanges 48 and 49 are set at such an angle as to wedge the rollers against the housing wall when the drive force is imparted in the direction of the arrow that is placed on the stamping 42. However, if the drive force imparted by the stamping 42 of the pinion 40 is in the opposite direction, this will release the rollers 46 and 47 from driving engagement with the housing 48 so that no driving force will be imparted to the housing. The stamping 43 will be carried along with the stamping 42 by reason of the fact that two springs 50 and 51 couple the two stampings together so as to maintain the flanges 48 and 49 in position to hold the rollers 46 and 47 against the pins 44 and 45. It is believed to be evident from the foregoing description that the pinion 40 is coupled to the shaft 26 by a one-way drive mechanism so that the roller 16 can be driven by the pinion 40 only in the direction of the arrow shown in Figure 3. Also the roller 16 can turn in that same direction entirely independent of the pinion 40 which is quite important to the operation of the present device as we will point out later.

Referring now to Figure 6. In this figure the housing 38 and the pinion 40 are illustrated in combination with the drive means for the pinion 40. This drive means comprises an arm 52 which is mounted by a stub shaft 54 to the side frame 7. The arm 52 carries a cam roller 55 which is in engagement with the cam 13. The cam 13 is so shaped that it presents a circular portion to the roller 55 at the time a sheet is fed to the rollers 16—17. The radius of the cam increases thereafter, first at a very slow rate then more rapidly. The effect is to start the rollers 16 and 17 very slowly then to bring them up to the same surface speed as the drum by the time a copy sheet has been advanced far enough to reach the platen roller. This provides better moistening and registration than is possible when the rollers 16—17 are brought up to drum speed suddenly. The free end of the arm 52 has a lateral extension 56 upon which teeth 57 are provided to form a rack engaging with the pinion 40. Each time the drum shaft 3 rotates, it will cause the cam 13 to reciprocate the arm 52, and thus rotate the pinion 40 first in a clockwise direction as shown in Figure 6 and then in the reverse direction. A spring 58 is connected to the arm 52 and to a pin 59 on the side frame 7 to hold the cam roller 55 in engagement with cam 13.

The shaft 54 carries a bell crank lever 60 which has a cam roller 61 riding on the cam 14. A spring 62 is connected to the lever 60 and to a pin 63 on the side frame 7 so as to hold the cam roller 61 in engagement with the cam. The bell crank lever has an elongated arm 64 extending downwardly and coupled by a pivot pin 65 and a link member 66 to a rack 67. The rack 67 is mounted to reciprocate in two guides 68 and 69 of a bracket 70 that is journaled upon a shaft 71. The bracket 70 is held in place by a headed screw 72 that threads into the shaft 71. The shaft 71 is adapted to drive a sheet feeding roller 73 which is slidably and removably fastened on the shaft, but which is held against rotation by a novel mechanism that will be described more fully hereinafter. The rack 67 engages a pinion 74 that is rotatably mounted upon a reduced end 75 of the shaft 71. It is this reduced end

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of the shaft 71 that mounts the bracket 70, there being a bearing 76 on the bracket 70 for the reduced end 75 of the shaft. A housing 77 is fixed to the shaft 71 by a pin 78. This housing 77 is one element of a one-way clutch essentially the same as that shown in Figures 4 and 5 of the drawings. Figures 7 and 8 illustrate the details of this one-way clutch. The pinion 74 has a flattened hub portion 79 extending through two stampings 80 and 81. The stamping 81 is non-rotatably mounted on the pinion 74, but the stamping 80 of course, must be able to rotate at least to a limited extent with respect to the pinion and the stamping 81. Two springs 82 and 83, two rollers 84 and 85 and two pins 86 and 87 function the same in this clutch as the like parts in the previously described clutch shown in Figures 4 and 5. It is believed unnecessary to repeat the detailed description at this point.

Referring now to Figures 2 and 10 to 12 inclusive, the detailed mounting of the feed roller 73 on the shaft 71 is shown in these figures and will be described in connection with them. The roller 73 desirably may be of any resilient material, such as rubber. A core 88 of any suitable metal or other hard material is provided for the roller 73. This core has a pocket 89 cut therein at one end. The side edges of the pocket are undercut as indicated at 90 and 91. A spring clip 92 extends into the pocket 89. This clip has its back portion 93 wider than its active portion 94 so that the shoulders at 90 and 91 prevent the clip from dropping off of a pin 95 that extends through the core 88 and through an opening 96 provided in the clip. The portion 94 of the clip bears against a flat surface 97 provided on the shaft 71. This flat surface extends from one end of the shaft to a point adjacent the other end so that the roller 73 can be adjusted lengthwise of the shaft with very little difficulty to any position desired by the operator.

The shaft 71 is supported by two arms 98 and 99. These arms are outside the side frames 6 and 7 and are pivotally mounted by a common shaft 100 which is journaled in suitable bearings carried by the side frames 6 and 7. The arm 98 has an extension 101 beyond the pivot point to which a counterweight 102 is attached. The arm 99 has a spring 103 fastened to a pin 104 on the arm and this spring is wound about an adjusting drum 105 and fastened to a pin 106 thereon so that the downward pressure of the roller 73 upon which sheets to be fed to the trough can be varied at the will of the operator. The drum 105 is mounted on a shaft 107 which extends out through the cover 6a of the side frame 6 where it is provided with a handle 108. Figures 15 to 18 show details of the mounting of the drum 105 as well as the detent mechanism for holding the drum in various adjusting positions. A bearing 109 is provided for the shaft 107 in the side frame 6. A plate 110 is mounted against the bearing 109 and the frame 6 and the drum 105 rests against the plate 110. A guide pin 111 is mounted on the side frame 6 and extends through the plate 110 into a semi-circular groove 112 that is provided in the drum 105. This limits the travel of the drum to approximately 180 degrees rotation with the shaft 107. The plate 110 has a series of apertures 113 covering a semi-circle opposite the pin 111. A ball 114 is seated in the drum 105 and spring pressed toward the apertures 113 by a spring 115 that is held in

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place by a screw 116. The handle 108 is fastened to the shaft 107 by a screw 117 and it is interlocked with the drum 105 by tongues 118 on the handle and grooves 119 on an extended portion 120 of the drum 105.

It is desirable to have the roller 73 movable out of the way, for example, when it is desired to feed the sheets by hand instead of automatically. The arm 99 has a dependent portion 121 which carries a three pointed trip latch 122 at its lower end. The trip latch is mounted upon a pivot pin 123 and is held against the head of the pivot pin by a spring 124. The pivot pin 123 is secured rigidly to the lower end of the arm portion 121. A cam plate 125 is mounted on the side frame 6 and cut out to provide the cam surfaces 126, 127, 128, and 129. The operation of the trip latch is illustrated in Figures 1, 13 and 14. Normally when the roller 73 is in lowered or operative position, the latch 122 occupies the position shown in Figure 1 where two of its prongs rest on the cam surface 126. When it is desired to raise the roller and hold it in rest position, the roller is lifted to bring one of the points against the cam surface 129 which is sloped so as to force the trip latch to turn until the latch comes up against the curved upper end of the surface 129. This serves as a stop and the roller is then allowed to drop slightly so as to bring the parts to the position shown in Figure 13. This effectively locks the roller 73 in raised position since it is impossible for the lever arm 99 to move in a counterclockwise direction so long as one of the points of the trip latch is in contact with cam surface 127. In order to release the roller for lowering into work position again, the operator merely lifts the roller again, which turns the trip latch to the position shown in Figure 14, so that it can turn back to the position shown in Figure 1 when the roller is lowered.

Referring now to Figures 1, 2, 3 and 19 particularly, the details of the feed tray and its cooperation with the feeding devices will be described. This feed tray comprises a rectangular inverted basin 130, the rim 131 of which is provided at its opposite ends with two spaced openings 132 which are adapted to receive mounting pins 133 on a cross bar 134 of the frame of the machine. The two side portions of the rim 131 carry oppositely disposed pins 135. The side plates 6 and 7 have supporting pins 136 thereon for the rim 131 to rest upon. The pins 135 constitute means for latching the tray in position by a latch mechanism that is carried on the side frames 6 and 7. This latch mechanism is shown best in Figures 3 and 19. An upstanding plate 137 is fastened to the side frame. It is notched at the top as indicated at 138 to receive one of the pins 135. A pivoted lever 139 is pivoted directly over the plate 137. It has a lug 140 that overlaps the plate 137. A spring 141 is connected to a pin 142 on the side frame and to a lug 143 on the lever 139. The lever 139 has a hook portion 144 at its upper end adapted to hook over one of the pins 135 seated in the notch 138 and thus latch it in position. The lever 139 projects above the level of the base 139 and this base has four slots 145 (see Figure 2) properly situated to pass the end of the lever regardless of which end of the tray happens to be facing the cross bar 134. In order to release the tray, all the operator has to do is to press the projecting portions of the levers toward the duplicating drum and then the tray can be lifted up and removed.

The tray is provided at its opposite ends with

two scales 146 and 147, the scales being duplicates. It is also sometime desirable to provide adjacent to the scales, friction pads as are indicated in Figure 3 at 148 and 149. These friction pads may be of rubber or of other material which will hold a stack of sheets with sufficient friction to prevent the entire stack from sliding when the top sheet is withdrawn by the sheet feeding roller 73.

Two side guides 150 and 151 are mounted for adjustment toward and away from each other on the base 130. The base is provided with a transverse slot 152 midway between its ends. The side guides are angular metal strips having horizontal portions resting on the base and vertical portions serving as guides. Tongues 153 and 154 are struck down from the horizontal portions of the side guides into the slot 152. On the outside of each side guide there is mounted a U-shaped member 155, the lower flange of which is the longer. This lower flange has a lug 156 struck down into the slot 152. A clamping bolt 157 extends through the upper and lower flanges of each of the members 155. This bolt has a reduced lower end portion 158 extending through the slot 152 and threaded into a nut 159 so that the guides may be clamped in any desired position or removed if desired. In order to prevent the nut 159 from falling, a channel is provided by two Z-shaped bars 160 and 161 welded to the under surface of the base 131. In order to keep the bolt 157 in position a snap ring 162 is provided between the upper and lower flanges of the members 155.

Each side guide carries a gripping pad 163. The gripping pads are mounted in such fashion that they can be replaced whenever desired. A cup shaped member 164 is welded to the outside of the vertical portion of the side guide and a leaf spring 165 is seated in this cup shaped member. The pads 163 are made of some such material as sponge rubber and they are mounted in shallow pans 166 which are flanged at the edges as indicated at 167. The pan surface bears against the leaf spring so that there is a fairly even pressure of the pads against a bundle of sheets placed between them in the manner illustrated in Figure 19. When the pads become damaged, or for any other reason it is necessary to remove them and insert a new pad, they may be compressed and pulled out through slots 168 which are provided in the horizontal portion of the side guides (see Figure 19). Figure 20 shows a modified pad 163' in which the surface is covered by a leather facing 169. This facing is secured on the sponge rubber in any way; for example, by adhesive. A good material to use for the facing is chamois skin which is a very soft pliable leather.

It is believed that the foregoing description will enable those skilled in this art to understand and take advantage of the novel features disclosed herein. The feed tray just described can be reversed end for end from the position shown in Figure 2 to the position shown in Figure 3 and thus accommodate the gripping pads 163 to long sheets or short cards with no difficulty. The feeding roller 73 can be moved into and out of operative position at the will of the operator.

Both the feeding roller 73 and the moistening roller 16 are positively driven from the drum 1 in timed sequence so that the feeding roller 73 can first shove the copy sheet against the meeting faces of the rollers 16 and 17 and buckle the sheet in the manner indicated at Figure 3 before the

roller 16 begins to turn in sequence. Then the roller 16 turns slowly at first to make sure that the buckled sheet is properly engaged in the notch formed by the rollers 16 and 17, and advances the sheet at the proper time to engage its forward edge with a forward edge of a master sheet on the drum as the forward edge of the master sheet reaches the meeting point of the drum and the platen roller. After the copy sheet is grasped between the master sheet on the drum and the platen roller, the driving of the roller 16 is finished. The rotation of the drum merely pulls the sheet through the rollers turning them as it does so. Because of the clutch mechanism between the driving means and the rollers this can be accomplished and no adjustment is needed for long or short sheets up to the limit of the drum circumference. For very short sheets the roller 16 rotates only so far as is necessary to moisten each short sheet, thereby saving liquid and avoiding danger of spreading excess moisture on the rollers. However, if a long sheet is being fed, the roller 16 is effective to moisten the entire sheet. Our improved driving means therefore, imposes no limitation on the use of the machine and it relieves the drum of the necessity of driving a lot of gearing and intermediate mechanism.

Having thus described our invention, we claim:

1. A duplicating machine comprising a drum, master sheet gripping means thereon, a feed tray having means thereon to support a stack of copy sheets thereon, sheet feeding and moistening rollers interposed between the feed tray and the drum, drum driving mechanism, sheet feed means operable from said mechanism to advance copy sheets to the bite of the rollers while the drum is turned a portion of one revolution, drive means comprising a member positively driven in one direction by said driving mechanism to start said rollers slowly after said sheets have been advanced to said rollers and accelerate them to the same surface speed as the drum while the drum is turned another portion of a revolution, a platen roller cooperating with the drum to receive the advancing end of a copy sheet therebetween when it is brought up to the speed of the drum by said rollers, said drive means including a one way clutch member releasing to permit said rollers to turn in response to pull on the copy sheet by the drum and platen roller and connecting one of said rollers with said driven member to be positively driven thereby only by movement of said driven member in said one direction, said sheet feed means comprising a roller, and means for positively driving the same by said mechanism only during the first named portion of the drum revolution, said means including one way clutch means permitting said roller to turn in response to pull of the feeding and moistening rollers upon a copy sheet under the roller, the driving means for said sheet feed means being independent of the driving means for said feeding and moistening rollers.

2. A duplicating machine comprising a drum, master sheet gripping means thereon, a feed tray having means thereon to support a stack of copy sheets thereon, sheet feeding and moistening rollers interposed between the feed tray and the drum, drum driving mechanism, sheet feed means operable from said mechanism to advance copy sheets to the bite of the rollers while the drum is turned a portion of one revolution, drive

means comprising a member positively driven in one direction by said driving mechanism to start said rollers slowly after said sheets have been advanced to said rollers and accelerate them to the same surface speed as the drum while the drum is turned another portion of a revolution, a platen roller cooperating with the drum to receive the advancing end of a copy sheet therebetween when it is brought up to the speed of the drum by said rollers, said drive means including a one way clutch member releasing to permit said rollers to turn in response to pull on the copy sheet by the drum and platen roller, comprising a driven member driving one of the rollers, a drive member mounted for rotation in one direction on said driven member, means for causing said driven member to rotate with the drive member in the opposite direction, and means actuated by the member actuated by said drive mechanism for turning said drive member alternately in opposite directions, said means turning said drive member in the direction to rotate said drive member during movement of said positively driven member in said one direction.

3. In a duplicating machine, a drum, means for rotating said drum, and means for feeding a copy sheet to said drum from a stack, comprising a feed roller for removing a sheet from the stack, and a pair of rollers to which said feed roller feeds said sheets, one of said pair of rollers being a combined feeding and moistening roller, and means for successively rotating said feed roller and said feeding and moistening roller in a feeding direction comprising a pair of cams mounted to rotate with said drum and having a predetermined relative position and a driving connection between each of said cams and the roller actuated thereby each comprising a member positively driven by said cam in one direction, and means interposed between said member and said roller to drive said roller in only said one direction.

4. In a duplicating machine, a drum, means for rotating said drum, and means for feeding a copy sheet to said drum from a stack, comprising a feed roller for removing a sheet from the stack, and a pair of rollers to which said feed roller feeds said sheets, one of said pair of rollers being a combined feeding and moistening roller, and means for successively positively rotating said feed roller and said feeding and moistening roller in a feeding direction comprising a pair of cams mounted to rotate with said drum and having a predetermined relative position and an independent driving connection between each of said cams and the roller actuated thereby, each comprising a follower positively driven by its cam in a feeding direction and a one way clutch in each of said driving connections driving the roller associated therewith only during movement of said follower in said feeding direction.

5. In a duplicating machine, a drum, means for rotating said drum, and means for feeding a

copy sheet to said drum from a stack, comprising a feed roller for removing a sheet from the stack, and a pair of rollers to which said feed roller feeds said sheets, one of said pair of rollers being a combined feeding and moistening roller, and driving means for successively positively rotating said feed roller and said feeding and moistening roller in a feeding direction comprising a pair of cams mounted to rotate with said drum and having a predetermined relative position, a follower for each cam, levers mounted for oscillation each having one of said followers thereon, said levers being related to said cams to be each positively moved by one of said cams in a feeding direction, rotatable members, each lever having means thereon for driving a rotatable member, a one-way clutch between said feed roller and one of said rotatable members, and a one-way clutch between said feeding and moistening roller and the other of said rotatable members, said one way clutches driving each of said rollers only during positive movement of the lever included in its driving means.

6. In a duplicating machine, a drum, means for rotating said drum, and means for feeding a copy sheet to said drum from a stack, comprising a feed roller for removing a sheet from the stack, and a pair of rollers to which said feed roller feeds said sheets, one of said pair of rollers being a combined feeding and moistening roller, a pair of pivoted arms, a shaft mounted on said arms, said feed roller being mounted on said shaft to rotate therewith, resilient means normally urging said arms in a direction to engage said feed roller with said stack, means for holding said arms in a raised position from said stack and against movement responsive to said resilient means, and means for driving said feed roller intermittently in only one direction comprising a pivotally mounted lever, means for oscillating said lever, a rack pivotally connected with said lever and having means mounted thereon for driving said feed roller comprising a pinion meshing with said rack and a one-way clutch interposed between said pinion and said feed roller.

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