Nov. 8, 1966 G. P. NIESEN ETAL 3,283,705

DUPLICATING MACHINE WITH DUAL RECEIVING TRAYS

Original Filed Aug. 13, 1962 4 Sheets-Sheet 1

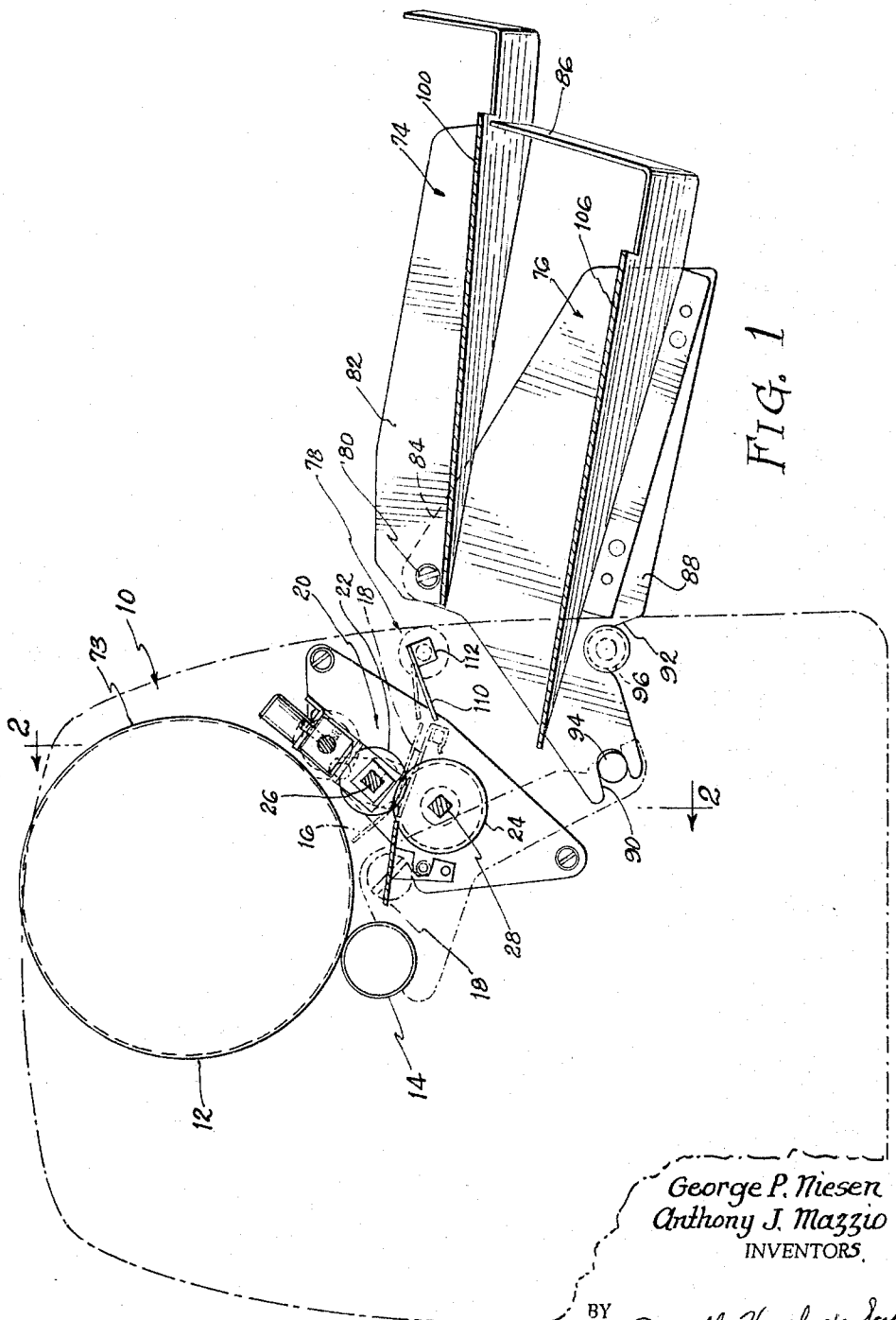


FIG. 1

George P. Niesen
Anthony J. Mazzio
INVENTORS.

BY McDougall, Hersh & Scott
Att'ys

Nov. 8, 1966 G. P. NIESEN ETAL 3,283,705

DUPLICATING MACHINE WITH DUAL RECEIVING TRAYS

Original Filed Aug. 13, 1962 4 Sheets-Sheet 2

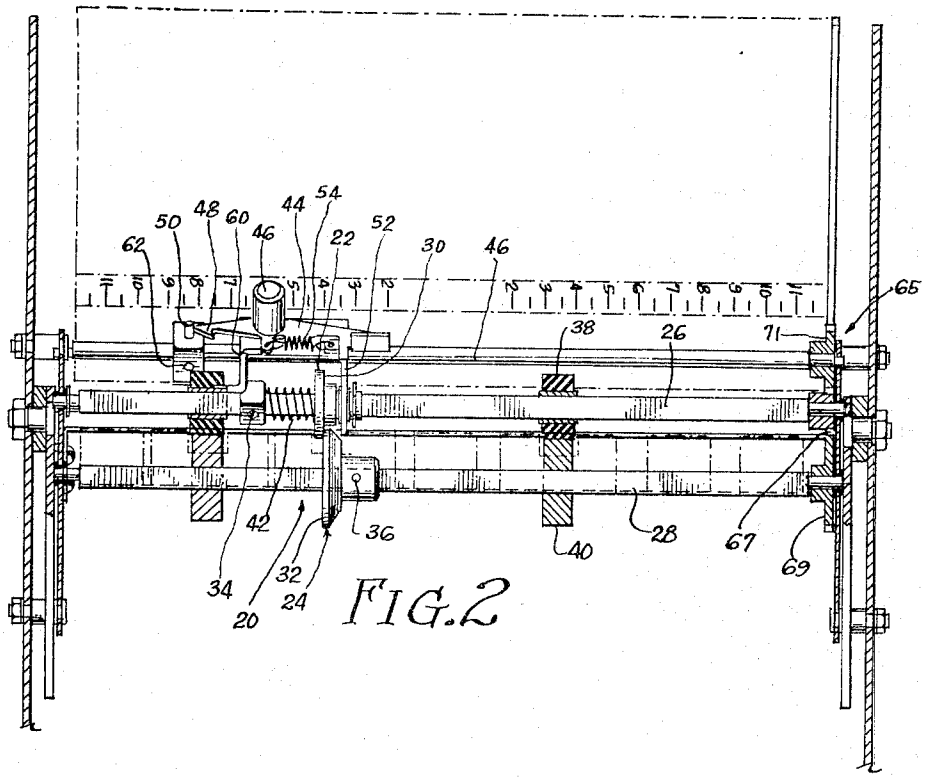


FIG. 2

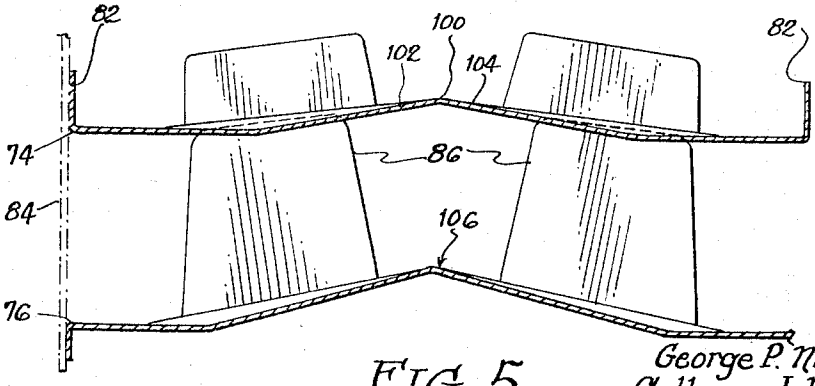


FIG. 5

George P. Niesen
Anthony J. Mazzio
INVENTORS

BY McDougall, Hersh & Scott
Attys

Nov. 8, 1966 G. P. NIESEN ETAL 3,283,705

DUPLICATING MACHINE WITH DUAL RECEIVING TRAYS

Original Filed Aug. 13, 1962 4 Sheets-Sheet 3

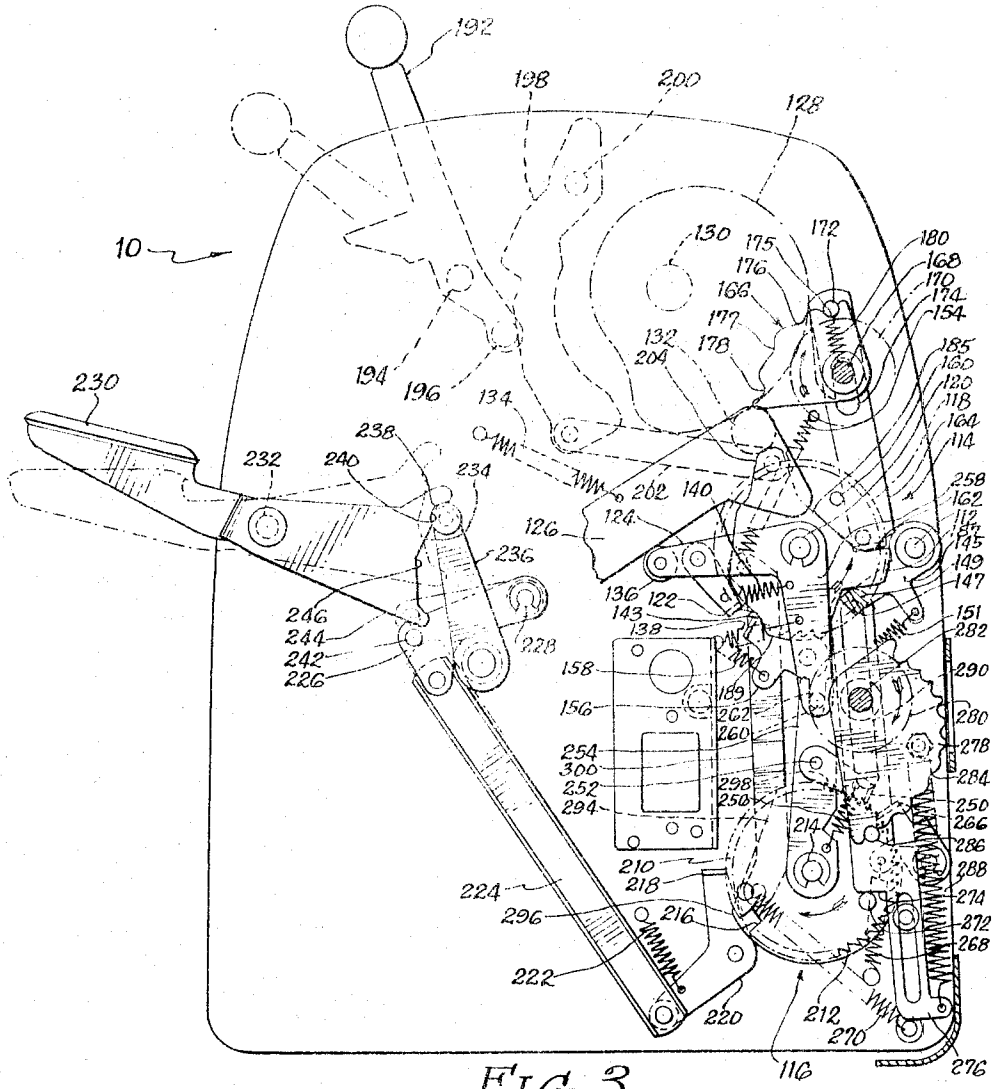


FIG. 3

George P. Niesen
Anthony J. Mazzio
INVENTORS

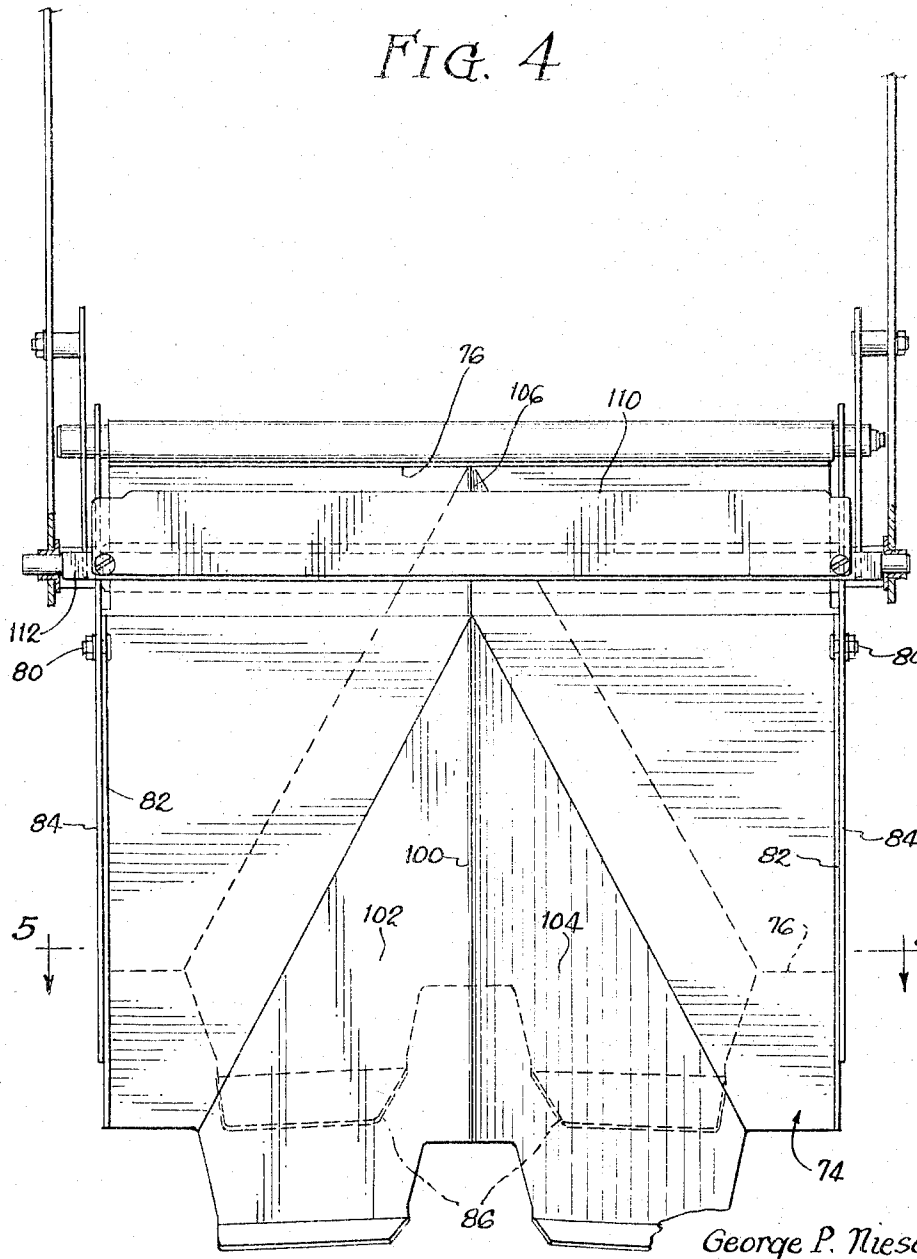
BY McDougall, Hersh & Scott
Attys

Nov. 8, 1966 G. P. NIESEN ETAL 3,283,705

DUPLICATING MACHINE WITH DUAL RECEIVING TRAYS

Original Filed Aug. 13, 1962 4 Sheets-Sheet 4

FIG. 4



George P. Niesen
Anthony J. Mazzio
INVENTORS

BY McDougall, Hersh & Scott
Attys

United States Patent Office 3,283,705 Patented Nov. 8, 1966

3,283,705
DUPLICATING MACHINE WITH DUAL RECEIVING TRAYS

George P. Niesen, Niles, and Anthony J. Mazzio, Chicago, Ill., assignors to A. B. Dick Company, Niles, Ill., a corporation of Illinois

Original application Aug. 13, 1962, Ser. No. 216,612, now Patent No. 3,234,832, dated Feb. 15, 1966. Divided and this application Sept. 2, 1965, Ser. No. 484,685
9 Claims. (Cl. 101—132)

This application is a division of our copending application, Serial No. 216,612, filed August 13, 1962, now Patent No. 3,234,832.

This invention relates to printing machines and pertains particularly to duplicating machines for office use. The invention is applicable to duplicators of all types, such as spirit or solvent transfer, stencil, and lithographic duplicators, for example.

One object of the present invention is to provide a new and improved duplicator having a plurality of receiving trays, together with means for selectively directing the printed copies into any of the trays.

A more specific object is to provide a new and improved duplicator having upper and lower receiving trays together with a movable deflecting member for directing the printed copies produced by the duplicator into either of the trays.

A further object is to provide a new and improved duplicator of the foregoing character having means for automatically directing the first copy of the first few copies into the upper tray, and then directing the remaining copies of the run into the lower tray.

Another object is to provide a new and improved duplicator having first counter means for directing a predetermined number of copies into one of the receiving trays, and then directing the subsequent copies into the other receiving tray, together with second counter means for stopping the operation of the duplicator after a desired number of copies have been directed into the second receiving tray.

It is a further object to provide a new and improved duplicator having means for delivering the initial copies to one position from which they may be readily removed, while the machine continues to produce copies which are delivered to a second position.

Further objects and advantages of the present invention will appear from the following description, taken with the accompanying drawings, in which:

FIG. 1 is a somewhat diagrammatic elevational sectional view of a duplicating machine to be described as an illustrative embodiment of the present invention.

FIG. 2 is an elevational sectional view taken generally along a line 2—2 in FIG. 1.

FIG. 3 is a somewhat diagrammatic side elevational view of the control mechanism for the duplicator.

FIG. 4 is a fragmentary plan view showing the dual receiving trays employed in the duplicator.

FIG. 5 is a somewhat diagrammatic elevational sectional view taken generally along a line 5—5 in FIG. 4.

The drawings illustrate the present invention in connection with a duplicator 10 which may be of any conventional or desired type. Thus, the duplicator 10 comprises a printing cylinder 12 which may be adapted to hold the printing master, stencil or plate, according to the type of duplicator. An impression roller 14 is provided to press the copy sheets against the printing cylinder or drum 12. It will be understood that the printing cylinder 12 may be driven manually, by an electric motor, or in any other desired manner. An appropriate mechanism may be provided to feed the copy sheets between the printing cylinder 12 and the impression roller 14.

After being compressed between the printing cylinder 12 and the impression roller 14, the copy sheets pass between upper and lower guide plates 16 and 18. In this case, the machine 10 is provided with a slitter mechanism 20 which slits or cuts each sheet in the direction in which it is traveling, as the sheet travels between the guide plates 16 and 18. In this case, the slitter mechanism 20 comprises upper and lower slitting or shearing wheels 22 and 24, which are secured to parallel shafts 26 and 28. It will be seen that the wheels 22 and 24 have side portions 30 and 32 which are in shearing engagement. The slitting wheels 22 and 24 may be adjusted to various positions along the length of the shafts 26 and 28. Thus, the illustrated wheels 22 and 24 are secured to the shafts 26 and 28 by means of set screws 34 and 36 which may be loosened to provide for adjustment of the wheels along the shafts.

To propel the copy sheet between the slitter wheels 22 and 24, it is preferred to provide forwarding rollers 38 and 40 on the shafts 26 and 28. As shown to advantage in FIG. 2, two sets of the forwarding rollers 38 and 40 may be employed. The rollers 38 and 40 may be adjustable in position along the shafts 26 and 28. Preferably, the shafts 26 and 28 are square or of some other noncircular shape for driving the slitter wheels 22 and 24 and the rollers 38 and 40.

The slitter wheel 22 is normally biased against the slitter wheel 24 by means of a spring 42 which may be mounted around the shaft 26. By means of a member 44, slidably mounted on a guide rod 46, the slitter wheel 22 may be retracted from the slitter wheel 24, against the biasing action of the spring 42. In this way, the slitter mechanism 20 is disabled so that the copy sheets will not be cut. The disabling member 44 may be provided with a convenient handle 46. To retain the slitter wheel 22 in its retracted position, the member 44 may be formed with a hook 48 which may be engaged with a pin 50. The member 44 has an arm or portion 52 which slidably engages the slitter wheel 22. A spring 54 is connected to the member 44 so as to bias the member in such a direction as to permit the slitter wheel 22 to engage the slitter wheel 24. Instead of the slitter wheels 22 and 24, the machine may be provided with perforating wheels or scoring wheels, if desired. As a further alternative, the slitter wheels may be omitted from the machine.

The retracting or disabling member 44 may be slidably mounted on a bracket 60 which may be secured to the rod 46 by means of a set screw 62. It will be understood that the set screw 62 may be loosened to adjust the position of the bracket 60 along the rod 64. The pin 50 may be mounted on a portion of the bracket 60. The spring 54 may be connected between the member 44 and the bracket 60.

The shafts 26 and 28 may be driven by means of a gear train 65 comprising gears 67 and 69, mounted on the shafts 26 and 28, and a gear 71, rotatably mounted on the rod 46. The gear 67 meshes with the gear 69, while the gear 71 meshes with the gear 67. The gear 71 may be adapted to mesh with a gear 73 secured to the printing cylinder 12.

The illustrated duplicator 10 is provided with a plurality of receiving trays for receiving the printed copy sheets from the slitting mechanism 20, or directly from the printing cylinder 12 if the slitting mechanism is not operating. While more than two receiving trays may be employed, the illustrated machine 10 utilizes upper and lower receiving trays 74 and 76, together with a mechanism 78 for selectively delivering the copy sheets to either of the trays. It is preferred to direct the first sheet or the first few sheets of a printing run to the upper receiving tray 74, where the sheets are readily accessible and may be quickly removed, while the remainder of the

sheets in the run are directed into the lower receiving tray 76. Thus, in many business operations, the first few sheets may be removed from the upper receiving tray 74 for immediate distribution, while the remaining copies may be accumulated in the lower receiving tray 76 for use as file copies or for later distribution.

To facilitate removal of the sheets from the lower receiving tray 76, the upper receiving tray 74 may be mounted for upward swinging movement. In this way, easy access is afforded to the lower receiving tray. Thus, the inner end portion of the upper receiving tray 74 is supported by a pair of pivots 80 which may extend through side flanges 82 on the upper receiving tray 74. In this case, the pivots 80 are mounted on upstanding side flanges 84 formed on the lower receiving tray 76. The outer portion of the upper receiving tray 76 is adapted to rest upon a pair of end flanges 86 which extend upwardly from the outer end of the lower receiving tray 76.

The receiving trays 74 and 76 are suitably mounted on the machine 10 so as to be easily removable therefrom. Thus, the lower receiving tray 76 has lower side flanges 88, each of which is formed with notches 90 and 92 adapted to be disengageably received over rods or pins 94 and 96 on the machine 10.

The receiving trays 74 and 76 are preferably provided with means for separating or deflecting the two portions of the sheets after they have been cut by the slitting mechanism 20. As shown to advantage in FIGS. 4 and 5, the upper receiving tray 74 is formed with a central generally triangular ridge or hump 100 having generally triangular deflector sides 102 and 104 sloping in opposite lateral directions. It will be seen from FIG. 4 that the ridge 100 tapers toward the inner end of the upper receiving tray 74. The lower receiving tray 76 has a similar ridge 106. When slit sheets are being delivered to the receiving tray 74, the separate portions of each sheet are normally deposited on the oppositely sloping sides 102 and 104 of the ridge 100. Thus, the slit portions of the sheets tend to be deflected toward opposite lateral sides of the receiving tray so as to be accumulated in separate piles. The ridge 106 of the lower receiving tray 76 produces a similar action.

The mechanism 78 for directing the sheets into either of the receiving trays 74 and 76 may comprise a deflector plate of baffle 110 movable between two positions, as shown in full and broken lines in FIG. 1. The deflector plate 110 may be secured to an operating shaft 112. When the deflector plate 110 is in its full-line position, the sheets pass from the guide plates 16 and 18 over the deflector plate 110 and into the upper receiving tray 74. When the deflector plate 110 is swung to its broken-line position, the sheets travel under the deflector plate and downwardly into the lower receiving tray 76. It will be evident that the deflector plate 110 could be operated manually, but it is preferred to employ a counter mechanism which keeps the deflector plate in its full-line position until a predetermined number of sheets have been directed into the upper receiving tray 74, and then shifts the deflector plate 110 into its broken-line position so that the remainder of the sheets in the run will be directed into the lower receiving tray 76. The mechanism may include an additional counter for stopping the operation of the machine after a preselected number of sheets have been delivered into the lower receiving tray.

Thus, the mechanism associated with the upper and lower receiving trays 74 and 76 preferably comprises an upper counter 114 and a lower counter 116. As illustrated, the upper counter employs a counter or ratchet wheel 118 which is rotatable about a shaft or pin 120. The ratchet wheel 118 is adapted to be advanced by a pawl 122 which is pivotally mounted on a rocker arm 124. Whenever the machine is running, the rocker arm 124 is oscillated back and forth about the shaft 120 by means of a power lever 126 operable by a cam 128 on the shaft 130 for the printing cylinder 12. The lever 126 carries a roller 132 which rides upon the cam 128. A suitable spring 134 is provided to bias the lever 126 in such a direction that the roller 132 will be maintained in engagement with the cam 128. In this case, the rocker arm 124 carries a roller 136 which engages one edge of the power lever 126. A spring 138 biases the rocker arm 124 in such a direction as to maintain the roller 136 against the power lever 126.

The pawl 122 may be biased toward the ratchet wheel 118 by means of a spring 140 connected between the pawl and the rocker arm 124. The pawl 122 is adapted to advance the ratchet wheel through one step for each oscillatory cycle of the rocker arm 124.

The ratchet wheel 118 has ratchet teeth 143 which extend for only a portion of the circumference of the ratchet wheel 118. The pawl 122 is adapted to advance the ratchet wheel 118 until the pawl runs out of teeth. In FIG. 3, the ratchet wheel 118 is shown in the position in which the pawl has run out of teeth. This is the zero position of the ratchet wheel, at which the deflector plate 110 is shifted so as to direct the sheets into the lower receiving tray 76.

It will be seen that the shaft 112 for the deflector plate 110 is fitted with a control arm 145 having a flange or tab 147 which is adapted to engage the counter wheel 118. At one point in its circumference, the counter wheel 118 is formed with a notch 149 adapted to receive the flange 147. A spring 151 is connected to the arm 145, so as to bias the flange 147 against the counter wheel 118. Thus, the spring 151 causes the arm 145 to swing clockwise when the flange 147 enters the notch 149. The consequent rotation of the shaft 112 causes the deflector plate 110 to swing between its full- and broken-line positions, as shown in FIG. 1. The flange 147 enters the notch 149 when the counter wheel 118 is moved to its zero position by the pawl 122.

The advancing movement of the ratchet wheel 118 by the pawl 122 is resisted by a return spring 154 which tends to rotate the ratchet wheel 118 in a clockwise direction, as seen in FIG. 3. Normally, however, such retrograde movement of the ratchet wheel 118 is prevented by a non-retrograde pawl 156, which is biased against the ratchet teeth 143 by a spring 158.

The initial position on the ratchet wheel 118 is determined by a stop pin 160, which is mounted on the ratchet wheel 118 and is engageable with a stop flange 162 on an adjustable stop member 164. The position of the stop member 164 may be changed by manually rotating a selector cam 166, which is rotatable about a shaft or pin 168. A manually rotatable knob 170 is connected to the cam 166. A pin or roller 172 is mounted on the adjustable stop member 164 for engagement with the cam 166. The stop member 164 is formed with a longitudinal slot 174, which is slidably received around the shaft 168.

To provide a detenting action, the cam 166 is formed with a plurality of notches 175, 176, 177, and 178 adapted to receive the pin 172. A biasing spring 180 may be connected to the pin 172 so as to bias the pin against the cam 166.

The ratchet wheel 118 is adapted to be reset to its initial position by means of a manually operable resetting cam 185 which is swingable about the shaft 120. It will be seen that the cam 185 is formed with lobes 187 and 189 adapted to push the flange 147, the nonretrograde pawl 156 and the advancing pawl 122 away from the ratchet or counting wheel 118, so that the wheel will be free to rotate in a clockwise direction under the biasing action of the spring 154. The return movement of the wheel 118 is limited by the engagement of the pin 160 with the flange 162 on the adjustable stop member 164. Thus, the initial position of the ratchet wheel 118 is variable, depending upon the position of the adjustable stop member 164. The adjustment of the initial position of the ratchet wheel 118 changes the number of steps through which the ratchet wheel will be advanced before the flange 147 enters the notch 149. Accordingly, the num-

ber of copies deflected into the upper machining tray 74 may be varied.

The lobe 187 of the resetting cam 185 is adapted to push the flange 147 out of the notch 149 and away from the counting or ratchet wheel 118. The lobe 189 is adapted to push the nonretrograde pawl 156 and then the main pawl 122 away from the ratchet teeth 143.

Provision may be made for operating the resetting cam 185 by means of a manually swingable lever 192, which may also be the lever which operates the master or plate clamp on the printing cylinder 12. Such clamp, not shown, is adapted to secure a master sheet or printing plate to the printing cylinder 12. Before each new run, a new master is normally mounted on the printing cylinder 12. This necessitates the operation of the lever 192 in a counterclockwise direction to open the master clamp, so that the old master may be removed from the printing cylinder 12, and may be replaced by a new master. In this case, the lever 192 is swingable about a pivot 194 and is provided with a pin 196 adapted to engage a lever 198. It will be seen that counterclockwise movement of the lever 192 causes the lever 198 to be swung in a counterclockwise direction about a pivot 200. As shown in FIG. 3, a link 202 is connected between the lever 198 and an arm 204 on the resetting cam 185, so that the counterclockwise movement of the lever 198 will cause clockwise rotation of the cam 185.

As already indicated, the lower counter 116 is adapted to stop the cooperation of the duplicating machine 10 after a predetermined number of copy sheets have been printed. Thus, the counter 116 comprises a counting or ratchet wheel 210 having ratchet teeth 212 extending around a portion of its periphery. The counting wheel 210 is rotatable about a shaft or pin 214.

It will be seen that the wheel 210 is also formed with a peripheral notch 216 adapted to receive a flange or pawl 218 on a control lever 220. A spring 222 is connected to the control lever 220 to bias the flange 218 against the wheel 210. When the notch 216 reaches the flange 218, the spring 222 causes the control lever 220 to swing in a clockwise direction. This movement of the control lever 220 is utilized to stop the feeding of copy sheets to the printing cylinder 12. In this case, a link 224 is connected between the control lever 220 and a lever 226. The link 224 causes the lever 226 to swing upwardly about a pivot 228 when the lever 220 swings clockwise.

As illustrated, the duplicating machine 10 has a main feed-control lever 230, which the operator may swing in a clockwise direction to start the feeding of copy sheets to the printing cylinder 12. The lever 230 is swingable about a pivot 232. In FIG. 3, the lever 230 is shown in full lines in the position in which the feed mechanism is activated so as to feed sheets to the printing cylinder 12. The inactive or "off" position of the feed lever 230 is shown in broken lines.

The lever 230 has a cam portion 234 adapted to operate a control arm 236 of the feed mechanism. The cam 234 is engaged by a roller 238 on the arm 236. It will be seen that the cam 234 is formed with a detent notch 240 adapted to receive the roller 238 when the lever 230 is in its actuated position.

In this case, the lever 226 carries a pin or roller 242 which is adapted to engage the lower edge portion 244 of the lever 230. Thus, when the lever 226 is swung in a clockwise direction, the pin 242 is effective to swing the main feed-control lever 230 in a counterclockwise direction to its "off" position, in which the roller 238 engages the low point 246 on the cam 234.

The counter or ratchet wheel 210 is adapted to be advanced in a clockwise direction from its initial position by a pawl 250, which is swingable about a pivot 252 carried by a rocker arm 254. It will be seen that the arm 254 is swingable about the shaft 214. A spring 256 is connected between the pawl 250 and the rocker arm 254 so as to bias the pawl against the counting wheel 210.

In order to operate the rocker arm 254, the rocker arm is connected to a depending arm 258 on the rocker 124. In this case, a pin-and-slot connection is employed between the arm 258 and the rocker arm 254. Thus, a pin 260 is mounted on the arm 258 and is received in a slot 262 formed in the upper end of the rocker arm 254.

A nonretrograde pawl 266 normally engages the ratchet teeth 212 to prevent retrograde movement of the counting wheel 210 in a counterclockwise direction. The pawl 266 is biased against the ratchet wheel 210 by a spring 268.

It will be seen that a return spring 270 is connected to the counter or ratchet wheel 210 to bias the ratchet wheel in a counterclockwise direction. The spring 270 affords resilient resistance to the clockwise advancing movement of the wheel 210.

The initial position of the counter wheel 210 is established by a stop pin 272, which is engageable with a shoulder 274 on an adjustable stop member 276. The position of the stop member 276 may be varied by manually rotating a cam 278 which is connected to a knob or hand wheel 280. The cam 278 is rotatable about a shaft or pin 282.

The cam 278 is formed with a plurality of detent notches 284, which are engageable by a follower pin 286 on the adjustable member 276. A spring 288 is preferably connected to the adjustable stop member 276 to bias the pin 286 against the cam 278. It will be seen that the adjustable stop member 276 is formed with a slot 290 which is slidably received around the shaft 282.

It will be evident that rotating the cam 278 controls the position of the movable stop member 276, and thus changes the initial position of the counter wheel 210.

As in the case of the first counter, the second counter 116 is adapted to be reset by means of a resetting cam 294, which is rotatable about the shaft 214. It will be seen that the cam 294 is formed with a lobe 296 for pushing the flange 218 out of the notch 216 and away from the counter wheel 210, and another lobe 298 for pushing the advancing pawl 250 and the nonretrograde pawl 266 away from the counter wheel 210. Thus, clockwise movement of the cam 294 releases the counter wheel 210 for counterclockwise return movement under the biasing impetus of the spring 270. The cam 294 is adapted to be operated by a link 300 connected between the cam 294 and the corresponding cam 185 of the upper counter 114. Thus, the link 300 causes the cam 294 to swing clockwise in unison with the cam 185.

It is believed that the operation of the duplicating machine will be clear from the foregoing description, but a brief review of the operation at this point may be helpful. To initiate the feeding of copy sheets, the operator raises the main feed lever 230. Sheets are then fed between the printing cylinder 12 and the impression roller 14 by the feed mechanism, not shown. Each printed copy sheet is cut into two portions by the slitter wheels 22 and 24.

The first few copy sheets to be printed are deflected into the upper receiving tray 74 by the movable deflecting plate 110. The triangular deflecting ridge or hump 100 deflects the two portions of each copy sheet in opposite lateral directions, so that the slit portions are deposited in two separate stacks.

The upper counter 114 is effective to shift the deflecting plate 110 in a clockwise direction after a predetermined number of sheets have been directed into the upper receiving tray 74. The remaining sheets of the run will then travel into the lower receiving tray 76. For each cycle of the machine, the ratchet or counter wheel 118 of the upper counter 114 is advanced in a counterclockwise direction through one step until the flange 147 enters the notch 149 in the counter wheel. At this point, the advancing pawl 122 runs out of ratchet teeth so that the

wheel 118 is not advanced any farther. The movement of the flange 147 causes the clockwise swinging movement of the deflecting plate 110.

The lower counter 116 is effective to shut off the feed mechanism after a predetermined number of copy sheets have been printed. Thus, the counter or ratchet wheel 210 for the lower counter 116 is advanced one step in a clockwise direction for each cycle of the machine. The movement of the lower counter wheel 210 continues until the flange 218 enters the notch 216 in the counter wheel. The resulting movement of the control lever 220 causes the main feed lever 230 to be swung to its "off" position by the pin 242 on the lever 226.

To make another run, the hand lever 192 is swung in a counterclockwise direction. Such movement of the lever 192 causes the lever 198 to be swung in a counterclockwise direction. By virtue of the connecting link 202, the cam plate 185 is swung in a clockwise direction. Simultaneously, the lower resetting cam 294 is swung in a clockwise direction by virtue of the interconnecting link 300. The lobes 187 and 189 on the upper cam 185 push the flange 147 and the pawls 156 and 122 away from the counter or ratchet wheel 118, so that the ratchet wheel is released for clockwise return movement under the impetus of the spring 154. The counter wheel 118 is thus returned to its initial position in which the pin 160 engages the flange 162 on the adjustable stop member 164. The position of the stop member 164 is controlled by the manually adjustable cam 166. By rotating the cam 166, it is possible to change the number of copies that will be directed into the upper receiving tray 74 during the next printing run.

In the case of the lower counter, the lobes 296 and 298 of the resetting cam 294 push the flange 218 and the pawls 266 and 250 away from the counter wheel 210 so that the counter wheel is released for counterclockwise return movement under the impetus of the spring 270. The wheel 210 thus returns to its initial position in which the pin 272 engages the stop shoulder 274 on the movable stop member 276. The position of the stop member 276 may be varied by turning the cam 278. In this way, the total number of copies to be printed in the next run may be varied.

The copies directed into the upper receiving tray 74 may be removed immediately while the machine is still running. Thus, the initial copies are available for immediate distribution. The remaining copies are accumulated in the lower receiving tray 76 for later distribution. The upper receiving tray 74 may be swung upwardly about the pivots 80, so as to afford convenient access to the lower receiving tray 76.

Various modifications, alternative constructions, and equivalents may be employed without departing from the true spirit and scope of the present invention, as exemplified in the foregoing description and defined in the following claims.

We claim:

1. In a printing machine,
the combination comprising printing means for printing successive copy sheets,
upper and lower receiving trays for selectively receiving the copy sheets from said printing means,
a deflector movable between a first position for directing the copy sheets into said upper receiving tray and a second position for directing the copy sheets into said lower receiving tray,
and a counter for moving said deflector between said first and second positions after a predetermined number of copy sheets have been directed into said upper receiving tray,
said counter comprising a counter wheel having ratchet teeth thereon,
a ratchet pawl operable by said printing means for engaging said ratchet teeth and advancing said counter wheel,

a spring connected to said counter wheel for biasing said wheel toward its initial position,
a nonretrograde pawl engageable with said ratchet teeth for normally preventing retrograde movement of said counter wheel,
means resiliently biasing said nonretrograde pawl against said counter wheel,
a movable control member engageable with said counter wheel and connected to said deflector,
an element on said counter wheel for operating said control member upon advancing movement of said counter wheel to a predetermined position,
a stop on said counter wheel,
an adjustable stop member engageable by said stop for selectively determining the initial position of said counter wheel,
and a manually operable resetting cam for moving said pawls and said control member away from said counter wheel to release said counter wheel for return movement by said spring to its initial position.

2. In a sheet-handling mechanism,
the combination comprising propelling means for propelling successive copy sheets,
upper and lower receiving trays for selectively receiving the copy sheets from said propelling means,
a deflector movable between a first position for directing the copy sheets into said upper receiving tray and a second position for directing the copy sheets into said lower receiving tray,
and a counter for moving said deflector between said first and second positions after a predetermined number of copy sheets have been directed into said upper receiving tray,
said counter comprising a counter wheel having ratchet teeth thereon,
a ratchet pawl engageable with and biased toward said ratchet teeth for advancing said counter wheel,
means operable by said propelling means for reciprocating said ratchet pawl,
biasing means connected to said counter wheel for biasing said wheel toward its initial position,
a nonretrograde pawl engageable with and biased against said ratchet teeth for normally preventing a retrograde movement of said counter wheel,
a movable control member engageable with said counter wheel and connected to said deflector,
an element on said counter wheel for operating said control member upon advancing movement of said counter wheel to a predetermined position,
a stop on said counter wheel,
an adjustable stop member engageable by said stop for selectively determining the initial position of said counter wheel and thereby determining the extent of advancing movement of said counter wheel to operate said control member,
and resetting means for moving said pawls and said control member away from said counter wheel to release said counter wheel for return movement by said biasing means to its initial position as determined by said adjustable stop member.

3. In a printing machine,
the combination comprising printing means for printing successive copy sheets,
upper and lower receiving trays for selectively receiving the copy sheets from said printing means,
a deflector movable between a first position for directing the copy sheets into said upper receiving tray and a second position for directing the copy sheets into said lower receiving tray,
and a counter for moving said deflector between said first and second positions after a predetermined number of copy sheets have been directed into said supper receiving tray,
said counter comprising a counter wheel having ratchet teeth thereon, a ratchet pawl operable by said print-

ing means for engaging said ratchet teeth and advancing said counter wheel,
biasing means connected to said counter wheel for biasing said wheel toward its initial position,
a nonretrograde pawl engaged with and biased against said ratchet teeth for normally preventing a retrograde movement of said counter wheel,
a movable control member engageable with said counter wheel and connected to said deflector,
an element on said counter wheel for operating said control member upon advancing movement of said counter wheel to a predetermined position,
a stop on said counter wheel,
an adjustable stop member engageable by said stop for selectively determining the initial position of said counter wheel and thereby determining the extent of advancing movement of said counter wheel to operate said control member,
and resetting means for moving said pawls and said control member away from said counter wheel to release said counter wheel for return movement by said biasing means to its initial position as determined by said adjustable stop member.

4. In a sheet handling mechanism,
the combination comprising propelling means for propelling successive copy sheets,
upper and lower receiving trays for selectively receiving the copy sheets from said propelling means,
a deflector movable between a first position for directing the copy sheets into said upper receiving tray and a second position for directing the copy sheets into said lower receiving trays,
and a counter for moving said deflector between said first and second positions after a predetermined number of copy sheets have been directed into said upper receiving tray,
said counter comprising a counter wheel having ratchet teeth thereon,
a ratchet pawl engageable with and biased toward said ratchet teeth for advancing said counter wheel,
means operable by said propelling means for reciprocating said ratchet pawl,
biasing means connected to said counter wheel and biasing said wheel toward its initial position,
a nonretrograde pawl engageable with and biased toward said ratchet teeth for normally preventing retrograde movement of said counter wheel,
a movable control member engageable with said counter wheel and connected to said deflector,
an element on said counter wheel for operating said control member upon advancing movement of said counter wheel to a predetermined position,
a stop on said counter wheel,
an adjustable stop member engageable by said stop for selectively determining the initial position of said counter wheel and thereby determining the number of copy sheets to be directed into said upper receiving tray,
and manually operable resetting means for moving said pawls and said control member away from said counter wheel to release said counter wheel for return movement by said biasing means to its initial position as determined by said adjustable stop member.

5. In a printing machine,
the combination comprising printing means for printing successive copy sheets,
upper and lower receiving trays for selectively receiving the copy sheets from said printing means,
a deflector movable between a first position for directing the copy sheets into said upper receiving tray and a second position for directing the copy sheets into said lower receiving tray,
a counter mechanism for moving said deflector between said first and second positions after a predetermined number of copy sheets have been directed into said upper receiving tray,
means operable by said printing means for actuating said counter mechanism,
said counter mechanism including selectively operable means for adjusting said control mechanism to change the number of copy sheets to be directed into said upper receiving tray,
and selectively operable means for resetting said counter mechanism to its initial condition.

6. In a printing machine,
the combination comprising printing means for printing copy sheets,
upper and lower receiving trays for selectively receiving the copy sheets from said printing means,
a deflector moveable between a first position and directing the copy sheets into said upper receiving tray and a second position for directing the copy sheets into said lower receiving tray,
a first counter mechanism for moving said deflector between said first and second positions after a predetermined number of copy sheets have been directed into said upper receiving tray,
means operable by said printing means for actuating said first counter mechanism,
said first counter mechanism including selectively operable means for adjusting said mechanism to change the number of copy sheets to be directed into said upper receiving tray,
and means for resetting said first counter mechanism to its initial position,
a second counter mechanism for stopping said printing means after a predetermined number of copy sheets have been printed,
and means operable by said printing means for actuating said second counter mechanism.

7. A combination according to claim 6,
including manually operable means for simultaneously resetting said first and second counter mechanism to their initial positions.

8. In a duplicating machine,
the combination comprising means for printing copy sheets,
upper and lower receiving trays for selectively receiving the printed copy sheets from said printing means,
said upper receiving tray covering at least a substantial portion of said lower receiving tray,
a frame,
means mounting said lower receiving tray on said frame,
pivot means connecting said upper receiving tray to said frame for upward swinging movement away from said lower receiving tray to afford easy access to said lower receiving tray,
said pivot means including elements retaining said upper receiving tray on said frame against accidental removal,
and means for selectively directing the copy sheets into either of said receiving trays,

9. In a sheet handling mechanism,
the combination comprising propelling means for propelling successive sheets,
upper and lower receiving members for selectively receiving the sheets from said propelling means,
said upper receiving member being disposed over and being effective to cover at least a substantial portion of said lower receiving member,
means for selectively directing the sheets upon either of said receiving members,
a frame,
means mounting said lower receiving member on said frame,
and pivot means connecting said upper receiving member to said frame for upward swinging movement

away from said lower receiving member to afford easy access to said lower receiving member,

said pivot means including elements for retaining said upper receiving member on said frame against accidental removal.

References Cited by the Examiner

UNITED STATES PATENTS

1,747,384	2/1930	Olson et al.	271—64
2,094,181	9/1937	Morrison et al.	101—132.5
2,475,804	7/1949	Rouan et al.	101—227
2,547,470	4/1951	Janke	101—233
2,661,209	12/1953	McGalliard	270—58 X
2,906,196	9/1959	Ritzerfeld et al.	101—232 X
2,919,917	1/1960	Worswick	270—58 X

ROBERT E. PULFREY, *Primary Examiner.*

DAVID KLEIN, *Examiner.*

W. McCARTHY, *Assistant Examiner.*