

Nov. 5, 1940.

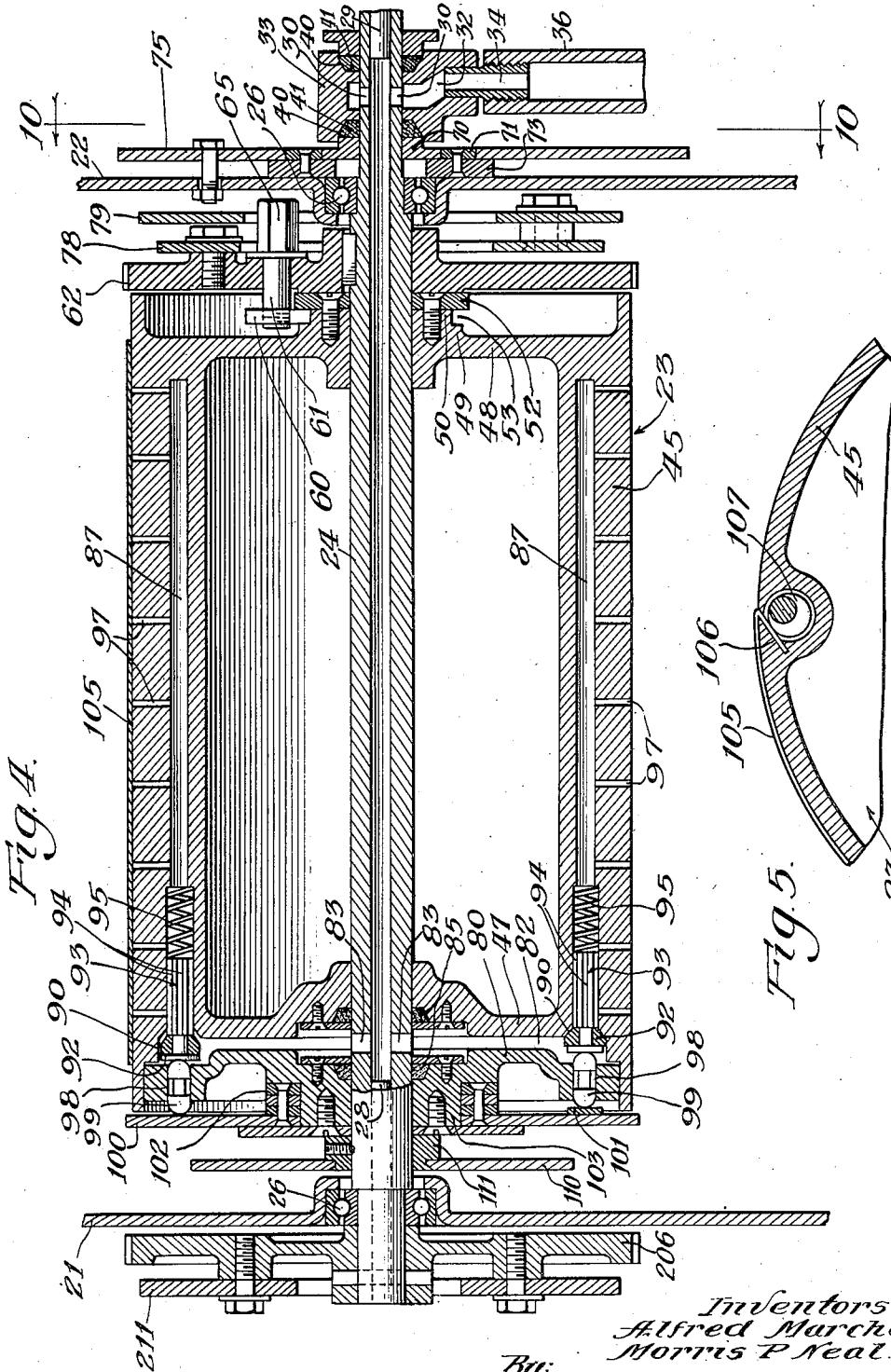
A. MARCHEV ET AL

2,220,255

DUPLICATING APPARATUS

Filed May 13, 1938

6 Sheets-Sheet 2



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6 Sheets-Sheet 3

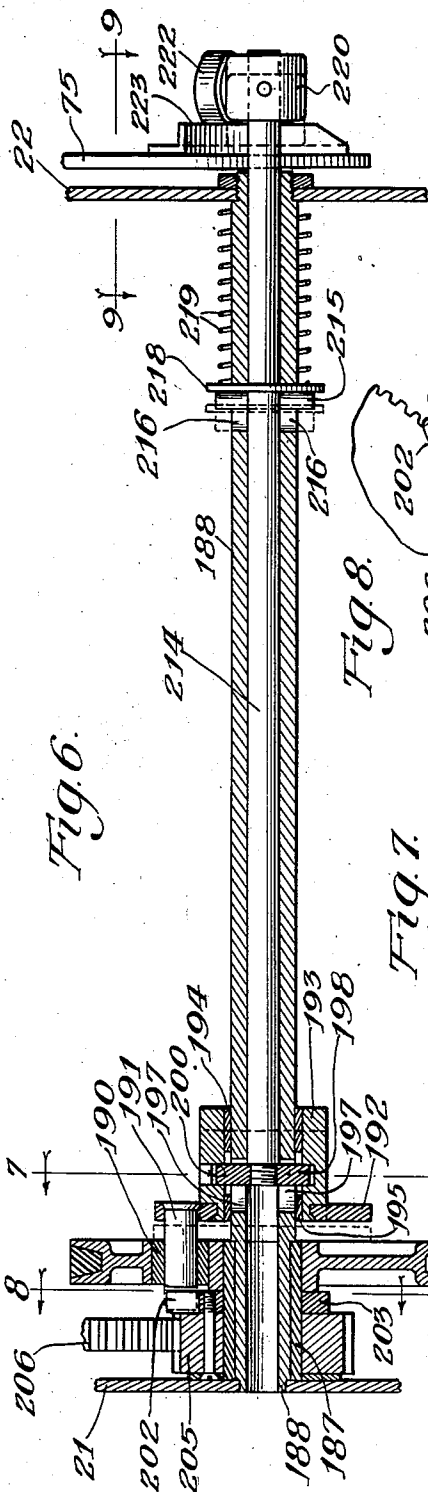


Fig. 6.

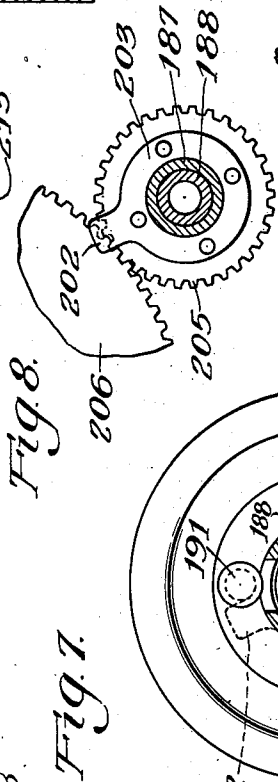


Fig. 7.

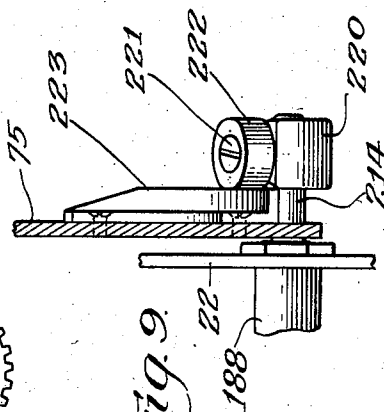
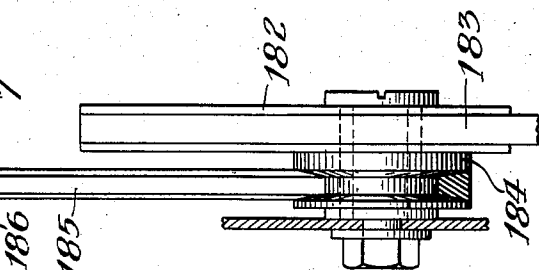


Fig. 8.

Fig. 9.



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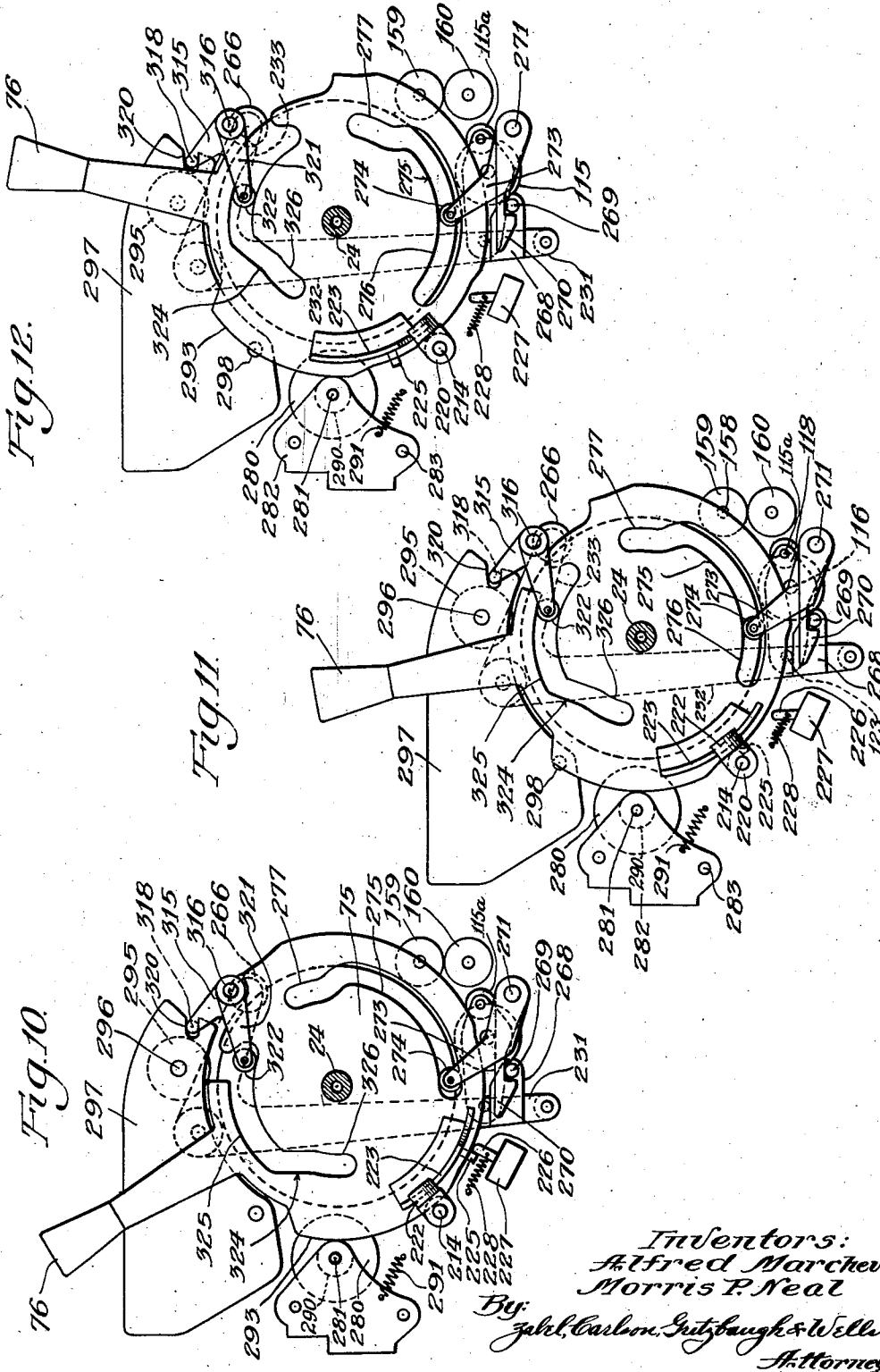
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6 Sheets-Sheet 4



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2,220,255

DUPLICATING APPARATUS

Filed May 13, 1938

6 Sheets-Sheet 5

Fig. 15.

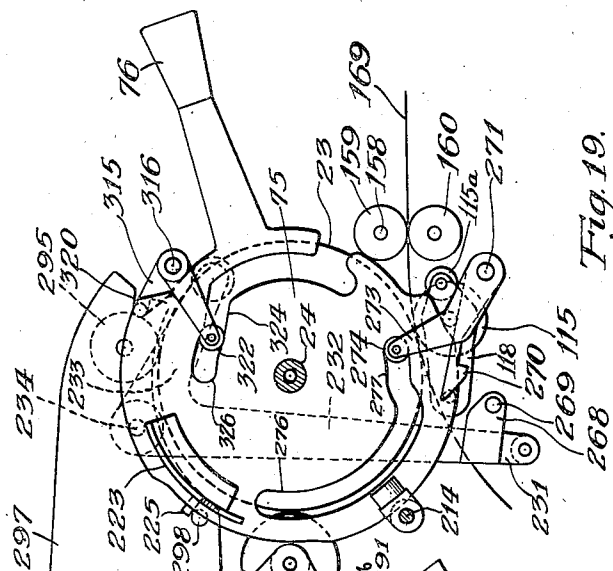


Fig. 19.

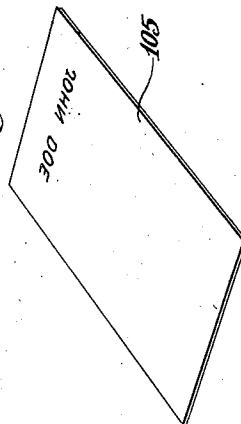


Fig. 14.

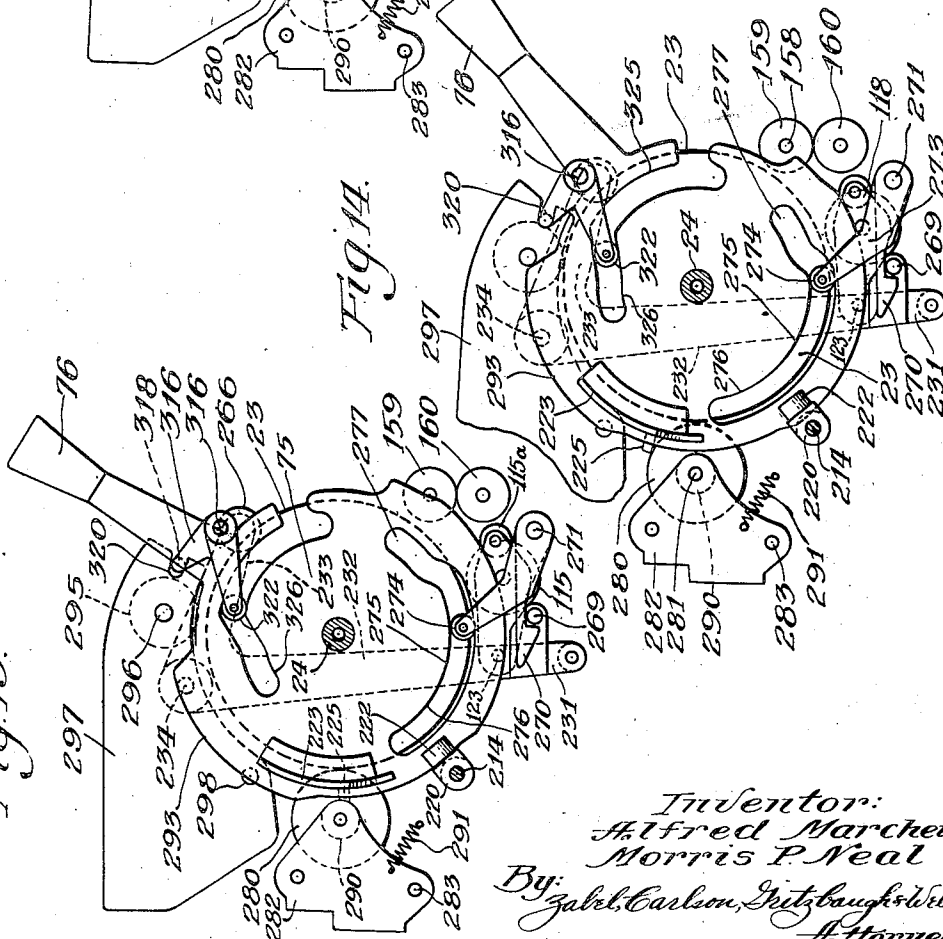
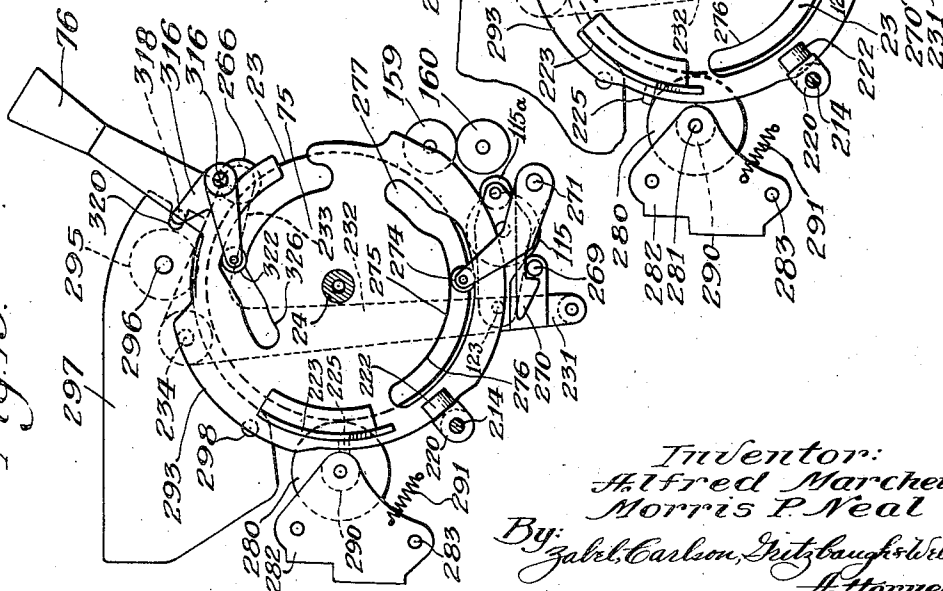


Fig. 13.



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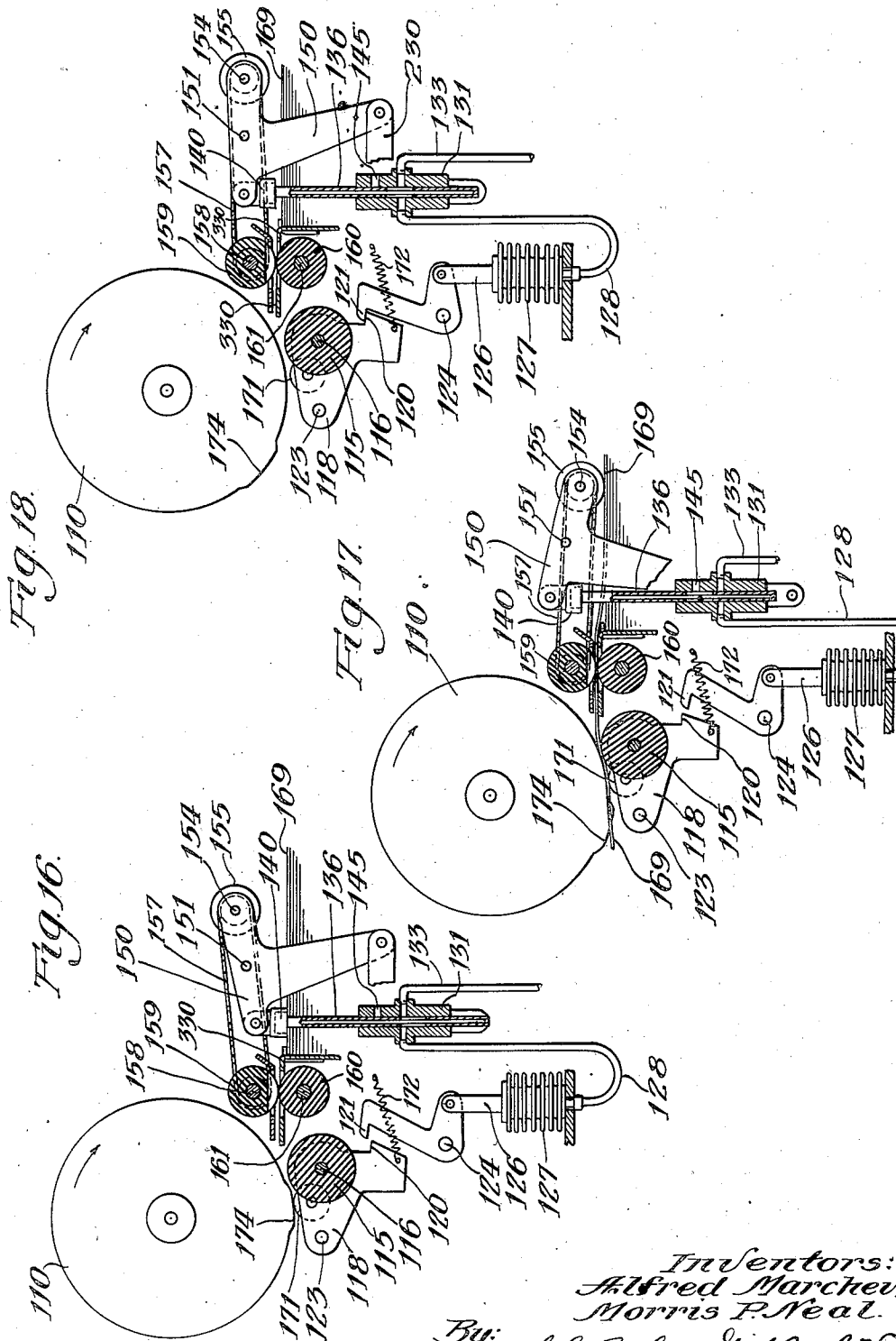
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DUPLICATING APPARATUS

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6 Sheets-Sheet 6



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UNITED STATES PATENT OFFICE

2,220,255

DUPLICATING APPARATUS

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Application May 13, 1938, Serial No. 207,730

16 Claims. (Cl. 101—145)

The invention relates to duplicating apparatus and has among its other objects the provision of a duplicating machine which will operate efficiently to produce a relatively large number of good copies for any given period of time.

One form of the invention is embodied in a duplicating machine wherein master sheets, preferably formed of aluminum foil, have the data to be duplicated, printed or written in reverse thereon so that when copy sheets are applied directly thereto, the data appears in positive upon the copy sheets. The machine includes means for re-inking the data on the master sheet after each duplicating operation, water or any other suitable repellent being applied also to the master sheet after each printing operation. Of course, the ink will adhere to the previously inked portions of the sheet and the water or other ink repellent will prevent the ink from adhering to the other portions of the master sheet.

The improved machine is substantially entirely automatic in its operation, it being only necessary to displace a control member manually to set the machine in operation or to stop it. When the machine is to be started, the control member is displaced manually to close the circuit of the electric motor which drives the machine, to bring the ink repellent applying means into contact with the master sheet, to bring the inking means into contact with the master sheet and to cause a paper feed means to feed the copy sheets automatically.

The machine comprises improved means for holding the master sheet snugly against the surface of a duplicating drum so that the master sheet will not be injured during the duplicating operations.

Other objects and advantages will become apparent as the following detailed description progresses, reference being had to the accompanying drawings, wherein—

Fig. 1 is a vertical longitudinal section, partly diagrammatic, of a duplicating machine which embodies the invention;

Fig. 2 is a vertical central section taken through a valve device which forms part of the improved duplicating machine;

Fig. 3 is a section taken on line 3—3 of Fig. 2;

Fig. 4 is a fragmentary enlarged section taken on line 4—4 of Fig. 1;

Fig. 5 is a fragmentary enlarged section taken through a duplicating drum which forms part of the improved machine;

Fig. 6 is an enlarged section taken on line 6—6 of Fig. 1;

Fig. 7 is a section taken on line 7—7 of Fig. 6;

Fig. 8 is a section taken on line 8—8 of Fig. 6;

Fig. 9 is a section taken on line 9—9 of Fig. 6;

Fig. 10 is a section taken on line 10—10 of Fig. 4;

Figs. 11, 12, 13, 14 and 15 are sections taken on the same lines as Fig. 10 but showing certain parts in changed positions;

Fig. 16 is a section, partly diagrammatic, taken through copy sheet feeding mechanism which forms part of the improved machine;

Figs. 17 and 18 are sections taken on the same line as Fig. 16 but showing certain parts in changed positions; and

Fig. 19 is a perspective view of the improved master sheet which is preferably employed in connection with the duplicating machine shown in Figs. 1 to 18, inclusive.

Referring to the drawings wherein a machine embodying a preferred form of the invention is illustrated, the reference character 20 designates generally the frame of the machine which comprises side frames 21 and 22 (Figs. 1 to 4).

Disposed between the side frames 21 and 22 is a duplicating cylinder or drum 23 which is rotatably journaled on a tubular or hollow shaft 24, the shaft 24 being rotatably journaled by ball bearings 25 mounted in the side frames 21 and 22. The ends of the tubular shaft 24 are closed by plugs 28 and 29. Adjacent the plug 29 the shaft 24 is provided with ports or apertures 30 which communicate with a chamber 32 provided in a block 33 mounted upon the shaft 24. The shaft 24 rotates in the block 33. Communicating with the chamber 32 is a tube 34 which opens into one end of a pipe 36, the other end of the pipe 36 being connected by a T-coupling 37 with the intake opening of a pump 38 which is driven by an electric motor 39 (Fig. 1). The purpose of this construction will presently appear.

Recesses 40 provided in the block 33 accommodate graphite washers or packing members 41.

The duplicating drum 23 comprises a cylindrical wall 45 formed integral with disks 47 and 48 which form the end walls of the drum. The disk 48 comprises an integral hub 49, the outer end 50 of which is of reduced diameter so that it cooperates with a collar 52 to form an annular groove 53. The collar 52 is rigidly secured to the hub 49. Projecting into the groove 53 and fixedly engageable with the collar 52 is a nut 60 screw-threaded upon a bolt 61 which is rotatably journaled in a gear 62, the gear 62 being keyed to the shaft 24.

The bolt 61 is provided with a head 65 whereby it may be rotated so that the nut 60 will be urged against the collar 52 or away from it, depending upon the direction in which the bolt is rotated, the nut 60 being held against rotation around the longitudinal axis of the bolt 61 by reason of its engagement with the reduced portion 50 of the hub 49. This construction permits one to adjust the drum 23 angularly around its axis of rotation through an angle of 360° with respect to the gear 62.

Disposed on the shaft 24 between the drum 23 and the block 33 is a collar 70 upon which a ring 71 is rotatably journaled, the ring 71 being secured to a second ring 73 which spaces the ring 71 from the side frame 22. Rotatably mounted upon the ring 71 is a cam 75 which is preferably provided with an integral handle 76 whereby the cam may be adjusted angularly with respect to the axis of rotation of the drum 23.

Mounted to rotate with the gear 62 and disposed between the gear 62 and the side frame 22 are cams 78 and 79. The cam 78 controls a margin bar (not shown) against which the copy sheets are advanced when they are being fed to the duplicating drum. The cam 79 controls a pump (not shown) which forms part of the improved apparatus.

Disposed adjacent the outer side of the disk 47 is a disk 80 which is fixed to the cylinder wall 45 and makes a tight joint with the inner side of the wall. The disks 47 and 80 form a chamber 82 between them which communicates with the interior of the shaft 24 through apertures or ports 83 formed in the shaft. Graphite packing members 85 are preferably provided in recesses formed in the disks 47 and 80.

Extending longitudinally of the drum 23 and formed in the cylindrical wall 45 thereof are a plurality of bores 87. It will be noted that the bores 87 are closed at their right hand end (Fig. 4) and that they open into valve seats 90 formed in the outer face of the disk 47. Valves 92 mounted on valve stems 93 are adapted to seat upon the valve seats 90. The valve stems 93 have grooves 94 extending longitudinally thereof for purposes hereinafter described. The valve stems are slidably journaled in the bores 87, the left hand ends (Fig. 4) of the bores 87 being of enlarged diameter to accommodate the valve stems 93 and springs 95 which yieldingly tend to unseat the valves 92. The bores 87 communicate with the outer surface of the cylindrical wall 45 through a plurality of smaller bores 97.

A plurality of bores 98 formed in the disk 80 may be aligned with the bores 87 in a manner hereinafter described and as shown in Fig. 4. Disposed in the bores 98 are plungers 99 which are engageable with the outer ends of the valve stems 93. Adjacent the outer side of the disk 80 is a disk 100 having an arcuate member 101 projecting from its inner surface, the arcuate member 101 being engageable with the outer ends of plungers 99. The disk 100 is secured to a fabricated hub 102 which frictionally engages a hub 103 formed integral with the disk 80, the construction being such that the disk 100 may be displaced angularly around the hub 103 but when the drum 23 is rotating the disk 100 would rotate with it.

There are a plurality of bores 87 with their co-operating bores 97 extending partly around the drum. The arcuate member 101 may be brought into a position to engage the outer ends of any desired number of plungers 99. When the plunger 99 is engaged by the arcuate member 101, it holds its corresponding valve 92 upon its seat 90 so that the corresponding bore 87 does not communicate with the chamber 82. Therefore, when a partial vacuum exists in the chamber 82, the bore or bores 87 closed by the corresponding valve or valves 92 will not have partial vacuums formed therein. However, the bores 87 having their corresponding valves 92 unseated will have partial vacuums therein and air will be drawn inwardly through the corresponding bores 87 unless

the outer ends of these bores are closed by the master sheet which is shown at 105 (Fig. 4). The forward end of the master sheet is secured to the drum 23 by bending it and inserting it into a slot 106 formed in the cylindrical wall 45. The forward end of the master sheet 105 is then clamped in the slot by means of an eccentric 107 rotatably journaled in the cylindrical wall 45. The master sheet is then trained over the outer surface of the cylindrical wall 45 and the arcuate member 101 is brought into a position wherein all of the bores 87 communicating with bores 97 over the outer ends of which the master sheet 105 has been trained will be open to the chamber 82 but the bores 87 communicating with bores 97 which do not have their outer ends covered by the master sheet will be closed by the corresponding valves 92. Obviously, a partial vacuum may be developed in the bores 97 which have their outer ends closed by the master sheet 105 and atmospheric pressure will hold the master sheet 105 firmly against the cylindrical wall 45. This construction permits master sheets 105 of different lengths to be firmly held against the outer surface of the cylindrical wall 45.

A cam 110 is disposed between the disk 100 and the side frame member 21, the cam 110 being fixed to a hub 111 which is secured rigidly to the shaft 24. The cam 110 controls a platen or impression roller 115 which is adapted to press copy sheets against the master sheet 105 secured to the drum 23 (Fig. 16).

The platen or impression roller 115 is mounted on a shaft 116 rotatably journaled in bracket members 118, one of the bracket members 118 being provided with a hooked portion 120 engageable by a latch member 121. The bracket members 118 are pivoted by pins 123 to the side frames 21 and 22. The latch member 121 is pivoted upon a pin 124 secured in the frame 20. A link 126 has one end pivoted to the latch member 121 and has its other end secured to one end of a diaphragm 127. The interior of the diaphragm 127 communicates through a pipe 128 with a bore 130 formed in a valve casing 131. The valve casing is also provided with a port 132 which communicates through a pipe 133 with the T-coupling 37 (Fig. 1). Slidably journaled in a bore 135 formed in the valve casing 131 is a tubular valve member 136 which is closed at its lower end (Fig. 2). The upper end of the tubular member 136 communicates with a suction cup 140 which forms part of improved mechanism for feeding copy sheets toward the duplicating drum 23, the construction being such that when a partial vacuum obtains within the tubular valve member 136, air will be drawn inwardly through the suction cup 140 unless it is contacting a copy sheet. If the suction cup is then contacting a copy sheet, the copy sheet will be held firmly against the suction cup by atmospheric pressure.

That part of the tubular valve member 136 which is disposed within the valve casing 131 is provided with two diametrically opposed slots 142 and 143. When the valve 136 is in the position wherein it is shown in Fig. 2, the bore 130 communicates with the interior of the valve member 136 through the slot 142 and the bore 132 communicates with the interior of the valve member 136 through the slot 143. When the valve 136 is displaced upwardly into the position wherein it is shown in Fig. 17, the slots 142 and 143 are not aligned with the bores 130 and 132 respectively, but the slot 143 is aligned with a port 145 in the

valve casing 131. The port 145 communicates with the atmosphere.

The upper end of the valve member 136 is connected operatively to a lever 150 which is oscillated to raise and lower the suction cup 140. It may be mentioned that while only one suction cup 140 is shown, it is the practice to employ a plurality of them communicating with the interior of the valve member 136.

10 The lever 150 is pivoted on a pin 151 projecting from the frame 20, there being a corresponding lever (not shown) on the other side of the frame pivoted on a pin (not shown) having its longitudinal axis coincident with that of the pin 151.
15 Rotatably journaled in the lever 150 and its corresponding lever (not shown) is a shaft 154 upon which a feed roller 155 is fixed. The shaft 154 is driven by a sprocket (not shown) fixed to one end of the shaft. A sprocket chain 157
20 trained over the sprocket (not shown) on the shaft 154 is trained over a sprocket (not shown) mounted on one end of a shaft 158 which carries a driven feed roll 159, the feed roll 159 being fixedly engageable with a cooperating feed roll
25 160 mounted on a shaft 161 (Figs. 16 to 18, inclusive).

Pivotaly mounted on a rod 163 extending between the side frames 21 and 22 are levers 164 between which a bar 165 extends (Fig. 1). One
30 of the levers 164 has an arm 167 engageable by a roller 168 mounted on the shaft 154. When the lever 150 is in the position wherein it is shown in Fig. 1, the levers 164 and bar 165 gravitate into the position wherein they are shown in Fig. 1
35 so that the bar rests against a stack of copy sheets which are designated by the reference character 169. This holds the copy sheets in place. However, when the lever 150 moves into the position wherein it is shown in Fig. 17, the
40 roller 168 will depress the arm 167 and lift the bar 165 out of contact with the uppermost copy sheet 169. Obviously, when the lever 150 is in the position wherein it is shown in Fig. 17 so that the roller 155 rests upon the uppermost copy
45 sheet, the sheet will be advanced by the roller if it is assumed that the machine is in operation.

A pinion 170 fixed to one end of the shaft 158 meshes with the gear 62.

It will be noted that the bracket 118 shown in
50 Figs. 1 and 16 to 18, inclusive, has a rotatably mounted roller 171 which rides upon the cam 110. The bracket 118 is urged yieldingly in a counter-clockwise direction (Fig. 16) by a spring
55 172 so as to hold the roller 171 in engagement with the cam 110. It will be noted that the cam 110 is circular except for a relatively small projection 174 adapted to displace the roller 171 and the bracket 118 in a clockwise direction (Fig. 16) against the action of the spring 172.

60 When the paper feeding apparatus is in the condition wherein it is illustrated in Fig. 16 with the suction cups 140 engaging the uppermost copy sheet 169, the slots 142 and 143 register with the ports 130 and 132 so that a partial vacuum obtains
65 in the suction cups and in the diaphragm 127. Therefore, the uppermost copy sheet will adhere to the suction cups and the latch member 121 will be held in the position wherein it is shown in Fig. 16 so that it cannot engage the hook portion
70 120 of the bracket 118. Then if the lever 150 is displaced in a clockwise direction toward the position wherein it is shown in Fig. 17, the valve member 136 will be displaced upwardly in the valve casing 131 so that the slots 142 and 143 will
75 be brought out of registry with the ports 130 and

132. The slot 143 will come into registry with the port 145 and this, of course, will destroy the partial vacuum in the cups 140 so that they will release the uppermost copy sheet and permit the roller 155 to advance it toward the bight of the
5 rollers 159 and 160. The partial vacuum obtaining in the diaphragm 127 will not be broken and therefore the latch member 121 will remain in position wherein it is shown in Figs. 16 and 17. However, if for any reason, there is no copy
10 sheet adhering to the cups 140 when they are displaced upwardly, air will be drawn into the valve device 136 through the cups and no vacuum will exist in the diaphragm 127. The latch member
15 121 will then move into the position wherein it is shown in Fig. 18 so that it engages the hook portion 120 of the lever 118. The construction is such that the projection 174 displaces the lever
20 118 and the platen roller 115 downwardly during the period of time the suction cups 140 are normally lifting the uppermost copy sheet. If no copy sheet is adhering to the cups 140, the latch member 121 engages the hook portion 120 and prevents the spring 172 from bringing the platen roller 115 into engagement with the duplicating
25 drum 23 so that the master sheet thereon will not be engaged by the platen roller even after the projection 174 has passed beyond the roller 171. This construction assures that if no copy sheet is advanced to the duplicating drum at
30 the proper time, the impression or platen roller 115 will not contact and smudge the master sheet.

When the suction cups 140 lift the forward edge of a copy sheet the partial vacuum in the cups is
35 destroyed when the slot 143 registers with the port 145 as best shown in Fig. 17. The copy sheet is then released and is advanced to the bight between the rollers 159 and 160 by the roller 155. The rollers 159 and 160 then advance the copy
40 sheet to the bight between the duplicating drum 23 and the platen roller 115, the copy sheet being pressed against the master sheet to duplicate the data thereon.

The improved duplicating machine is preferably
45 driven by an electric motor shown at 180 (Fig. 1) having a pulley 181 on its shaft. The pulley 181 is connected operatively to a pulley 182 by a belt 183. Constrained to rotate with the pulley 182 is a smaller pulley 184 which is
50 connected operatively by a belt 185 to a pulley 186 (Fig. 6). The pulley 186 is rotatably mounted on a sleeve 187 which is mounted at one end of a tubular shaft 188, the shaft 188 having its ends fixed in the side frames 21 and 22. A bushing
55 190 is provided in the web of the pulley 186 and projecting into the bushing 190 is a pin 191 carried by a disk 192 which is rigidly secured to a collar 193 rotatably journaled on bushings 194 and 195 mounted upon the shaft 188. The shaft
60 188 is provided with diametrically opposed slots 197 and projecting through the slots is a key member 198, the outer ends of which ride in an annular groove 200 formed in the inner surface of the collar 193. Obviously, the collar 193 may
65 rotate relative to the key member 198 but the key member 198 may be shifted longitudinally of the shaft 188 to displace the collar 193 in the same direction. When the collar 193 is displaced to the left (Fig. 6) by the key member 198, the
70 pin 191 is displaced also to the left (Fig. 6) so that it will be engaged by a lug 202 projecting from a collar 203 journaled on the sleeve 187. The collar 203 is secured rigidly to a pinion 205 which meshes with a gear 206. The gear 206 is
75

pinned to the lefthand end (Fig. 4) of the tubular shaft 24.

A cam 211 is secured to the gear 206 and rotates therewith.

- Obviously, the gear 206, the cam 211, the shaft 24, the gear 62, the duplicating drum 23 and the cams 78 and 79 will be rotated whenever the pin 191 is in a position wherein it will engage the lug 202 when the pin 191 is rotated bodily around the longitudinal axis of the shaft 188 by the pulley 186.

- The key member 198 is secured rigidly to the lefthand end (Fig. 6) of a plunger 214 slidably journaled in the tubular shaft 188. A pin 215 projects through the plunger 214 and its ends ride in slots 216 formed in the tubular shaft 188. Disposed around the stationary shaft 188 and abutting against the outer ends of the pin 215 is a washer 218. A spring 219 disposed around the shaft 188 and interposed between the washer 218 and the side frame member 22 yieldingly urges the washer 218 and the plunger 214 to the left (Fig. 6). Secured to the righthand end (Fig. 6) of the plunger 214 is a short lever 220 having a pin 221 which rotatably journals a roller 222. The roller 222 is adapted to ride upon a cam member 223 secured to the outer side of the cam 75. When the roller 222 is resting upon the highest part of the cam 223 as shown in Figs. 9, 10 and 11, the plunger 214 is held in its retracted position so that the pin 191 cannot engage the lug 202. However, if the cam 75 is displaced angularly so that the roller 222 leaves the cam member 223 as illustrated in Figs. 12 to 15, inclusive, the spring 219 displaces the plunger 214 to the left (Fig. 6) so that the pin 191 engages the lug 202 and causes the pinion 205 to drive the gear 206. The purpose of this construction will presently appear.

- Projecting from the cam 75 is a pin 225 engageable with a lever 226 forming part of a switch device 227 which controls the circuit of the motor 180. When the cam 75 is in the position wherein it is shown in Fig. 10, the pin 225 holds the switch lever 226 in a position which holds the switch 227 open. However, if the cam 75 is displaced in a clockwise direction (Figs. 10 and 11), the pin 225 is disengaged from the lever 226 and permits a spring 228 to displace the lever 226 so as to close the switch 227, whereupon the electric motor 180 will be set in operation.

- Returning now to the description of the copy sheet feeding mechanism, it will be noted that a link 230 has one of its ends pivoted to the lever 150 and has the other of its ends pivoted to an arm 231 of a bell crank lever 232 which comprises a second arm 233. The bell crank lever 232 is pivoted on a pin 234 projecting from the frame 20. Means hereinafter described is provided for oscillating the bell crank lever 232 so that will reciprocate the link 230 and the link, in turn, will oscillate the lever 150.

- A link 237 has one of its ends pivoted to the lever 150 and has another of its ends pivoted to the free end of a lever 238, the lever 238 being pivoted on a pin 239 projecting from the frame 20. Pivoted to the lever 238 intermediate its ends is a pawl 240 which is yieldingly urged into engagement with a ratchet 241 rotatably journaled on a pin 242 mounted in the frame 20. Constrained to rotate with the ratchet 241 and mounted on the pin 242 is a pinion 244 which meshes with a gear 245 and the gear 245 meshes with a gear 246. The gears 245 and 246 are mounted on shafts 247 and 248 respectively, which

are mounted in the frame 20. Secured to the shafts 247 and 248 are levers 250 and 251 respectively, which have pins 252 and 253 respectively, riding in slots 255 and 256 respectively. The slots 255 and 256 are formed in a frame 258 which is slidably mounted in the frame 20 so that it may be moved upwardly and downwardly. The frame 258 carries a table 260 upon which the copy sheets may be stacked as best shown in Fig. 1.

When the lever 238 is oscillated, the pawl 10 will engage the teeth of the ratchet 241 and slowly rotate it in a counterclockwise direction (Fig. 1) so that the pinion 244 will drive the gear 245 and the gear 245, in turn, will drive the gear 246. When the gears 245 and 246 are driven in this manner, the levers 250 and 251 are displaced angularly in opposite directions and the pins 252 and 253 riding in the slots 255 and 256 will raise the frame 258 and the table 260 in a step by step manner so that the table 260 will be elevated to hold the uppermost copy sheet in a position wherein it may be engaged by the suction cups 140.

A holding pawl 262 prevents the ratchet 241 from rotating in a clockwise direction (Fig. 1).

As best shown in Fig. 1, a spring 265 yieldingly urges the link 230 to the left (Fig. 1) so that a roller 266 rotatably journaled on the free end of the arm 233 is urged yieldingly toward the cam 211 shown in Fig. 4.

As best shown in Figs. 10 to 15, inclusive, the arm 231 has a plate 268 secured to it. Projecting from the plate 268 is a pin 269 engageable by a pawl 270 which is pivoted on a pin 271 mounted in the frame 20. Constrained to oscillate with the pawl 270 is a lever 273 which has a roller 274 rotatably journaled at its free end. The roller travels in a cam slot 275 formed in the cam 75. It will be noted that the cam slot 275 comprises a dwell portion 276 which is concentric with the longitudinal axis of the shaft 24. The cam slot 275 comprises another portion 277 which is inclined inwardly toward the longitudinal axis of the shaft 24. It will be readily understood that when the roller 274 and the cam 75 are in the relative positions wherein they are shown in Figs. 10, 11, 12, 13 and 14, the pawl 270 will be held in the position wherein it is shown in the same figures and will engage the pin 269 to hold the bell crank lever 232 in the position wherein it is shown in Figs. 10 to 14, inclusive, against the action of the spring 265. However, when the cam 75 is brought into the position wherein it is shown in Fig. 15, the roller 274 passes into the portion 277 of the cam slot 275 and the pawl 270 is disengaged from the pin 269 so that the bell crank lever 232 will oscillate under the action of the cam 211 and the spring 265, the construction being such that unless the latch member 121 is engaged with the hook portion 120, the platen roller 115 will be urged yieldingly toward the duplicating drum 23 to press a copy sheet against the master sheet thereon. This takes place once during each revolution of the drum 23. The platen roller 115 is also controlled by the cam 75 as hereinafter described.

Means is provided for applying water or suitable ink repellent to the master sheet during each cycle of operation and means is also provided for re-inking the data on the master sheet during each cycle of operation. A master sheet 105 is shown in Fig. 19 and it will be noted that the data to be duplicated appears in reverse on one side thereof. This is the side which is dis-

posed outermost on the duplicating drum and comes into contact with the copy sheets so that the data will be duplicated in positive on the copy sheets. The master sheet is preferably formed from an aluminum sheet about .002 inch thick. The data shown at 105a on the master sheet 105 is written or typewritten upon the master sheet while the master sheet has a suitable carbon sheet against the back surface thereof, the carbon coating being in contact with the back surface of the master sheet. Of course, one writes or typewrites on the front surface of the master sheet and the data will appear in reverse upon the back surface thereof. It may be mentioned that carbon or transfer sheets of the type disclosed in the co-pending application Serial No. 188,706, filed February 4, 1938, by Johan Bjorksten and William J. Champion are preferably used in preparing the master sheets 105.

The means for applying water or other suitable ink repellent to the master sheet preferably comprises a roller 280 mounted upon a shaft 281 which is rotatably journaled in the auxiliary frame 282 pivoted upon a shaft 283, the shaft 283 being mounted in the frame 20. The ink repellent is sprayed from a perforated tube 285 (Fig. 1), the water or other ink repellent being delivered to the perforated tube 285 by a pipe 286. The pipe 286 is connected to the outlet port of a pump 287 adapted to pump the liquid from a container (not shown) and deliver it to the pipe 286. The pump 287 is operated by means (not shown) controlled by the cam 79. The perforated tube 285 is rotatably journaled in the auxiliary frame 282 and may be brought into a position wherein it will spray the ink repellent directly upon the roller 280. This is done when the apparatus is first set in operation to insure a quick delivery of repellent to the roller 280. However, after the machine is in operation the tube 285 is turned until it sprays the ink repellent upon a felt strip 285a mounted upon the upper end of a sheet metal bracket 285b carried in the frame 282, the bracket 285b being formed with a trough 285c at its lower end. Of course, excess ink repellent will drain into the trough 285c. The ink repellent delivered to the felt strip 285a travels upwardly through the strip by capillary action and delivers the liquid to a roller 285d which, in turn, delivers the liquid to the roller 280. The roller 280 then applies the ink repellent to the master sheet as the duplicating drum rotates. It may be advisable in some instances to saturate the felt strip 285a with the ink repellent before the machine is set in operation.

Rotatably journaled on the shaft 281 is a roller 290 which rides upon the periphery of the cam 75, the roller 290 being yieldingly urged against the cam 75 by a spring 291. When the cam 75 is in the positions wherein it is shown in Figs. 10, 11 and 12, the roller 290 rides upon a high dwell 293 of the cam 75 and holds the roller 280 in a position wherein it cannot contact the master sheet 105. However, when the cam 75 is in the positions wherein it is shown in Figs. 13, 14 and 15, the roller 290 passes from the dwell 293 and the spring 291 brings the roller 280 against the duplicating drum 23 or the master sheet thereon so that as the master sheet passes beneath the roller 280, the water or other ink repellent is applied thereto.

The means for re-inking the master sheet during each cycle of operation preferably comprises a roller 295 mounted on a shaft 296 which is jour-

nalled in an auxiliary frame 297 pivoted upon a shaft 298 which has its ends rotatably journaled in the frame 20. A pinion 299 fixed to the shaft 298 meshes with the gear 206. The pinion 299 meshes with a train of pinions which are identified by the reference characters 300, 301, 302 and 303, the pinion 303 being fixed to the shaft 296 so that the roller 295 is driven whenever the gear 206 is driven. The roller 295 is supplied with ink by a series of rollers 306, 307 and 308, the roller 306 being mounted on a frame (not shown) which, in turn, is mounted in the frame 297. The roller 306 oscillates between the roller 307 and a roller 310 which forms one side of a container 311 which holds the supply of ink. Means (not shown) is provided for rotating the roller 306 in a step by step manner during its oscillations. Means is provided for displacing the frame 297 angularly in order to bring the roller 295 into and out of a position wherein it will re-ink the data on the master sheet. This means comprises a lever 315 pivoted on a pin 316 projecting from the frame 20. At its free end, the lever 315 is provided with a pin 318 which rides in a slot 320 formed in the frame 297 (Fig. 1). Constrained to move with the lever 315 and pivoted upon the pin 316 is a lever 321 which has a roller 322 rotatably journaled on its free end. The roller 322 rides in a cam slot 324 formed in the cam 75. The cam slot 324 has an arcuate dwell 325 which is concentric with the longitudinal axis of the shaft 24. The cam slot 324 is also provided with a portion 326 inclined toward the longitudinal axis of the shaft 24. The construction is such that when the roller 322 is riding in the arcuate dwell 325 (Figs. 10, 11, 12 and 13) the frame 297 is held in a position wherein it holds the roller 295 in a position wherein it cannot contact the master sheet. However, when the roller 322 rides into the inclined portion 326 of the cam slot 324, the roller 295 is brought into a position wherein it will contact the master sheet during each cycle of operation as best shown in Figs. 14 and 15.

Referring to Fig. 4, it will be noted that the cam 75 is not constrained to rotate with the duplicating drum 23. The cam 75 is adapted to be oscillated by the operator, the lever 76 being provided for this purpose.

The platen roller 115 is also controlled by the cam 75 so that when the machine is not in operation, and during the initial application of ink repellent and ink to the master sheet, the platen roller is spaced away from the duplicating drum 23 so that it cannot engage and smudge the master sheet. For this purpose, the bracket 118 shown in Figs. 10 to 15, inclusive, is provided with a roller 115a engageable with the periphery of the cam 75. It will be noted that in Figs. 10, 11, 12, 13 and 14, the roller 115a is riding upon a relatively high dwell on the cam 75 so that the platen roller 115 is spaced away from the duplicating drum 23. Therefore, when the machine is idle as illustrated in Fig. 10, when the clutch mechanism is being engaged as illustrated in Fig. 12, when the ink repellent is being applied to the master sheet as illustrated in Fig. 13 and when the master sheet is being inked as illustrated in Fig. 14, prior to the next step of setting the copy sheet feeding mechanism in operation as illustrated in Fig. 15, the platen roller 115 cannot come into contact with the master sheet to smudge it. However, when the cam 75 is moved into the position wherein it is shown in Fig. 15 so that the copy sheet feeding mechanism is set in operation, the roller 115a leaves the high dwell upon the cam 75

75, and the spring 172 urges the platen roller against the copy sheet. The platen roller remains in a position wherein it can engage each succeeding copy sheet unless the latch member 121 engages the hook portion 120 and holds the platen roller in the position wherein it is shown in Fig. 18.

When the machine is idle, the cam 75 and the lever 76 are in the positions wherein they are illustrated in Fig. 10. When the operator wishes to set the machine in operation, the lever 76 (formed integral with the cam 75) is moved into the position wherein it is shown in Fig. 11, whereupon the switch device 227 is closed so that the motor 180 is set in operation. The motor 39 is preferably set in operation through the same switch but, of course, may have a separate switch if it is so desired. After the motor has been set in operation, the lever 76 is advanced into the position wherein it is shown in Fig. 12 so that the roller 222 leaves the cam member 223 and permits the pin 191 to engage the lug 202, whereupon the duplicating drum 23 is rotated as the pinion 205 drives the gear 206 which, in turn, drives the shaft 24, the drum 23 and the pinion 299, causing rotation of the inking roller 295. It will be noted that in Figs. 10, 11 and 12, the roller 322 holds the auxiliary frame 297 in a position wherein the roller 295 cannot contact the master sheet as the drum 23 rotates. In the same figures, it will also be noted that the roller 274 holds the pawl 270 engaged with the pin 269 so that the copy sheet feeding mechanism is held in a functionally inoperative condition. Likewise, in Figs. 10, 11 and 12, the roller 290 resting upon the dwell 293 of the cam 75 holds the roller 280 in its retracted position so that it cannot contact the master sheet on the drum 23. However, when the lever 76 was displaced from the position wherein it is shown in Fig. 10 to the position wherein it is shown in Fig. 11, the motor 180 was set in operation and also the motor 39 in the preferred embodiment of the invention. When the lever 75 was displaced from the position wherein it is shown in Fig. 11 to the position wherein it is shown in Fig. 12, the clutch mechanism comprising the pin 191 and the lug 202 became functionally operative so that the duplicating drum 23 and the cams 78, 79, 110 and 211 were set in operation. The gear 62 is also driven and drives the pinion 170 and the feed roller 159. Therefore, when the lever 76 has been moved into the position wherein it is shown in Fig. 12, the duplicating drum is rotating and so also are the cams which operate the copy sheet feeding mechanism but the copy sheet feeding mechanism remains functionally inoperative and the ink repellent applying means and the re-inking means are also functionally inoperative.

Now if the lever 76 is displaced into the position wherein it is shown in Fig. 13, the roller 290 leaves the dwell 293 and the spring 291 yieldingly urges the roller 280 into a position wherein the roller 280 applies the water or other ink repellent to the copy sheet each time the copy sheet passes beneath it. The operator may leave the lever 76 in the position wherein it is shown in Fig. 13 as long as it is desired to insure that the master sheet will be thoroughly wet with the water or other ink repellent. The lever 76 is then advanced into the position wherein it is shown in Fig. 14 so that the roller 322 enters the inclined portion 325 of the cam slot 324 and permits the inking roller 295 to rest upon the duplicating drum and to contact the master sheet each time the master sheet passes beneath it. Of course,

the water or other ink repellent does not adhere to the previously inked data on the master sheet but the ink from the roller 295 does so that each time the duplicating drum 23 makes a complete revolution, the data on the master sheet are re-inked. The lever 76 may be left in the position wherein it is shown in Fig. 14 as long as it is desired and is then advanced to the next or final position shown in Fig. 15. When the lever 76 is in the position wherein it is shown in Fig. 15, the roller 274 has entered the inclined portion 277 of the cam slot 275 and has lifted the pawl 270 out of engagement with the pin 269 so that the bell crank lever 232 is oscillated by the action of the cam 211 and the spring 265. The machine thus operates as follows: The rollers 280 and 295 remain in positions wherein they contact the master sheet throughout its entire length during each revolution of the duplicating drum 23. The bell crank lever 232 makes a complete oscillation for each complete revolution of the duplicating drum 23 and therefore causes the suction cups 140 to be lowered into contact with the uppermost copy sheet 169 and elevated so that the forward edge of the copy sheet is lifted from the stack. When the suction cups 140 are lifted, the roller 155 is brought into contact with the uppermost copy sheet and advances it between the rollers until it engages the margin bar (not shown) whereupon the uppermost feed roller 159 frictionally engages the copy sheet and co-operates with the feed roller 160 to advance the copy sheet to the bight of the duplicating drum 23 and the platen roller 115. The platen roller 115 presses the copy sheet against the master sheet as it advances the copy sheet and thereby causes the data on the master sheet to be duplicated in positive on the copy sheet. The duplicated copy sheets are discharged upon any suitable tray (not shown) or the like. As described above, as long as the uppermost copy sheet adheres to the suction cups 140 when they are lifted to raise the forward edge of the copy sheet, a partial vacuum obtains in the diaphragm 127 and the latch member 121 remains in its functionally inoperative position as illustrated in Fig. 16 so that the momentary depression of the platen roller 115 by the dwell 174 on the cam 110 does not result in latching of the platen roller in its functionally inoperative position. However, when the suction cups 140 have elevated the forward end of the uppermost copy sheet the desired distance, the partial vacuum obtaining in the suction cups is destroyed and the forward edge of the copy sheet drops upon a guide plate 330 and a copy sheet is advanced by the roller 155. If it so happens that the uppermost copy sheet is not lifted by the suction cups 140, the partial vacuum obtaining in the suction cups will be destroyed and the diaphragm 127 will expand so that the latch member 121 will engage the hook portion 120 and hold the platen roller 115 in its functionally inoperative position after the roller 171 has left the dwell 174. As pointed out above, this insures that the platen roller 115 will not smudge the data on the master sheet and also insures that the data on the master sheet will not be offset on the platen roller.

As the machine continues to feed the copy sheets to the duplicating drum, it is, of course, obvious that the height of the stack will be lowered. Such lowering of the height of the stack is compensated by the step by step lifting of the table 260 as described above. After all of the copy sheets have been passed through the machine, the machine may be stopped and the table

260 lowered to receive a new stack of copy sheets. The machine may be stopped by moving the lever 76 from the position wherein it is shown in Fig. 15 to the position wherein it is shown in Fig. 10, the lever 76 and the cam 75 being displaced angularly in a counter-clockwise direction (Figs. 10 and 15). Of course, as long as it is desired to have the machine continue operation, the lever 76 is left in the position wherein it is shown in Fig. 15.

10 To facilitate the separation of the copy sheets, a pipe 335 is provided which has one end connected to the exhaust port of the pump 38 and has its other end disposed at 336 to blow air between the edges of the uppermost copy sheets. 15 The pipe 335 may be of cross-sectional area and may receive only part of the air exhausted if it is so desired. In other words, the strength of the current of air discharged at 336 by the pipe 335 may be determined.

20 The master sheet is preferably formed from a thin flexible aluminum sheet having a surface which has been sandblasted or otherwise treated so that when liquid is applied thereto, it will spread quickly over the surface and adhere thereto. In some instances, parchment paper may be used as the master sheet as parchment paper possesses the characteristic that water will spread quickly over its surface. However, the thin flexible metallic sheet is preferred as the master sheet. It is understood, of course, that the data is printed in reverse upon that surface of the master sheet which has been sandblasted or otherwise treated for the purpose described above. The surface resulting upon the master sheet from sandblasting or other mechanical means or by being treated with an etching fluid is sometimes called a "grained" surface. Of course, when the master sheet is to be re-inked during the duplicating operations, it is preferable to employ an oil body ink, the original data being made with an oil body having pigment therein or with an oily substance having little or no pigment therein.

While certain embodiments of the invention have been shown and described, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims in which it is the intention to claim all novelty inherent in the invention as broadly as possible in view of the prior art.

We claim:

1. Duplicating apparatus comprising a duplicating drum adapted to have a master sheet secured thereto, a platen roller for pressing copy sheets against said master sheet, means for applying an ink repellent liquid to said master sheet, means for re-inking said master sheet, means for feeding copy sheets to the bight between said duplicating drum and said platen roller, and means for holding said copy sheet feeding means and said platen roller functionally inoperative while said duplicating drum, said repellent applying means and said re-inking means are in operation.

2. Duplicating apparatus comprising power driven means, a rotatable duplicating drum adapted to have a master sheet secured thereto, clutch means between said power driven means and said duplicating drum, means for re-inking said master sheet, means for applying an ink repellent to said master sheet, means for feeding copy sheets to said duplicating drum, and a control member movable into one position to cause engagement of said clutch to drive said duplicat-

ing drum, movable into another position to cause said repellent applying means to become functionally operative while said drum is rotating, movable into another position to cause said ink applying means to become functionally operative while said drum is rotating, and movable into another position to cause said copy sheet feeding means to become functionally operative.

3. Duplicating apparatus comprising power driven means, a rotatable duplicating drum adapted to have a master sheet secured thereto, clutch means between said power driven means and said duplicating drum, means for applying an ink repellent to said master sheet, means for re-inking said master sheet, means for feeding copy sheets to said duplicating drum, and control mechanism including a manually movable control member, said control member movable into one position to adjust said control mechanism to cause engagement of said clutch to drive said duplicating drum, movable into another position to adjust said control mechanism to cause said repellent applying means to become functionally operative while said drum is rotating, movable into another position to adjust said control mechanism to cause said ink applying means to become functionally operative while said drum is rotating, and movable into another position to adjust said control mechanism to cause said copy sheet feeding means to become functionally operative.

4. Duplicating apparatus comprising power driven means, a rotatable duplicating drum adapted to have a master sheet secured thereto, clutch means between said power driven means and said duplicating drum, means for applying an ink repellent to said master sheet, means for re-inking said master sheet, means for feeding copy sheets to said duplicating drum, and control mechanism including a manually movable control member, said control member movable into one position to adjust said control mechanism to cause engagement of said clutch to drive said duplicating drum, movable into another position to adjust said control mechanism to cause said repellent applying means to become functionally operative while said drum is rotating, movable into another position to adjust said control mechanism to cause said ink applying means to become functionally operative while said drum is rotating and while said repellent applying means is functionally operative, and movable into another position to adjust said control mechanism to cause said copy sheet feeding means to become functionally operative while said duplicating drum is rotating and while said repellent applying means and said re-inking means are functionally operative.

5. Duplicating apparatus comprising power driven means, a rotatable duplicating drum adapted to have a master sheet secured thereto, clutch means between said power driven means and said duplicating drum, means for applying an ink repellent to said master sheet, means for re-inking said master sheet, means for feeding copy sheets to said duplicating drum, control mechanism including a manually movable control member, said control member movable into one position to adjust said control mechanism to cause engagement of said clutch to drive said duplicating drum, movable into another position to adjust said control mechanism to cause said repellent applying means to become functionally operative while said drum is rotating, movable into another position to adjust said control

mechanism to cause said ink applying means to become functionally operative while said drum is rotating and while said repellent applying means is functionally operative, and movable into another position to adjust said control mechanism to cause said copy sheet feeding means to become functionally operative while said duplicating drum is rotating and while said repellent applying means and said re-inking means are functionally operative, a platen roller for pressing said copy sheets against said master sheet, and means controlled by said control mechanism for bringing said platen roller into and out of its functionally operative position.

6. Duplicating apparatus comprising power driven means, a rotatable duplicating drum adapted to have a master sheet secured thereto, clutch means between said power driven means and said duplicating drum, means for applying an ink repellent to said master sheet, means for re-inking said master sheet, means for feeding copy sheets to said duplicating drum, control mechanism including a manually movable control member, said control member movable into one position to adjust said control mechanism to cause engagement of said clutch to drive said duplicating drum, movable into another position to adjust said control mechanism to cause said repellent applying means to become functionally operative while said drum is rotating, movable into another position to adjust said control mechanism to cause said ink applying means to become functionally operative while said drum is rotating and while said repellent applying means is functionally operative, and movable into another position to adjust said control mechanism to cause said copy sheet feeding means to become functionally operative while said duplicating drum is rotating and while said repellent applying means and said re-inking means are functionally operative, a platen roller for pressing said copy sheets against said master sheet, and means for holding said platen roller in a functionally inoperative position when said copy sheet feeding means fails to deliver a copy sheet to said duplicating drum at the proper time.

7. Duplicating apparatus comprising power driven means, a rotatable duplicating drum adapted to have a master sheet secured thereto, clutch means between said power driven means and said duplicating drum, means for applying an ink repellent to said master sheet, means for re-inking said master sheet, means for feeding copy sheets to said duplicating drum, and control mechanism including a manually movable control member, said control member having cam means for controlling said clutch, having cam means for controlling said ink repellent applying means, having cam means for controlling said re-inking means, and having cam means for controlling said copy sheet feeding means.

8. Duplicating apparatus comprising power driven means, a rotatable duplicating drum adapted to have a master sheet secured thereto, clutch means between said power driven means and said duplicating drum, means for applying an ink repellent to said master sheet, means for re-inking said master sheet, means for feeding copy sheets to said duplicating drum, and control mechanism including a manually movable control member, said control member having cam means for controlling said clutch, having a second cam means for controlling said ink re-

pellent applying means, having a third cam means for controlling said re-inking means, and having a fourth cam means for controlling said copy sheet feeding means, said control member being movable into one position to have the first mentioned cam means cause engagement of the clutch means to drive said duplicating drum, being movable into a second position to have said second cam means cause said ink repellent applying means to become functionally operative, being movable into a third position to have said third cam means cause said re-inking means to become functionally operative and movable into a fourth position to have said fourth cam means cause said copy sheet feeding means to become functionally operative.

9. Duplicating apparatus comprising power driven means; a rotatable duplicating drum adapted to have a master sheet secured thereto; clutch means between said power driven means and said duplicating drum; means for applying an ink repellent to said master sheet; means for re-inking said master sheet; means for feeding copy sheets to said duplicating drum; a platen roller for pressing the copy sheets against the master sheet; and control mechanism including a manually movable control member, said drum member having cam means for controlling said clutch, having a second cam means for controlling said ink repellent applying means, having a third cam means for controlling said re-inking means, having a fourth cam means for controlling said copy sheet feeding means and having a fifth cam means for controlling said platen roller, said control member being movable into one position to have the first-mentioned cam means cause engagement of the clutch means to drive said duplicating drum, being movable into a second position to have said second cam means cause said ink repellent applying means to become functionally operative, being movable into a third position to have said third cam means cause said re-inking means to become functionally operative and movable into a fourth position to have said fourth cam means and said fifth cam means cause said copy sheet feeding means to become functionally operative and cause said platen roller to move into its functionally operative position.

10. Duplicating apparatus comprising power driven means; a rotatable duplicating drum adapted to have a master sheet secured thereto; clutch means between said power driven means and said duplicating drum; means for applying an ink repellent to said master sheet; means for re-inking said master sheet; means for feeding copy sheets to said duplicating drum; a platen roller for pressing the copy sheets against the master sheet; control mechanism including a manually movable control member, said drum member having cam means for controlling said clutch, having a second cam means for controlling said ink repellent applying means, having a third cam means for controlling said re-inking means, having a fourth cam means for controlling said copy sheet feeding means and having a fifth cam means for controlling said platen roller, said control member being movable into one position to have the first-mentioned cam means cause engagement of the clutch means to drive said duplicating drum, being movable into a second position to have said second cam means cause said ink repellent applying means to become functionally operative, being movable into a third position to have said third cam means

cause said re-inking means to become functionally operative and movable into a fourth position to have said fourth cam means and said fifth cam means cause said copy sheet feeding means to become functionally operative and cause said platen roller to move into its functionally operative position; and means for holding said platen roller in a functionally inoperative position when said copy sheet feeding means fails to deliver a copy sheet to said duplicating drum at the proper time.

11. In a duplicating apparatus, the combination of a frame, a drum rotatably mounted thereon, means for driving said drum, means for securing a master sheet on said drum, a platen roller rotatably mounted in position for pressing a copy sheet against said master sheet as the drum rotates, means for applying an ink repellent liquid to said master sheet as the drum rotates, means for applying ink upon said master sheet as the drum rotates, means for feeding copy sheets to the bite of said drum and said platen roller comprising a lever swinging in timed relation to the operative movement of the parts, and latch means adapted by engagement with said lever to hold the sheet feeding means out of operation.

12. In a duplicating apparatus, the combination of a frame, a drum rotatably mounted thereon, means for driving said drum, means for securing a master sheet on said drum, a platen roller rotatably mounted in position for pressing a copy sheet against said master sheet as the drum rotates, means for applying an ink repellent liquid to said master sheet as the drum rotates, means for applying ink upon said master sheet as the drum rotates, means for feeding copy sheets to the bite of said drum and said platen roller comprising a lever swinging in timed relation to the operative movement of the parts, cam means connected with said drum for rotation therewith adapted by operative engagement with said lever to give it a swinging movement for operating said sheet feeding means, latch means adapted by engagement with said lever to hold the sheet feeding means out of operation, and manually movable cam means for holding said latch means out of operative engagement with said lever.

13. In a duplicating apparatus, the combination of a frame, a drum rotatably mounted thereon, means for driving said drum, means for securing a master sheet on said drum, a platen roller rotatably mounted in position for pressing a copy sheet against said master sheet as the drum rotates, means for applying an ink repellent liquid to said master sheet as the drum rotates, means for applying ink upon said master sheet as the drum rotates, means for feeding copy sheets to the bite of said drum and said platen roller comprising a lever swinging in timed relation to the operative movement of the parts, cam means connected with said drum for rotation therewith adapted by operative engagement with said lever to give it a swinging movement for operating said sheet feeding means, latch means adapted by engagement with said lever to hold the sheet feeding means out of operation, and manually movable control means adapted by successive step by step movements to move said platen roller out of engagement with the drum and release said latch means so as to stop the feed of the copy sheets, and then to throw out of

operation successively said ink applying means, said ink repellent applying means and said drum driving means.

14. In a duplicating apparatus, the combination of a frame, a drum rotatably mounted on said frame, means for driving said drum, means for securing a master sheet on said drum, a platen roller rotatably mounted in position and movable toward and from the drum for pressing copy sheets against said master sheet as the drum rotates, means for applying an ink repellent liquid to said master sheet as the drum rotates, means for applying ink upon said master sheet as the drum rotates, means for feeding copy sheets to the bite of said drum and said platen roller, means adapted at a predetermined point in the rotation of the drum to move said platen roller temporarily out of operative position, and means rendered operative for preventing the return of said platen roller from its said inoperative position when said sheet feeding means upon an operation fails to forward a copy sheet to the drum.

15. In a duplicating apparatus, the combination of a frame, a drum rotatably mounted on said frame, means for driving said drum, means for securing a master sheet on said drum, a platen roller rotatably mounted in position and movable toward and from the drum for pressing copy sheets against said master sheet as the drum rotates, means for applying an ink repellent liquid to said master sheet as the drum rotates, means for applying ink upon said master sheet as the drum rotates, means for feeding copy sheets to the bite of said drum and said platen roller, means adapted at a predetermined point in the rotation of the drum to move said platen roller temporarily out of operative position, latch means adapted by operative engagement with said platen roller to prevent its return from said inoperative position, and means rendered operative for moving said latch means into operative engagement with said platen roller for preventing its return from said inoperative position when said sheet feeding means upon an operation fails to forward a copy sheet to the drum.

16. In a duplicating apparatus, the combination of a frame, a drum rotatably mounted on said frame, means for driving said drum, means for securing a master sheet on said drum, a platen roller rotatably mounted in position and movable toward and from the drum for pressing copy sheets against said master sheet as the drum rotates, means for applying an ink repellent liquid to said master sheet as the drum rotates, means for applying ink upon said master sheet as the drum rotates, means for feeding copy sheets to the bite of said drum and said platen roller, means adapted at a predetermined point in the rotation of the drum to move said platen roller temporarily out of operative position, latch means adapted by operative engagement with said platen roller to prevent its return from said inoperative position, and vacuum means effective normally for holding said latch means out of operation so as to permit said platen roller to return to operative position but rendered inoperative when said sheet feeding means upon an operation fails to forward a copy sheet to the drum.

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