



Dec. 7, 1943.

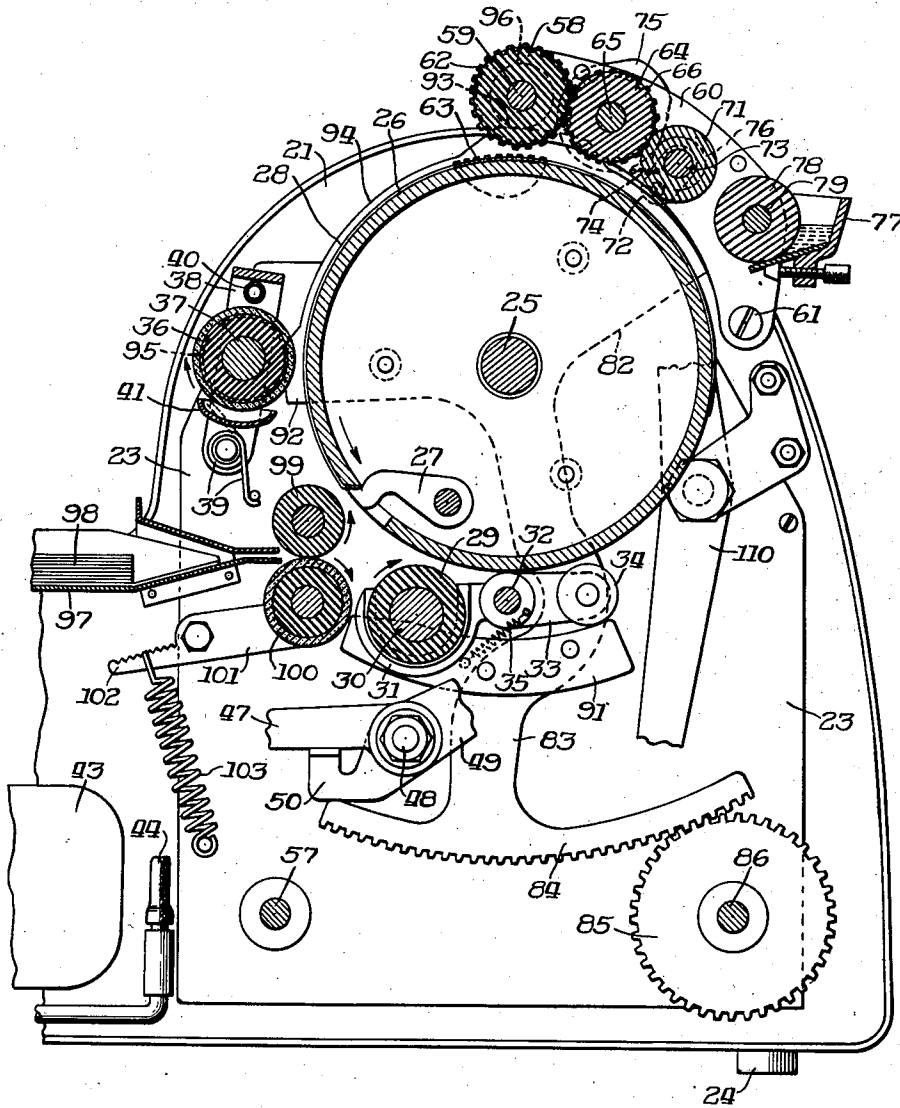
M. P. NEAL

2,335,954

DUPLICATING MACHINE

Original Filed Sept. 16, 1938 5 Sheets-Sheet 2

Fig. 2.



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5 Sheets-Sheet 3

Fig. 3.

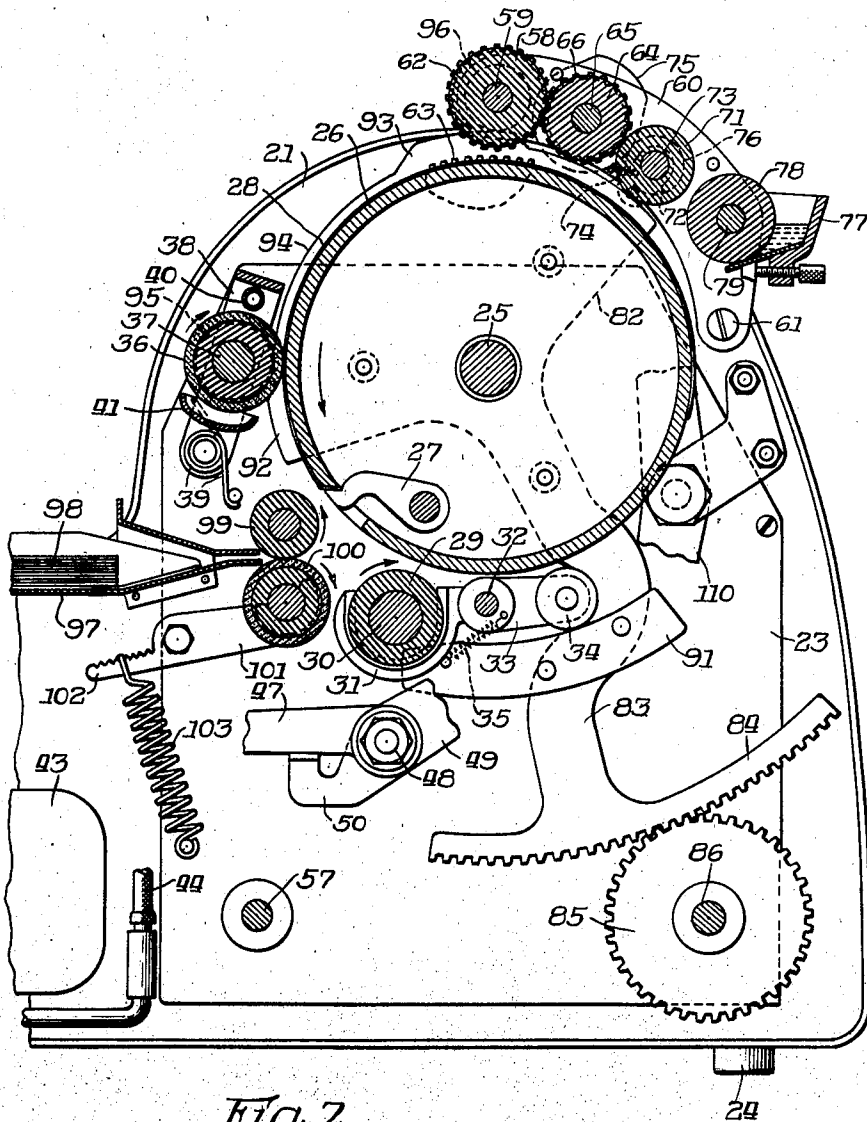
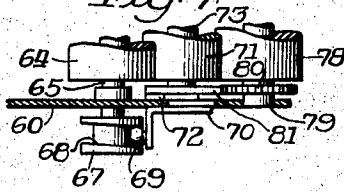


Fig. 7.



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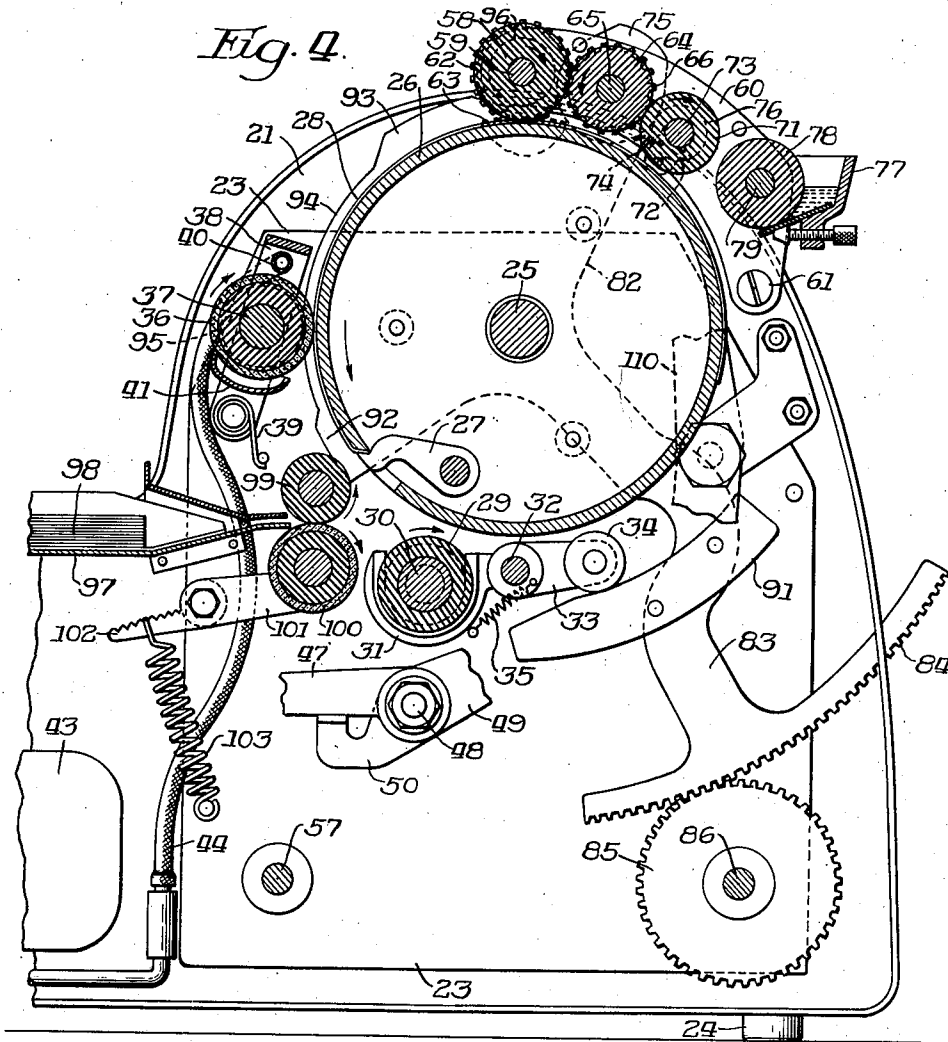
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DUPLICATING MACHINE

Original Filed Sept. 16, 1938 5 Sheets-Sheet 4



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# UNITED STATES PATENT OFFICE

2,335,954

## DUPLICATING MACHINE

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Original application September 16, 1938, Serial No. 230,172. Divided and this application January 2, 1942, Serial No. 425,409

8 Claims. (Cl. 101—145)

This invention relates to improvements in duplicating machines, being illustrated in connection with a machine of the type employing a master sheet in the form of a thin sheet of aluminum or a sheet of parchment paper, or the like, upon which water or other suitable ink repellent is adapted to spread and adhere when applied thereto, such master sheet being inked before each impression so as to make a good copy upon a copy sheet brought into effective pressure relationship thereto. My present improvements are not to be restricted to use in connection with this type of machine, however, so far as they are applicable for use with other types of duplicating machines.

My invention relates further to improved means for feeding water or other ink repellent as the drum rotates, together with improved means for applying ink on the master sheet. Improved means is also provided for moving the repellent applying means and the inking means successively into and out of operative position and for applying pressure to the copy sheets through a platen roller which likewise may be moved into and out of operative position under the control of the operator.

The throw-off means for the feeding, inking and dampening mechanisms comprises a cam member which is adapted by movement to successive selected positions to throw the impression roller first out of operative position, to throw the inking mechanism next out of operation, and to throw the moistening or repellent applying mechanism lastly out of operation, the arrangement being such that upon a reverse stroke of the cam member the mechanisms are again thrown into operation in the reverse order. The construction is such that the machine is adapted to be run for a period of time at each of the successive positions of the cam member as the machine is being put into operation so as to insure that the moistening and inking shall be effective before the machine is brought fully into operation for duplicating purposes. The improved construction preferably includes also a latch or detent by which the cam member may be easily brought into the successive operative positions and releasably held at the desired position for the preliminary preparation of the machine for complete operation.

It is still another object of the invention to improve duplicating machines of this type in sundry details hereinafter pointed out. The preferred means by which the several objects have

been accomplished are illustrated in the accompanying drawings, in which—

Fig. 1 is a longitudinal vertical sectional view through a duplicating machine embodying the improved construction, and with all of the operative mechanisms in operative position;

Fig. 2 is a view similar to a portion of Fig. 1 but with certain of the parts omitted or partially broken away, and with some parts in changed position, with the impression roller, the inking mechanism, and the repellent applying mechanism all thrown out of operation;

Fig. 3 is a view similar to Fig. 2, but with the repellent applying mechanism thrown into operation;

Fig. 4 is a view similar to Fig. 2, but with both the repellent applying mechanism and the inking mechanism thrown into operation;

Fig. 5 is a detailed view showing the preferred form of means for holding the control cam member releasably in its selected set position, being substantially a section taken at the line 5—5 of Fig. 6;

Fig. 6 is a vertical sectional view taken substantially at the line 6—6 of Fig. 5;

Fig. 7 is a top plan view of a fragmentary portion of the structure at the near side of the machine as shown in Fig. 3; and

Fig. 8 is a longitudinal vertical sectional view taken at the near side of the machine as shown in Fig. 1.

Referring now to the several figures of the drawings, in which corresponding parts are indicated by the same reference characters, the framework of the machine comprises standards 21 at opposite sides of the machine connected together by a sheet metal crossbar portion 22. The standards 21 are reinforced by heavy side plate members 23, and the framework is mounted on rubber blocks 24. The standards 21 support a heavy shaft 25 rotatably in position, said shaft having a drum 26 mounted thereon so as to be rotatable thereby. The drum 26 is provided with a plurality of grippers 27 of any approved type for releasably attaching a master sheet 28 to the drum. The master sheet is preferably formed from a thin sheet of aluminum or other suitable material adapted to cause water or other ink repellent to spread over the surface of the sheet when applied thereto.

An impression roller 29 is rotatably mounted in position so as to be movable into and out of operative relation to the drum. In the arrangement shown, the impression roller 29 is rotatably mounted in position by means of a shaft 30 which

is journaled in the end portions of levers 31 which in turn are fixedly mounted on a shaft 32 rotatably mounted between the standards 21. Upon the shaft 32, there is fixedly mounted an arm 33, upon the forward end of which (at the right in Fig. 1) a roller 34 is rotatably mounted for controlling the position of the roller 29 as hereinafter described. A coiled spring 35 is connected at one end with the arm 33 and at its opposite end with a suitable portion of the framework, serving normally to draw the arm 33 downwardly for causing the impression roller 29 to press against the drum. Adjacent to the drum at the left as shown in Fig. 1, I have mounted a roller 36 rotatably in position by means of a shaft 37 journaled in the arms of a swingingly mounted bracket 38, a spring 39 being provided for pressing the roller normally into operative engagement with the master sheet 28 on the drum. Above the roller 36, there is a transversely extending pipe 40 having a series of openings in its bottom wall portion for delivering water or other suitable ink repellent on the face of the roller. A trough 41 of any suitable type is provided on the bracket 38 underneath the roller 36 for carrying away any excess water or other ink repellent not taken up by the master sheet 28. In the preferred arrangement, the roller 36 comprises a facing portion of felt or other suitable absorbent material mounted in position about a base portion of rubber.

Means is provided for delivering water or other suitable ink repellent to the pipe 40 for application to the face of the roller 36. This means comprises a pump 42 mounted within a receptacle 43 adapted to hold a supply of water or other liquid, the pump being arranged so as to deliver a stream of liquid from the receptacle through a tube 44 connected with the pipe 40 upon downward movement of the plunger 45 of the pump, such downward movement of the plunger being effected through the medium of a spring 46. The upward stroke of the plunger against the action of the spring 46 is effected through the medium of a lever 47 which is pivotally mounted upon one of the standards 21 by means of a bolt 48. The lever 47 in turn is actuated by a second lever 49 which is pivotally mounted upon said bolt 48 and which has a short arm 50 extending underneath the lever 47 with a turned end portion in position to engage the bottom face of said lever 47. The lever 49 extends upwardly and forwardly from the bolt 48, having a roller 51 rotatably mounted on its upper end in position to engage a cam 52 fixedly mounted on the shaft 25 of the drum. The arrangement is such that upon each revolution of the drum 26 the lever 49 is moved downwardly by the cam 52, serving to raise the lever 47 and the plunger 45. The lever 47 is provided with a handle portion 53 by which the lever can be manipulated for actuating the pump whenever such operation is desired.

The lever 47 is also provided with a downwardly extending arm 54 carrying a roller 55 on its lower end in position to engage a cam 56 for limiting the downward movement of the lever 47. The cam 56 is rotatably mounted in position by means of a shaft 57 by which the cam 56 may be moved to any desired adjusted position for controlling the effective length of the stroke of the plunger 45 of the pump and controlling thus the amount of liquid delivered through the tube 44 and the pipe 40.

Means is also provided for applying ink upon the master sheet 28 as it is carried around by the

drum. This means comprises a roller 58 journaled by means of a shaft 59 between arms 60 which are pivotally mounted at their forward ends by means of screws 61. The roller 58 is driven by means of a pinion 62 meshing with a gear 63 fixedly mounted on the end of the drum. The arrangement is such that the inking roller 58 is driven continuously during the rotary movement of the drum.

Adjacent to the inking roller 58 so as to bear against said roller, there is an ink cutting roller 64 mounted between the arms 60 by means of a shaft 65. At one end the shaft 65 is provided with a gear 66 which meshes with the gear 62 carried by the inking roller 58. At its opposite end portion, the shaft 65 is provided with a small drum 67 having a cam groove 68 in its face (see Fig. 7). A roller 69 rotatably mounted in position upon a bracket 70 engages the cam groove 68 so as to cause the roller 64 to be reciprocated longitudinally transversely of the machine during the rotation of the roller, the gear 66 being of such size axially as to permit such movement without breaking its connection with the gear 62. The bracket 70 is mounted upon the adjacent arm 60.

Adjacent to the ink cutting roller 64, I have provided a vibrating roller 71 rotatably mounted upon the upper ends of pivotally mounted arms 72 by means of a shaft 73. As is best shown in Fig. 3, springs 74 are provided in connection with the arms 72 for normally pressing the roller 71 against the roller 64. The roller 71 is moved periodically toward the right in said Fig. 3 out of engagement with the roller 64 by means of a cam 75 mounted on the shaft 65 of the roller 64, such cam 75 cooperating with the roller 76 on the shaft 73 of the roller 71 for effecting the desired movement of the roller 71 toward the right.

Adjacent to the vibratory roller 71, I have provided an ink fountain 77 of any approved type, with a roller 78 forming the inner side face of the fountain, such roller 78 being mounted by means of a shaft 79 journaled in the arms 60. At one end, the shaft 79 is provided with a ratchet 80 fixedly mounted thereon and arranged to be actuated by a pawl 81 pivotally mounted on the adjacent arm 72 by which the roller 71 is supported movably in position. The arrangement is such that when the arm 72 is swung toward the right in Fig. 3 the pawl slides under one or more teeth of the ratchet 80 and that as the arm swings again toward the left in said figure the fountain roller 78 is given a slight rotary movement in clockwise direction in said Fig. 3.

The means for throwing the repellent applying roller 36, the inking roller 58, and the impression roller 29 into and out of operative position with respect to the drum 26 and the master sheet 28 carried thereby comprises a cam member 82 rotatably mounted upon the shaft 25 of the drum at one side of the machine. This cam member 82 is provided with a downwardly extending arm 83 which terminates at its lower end in a toothed segmental portion 84 which meshes with a gear 85 mounted by means of a transverse shaft 86 journaled in the standards 21. At the end opposite that at which the gear 85 is mounted, the shaft 86 is provided with a head member 87 having a plurality of notches 88 therein with one or another of which a spring detent 89 engages, the arrangement being such that the detent 89 holds the cam member 82 releasably against rotary movement about the shaft 25 of the drum. Upon its outer end, the

shaft 86 is provided with a setting head 90 in the form of a knob by which the shaft 86 can be turned for giving the cam member 82 a rotary movement as hereinafter described.

As is clearly shown in the drawings, the arm 83 of the cam member 82 is provided with a cam bar 91 fixedly mounted in position with respect to said arm so as to engage the roller 34 by which the position of the impression roller 29 is controlled. In the arrangement shown in Figs. 2, 3 and 4, the cam bar 91 holds the roller 34 in raised position for holding the impression roller 29 out of engagement with the drum. When however the cam bar 91 has been moved to the limit of its motion toward the right in Fig. 1, the roller 34 rides down the top face of the cam bar so as to permit the spring 35 to move the impression roller 29 into operative relation with the drum 26.

As is best shown in Fig. 1, the cam member 82 is provided with high portions 92 and 93 separated by a low portion 94. The high portion 92 is arranged so as to engage a roller 95 carried by the shaft 37 of the roller 36 when the cam member 82 is moved to the limit of its motion in clockwise direction in Fig. 1 so as to move the repellent applying roller 36 toward the left into the position as shown in Fig. 2 out of pressure relationship with the drum 26. The high portion 93 is arranged so as to engage a roller 96 carried by the shaft 59 of the inking roller 58 for forcing such inking roller upwardly out of operative relation to the drum 26, also as shown in Fig. 2.

With the parts in the positions as shown in Fig. 1, the impression roller 29, the inking roller 58, and the repellent applying roller 36 are all in operative relationship to the drum 26 ready for a duplicating operation, the cam 82 being under these circumstances at the limit of its movement in counterclockwise direction in said figure. When the cam 82 is moved slightly in clockwise direction from the position shown in Fig. 1, the impression roller 29 is forced out of operative position into the position as shown in Fig. 4. When the cam 82 is given a slight additional movement in clockwise direction in the figures, the inking roller 58 is moved outwardly by the engagement of the high portion 93 of the cam with the roller 96, the roller 36 being still in pressure relationship with the drum (see Fig. 3). When the cam 82 then is moved still farther in clockwise direction into the position as shown in Fig. 2, the repellent applying roller 36 also is moved out of operative relationship with the drum.

With the parts in the arrangement as shown in Fig. 2, following a period of non-use of the machine, the cam 82 is first moved a short distance in counterclockwise direction from the position shown in Fig. 2 to the position shown in Fig. 3, such movement being effected by pressure applied upon the knob 90. Such slight movement of the cam 82 brings the parts to the arrangement as shown in Fig. 3, with the roller 36 in operative position while the rollers 29 and 58 are held out of operative position. The drum 26 is given a number of revolutions under these conditions so as to be sure that the face of the master sheet 28 is thoroughly moistened by the ink repellent delivered through the pipe 40. The cam 82 is then given a slight additional movement in counterclockwise direction from the position shown in Fig. 3 to the position shown in Fig. 4 so as to bring the inking roller 58 also into operative position. The drum 26 is given a num-

ber of revolutions with the parts in this position so as to insure that the design upon the master sheet 28 is thoroughly inked before the commencement of effective operation of the machine. The cam 82 is then moved still further in counterclockwise direction to the position as shown in Fig. 1 so as to permit the impression roller 29 to move to operative position.

The arrangement of the notched head 87 and the spring detent 89 is such that the detent serves effectively for holding the cam 82 releasably in each of the successive positions of the cam as above described, the head 87 being provided with four notches 88 in such relation to each other as to insure that the detent 89 will be in operative engagement with one of such notches in each of the several selective positions of the cam.

In the machine as illustrated, means is shown for feeding copy sheets one at a time into position between the drum and the impression roller. This sheet feeding means however forms in and of itself no part of the present invention, and the arrangement will accordingly be described very briefly. This paper feeding means as shown comprises a table or tray 97 adapted to support a pile of copy sheets 98 in position a short distance to the rear of a pair of forwarding rollers 99 and 100. The forwarding roller 99 is rotatably mounted upon a fixed axis, while the roller 100 is movable vertically with respect to the roller 99. The mounting means for the roller 100 comprises arms 101 pivotally mounted upon the standards 21, such arms 101 having backward extensions 102 to which coiled springs 103 are adjustably connected. The arrangement is such that the lower forwarding roller 100 is pressed yieldingly at all times against the roller 99.

For feeding sheets from the pile 98, a forwarding roller 104 is provided rotatably mounted upon an arm 105 above the table 97, means being provided for driving the roller 104 from a cross shaft 106 about which the arm 105 is pivotally mounted. The shaft 106 is driven in the direction for giving the roller 104 rotary movement in counterclockwise direction in Fig. 1 by means of a pinion 107 meshing with a toothed segment 108 pivotally mounted at one side of the table 97. The segment 108 is pivotally connected at its lower end with a link 109 which in turn is pivotally connected with the lower end of an arm 110 provided at its upper end with a roller 111 in position to engage the cam 52. A coiled spring 112 connected with the link 109 normally holds the roller 111 pressed against the cam 52. The arrangement is such that upon each revolution of the drum 26 the roller 104 is driven by the segment 108 for forwarding a copy sheet from the pile 98 to the forwarding rollers 99 and 100. The connections between the pinion 107 and the roller 104 include a one-way clutch so that the roller is driven only in the direction for forwarding a sheet, as disclosed in my prior application Serial No. 230,172, filed September 16, 1938, of which the present application is a division.

Means is provided for driving the forwarding rollers 99 and 100 by power from the drum 26. This means comprises a large gear 113 rotatably mounted on the shaft 25, meshing with an idler pinion 114 which in turn meshes with a pinion 115 carried by the roller 99. The gear 113 is driven intermittently by power from the drum through the medium of a ratchet wheel 116 fixedly connected with the gear and a pawl 117 pivotally mounted on the drum in position for re-



leasable engagement with the ratchet wheel. The pawl 117 is effective for driving the forwarding rollers through the gear 113 except when the pawl is moved out of engagement with the ratchet wheel by a cam 118 at a predetermined point in the rotation of the drum, such cam serving to move the pawl out of operative position against the action of a spring 119 for only a very short period at each revolution of the drum. In the arrangement shown, the pawl 117 is thrown out of engagement with one tooth of the ratchet wheel 116 and almost immediately thereafter is brought into engagement with the next adjacent tooth of the ratchet wheel. For insuring that the gear 113 and the connected forwarding rollers 99 and 100 shall be held stationary when the gear is disconnected from the drum, a latching pawl 120 is provided, pivotally mounted in position to engage one or another of a series of pins 121 carried by the gear 113. A cam 122 carried around with the drum serves to control the position of the pawl 120 by engaging a roller 123 rotatably mounted on the pawl. The arrangement is such that the pawl 120 is permitted to move inwardly for engaging a pin 121 at the time when the pawl 117 is out of engagement with the ratchet wheel 116. A spring 124 normally presses the pawl 120 inwardly for engagement with the pins 121. The arrangement of the driving means is such that the forwarding rollers 99 and 100 are driven at the same surface speed as that of the drum 26. Inasmuch as this driving means corresponds with that shown by my said earlier application, it is believed to be unnecessary to describe the same further herein.

With respect to the position of the repellent applying roller 36 at the left of the drum as shown in Fig. 1, it will be understood that this roller and its cooperating mechanism might be shifted to any other desired position relative to the drum, if such changed position should be deemed advisable. It is to be understood that if this moistening mechanism should be shifted, a corresponding change would be made in the position of the high portion 92 of the cam member 82. Whether the roller 36 is kept at the left of the drum as shown in the drawings or is transferred to the opposite side of the drum, as might well be done, the arrangement is still to be kept such that upon the rotation of the knob 90 for shifting the position of the cam 82 the inking mechanism is always thrown out of operation before the repellent applying means is thrown out of operation, and is in turn thrown again into operation upon the reverse rotation of the knob after the completion of the movement of the parts for throwing the repellent applying means into operative position.

As will be appreciated from a study of the construction above described, it would be readily possible to transform this machine into a liquid process machine if desired. With the inking mechanism and the bracket 39 and its connected parts silenced or removed from the machine, all that would be required for effecting the suggested transformation would be the provision of a suitable moistening mechanism of any approved well-known type for applying a film of solvent to the face of the forwarding roller 99, the pump 42 being available for connection with such moistening mechanism to supply solvent in lieu of water or other ink repellent.

While I prefer to employ the form and arrangement of parts as shown in the drawings and as above described, it is to be understood that my invention is not limited to the construction shown

except so far as the claims may be so limited. Changes may well be made in the form and arrangement of the parts without departing from the spirit of the invention.

I claim:

1. In a duplicating machine, the combination of a drum, means for removably mounting a master sheet on said drum, means for rotating the drum, a roller rotatably mounted in position so as to be movable toward and from the drum, yielding means normally holding the roller in pressure relationship to the drum so as to press the master sheet against the drum, means for feeding an ink repellent to the face of the master sheet as the drum rotates, means for applying ink on the master sheet as the drum rotates, a cam member rotatably mounted adjacent to said drum adapted upon rotary movement to successive positions to throw said repellent feeding means and said inking means one at a time out of operation and to move said roller out of pressure relationship to the drum, a head movably mounted in position adjacent to said cam member and connected with the cam member so as to move therewith, and means for releasably holding said head in a plurality of different positions for controlling the operation of said repellent feeding means and said inking means and for controlling the position of said roller.

2. In a duplicating machine, the combination of a drum, means for removably mounting a master sheet on said drum, means for rotating the drum, a roller rotatably mounted in position so as to be movable toward and from the drum, yielding means normally holding the roller in pressure relationship to the drum so as to press the master sheet against the drum, means for feeding an ink repellent to the face of the master sheet as the drum rotates, means for applying ink on the master sheet as the drum rotates, a cam member rotatably mounted adjacent to said drum adapted upon rotary movement to successive positions to throw said repellent feeding means and said inking means one at a time out of operation and to move said roller out of pressure relationship to the drum, a head having a plurality of notches in its periphery and mounted so as to rotate with said cam member, and resilient latch means adapted to have releasable engagement with said notches respectively for holding the head and the cam member in a plurality of different positions so as to control the operation of said repellent feeding means and said inking means and to control the position of said roller.

3. In a duplicating machine, the combination of a drum, means for removably mounting a master sheet on said drum, means for rotating the drum, a roller rotatably mounted in position so as to be movable toward and from the drum, yielding means normally holding the roller in pressure relationship to the drum so as to press the master sheet against the drum, means for feeding an ink repellent to the face of the master sheet as the drum rotates, means for applying ink on the master sheet as the drum rotates, a cam member rotatably mounted adjacent to said drum adapted upon rotary movement to successive positions to throw said repellent feeding means and said inking means one at a time out of operation and to move said roller out of pressure relationship to the drum, an arm in fixed position on said cam member and extending radially beyond the drum, a segmental gear portion carried by said arm, a gear adapted by engagement with said segmental gear portion to give

said cam member an operative stroke, a notched head adapted to rotate with said gear, and a spring detent adapted by engagement with said notches to hold the gear and the cam member releasably against rotary movement.

4. In a duplicating machine, the combination of a drum, means for removably mounting a master sheet on said drum, means for rotating the drum, a roller rotatably mounted in position so as to be movable toward and from the drum, yielding means normally holding the roller in pressure relationship to the drum so as to press the master sheet against the drum, means for feeding an ink repellent to the face of the master sheet as the drum rotates, means for applying ink on the master sheet as the drum rotates, a cam member rotatable about the axis on which the drum is mounted adapted upon rotary movement to successive operative positions to throw said repellent feeding means and said inking means one at a time out of operation and to move said roller out of pressure relationship to said drum, an arm in fixed position on said cam member and extending radially beyond the drum, a segmental gear portion carried by said arm in concentric position about said axis, a gear adapted by engagement with said segmental gear portion to give said cam member an operative stroke, a notched head adapted to rotate with said gear, and a spring detent adapted by engagement with said notches to hold the gear and the cam member releasably against rotary movement.

5. In a duplicating machine, the combination of a drum, means for removably mounting a master sheet on said drum, means for rotating the drum, a shaft rotatably mounted longitudinally of the drum a short distance therefrom, arms extending from said shaft, a roller rotatably mounted between said arms so as to be movable into and out of pressure relationship to the drum, yielding means normally holding the roller pressed against the drum so as to press the master sheet against the face of the drum, an arm mounted to swing about the axis on which said drum is rotatable, a cam bar mounted on said arm in substantially circumferential position with respect to the drum, bearing means connected with said shaft and roller adapted by engagement with said cam bar to move said roller outwardly away from the drum against the action of said yielding means when said arm is given a swinging movement, means for moving said arm in the direction for operative engagement of said cam bar with said bearing means, and means for holding said arm releasably in a plurality of different positions to which it may be swung.

6. In a duplicating machine, the combination of a drum, means for removably mounting a master sheet on said drum, means for rotating the drum, a shaft rotatably mounted longitudinally of the drum a short distance therefrom, arms extending from said shaft, a roller rotatably mounted between said arms so as to be movable into and out of pressure relationship to the drum, yielding means normally holding the roller pressed against the drum so as to press the master sheet against the face of the drum, an arm mounted to swing about the axis on which said drum is rotatable, a cam bar mounted on said arm in substantially circumferential position with respect to the drum, bearing means connected with said shaft and roller adapted by engagement with said cam bar to move said roller outwardly away from the drum against the action of said

yielding means when said arm is given a swinging movement, a segmental gear portion on said arm in concentric position about said axis, a gear adapted by engagement with said segmental gear portion to give said arm an operative movement, a notched head adapted to rotate with said gear, and a spring detent adapted by engagement with said notches to hold the gear and the cam member releasably against rotary movement.

7. In a duplicating machine, the combination of a drum, means for removably mounting a master sheet on said drum, means for rotating the drum, a shaft rotatably mounted longitudinally of the drum a short distance therefrom, arms extending from said shaft, a roller rotatably mounted between said arms so as to be movable into and out of pressure relationship to the drum, yielding means normally holding the roller pressed against the drum so as to press the master sheet against the face of the drum, an arm mounted to swing about the axis on which said drum is rotatable, a cam bar mounted on said arm in substantially circumferential position with respect to the drum, bearing means connected with said shaft and roller adapted by engagement with said cam bar to move said roller outwardly away from the drum against the action of said yielding means when said arm is given a swinging movement, said cam bar being so mounted and shaped as to cause an operative camming action at about the beginning of an operative stroke of said arm and so arranged that upon continued movement of the arm in the same direction through a considerable angle the bar maintains the roller in substantially evenly spaced relationship to the drum, means for moving said arm in the direction for operative engagement of said cam bar with said bearing means, and means for holding said arm releasably in a plurality of different positions to which it may be swung.

8. In a duplicating machine, the combination of a drum, means for removably mounting a master sheet on said drum, means for rotating the drum, a shaft rotatably mounted longitudinally of the drum a short distance therefrom, arms extending from said shaft, a roller rotatably mounted between said arms so as to be movable into and out of pressure relationship to the drum, yielding means normally holding the roller pressed against the drum so as to press the master sheet against the face of the drum, an arm mounted to swing about the axis on which said drum is rotatable, a cam bar mounted on said arm in substantially circumferential position with respect to the drum, bearing means connected with said shaft and roller adapted by engagement with said cam bar to move said roller outwardly away from the drum against the action of said yielding means when said arm is given a swinging movement, said cam bar being so mounted and shaped as to cause an operative camming action at about the beginning of an operative stroke of said arm and so arranged that upon continued movement of the arm in the same direction through a considerable angle the bar maintains the roller in substantially evenly spaced relationship to the drum, a segmental gear portion on said arm in concentric position about said axis, a gear adapted by engagement with said segmental gear portion to give said arm an operative movement, a notched head adapted to rotate with said gear, and a spring detent adapted by engagement with said notches to hold the gear and the cam member releasably against rotary movement.

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