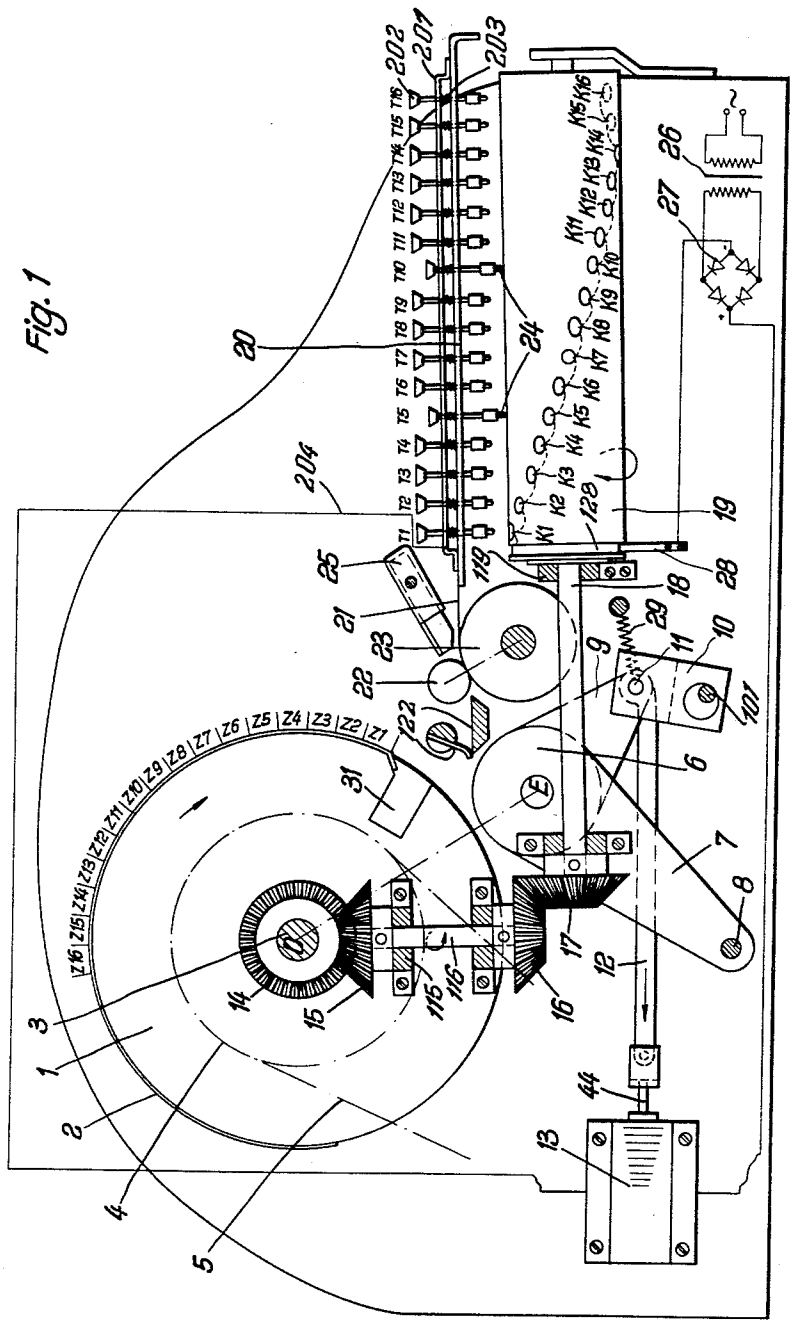
April 5, 1960 W. RITZERFELD ET AL 2,931,294

APPARATUS FOR SELECTIVE PRINTING

Filed March 20, 1958 5 Sheets-Sheet 1

Fig. 1



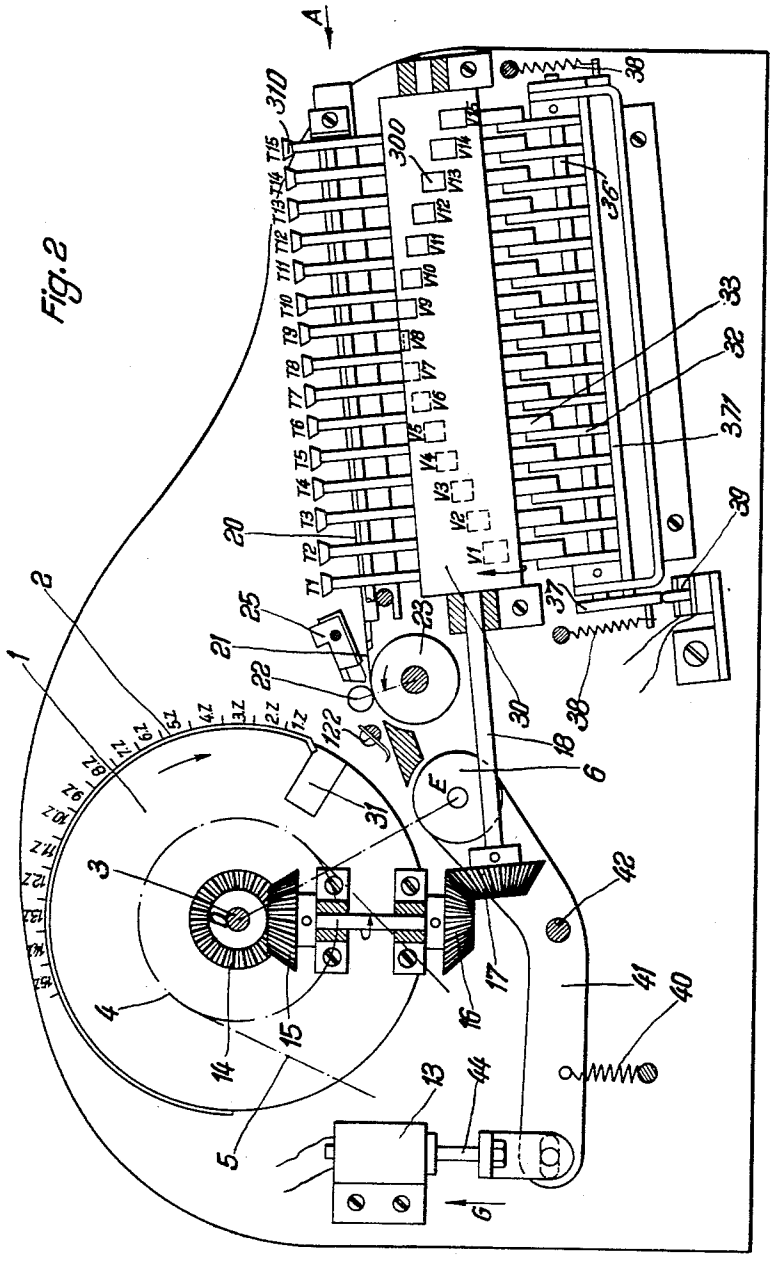
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APPARATUS FOR SELECTIVE PRINTING

Filed March 20, 1958 5 Sheets-Sheet 2

Fig. 2



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APPARATUS FOR SELECTIVE PRINTING

Filed March 20, 1958 5 Sheets-Sheet 3

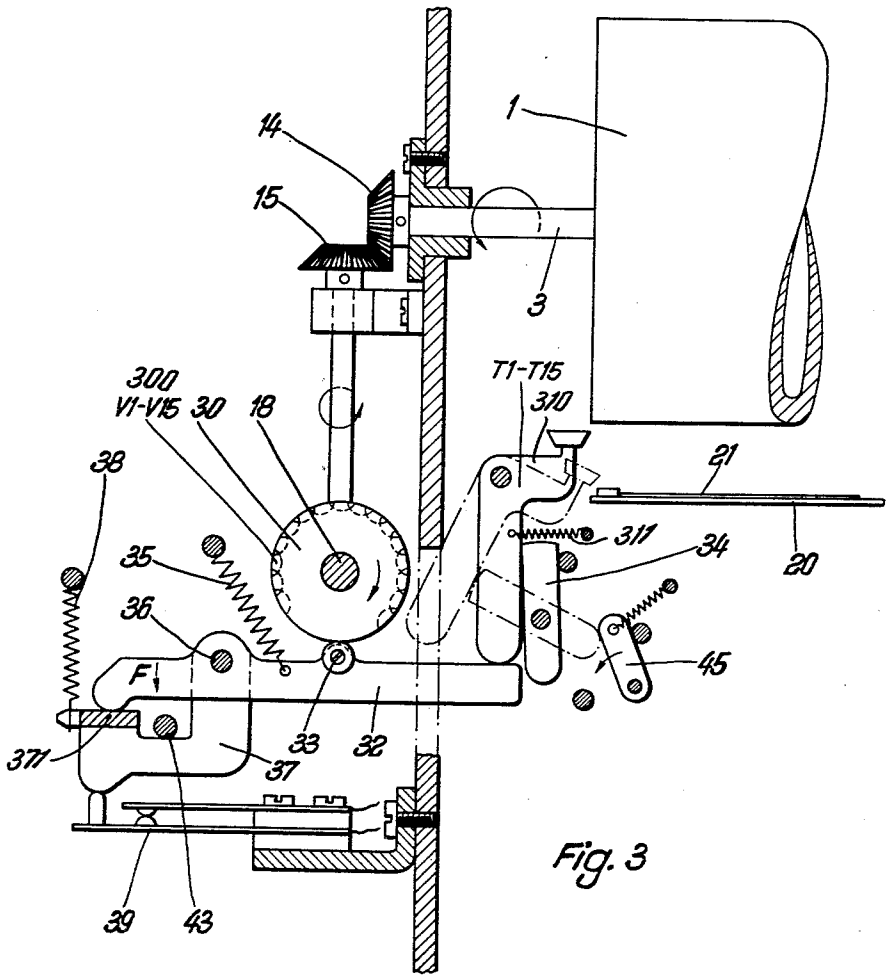


Fig. 3

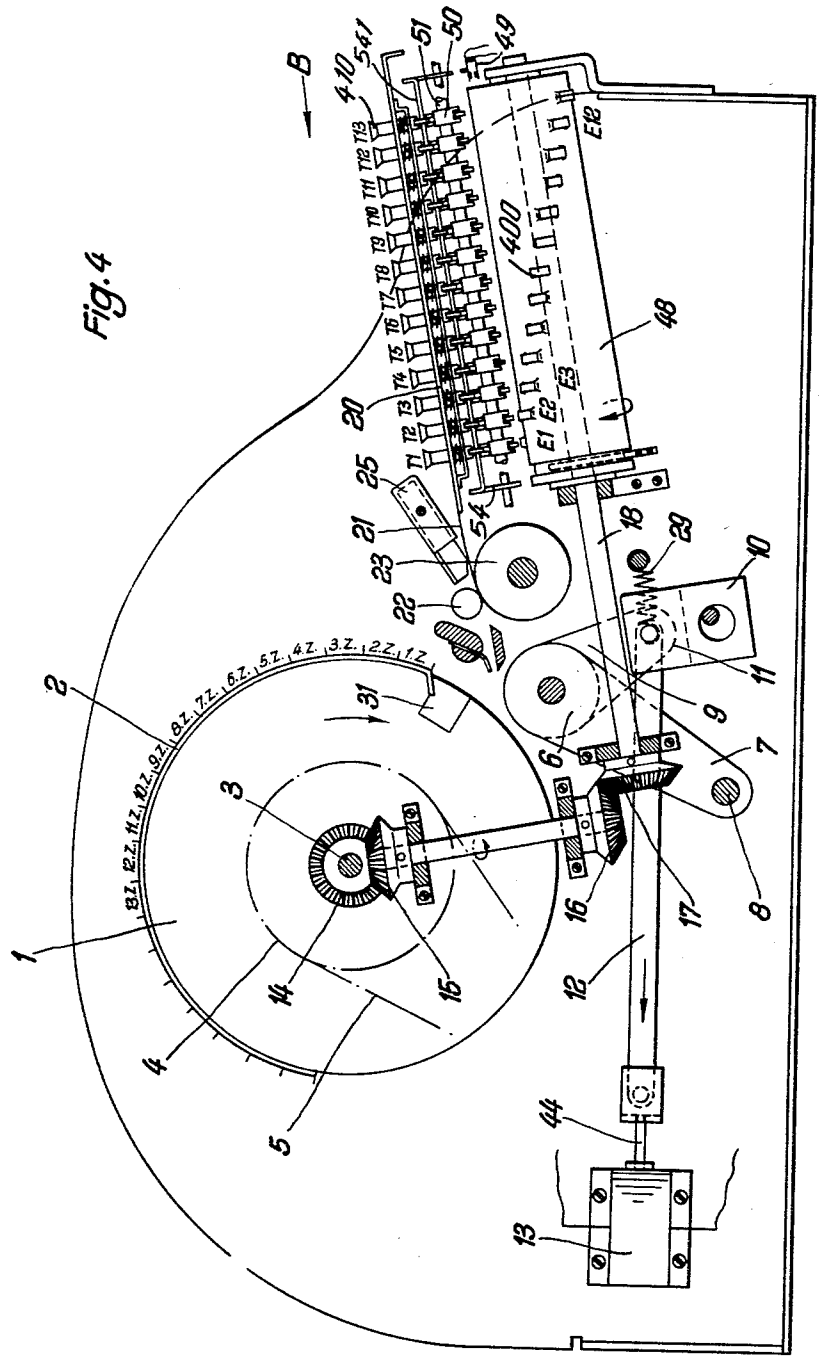
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APPARATUS FOR SELECTIVE PRINTING

Filed March 20, 1958 5 Sheets-Sheet 4

Fig. 4



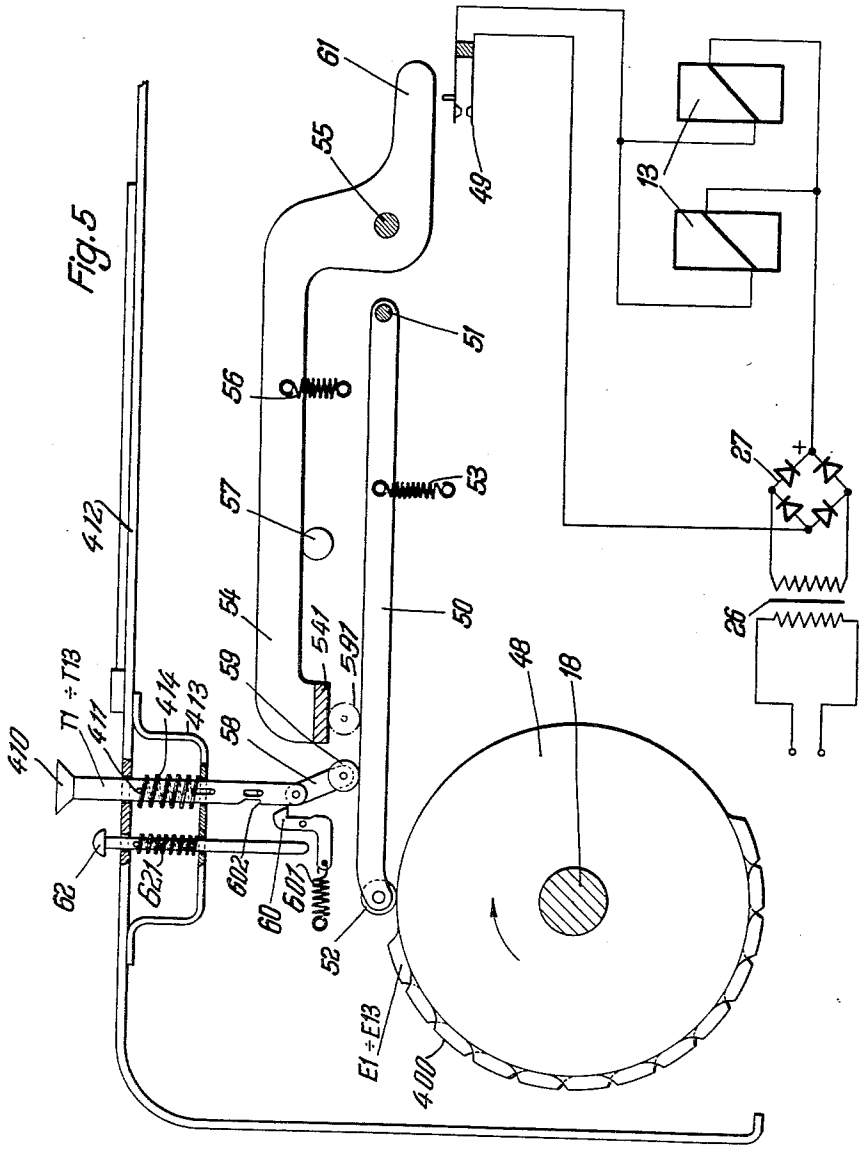
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APPARATUS FOR SELECTIVE PRINTING

Filed March 20, 1958 5 Sheets-Sheet 5

Fig. 5



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APPARATUS FOR SELECTIVE PRINTING

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Application March 20, 1958, Serial No. 722,790

Claims priority, application Germany March 22, 1957

20 Claims. (Cl. 101—132.5)

The present invention relates to an apparatus for selective printing, and more particularly to a duplicating machine for reproducing selected sections of a printing form on a copy sheet.

More particularly, the present invention relates to a duplicating machine of the type in which a master printing form prints on a moistened copy sheet, and in which an electro-magnetic means is provided for rendering the printing means operative when a desired section of the printing form passes the copy sheet.

It is one object of the present invention to provide a printing machine by which selected sections of a printing form are reproduced on a copy sheet upon selection by means of manually operated keys.

It is another object of the present invention to control selective printing of sections of a master sheet on a moistened copy sheet by means of manually operated key means.

It is another object of the present invention to provide a duplicating machine capable of automatically and selectively reproducing printing sections of a printing form.

It is another object of the present present invention to provide a duplicating machine of very simple and compact construction permitting the printing of selected sections of a master sheet carried by the duplicating drum.

With these objects in view, the present invention mainly consists in a printing machine which comprises a rotary printing roller and a counter-roller cooperating with the printing roller, one of the rollers, preferably the counter-roller being movable to and from a printing position in close proximity with the other roller; operating means for effecting movement of the counter-roller to and from the printing position, the operating means including an electro-magnetic means; feeding means for feeding copy sheets to the printing roller; a printing form attached to the printing roller and having a set of circumferentially spaced printing sections, such as lines; a turnable control member having an axis of rotation and including a set of axially spaced control means respectively associated with said printing sections of the printing form and being staggered in direction of rotation of the control member; means connecting the control member with the printing roller for turning movement in timed relation with the same; a set of sensing means arranged in an axially extending row along the control member, each of the sensing means being associated with one of the control means and being normally in an inoperative condition; a set of selector means respectively associated with the printing sections and the sensing means, each selector means being selectively movable to an actuating position for rendering the associated sensing means operative; and circuit means connected to the electro-magnetic means and being controlled by sensing means rendered operative by the associated selector means. The above defined elements cooperate in such a manner that the electro-magnetic means is controlled to effect movement of the counter-roller to the printing position when an operative sensing means senses the associated control means during turning of the control member. In this manner, selected printing sections associated with actuated selector means are printed on the copy sheets.

The selector means are preferably constructed as manually operated keys so that depression of a selected key will result in printing of the respective associated printing section of the printing form on the copy sheet which passes between the printing roller and the counter-roller. When the construction of the present invention is applied to a hectographic duplicating machine, moistening means are provided for moistening the copy sheets before they pass between the printing roller and the counter-roller.

According to one embodiment of the present invention the selector keys carry sensing contacts, and the control means on the control member are contact buttons engaged by associated sensing contacts when the respective keys are depressed. Associated selected contacts engage during turning movement of the control member, and close the circuit of the electro-magnetic means so that the electro-magnetic means moves the counter-roller to its printing position. According to another embodiment of the present invention, the sensing means include cam follower means cooperating with the control member which is constructed as a cam drum. The cam drum constitutes the control member of the apparatus and has axially and circumferentially spaced control means in the form of recesses or projecting cams. Thereby the sensing cam follower levers are actuated to close or open a contact in the circuit of the electro-magnetic means.

The selector key means are normally in a position in which the cam follower levers cannot effect closing or opening of the contact means. However, when the selector key means are moved to an actuating position, the control movement of the respective associated sensing levers becomes possible.

In all embodiments of the present invention actuation of a selected key will result in movement of the counter-roller to printing position in the moment in which a selected section of the printing form is located opposite the copy sheet.

Preferably, the control means on the control member are arranged along a helix, and the sensing means are arranged in an axially extending row. The control member is preferably a cylindrical drum, but it is also contemplated to use a control member of conical shape. In this event, the row of sensing means will extend parallel to the surface of the conical control member.

The electro-magnetic means by which the counter-roller is controlled, may be constructed as an alternating current, or as a direct current electro-magnet. Direct current electro-magnets are preferred to avoid a delay in response until alternating current reaches its surge. Direct current electro-magnetic means are connected by a rectifier to a source of alternating current.

Either the printing roller, or the counter-roller can be constructed for movement toward the other roller when printing of a selected section is desired. The movable roller is preferably mounted on a toggle-lever means. According to one embodiment of the present invention spring means urge the toggle-lever means into a straight position in which printing takes place, and the electro-magnetic means holds the toggle-lever means in an angular position, when energized. In another embodiment of the present invention, the spring means urge the toggle-lever means to the angular position in which the printing roller and the counter-roller are spaced from each other, while the electro-magnetic means straighten the toggle-lever when energized to move the movable roller to the printing position. In the preferred embodiments of the present invention, the selector means are manually operated keys, but any other shiftable members can be used for this purpose.

In the preferred embodiments of the present invention, the axis of the turnable control member is transverse to the axis of the printing roller. However, it is also contemplated to arrange the axes of the printing roller and of the control member parallel to each other, or in any other angular position.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

Figure 1 is a schematic fragmentary side view of one embodiment of the present invention, one lateral wall being omitted for the sake of clarity;

Figure 2 is a schematic fragmentary side view of another embodiment of the present invention, one lateral wall being omitted for the sake of clarity;

Figure 3 is a fragmentary view, partly in section, of the embodiment shown in Figure 2 as viewed in direction of the arrow A in Figure 2;

Figure 4 is a schematic fragmentary side view of a further embodiment of the present invention, one lateral wall being omitted for the sake of clarity; and

Figure 5 is a fragmentary view, partly in section, of the embodiment shown in Figure 4 as viewed in direction of the arrow B in Figure 4.

Figures 1 and 5 also include a diagrammatic showing of the electric circuit means used in the machine, and it will be understood that the embodiment of Figures 2 and 3 is provided with a corresponding circuit means.

Referring now to the drawings, and more particularly to Figure 1 which illustrates one embodiment of the present invention, a printing drum, shown to be a duplicating drum 1 is mounted on a shaft 3, and is driven by a motor, not shown, through a chain 5 passing over a chain wheel 4 which is connected to the duplicating drum 1. A printing form, shown to be a master duplicating sheet 2, is attached to the periphery of the duplicating drum 1 by a suitable clamping means, not shown, located in the recess 31. The printing form 2 has a set of printing sections Z1 to Z16. It is the purpose of the apparatus to print only selected sections of the printing form, if so desired.

A counter-roller 6 is turnably mounted on a pair of pivoted arms 7 which are turnable about a shaft means 8. The counter-roller 6 can turn with arms 7 between a printing position located in close proximity to the duplicating roller 1 and a spaced position in which no printing takes place. Toggle-lever means 9, 10 are respectively connected to the arms 7 and to a bar 101 on the frame of the machine. A spring 29 is secured to the toggle lever means and to the frame of the machine, and urges the toggle lever means 9, 10 to the illustrated angular position in which the counter-roller 6 is spaced from the duplicating roller 1. The operating means for the counter-roller 6 further include a connecting rod 12 which is secured to the movable member 44 of an electro-magnetic means 13. When the electro-magnetic means 13 is energized, rod 12 will move in direction of the arrow, and pull the toggle-lever means 9, 10 to a straightened position in which the counter-roller tends to engage the duplicating drum, or the printing form 2 thereon during rotation of the printing drum. A supply table 20 is provided for copy sheets which are fed successively by a pair of feeding rollers 22 and 23 through moistening means 25. Resilient holding means 122 are provided for holding the copy sheet in a known manner when the same is located between the rollers 1 and 6. The printing plane is designated D—E, and the printing form 2 and a copy sheet engage each other along a printing line when the counter-roller 6 is moved to printing position. While the counter-roller 6 is retracted to its inoperative position, the copy sheet does not move. Consequently it is possible to print selected sections of the printing form on the copy sheet, if the counter-roller 6 is moved to printing position in the moment in which respective selected sections of the printing form 2 are located in the printing line.

A turntable control member 19 is connected to a shaft 18 supported by bearings 119 on the frame of the machine. A bevel gear 17 is fixedly secured to shaft 18, and meshes with another bevel gear 16 which is connected to a further bevel gear 15 by a shaft 116. Shaft 116 is mounted in bearings 115 on the machine frame. The bevel gear 15 meshes with a further bevel gear 14 which is connected to the printing roller, or to the chain wheel 4 for rotation therewith. Consequently, when the printing roller 1 is driven by a motor, not shown, the control member 19 will turn in a timed relation with the printing roller, and in the illustrated embodiment, the transmission means 15 to 18 is designed to obtain synchronous rotation of the printing roller 1 and of the control member 19.

The control member 19 is shown to be a drum consisting of insulating material and being provided with a set of control means shown to be contact buttons K1 to K16. The contact buttons are arranged along a helix on the surface of the control drum 19. All contact buttons are electrically connected by a conductor which is also electrically connected to a contact ring 128 on which a slide contact 28 slides.

A support 201 is secured to the supply table 20 and movably supports a set of selector keys 202 numbered T1 to T16 which are respectively associated with the printing sections Z1 to Z16 of the printing form 2. The keys 202 are also respectively associated with the contact buttons K1 to K16 and are arranged in a row axially spaced from each other the same distances as the contact buttons K1 to K16. Spring means 203 hold the selector keys 202 in a normal inoperative position, but the keys can be depressed, as shown for keys T5 and T10, to an actuating position in which they are closer spaced from the surface of the drum 19. Each selector key means 202 carries a sensing contact means 24 which slidably engages the drum surface in the actuating position of the respective key. During rotation of the control drum 19, each contact button will pass under the associated sensing contact 24. When the selector key is in actuating position, as shown for keys T5 and T10, the sensing contact means 24 will engage the respective associated contact K5 and K10 during turning of the control member 19, but it will be understood that such contact engagement takes place at timed intervals. All sensing contacts 24 are connected by a conductor 204 which is connected to the electro-magnetic means 13. The other terminal of electro-magnetic means 13 is connected to a rectifier 27 which is also connected to the slide contact 28. A transformer 26 supplies alternating current to the rectifier 27 so that a direct current passes through the circuit of the electro-magnetic means 13 and through the contacts on the selector keys and on the control drum. Locking means are provided for temporarily locking the selector keys 202 in actuating position, and releasing means are provided for releasing the locking means after a printing operation has been terminated. The locking and releasing means are not shown in Figure 1, and may be constructed similar to the corresponding locking and releasing means shown in Figure 5 which will be described hereinafter.

The embodiment illustrated in Figure 1 operates in the following manner.

A copy sheet to be printed by selected sections Z5 and Z10, is placed on the supply table 20. The respective selector keys T5 and T10 are depressed. The motor is started and the printing roller 1 starts to rotate together with the control drum 19. When the control contact means K5 passes the sensing contact means 24 of the

key T5, the circuit of the electro-magnetic means 13 is completed, and the toggle-lever means 9, 10 are straightened by the pull of the rod 12 so that the counter-roller 6 moves toward the printing roller to its printing position. Before that, the feeding rollers 22 and 23 have already moved the copy sheet through the moistening means 25 so that the copy sheet is already located between the rollers 1 and 6, held by the holding means 122. When in this position of the copy sheet the respective printing section Z5 arrives at the printing plane D—E, the counter-roller is moved to printing position, as described above, and the respective section Z5 is printed on the copy sheet which is taken along by the turning rollers 1 and 6. After the selected section of the printing form is printed, the control contact K5 moves beyond the sensing contact 24, and the circuit of the electro-magnetic means 13 is interrupted so that the spring 29 retracts the toggle-lever means 9, 10 with the counter-roller 6 whereby the copy sheet is released and remains at a standstill until the next selected section Z10 arrives in the printing plane. In this moment, the control contact means K10 passes the sensing contact 24 so that the circuit of the electro-magnetic means 13 is again closed. As described above, this effects movement of the counter-roller 6 to printing position, and printing of the section Z10 on the copy sheet adjacent the previously printed section Z5. The copy sheet is thereupon ejected by suitable means, not shown, which are not an object of the present invention. It will be understood that further sections could have been selected for printing by depression of the respective associated selector key 202. Instead of the axially extending set of control contact means K1 to K16, a single helical contact band can be provided on the surface of the control drum 19.

In the embodiment of Figures 2 and 3, a duplicating drum 1 is driven by drive means 4 and 5, and it is connected by bevel gear transmission means 14, 15, 16, 17, and by the shaft 18 to a turnable control drum 30. The duplicating drum carries a printing form 2 having printing sections 1Z to 15Z. Feeding rollers 22 and 23 are provided for feeding a copy sheet on the supply table 21 through the moistening means 25 toward the holding means 122. The counter-pressure roller 6 is mounted for pivotal movement about a shaft 42, and is urged to its printing position by a spring 40. The electro-magnetic means 13 is connected by a member 44 to the lever 41 and holds lever 41 against the action of spring 40 so that the counter-roller 6 remains in the illustrated inoperative position as long as the electro-magnetic means 13 is energized. As described with reference to Figure 1, the control member 30 will turn through a single revolution, when the printing roller turns through a single revolution.

The construction of the control arrangement by which selective printing is effected, will be best understood with reference to Figure 3 taken in connection with Figure 2. The control member 30 is a drum, and a set of control means 300 is provided in the form of a set of recesses V1 to V15 which are arranged along a helical line on the drum surface. Each control recess 300 is associated with a corresponding printing section of the printing form 2.

Each control recess 300 is also associated with a sensing means which includes a sensing lever 32 carrying a cam follower roller 33 engaging the surface of the control drum 30 under the action of a spring 35. The sensing levers 32 are spaced the same distance in axial direction as the recesses 300 so that each sensing lever tends to pivot into an operative position when the associated cam follower roller 33 passes into the respective associated recess 300. An actuating bar member 37 is pivotally mounted on the shaft 36 and has a bar portion 371 extending across all sensing levers 32. A spring 38 urges the actuating bar member 37 into a position in which the portion 371 abuts against the sensing levers 32. A switch 39 is controlled by the actuating bar member 37, and is

normally in closed position. Switch 39 is connected into the circuit of the electro-magnetic means 13 so that the same is normally energized to hold the counter-roller 6 in the illustrated inoperative position. When any of the sensing levers 32 pivots due to the passing of the cam follower 33 into the associated control recess 300, the actuating bar member 37 is pivoted to an operative position against the action of spring 38, and opens contact 39 whereby the circuit of electro-magnetic means 13 is interrupted permitting the spring 40 to move the counter-roller to its printing position.

During turning of the control drum 30, all sensing levers would consecutively pivot when the respective cam followers pass into the respective associated recesses 300. However, this is normally prevented by the selector key means 310 which include keys T1 to T15 which are respectively associated with the printing sections of the printing form 2. As best seen in Figure 3, the keys 310 are normally in the position illustrated in solid lines, and block the respective associated sensing levers 32. Depressed keys 310 assume the position shown in dash and dot lines in Figure 3, and are automatically locked in this actuating position by a locking means 34. By operation of the spring loaded release means 45, the locking means 34 can be returned to its normal inoperative position shown in solid lines in Figure 3. A spring 311 tends to hold each key 310 in its normal position locking the respective sensing lever 32.

The embodiment shown in Figures 2 and 3 operates in the following manner:

When the motor is started, the printing roll 1 turns together with the control drum 30. The feed rollers 22 and 23 feed a copy sheet from the table 21 through the moistening means 25 toward the printing plane D—E. The electro-magnetic means 13 is energized since contact 39 is closed and holds the counter-roller 6 in the illustrated inoperative position.

Assuming that a selected printing portion of the printing form is to be printed, the respective key 310 is depressed. This will result in the release of the respective lever 32. At the moment in which the respective associated recess 300 arrives at the cam follower, the cam follower moves into the respective recess, and the respective sensing lever turns under the action of spring 35. Thereby, the actuating bar member is also pivoted and opens contact 39 so that the electro-magnetic means 13 is de-energized, and permits the spring 40 to pull the counter-roller 6 to its printing position. At this moment the respective printing section associated with the respective depressed selector key 310 arrives at the printing plane D—E, and the respective section is printed on the copy sheet. When during further turning of the printing roll 1 and of the control drum 30, the respective recess moves beyond the cam follower 33, the lever 32 is returned to its normal position by the outer surface of the drum 30, and consequently the actuating bar member 37 returns under the action of the spring 38 to its normal position in which the contact 39 is closed. In this moment, the electro-magnetic means 13 is again energized, and overcomes the force of spring 40 to return the counter-roller 6 to its inoperative position. If during further turning of the printing roll, a sensitive lever 32 released by operation of its associated selector key 310 is permitted to fall into the associated recess, the printing operation is repeated with another printing section selected by the respective depressed key 310.

Such selective printing can be repeated during a number of revolutions of the printing roller. When it is no longer desired to print the respective sections of the printing form, the depressed keys 310 are released by operation of the release means 35 so that even during rotation of the printing roller and of the control drum 30, no printing takes place since all sensing levers 22 are locked by the associated keys 310.

The embodiment illustrated in Figures 4 and 5 also in-

cludes a printing roller 1, a counter-roller 6, an electro-magnetic means 13 for actuating the toggle-lever operating means 9 and 10, and transmission means 15 and 16, 17 and 18 for driving the control drum 48 at the rotary speed of the printing drum 1. Similar to the embodiment of Figure 1, the spring 29 is secured to the toggle-lever for moving the counter-roller 6 to its inoperative position, while energizing of the electro-magnetic means 13 will effect movement of the counter-roller 6 to its printing position.

In the embodiment of Figures 4 and 5, the control member 48 is a cam drum having a set of axially and circumferentially spaced cams 400 designated E1 to E13 which are respectively associated with the printing sections 1Z to 13Z of the printing form 2. A set of selector keys 410 is also provided, which are respectively designated T1 to T13 to indicate their association with the printing sections.

As best seen in Figure 5, the control drum 48 cooperates with a set of sensing levers 50 which are pivoted at 51 and are urged by springs 53 against the surface of the drum 48. Whenever one of the cams 400 passes the cam follower roller 52 of the respective associated sensing lever 50, the respective sensing lever will be pivoted. The electro-magnetic means 13 is schematically indicated in Figure 5 from which it will be seen that the electro-magnetic means 13 is in a circuit including a transformer 36 and a rectifier 27, as well as a contact 49. When the contact 49 is open, the electro-magnetic means 13 is de-energized, and consequently the spring 29 pulls the counter-roller 6 to its inoperative position. When the contact 49 is closed, the electro-magnetic means 13 is energized, and pulls the counter-roller 6 to its printing position. The closing of the contact 49 is effected by an actuating bar member 54 which includes a transverse bar portion 541 passing across all sensing levers 50. The bar portion 541 is spaced from the sensing levers 50 so that the pivotal movement of the sensing levers 50 caused by the cams E1 to E13 has normally no effect on the actuating bar member 54. A stop 57 holds the actuating bar 54 in the illustrated normal position. Member 54 has an end portion 61 which cooperates with the switch 49.

The set of selector key means 410 is shiftably mounted in the frame portion 412. A bracket portion 413 is secured to the frame 412. The shank portions of the key means 410 are provided with pins 411 engaged by springs 414 which normally hold the keys 410 in the illustrated inoperative position. A lever 58 is pivotally mounted on the end of each shank 411 and turnably carries a roller 59 which contacts the associated sensing lever 50. When a key 410 is depressed, roller 59 rolls on the respective sensing lever to the position 591 illustrated in dash and dot lines. In this position, the respective sensing lever 50 is coupled to the actuating bar member 54, and consequently the members 58, 59 constitute a coupling means moving to a coupling position when the respective associated key 410 is depressed to its actuating position.

A hook-shaped locking means 60 is provided which includes a spring 601 urging the locking means 60 to engage a recess 602 in the shank of the associated key 410 when the respective key is depressed. The pivoted locking means 60 can be released by operation of the release means 62 which is normally held in an inoperative position by a spring 621.

The embodiment of the present invention illustrated in Figures 4 and 5 operates in the following manner:

At the beginning of the operation, the counter-roller 6 is retracted by the spring 29. During synchronous turning of the printing roller 1 and the control member 48, all cams 400 will successively engage the associated sensing levers 50 and urge them to make a short pivotal movement. Such pivotal movement will have no effect on the switch 49, since the sensing levers 50 are spaced from the bar portion 541.

If a selected key 410 is depressed, its coupling means 58, 59 will move to coupling position, and the coupling roller 591 will be located between the respective sensing lever and the bar portion 541. When during turning of the printing roller and of the control drum 48, the cam 400 associated with depressed key 410 and the respective printing section of the printed form, arrives under the cam follower roller 52, the respective sensing lever will perform its pivotal movement as before, but since it is coupled to the bar portion 541 by the coupling roller 59, the actuating bar member will perform a short pivotal movement about the shaft 55 against the action of spring 56, and the portion 61 will engage switch 49 and close the circuit of the electro-magnetic means 13.

The electro-magnetic means 13 is thereby energized and pulls the toggle-lever means 9, 10 to a straightened position in which the counter-roller 6 is in printing position. Consequently, the printing section of printing form 2 associated with the depressed selector key is printed on the copy sheet. When this printing section has passed the counter-pressure roller, the respective associated cam 400 has also pased the cam follower 52, and the spring 53 returns the sensing lever 50 to its normal position in which the cam follower roller 52 rolls on the surface of the control drum 48. Consequently, the spring 56 is able to turn the actuating bar member 54 in counter-clockwise direction into the position illustrated in Figure 5 whereby the switch 49 is released and opened so that the spring 29 pulls the counter-roller 6 to its inoperative position. If another selector key is depressed, the respective associated printing section will be printing on the copy sheet in the same manner.

Each depressed selector key 410 is held in depressed position by the associated locking means 60 so that a number of copy sheets can be printed in the same manner with the same selected printing sections during repeated revolutions of the printed roller and of the control drum 48. When printing of the selected printing sections is no longer desired, the releasing means 62 is depressed, so that the previously actuated keys 410 return to their normal position under the action of springs 414. Thereby the actuating bar member 54 is no longer coupled to the sensing levers so that further turning of the control drum 48 has no influence on the printing.

It will be understood that the control means K1 to K16 in Figure 1, the control means V1 to V15 in Figure 2, and the control means E1 to E13 in Figure 5 are staggered in circumferential direction relative to each other for distances corresponding to the spacing of the printing sections Z on the printing form. Also, the relative angular position between the recess 31, in which the clamping means for the printing form 2 is located, and the positions of the control means must be determined in such a manner that the first control means is sensed at the moment in which the first printing section Z1 passes the printing plane D—E.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of printing machines differing from the types described above.

While the invention has been illustrated and described as embodied in a duplicating machine in which portions of a printing form are selected for printing by operation of selector keys, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential charac-

teristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. In a duplicating machine, in combination, a rotary printing roller and a counter-roller cooperating with said printing roller, one of said rollers being movable to and from a printing position in close proximity with the other roller; operating means for effecting movement of said one roller to and from said printing position and including an electro-magnetic means; feeding means for feeding copy sheets to said rollers; a printing form attached to said printing roller and having a set of circumferentially spaced printing sections; a turnable control member having an axis of rotation and including an axially extending set of control means respectively associated with said printing sections and being staggered in direction of rotation of said control member so as to be arranged along a helix; means connecting said control member with said printing roller for turning movement in timed relation with the same; a set of sensing means arranged in an axially extending row along said control member, each of said sensing means being associated with one of said control means and being normally in an inoperative condition; a set of selector means axially spaced corresponding to the axial spacing of said sensing means and respectively associated with said printing sections and said sensing means, each selector means being selectively movable to an actuating position for rendering the associated sensing means operative; and circuit means connected to said electro-magnetic means and being controlled by sensing means rendered operative by the associated selector means so that said electro-magnetic means is controlled to effect movement of said one roller by said operating means to said printing position when an operative sensing means senses the associated control means during turning of said control member whereby selected printing sections associated with actuated selector means are printed on said copy sheets.

2. In a duplicating machine, in combination, a rotary printing roller and a counter-roller cooperating with said printing roller, one of said rollers being movable to and from a printing position in close proximity with the other roller; operating means for effecting movement of said one roller to and from said printing position and including an electro-magnetic means; feeding means for feeding copy sheets to said rollers; a printing form attached to said printing roller and having a set of circumferentially spaced printing sections; a turnable control member having an axis of rotation and including an axially extending set of control contact means connected to each other and respectively associated with said printing sections and being staggered in direction of rotation of said control member so as to be arranged along a helix; means connecting said control member with said printing roller for turning movement in timed relation with the same; a set of sensing contact means connected to each other and arranged in an axially extending row along said control member, each of said sensing contact means being associated with one of said control contact means and being normally in an inoperative condition; a set of selector means axially spaced corresponding to the axial spacing of said sensing means and respectively associated with said printing sections and said sensing contact means, each selector means being selectively movable to an actuating position for moving the associated sensing contact means to an operative position located in the path of movement of the associated control contact means; and circuit means connected to said electro-magnetic means and being controlled by contact means closed by the associated selector means so that said electro-magnetic means is energized to effect movement of said one roller by said operating means to said printing position when an operative sensing contact means engages the associated control contact means during turning of said control member whereby selected printing sections associated with actuated selector means are printed on said copy sheets.

3. In a duplicating machine, in combination, a rotary printing roller and a counter-roller cooperating with said printing roller, one of said rollers being movable to and from a printing position in close proximity with the other roller; operating means for effecting movement of said one roller to and from said printing position and including an electro-magnetic means and means urging said one roller to said printing position, said electro-magetic means holding said one roller in an operative position when energized; feeding means for feeding copy sheets to said rollers; a printing form attached to said printing roller and having a set of circumferentially spaced printing sections; a turnable control drum member having an axis of rotation and including an axially extending set of control recesses respectively associated with said printing sections and being staggered in direction of rotation of said control member so as to be arranged along a helix; means connecting said control drum member with said printing roller for turning movement in timed relation with the same; a set of sensing means arranged in an axially extending row along said control drum member, each of said sensing means being associated with one of said control recesses and being normally in an inoperative condition; a set of selector means axially spaced corresponding to the axial spacing of said sensing means and respectively associated with said printing sections and said sensing means, each selector means being selectively movable to an actuating position for rendering the associated sensing means operative; and circuit means connected to said electro-magnetic means and being controlled by sensing means rendered operative by the associated selector means so that said electro-magnetic means is de-energized to effect movement of said one roller by said operating means to said printing position when an operative sensing means senses the associated control recess during turning of said control drum member whereby selected printing sections associated with actuated selector means are printed on said copy sheets.

4. In a duplicating machine, in combination, a rotary printing roller and a counter-roller cooperating with said printing roller, one of said rollers being movable to and from a printing position in close proximity with the other roller; operating means for effecting movement of said one roller to and from said printing position and including an electro-magnetic means for moving said one roller to said printing position when energized; feeding means for feeding copy sheets to said rollers; a printing form attached to said printing roller and having a set of circumferentially spaced printing sections; a turnable control member having an axis of rotation and including an axially extending set of control cam means respectively associated with said printing sections and being staggered in direction of rotation of said control member so as to be arranged along a helix; means connecting said control member with said printing roller for turning movement in timed relation with the same; a set of sensing means arranged in an axially extending row along said control member, each of said sensing means being associated with one of said control cam means and being normally in an inoperative condition; a set of selector means axially spaced corresponding to the axial spacing of said sensing means and respectively associated with said printing sections and said sensing means, each selector means being selectively movable to an actuating position for rendering the associated sensing means operative; and circuit means connected to said electro-magnetic means and being controlled by sensing means rendered operative by the associated selector means so that said electro-magnetic means is energized to effect movement of said one roller by said operating means to said printing position when an operative sensing means senses the associated

control drum during turning of said control member whereby selected printing sections associated with actuated selector means are printed on said copy sheets.

5. In a duplicating machine, in combination, a rotary printing roller and a counter-roller cooperating with said printing roller along a printing line, said counter-roller being movable to and from a printing position in close proximity with said printing roller; operating means for effecting movement of said counter-roller to and from said printing position and including an electro-magnetic means; feeding means for feeding copy sheets to said rollers; a printing form attached to said printing roller and having a set of circumferentially spaced printing sections; a turnable control drum member having an axis of rotation and including a contact means on the periphery thereof, said control means having a set of axially spaced circumferentially staggered contact surfaces connected to each other and respectively associated with said printing sections and arranged along a helix; transmission means connecting said control drum member with said printing roller for synchronous rotation; a set of selector key means respectively associated with said printing sections and being arranged in an axially extending row along said control drum member, each selector key means being selectively movable to an actuating position closer spaced from said control drum member; a set of sensing contact means connected to each other and respectively mounted on said selector key means, each of said sensing contact means being associated with one of said contact surfaces and being normally spaced from the associated contact surface, each sensing contact means being moved by the associated selector key means to an operative position located in the path of movement of respective associated contact surface when the respective selector key means is moved to said actuating position so that sensing contact means in operative position slidably engage the associated contact surface during turning of said control drum member; and circuit means connecting all said sensing contacts and all said contact surfaces with said electro-magnetic means so that the circuit is closed and so that said electro-magnetic means is energized to effect movement of said counter-roller to said printing position when a sensing contact means in operative position slides over the associated contact surface during turning of said control drum member whereby selected printing sections associated with actuated selector key means are printed on said copy sheets.

6. In a duplicating machine, in combination, a rotary printing roller and a counter-roller cooperating with said printing roller along a printing line, said counter-roller being movable to and from a printing position in close proximity with said printing roller; operating means for effecting movement of said counter-roller to and from said printing position and including an electro-magnetic means; feeding means for feeding copy sheets to said rollers; a printing form attached to said printing roller and having a set of circumferentially spaced printing sections; a turnable control drum member having an axis of rotation and including a set of axially spaced circumferentially staggered contact buttons connected to each other and respectively associated with said printing sections, said contact buttons being equidistant from said axis of rotation and arranged substantially along a helix; transmission means connecting said control drum member with said printing roller for synchronous rotation; a set of selector key means respectively associated with said printing sections and being arranged in an axially extending straight row along said control drum member, each selector key means being selectively movable to an actuating position closer spaced from said control drum member; means for normally holding said selector key means in a retracted inoperative position; a set of sensing contact means connected to each other and respectively mounted on said selector key means, each of said sensing contact means being associated with one of said contact buttons and being normally spaced from the associated contact button, each sensing contact means being moved by the associated selector key means to an operative position located in the path of movement of respective associated contact button when the respective selector key means is moved to said actuating position so that sensing contact means in operative position slidably engage the associated contact button during turning of said control drum member; and circuit means including a first conductor connecting all said sensing contacts and a second conductor connecting all said contact buttons with said electro-magnetic means so that the circuit is closed and so that said electro-magnetic means is energized to effect movement of said counter-roller to said printing position when a sensing contact means in operative position slides over the associated contact button during turning of said control drum member whereby selected printing sections associated with actuated selector key means are printed on said copy sheets.

7. In a duplicating machine, in combination, a rotary printing roller and a counter-roller cooperating with said printing roller along a printing line, said counter-roller being movable to and from a printing position in close proximity with said printing roller; operating means for effecting movement of said counter-roller to and from said printing position and including toggle lever means connected to said counter-roller, and an electro-magnetic means having a movable member connected to said toggle lever means so that said toggle lever means is straightened to move said counter-roller to said printing position when said electro-magnetic means is energized; feeding means for feeding copy sheets to said rollers; a printing form attached to said printing roller and having a set of circumferentially spaced printing sections; a turnable control drum member having an axis of rotation and including a set of axially spaced circumferentially staggered contact buttons connected to each other and respectively associated with said printing sections, said contact buttons being equidistant from said axis of rotation and arranged substantially along a helix; transmission means connecting said control drum member with said printing roller for synchronous rotation; a set of selector key means respectively associated with said printing sections and being arranged in an axially extending straight row along said control drum member, each selector key means being selectively movable to an actuating position closer spaced from said control drum member; means for normally holding said selector key means in a retracted inoperative position; a set of sensing contact means connected to each other and respectively mounted on said selector key means, each of said sensing contact means being associated with one of said contact buttons and being normally spaced from the associated contact button, each sensing contact means being moved by the associated selector key means to an operative position located in the path of movement of respective associated contact button when the respective selector key means is moved to said actuating position so that sensing contact means in operative position slidably engage the associated contact button during turning of said control drum member; and circuit means including a first conductor connecting all said sensing contacts and a second conductor connecting all said contact buttons with said electro-magnetic means so that the circuit is closed and so that said electro-magnetic means is energized to effect movement of said counter-roller to said printing position when a sensing contact means in operative position slides over the associated contact button during turning of said control drum member whereby selected printing sections associated with actuated selector key means are printed on said copy sheets.

8. A machine as set forth in claim 7 wherein said circuit means include a contact ring on said control drum member connected to said second conductor, and a slide contact slidably engaging said contact ring.

9. A machine as set forth in claim 1 and including means for holding said printing form on said printing drum in a selected circumferential position so that any printing section of said printing form passes through said printing line when the associated contact means passes the associated sensing means during rotation of said control member.

10. In a duplicating machine, in combination, a rotary printing roller and a counter-roller cooperating with said printing roller along a printing line, said counter-roller being movable to and from a printing position in close proximity with said printing roller; operating means for effecting movement of said counter-roller to and from said printing position and including an electro-magnetic means; feeding means for feeding copy sheets to said rollers; a printing form attached to said printing roller and having a set of circumferentially spaced printing sections; a turnable control drum member having an axis of rotation having a set of axially spaced circumferentially staggered recesses respectively associated with said printing sections and arranged substantially along a helix; transmission means connecting said control drum member with said printing roller for synchronous rotation; a set of sensing means respectively associated with said recesses, each of said sensing means including a lever, a cam follower member on each lever, said cam follower members being arranged in an axially extending row, means urging said levers into a position in which said cam follower members engage the surface of said control drum member and tend to move into the respective associated recess so that the associated lever moves to an operative position; a movable actuating bar member engaged by said levers and moved by the same to an operative position when any one of said levers moves to said operative position; a set of selector key means axially spaced corresponding to the axial spacing of said sensing means and respectively associated with said printing sections and said sensing means, each selector key means tending to assume a normal inoperative position and engaging in said inoperative position the associated lever so as to block movement of the same to said operative position, each selector key means being selectively movable to an actuating position releasing the associated lever so that the same is free to move to said operative position thereof when during turning of said control drum member the respective associated recess passes the respective associated cam follower member; and circuit means including a contact means controlled by said actuating bar member and being connected to said electro-magnetic means so that said electro-magnetic means is controlled to effect movement of said counter-roller by said operating means to said printing position when one of said levers selected by actuation of the associated selector key means moves to said operative position when the associated recess passes the respective cam follower member during turning of said control drum member whereby selected printing sections associated with actuated selector key means are printed on said copy sheets.

11. In a duplicating machine, in combination, a rotary printing roller and a counter-roller cooperating with said printing roller along a printing line, said counter-roller being movable to and from a printing position in close proximity with said printing roller; operating means for effecting movement of said counter-roller to and from said printing position and including an electro-magnetic means and means urging said counter-roller to said printing position, said electro-magnetic means holding said printing roller in an inoperative position, when energized; feeding means for feeding copy sheets to said rollers; a printing form attached to said printing roller and having a set of circumferentially spaced printing sections; a turnable control drum member having an axis of rotation having a set of axially spaced circumferentially staggered recesses respectively associated with said printing sections and arranged substantially along a helix; transmission means connecting said control drum member with said printing roller for synchronous rotation; a set of sensing means respectively associated with said recesses, each of said sensing means including a lever, a cam follower member on each lever, said cam follower members being arranged in an axially extending row, means urging said levers into a position in which said cam follower members engage the surface of said control drum member and tend to move into the respective associated recess so that the associated lever moves to an operative position; a movable actuating bar member engaged by said levers and moved by the same to an operative position when any one of said levers moves to said operative position; a set of selector key means axially spaced corresponding to the axial spacing of said sensing means and respectively associated with said printing sections and said sensing means, each selector key means tending to assume a normal inoperative position and engaging in said inoperative position the associated lever so as to block movement of the same to said operative position, each selector key means being selectively movable to an actuating position releasing the associated lever so that the same is free to move to said operative position thereof when during turning of said control drum member the respective associated recess passes the respective associated cam follower member; and circuit means including a contact means closed by said bar member in operative position and being connected to said electro-magnetic means so that said electro-magnetic means is de-energized to effect movement of said counter-roller by said operating means to said printing position when one of said lever selected by actuation of the associated selector key means moves to said operative position when the associated recess passes the respective cam follower member during turning of said control drum member whereby selected printing sections associated with actuated selector key means are printed on said copy sheets.

12. A machine as set forth in claim 11 wherein said cam follower member is a roller turnably mounted on the respective lever.

13. A machine as set forth in claim 11 and including locking means for automatically locking each of said selector key means in said actuating position thereof; and means for releasing said locking means.

14. In a duplicating machine, in combination, a rotary printing roller and a counter-roller cooperating with said printing roller along a printing line, said counter-roller being movable to and from a printing position in close proximity with said printing roller; operating means for effecting movement of said counter-roller to and from said printing position and including an electro-magnetic means; feeding means for feeding copy sheets to said rollers; a printing form attached to said printing roller and having a set of circumferentially spaced printing sections; a turnable control drum member having an axis of rotation and including a set of axially spaced circumferentially staggered projecting cams respectively associated with said printing sections and arranged substantially along a helix; transmission means connecting said control drum member with said printing roller for synchronous rotation; a set of sensing means respectively associated with said cams, each of said sensing means including a sensing lever, a cam follower member on each sensing lever, said cam follower members being arranged in an axially extending row, means urging said sensing levers into a position in which said cam follower members engage the surface of said control drum member so that said sensing levers move to an operative position when the respective cam follower member passes over the associated cam; a movable actuating bar member tending to assume an inoperative position and being movable to an operative position, said bar member having a portion extending across all said sensing levers spaced from the same; a set of selector key means axially spaced corresponding to the axial spacing of said sensing means

and respectively associated with said printing sections and said sensing means, each selector key means tending to assume an inoperative position and being movable to an actuated position, each selector key means including a coupling member assuming to a coupling position located between and coupling said portion of said bar member and the respective associated sensing lever when the associated selector key means is in said actuating position so that said actuating bar member moves to said operative position thereof when any sensing lever moves to the operative position thereof while the associated selector key means is in said actuating position thereof; and circuit means including contact means controlled by said actuating bar member and being connected to said electro-magnetic means so that said electro-magnetic means is controlled to effect movement of said counter-roller by said operating means to said printing position when one of said sensing levers selected by actuation of the associated selector key means moves to said operative position during turning of said control drum member whereby selected printing sections associated with actuated selector key means are printed on said copy sheets.

15. In a duplicating machine, in combination, a rotary printing roller and a counter-roller cooperating with said printing roller along a printing line, said counter-roller being movable to and from a printing position in close proximity with said printing roller; operating means for effecting movement of said counter-roller to and from said printing position and including an electro-magnetic means for moving said counter-roller to said printing position, when energized; feeding means for feeding copy sheets to said rollers; a printing form attached to said printing roller and having a set of circumferentially spaced printing sections; a turnable control drum member having an axis of rotation and including a set of axially spaced circumferentially staggered projecting cams respectively associated with said printing sections and arranged substantially along a helix; transmission means connecting said control drum member with said printing roller for synchronous rotation; a set of sensing means respectively associated with said cams, each of said sensing means including a sensing lever, a cam follower member on each sensing lever, said cam follower members being arranged in an axially extending row, means urging said sensing levers into a position in which said cam follower members engage the surface of said control drum member so that said sensing levers move to an operative position when the respective cam follower member passes over the associated cam; a movable actuating bar member tending to assume an inoperative position and being movable to an operative position, said bar member having a portion extending across all said sensing levers spaced from the same; a set of selector key means axially spaced corresponding to the axial spacing of said sensing means and respectively associated with said printing sections and said sensing means, each selector key means tending to assume an inoperative position and being movable to an actuated position, each selector key means including a coupling member assuming to a coupling position located between and coupling said portion of said bar member and the respective associated sensing lever when the associated selector key means is in said actuating position so that said actuating bar member moves to said operative position thereof when any sensing lever moves to the operative position thereof while the associated selector key means is in said actuating position thereof; and circuit means including contact means closed by said actuating bar member in operative position of the same and being connected to said electro-magnetic means so that said electro-magnetic means is energized to effect movement of said counter-roller by said operating means to said printing position when one of said sensing levers selected by actuation of the associated selector key means moves to said operative position during turning of said control drum member whereby selected printing sections associated with actuated selector key means are printed on said copy sheets.

16. A machine as set forth in claim 15 and including locking means for locking each of said selector key means in said actuating position; and means for releasing said locking means.

17. A machine as set forth in claim 15 wherein each selector key means includes a shank portion, spring means engaging said shank portion for urging said key means to said inoperative position thereof, and wherein said coupling member including a coupling lever pivotally connected to said shank portion and a roller mounted on said coupling lever and in rolling contact with the respective associated sensing lever, said roller being located between said portion of said bar member and the respective sensing lever in said coupling position.

18. A machine as set forth in claim 1 wherein said operating means include toggle lever means movable between a straightened position for urging said one roller to said printing position, and an angular position; and spring means connected to said toggle lever means for urging said toggle lever means into one of said positions of the same, said electro-magnetic means being connected to said toggle lever means for holding the same in the other position of the same when energized.

19. A machine as set forth in claim 1 wherein the axes of said printing roller and said counter-roller are parallel, wherein the axis of said control member is transverse to said axes of said rollers; and wherein said transmission means include a shaft connected to said control member for rotation and being coaxial with the same, a bevel gear on said shaft, and other bevel gear means meshing with said bevel gear and being driven from said printing roller.

20. In a duplicating machine, in combination, a rotary printing roller and a counter-roller cooperating with said printing roller, one of said rollers being movable to and from a printing position in close proximity with the other roller; operating means for effecting movement of said one roller to and from said printing position and including an electro-magnetic means; feeding means for feeding copy sheets to said rollers; a printing form attached to said printing roller and having a set of circumferentially spaced printing sections; a turnable control member having an axis of rotation and including an axially extending set of control elements respectively associated with said printing sections; means connecting said control member with said printing roller for turning movement in timed relation with the same; a set of sensing elements, each of said sensing elements being associated with one of said control elements and being normally in an inoperative condition, the elements of one of said sets of elements being arranged along a helix, and the elements of the other set of elements being arranged in an axially extending straight row; a set of selector means axially spaced to the axial spacing of said sensing elements and respectively associated with said printing sections and said sensing elements, each selector means being selectively movable to an actuating position for rendering the associated sensing elements operative; and circuit means connected to said electro-magnetic means and being controlled by sensing elements rendered operative by the associated selector means so that said electro-magnetic means is controlled to effective movement of said one roller by said operating means to said printing position when an operative sensing element senses the associated control elements during turning of said control member whereby selected printing sections associated with actuated selector means are printed on said copy sheets.

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