

March 29, 1966

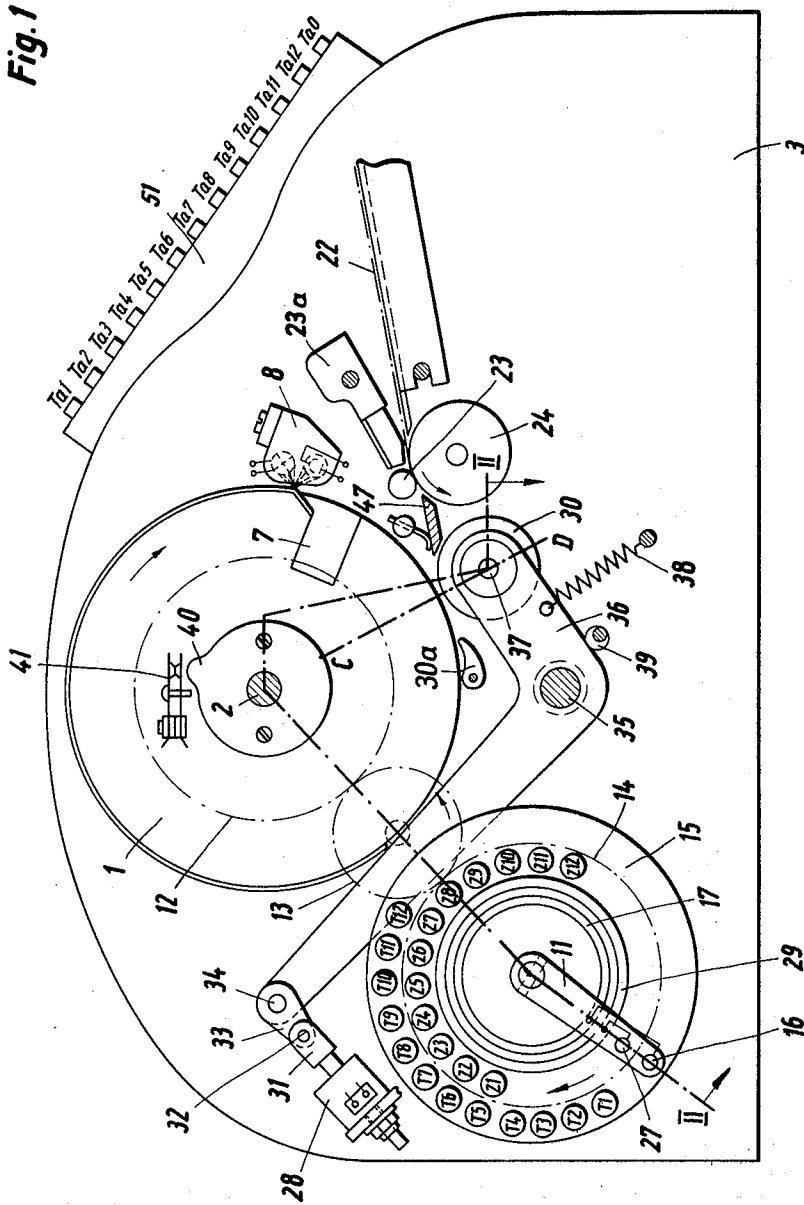
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3,242,854

PROGRAM CONTROLLED SELECTIVE PRINTING MACHINE

Filed April 10, 1964

8 Sheets-Sheet 1



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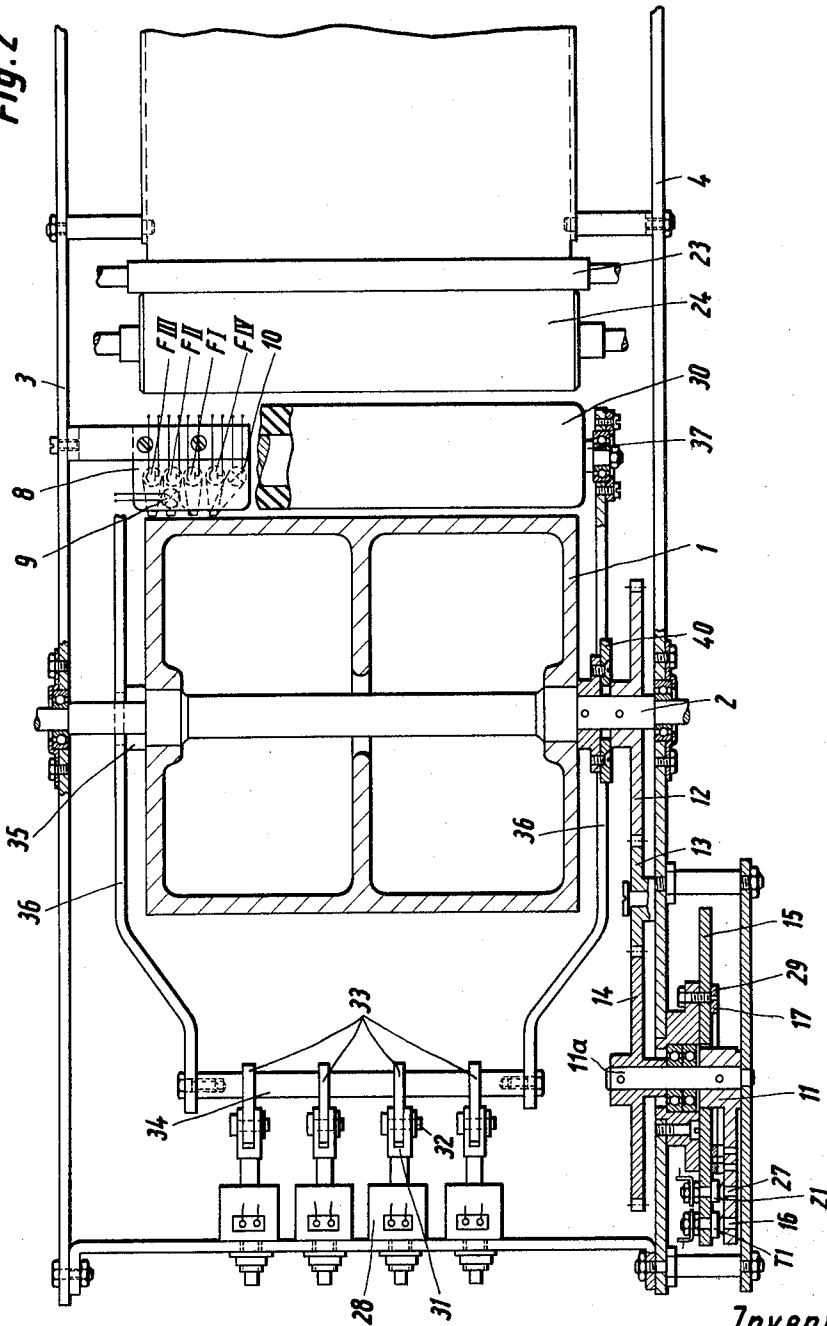
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PROGRAM CONTROLLED SELECTIVE PRINTING MACHINE

Filed April 10, 1964

8 Sheets-Sheet 2

Fig. 2



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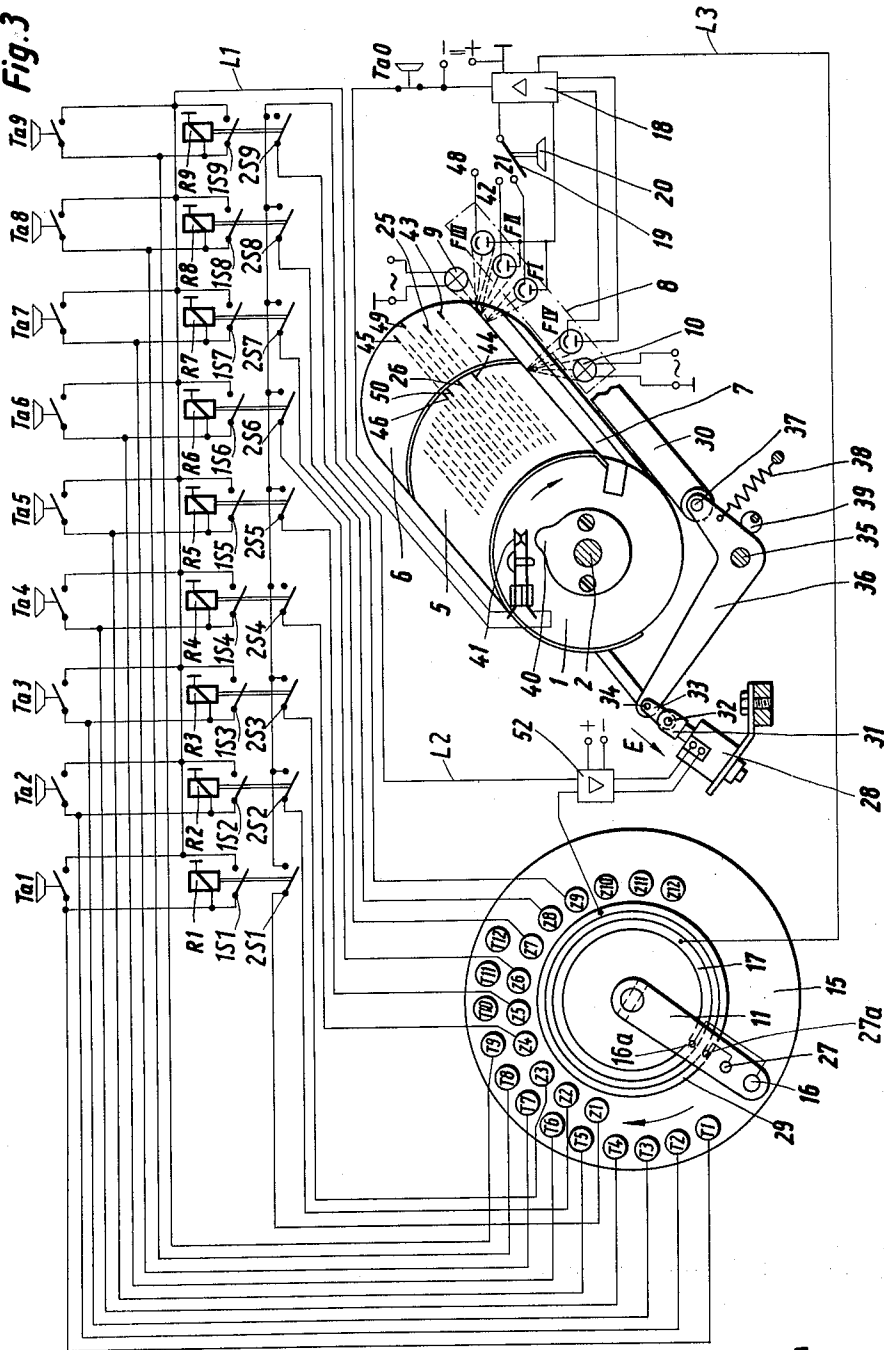
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PROGRAM CONTROLLED SELECTIVE PRINTING MACHINE

Filed April 10, 1964

8 Sheets-Sheet 3

Fig. 3



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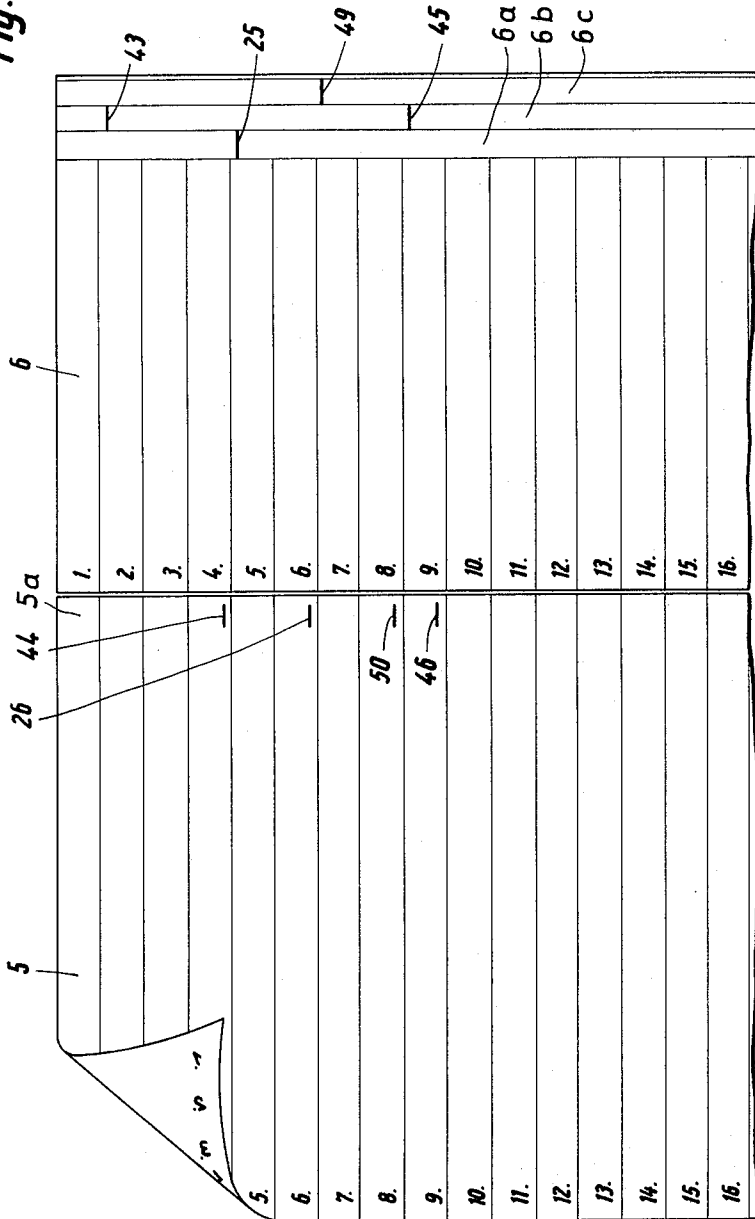
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PROGRAM CONTROLLED SELECTIVE PRINTING MACHINE

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8 Sheets-Sheet 4

Fig. 4



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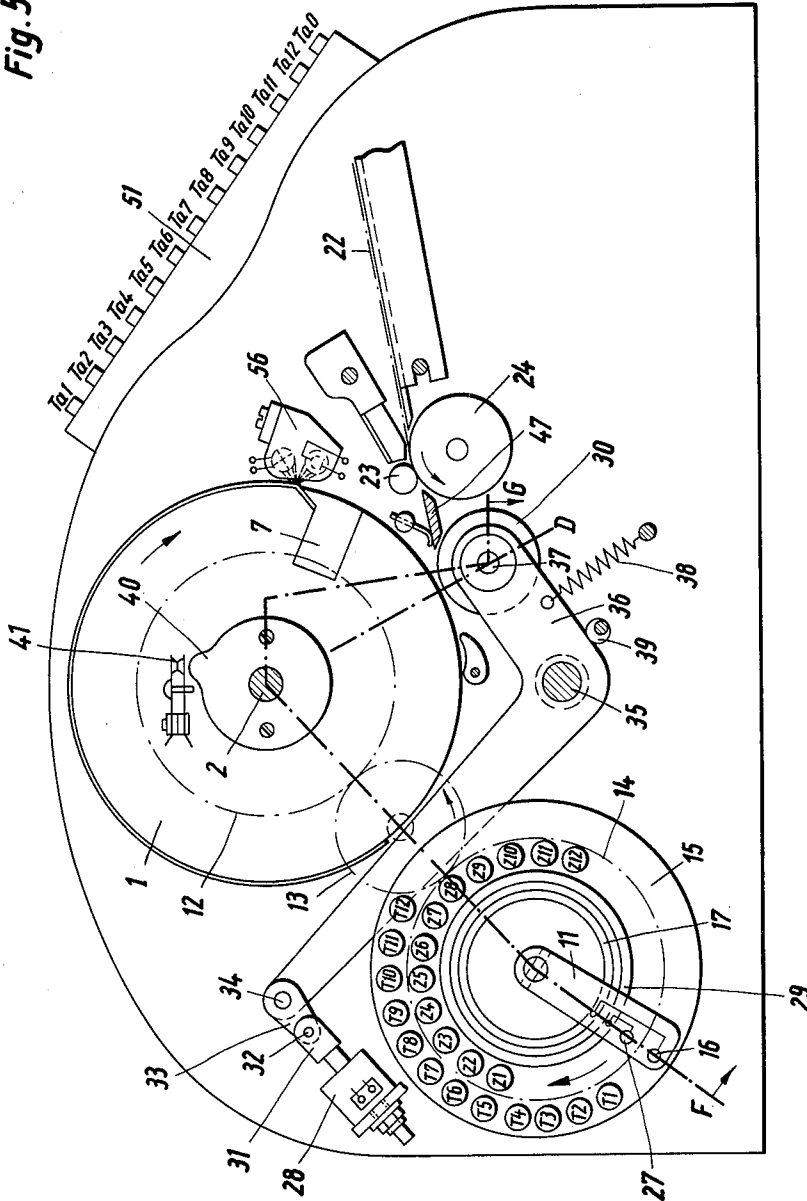
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PROGRAM CONTROLLED SELECTIVE PRINTING MACHINE

Filed April 10, 1964

8 Sheets-Sheet 5

Fig. 5



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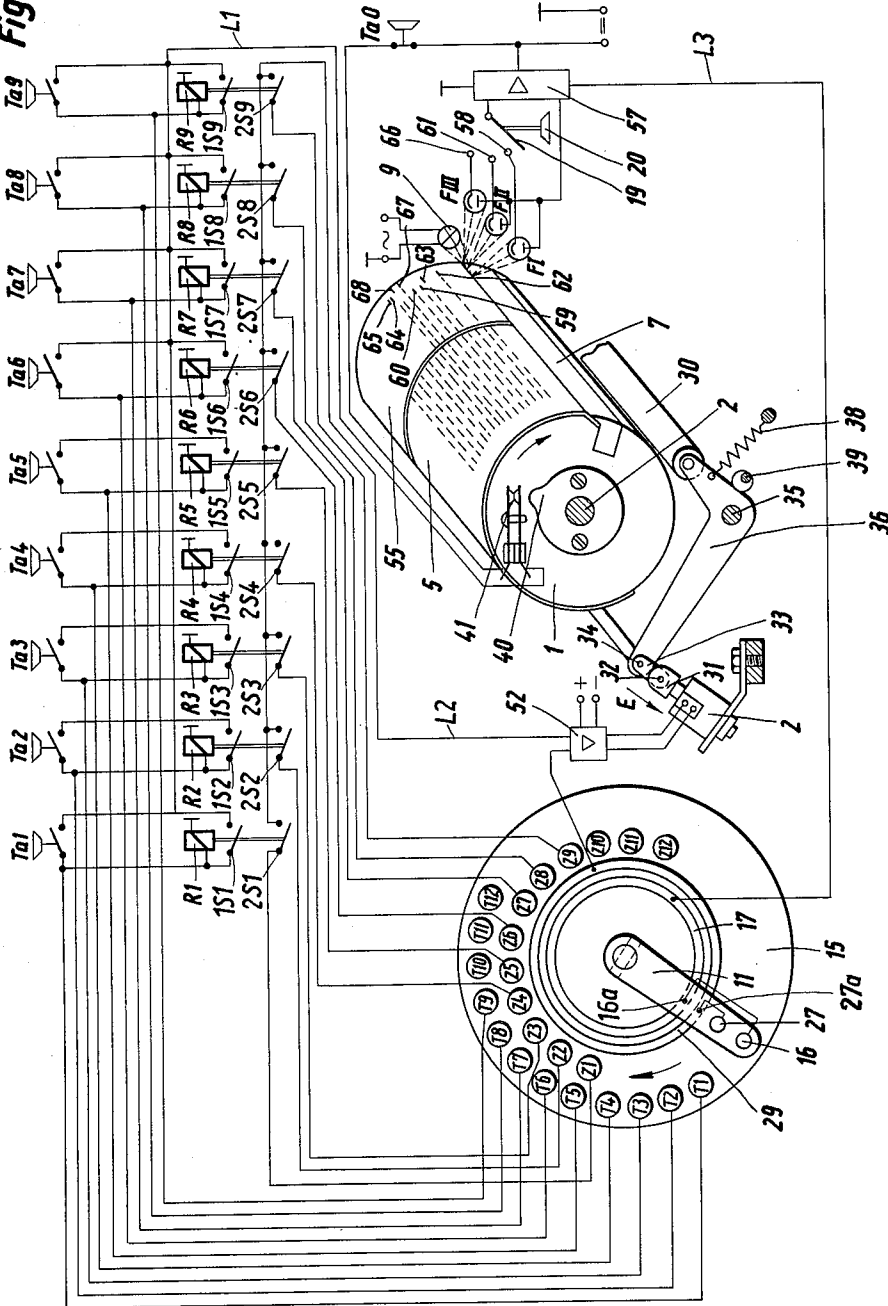
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PROGRAM CONTROLLED SELECTIVE PRINTING MACHINE

Filed April 10, 1964

8 Sheets-Sheet 7

Fig. 7



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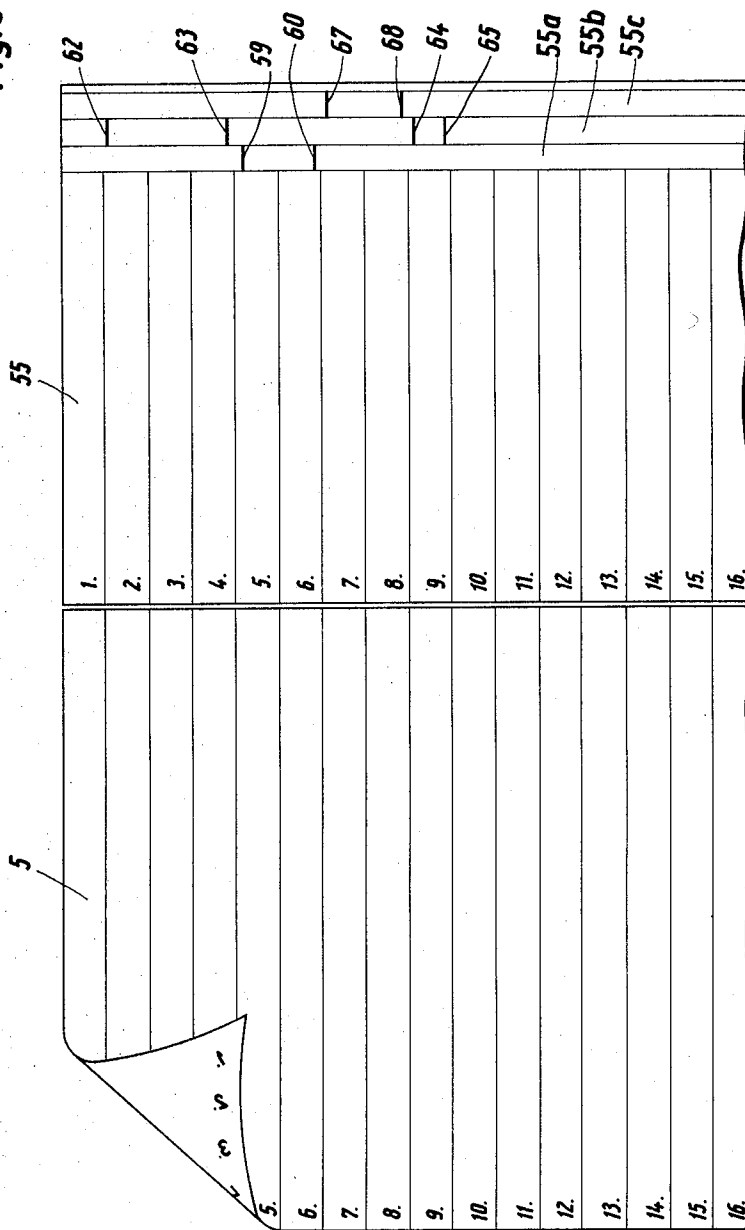
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PROGRAM CONTROLLED SELECTIVE PRINTING MACHINE

Filed April 10, 1964

8 Sheets-Sheet 8

Fig. 8



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3,242,854
PROGRAM CONTROLLED SELECTIVE PRINTING MACHINE

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R 34,942

15 Claims. (Cl. 101—91)

The present invention relates to a program controlled selective printing machine, and more particularly to a rotary duplicator of the type in which selected text line sections of a printing form or master sheet, are selected for printing by sensing means sensing marks provided for designating desired text sections.

It is known to provide printing machines of this type with electromagnetic means for moving a counter-pressure roller in a translatory movement toward and away from the printing roller, and to control the electromagnetic means by impulses derived from sensing means sensing markings correlated with each text line section of the printing form which is to be reproduced. For example, if eight text lines of a text on a printing form are to be printed in succession on a copy sheet, eight markings have to be placed on the printing form for causing an impulse of the sensing means for each desired text line section, and corresponding movement of the counterpressure roller toward the printing roller into a printing position.

The marking of each selected line is a time consuming operation, and it is one object of the present invention to overcome this disadvantage of known program controlled selective printing machines, and to provide a printing machine which automatically prints series of text line sections under control of only two impulses received from sensing means.

Another object of the invention is to provide in a selective printing machine a program producing a starting impulse and a stop impulse for the first line and for the last line of a series of successive text line sections which are to be printed.

Another object of the invention is to rotate a program carrier in synchronism with a printing form, and to mark on the program carrier the beginning and end of a series of text line sections desired to be printed.

Another object of the invention is to prepare a number of circuits respectively associated with text line sections by an impulse received from a first marking, and to successively close the prepared circuits as a selected series of text line sections passes the printing line so that the closed circuits cause printing of the respective series of text line sections until all circuits are interrupted under the control of a final sensed marking indicating the end of the series.

Another object of the invention is to provide a selective printing machine adapted to print selected series of text line sections during successive revolutions of the printing roller in accordance with a program having pairs of markings respectively indicating the beginning and end of each series of text line sections to be printed during successive revolutions of the printing roller.

With these objects in view, the present invention relates to a program controlled selective printing machine which comprises a rotary printing roller; record carrier means including a printing form located on the periphery of the printing roller, and program means, preferably a program sheet also located on the periphery of the printing roller; a counterpressure roller; operating means for moving one of the rollers to a printing position in which a copy sheet

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is imprinted by the printing form; sensing means; and control means controlled by the sensing means to actuate the operating means to move the movable roller to the printing position and to the inoperative position.

In accordance with the present invention, the printing form is composed of a series of circumferentially adjacent text line sections, and the program means is composed of a series of line sections correlated with corresponding text line sections. First and second markings are provided in the line sections either only on the program means, or partly on the program means and partly on the printing form, for identifying the first and last text line sections only of a group of adjacent successive text line sections.

The sensing means sense the first and second markings during rotation of the printing roller and prepare the circuit of the operating means to start the printing operation when the sensing means senses a first marking and to stop printing when the sensing means senses a second marking. In this fashion, the group of text line sections between the first and second markings is printed on a copy sheet.

In one embodiment of the present invention, the program sheet carries the first markings which cause the start of printing operations by which a series or group of text line sections is printed, and the printing form carries second stop markings which, when sensed, will cause the termination of the printing operation so that a limited series of text line sections is printed. In another embodiment of the invention, the first and second markings are both provided on a program sheet and are successively sensed by the sensing means which control the movable roller, preferably counterpressure roller, to move to a printing position at the beginning of a series of text line sections to be printed, and to move to an inoperative position when the last text line section of the series has passed through the gap between the counterpressure roller and the printing roller.

In order to provide the program for successive revolutions of the printing roller, the program means has a plurality of columns respectively composed of line sections, and respectively correlated with successive revolutions of the printing roller. First and second markings may be provided in each of the columns for indicating the start and the end of a series of text line sections which are to be printed during the respective revolution of the printing roller, and if several series of successive text line sections are to be printed, first and second markings will be provided in the line sections of the respective column at the beginning and end of each series of text line sections. It is also possible to provide the first markings in the columns of the program means, and second markings in a column of the printing form. In fact, the place where the first and second markings are provided is immaterial as long as the program means move in synchronism with the printing roller and have line sections respectively correlated with the text line sections of the printing form.

If several start and stop markings are provided in several columns correlated with successive revolutions of the printing roller, the sensing means are connected to a selector switch by which the sensing means can be set before each revolution of the printing roller to sense the column having the start and stop markings related to the respective revolution of the printing roller.

In one embodiment of the invention, the impulses produced by sensing means sensing a first or second marking, are supplied to the circuit of a flip-flop amplifier which is placed in one condition when receiving an impulse produced by a start marking, and switched to another condition when receiving an impulse produced by the stop

marking. The two conditions of the amplifier are used for controlling a circuit preparing switch of another circuit in such a manner that successive text line sections are printed in the first condition of the flip-flop amplifier, whereas no printing takes place in the second condition of the flip-flop amplifier.

A contact arm rotates in synchronism with the printing roller, and cooperates with two sets of contacts of the two circuits, the contacts of each set being respectively correlated with the text line sections of the printing form, but being arranged offset relative to each other.

As the contact arm moves along the first set of contacts, relays are energized if the flip-flop amplifier is in its first condition making a circuit so that the corresponding circuit preparing relay switches are closed and prepare the circuit of the second set of contacts which are then engaged by the rotating contact arm to actuate an electromagnetic operating means by which the counterpressure roller is moved to the printing position. When the flip-flop amplifier is switched to its second condition breaking the circuit, the relays correlated with successive circuit preparing switches and contacts of the first set are not energized, and consequently the electromagnetic means is not energized when the contact arm passes over the following contacts of the second set. At the end of each revolution of the printing roller, a clearing switch is opened which causes deenergization of the energized relays which until then are held by holding contacts, so that the circuit is again in its initial position. The sensing means may then be set by a selector switch to a condition sensing the markings associated with the next following revolution of the printing roller and determining the beginning and the end of the series of text line sections which are to be printed during such next following revolution of the printing roller.

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:

FIG. 1 is a side view, partially in section, and with one side wall omitted, and illustrating a printing machine in accordance with one embodiment of the invention;

FIG. 2 is an exploded sectional view taken on line II—II in FIG. 1;

FIG. 3 is partly a schematic perspective view illustrating the embodiment of FIG. 1, and partly a diagram illustrating the electric circuit of the embodiment of FIG. 1;

FIG. 4 is a view illustrating a record carrier means used in the embodiment of FIG. 1 and including a printing form and a program sheet;

FIG. 5 is a side view, partly in section, with one side wall omitted, and illustrating a machine according to another embodiment of the invention;

FIG. 6 is an exploded sectional view taken on line VI—VI in FIG. 5;

FIG. 7 is partly a schematic perspective view illustrating the embodiment of FIG. 5, and partly a diagram illustrating the electric circuit of the embodiment of FIG. 5; and

FIG. 8 is a record carrier used in the embodiment of FIG. 5 and including a printing form and a program sheet.

Referring now to the drawings, and more particularly to FIGS. 1 to 4 which illustrate the first embodiment of the invention, the general construction of the printing or duplicating machine is somewhat schematically illustrated since machines of this type are well known. A printing roller 1 is mounted on a shaft 2 on support walls 3 and 4 of the machine frame, and is rotated in the direction of the arrow by a motor, not shown. Record carrier means are secured to the periphery of the printing roller

by a holding means 7, and as best seen in FIG. 4 include a printing form 5 provided with sixteen text line sections, for example, and a program sheet 6 provided with corresponding sixteen line sections, the two sheets being attached to the printing roller in such a manner that the respective line sections are located adjacent each other in circumferential direction of the printing roller, while correlated text line sections and line sections of sheets 5 and 6 are aligned in axial direction of the printing roller. Markings 44, 26, 50, 46 are applied in selected line sections of printing form 5, and markings 43, 25, 49, 45 are applied in selected line sections of the program sheet 6 in a fashion which will be explained hereinafter in greater detail. Such markings may be made by imprints of a type-writer, with ink, or with pencils by the operator which plans the program of printing operations. The markings on printing form 5 are located in a single column, while the markings on program sheet 6 are provided in three adjacent circumferentially extending columns. The respective columns of program sheet 6 are respectively associated with successive revolutions of the printing form, as will be explained hereinafter.

As shown in FIG. 1, sensing means 8 are provided for sensing the markings, and as shown in FIG. 3, sensing means 8 includes a lamp 9 cooperating with three photocells FI, FII, FIII which respectively sense the three columns on program sheet 6. A fourth photocell FIV senses the markings on the printing form 5. The light of lamp 9 falls on the area covered by the columns of program sheet 6 so that markings will cause an impulse in the respective photocells, while light of lamp 10 will be reflected by the markings on the printing form to cause photocell FIV to produce an impulse.

Referring again to FIGS. 1 and 2, printing roller 1 cooperates with the counterpressure roller 30 which is mounted for turning movement on a shaft 37 carried by a pair of angular levers 36 turnable about a shaft 35, and being actuated by electromagnetic operating means 28 which have movable armatures 31 connected by pivot pins 32 to links 34 connected with a rod 34 extending between levers 36. It is evident that upon energization of the electromagnetic means 28, which are shown to include four electromagnets, the counterpressure roller 30 will be moved toward the printing roller into a printing position, while spring 38 will retract counterpressure roller 30 to an inoperative position illustrated in FIG. 1 when electromagnetic means 28 are deenergized. An eccentric stop 39 limits the movement of levers 36 when the counterpressure roller 30 arrives in its inoperative position.

Copy sheets 22 supplied in a conventional manner before each revolution of the printing roller, are moistened by moistening means 23a, and are transported between transporting rollers 23 and 24 to a resilient clamping means 47 which stops the respective copy sheet when the same is not positively transported. When a copy sheet moves into the gap between the printing roller and the counterpressure roller, and counterpressure roller 30 is moved to its printing position, the printing roller and counterpressure roller will transport the copy sheet while an imprint is made by the respective text line section of printing form 1 passing through the printing plane C—D. A stripper 30a strips the printed copy sheet from the printing form.

A contact arm 11 rotates in synchronism with the printing roller 1 and is connected to shaft 2 by a gear train 12, 13, and 14, gear 14 being secured to shaft 11a which carries the rotary contact arm 11.

Contact arm 11 carries a first pair of connected contacts 27, 27a, and a second pair of connected contacts 16 and 16a. Contact 27a and 16a respectively slide on circular slide rings 29 and 17, while contacts 16 and 27 cooperate, respectively, with two series of contacts T1 to T12, and Z1 to Z12 which are arranged along circular concentric lines staggered relative to each other so that contact arm 11 will first cooperate with contacts T1 to

T4, and then cooperate with contacts Z1 to Z12 and contacts T5 to T12 while rotating in the direction of the arrow in synchronism with the printing roller 1.

FIG. 1 also shows a keyboard including a set of selector keys Ta1 to Ta12 and also a key Ta0. Keys Ta1 to Ta9, and key Ta0 are also shown in FIG. 3, while keys Ta10 to Ta12 are omitted for the sake of simplicity. Each key Ta1 to Ta12 operates a switch one terminal of which is connected to a line L1, while the other terminals are respectively connected to first terminals of a series of relays R1 to R12, of which only relays R1 to R9 are shown. The second terminal of each relay is connected to mass and thereby to the positive pole of a source of direct current. The relays operate holding contacts 1S1 to 1S12, and other contacts 2S1 to 2S12 one terminal of each holding contact is connected by line L1 and a switch 41 to a manually operated clearing switch controlled by key Ta0. Switch 41, also shown in FIG. 1 is operated by a cam 40 secured to shaft 2 and rotating in synchronism with printing roller 1 to open switch 41 at the end of each revolution of printing roller 1. The other terminal of each holding contact 1S1 to 1S12 is connected to the first terminal of the respective relay.

One terminal of each relay contact 2S1 to 2S12 is connected to a line L2 which leads to an amplifier 52 connected to electromagnetic means 28 by which the counterpressure roller 30 is operated. The other terminal of amplifier 52 is connected to slide ring 29. Slide ring 17 is connected by a line L3 to a flip-flop amplifier 18, one terminal of which is connected to mass.

Flip-flop amplifier 18 is controlled by the four photocells FI, FII, FIII, and FIV. A selector switch 19, 20 is provided between amplifier 18 and the three photocells FI, FII, FIII, and when switch 19 is connected to contacts 21, 42, 48 by a manual operation, the flip-flop amplifier is controlled by the respective photocell. The arrangement is such that any impulse produced by a photocell will place the flip-flop amplifier in a first condition, and any following impulse received from a photocell will place the flip-flop amplifier in another condition for making or breaking, respectively, the circuit including line L3.

Contacts T1 to T12 are respectively connected to the relays R1 to R12 and to the key contacts of keys Ta1 to Ta12, as shown in FIG. 3 for the first nine contacts. Contacts Z1 to Z12 are respectively connected to corresponding terminals of relay contacts 2S1 whose other contacts are connected by line L2 to amplifier 52 and electromagnetic means 28. The embodiment of FIGS. 1 to 4 is operated as follows:

It is assumed that from one master sheet 5, three different sets of prints are to be made on copy sheets. For example, one copy sheet, or set of copy sheets, is to receive imprints of lines 5 and 6 only. A second copy sheet, or set of copy sheets, is to receive imprints of lines 2 to 6 and of line 9 only. A third copy sheet, or set of copy sheets, is to receive imprints of lines 7 and 8 only. Printing from 5 and program sheet 6 are marked correspondingly as shown in FIG. 4. The first column 6a of program sheet 6 will be used for printing the first selection, and a marking 25 is entered in column 6a in the leading portion of line 5. A marking 26 is entered in column 5a in the trailing portion of line 6. Marking 25 will indicate the start of a printing operation by which lines 5 and 6 will be printed, and marking 26 will terminate the printing operation.

A marking 43 is entered in the second column 6b at the leading end of the second line to indicate the start of a printing operation during another revolution of the printing roller, and marking 44 is entered in column 5a of printing form 5 at the trailing end of line 4 to indicate the end of the respective printing operation by which lines 2, 3 and 4 will be printed. A marking 45 is entered in the same column 6b at the leading portion of line 9, and the marking 46 is entered at the trailing

portion of line 9 in column 5a to indicate that line 9 will also be printed during the same revolution of the printing roller as lines 2 to 4.

A marking 49 is entered in column 6c at the leading portion of line 7, and a marking 50 is entered at the trailing portion of line 8 to indicate the beginning and end of a printing operation for printing lines 7 and 8 during a third revolution of the printing roller.

After the operator has prepared the printing form and program sheet for the intended automatic printing operations, the record carrier means 5, 6 is clamped by holding means 7 to the periphery of printing roller 1, and as best seen in FIG. 3, photocells FI, FII, FIII are positioned to sense columns 6a, 6b, 6c, respectively, while photocell FIV is positioned to sense column 5a of the printing form 5. Whenever the light of the respective lamp falls on a marking, an impulse is produced by the respective photocell and supplied to the flip-flop amplifier 18 to switch the same between its circuit making and circuit breaking conditions.

In order to print the fifth and sixth text line sections of the printing form during the first revolution of the printing line, selector switch is connected to contact 21 of photocell FI. Photocell FI is now connected to flip-flop amplifier 18 and controls the same together with photocell FIV.

Before the text line sections of the printing form approach the printing plane C-D, contact arm 11, rotating in synchronism with printing roller 1, arrives at a position in which contact 16 engages contact T1, and then the following contacts. Shortly before marking 25 in the fifth line of column 6a of program sheet 6 enters the zone of the light beam of lamp 9, contact 16 engages contact T5 and establishes through slide ring 17 and line L3 a connection with flip-flop amplifier 18. Directly thereafter, the light reflected from marking 25 creates an impulse in photocell FI which passes through selector switch 21, 20 to flip-flop amplifier 18, line L3, slide ring 17, contacts 16a, 16, T5 to relay R5 so that the same is energized and closes relay contacts 1S5 and 2S5 so that holding contact 1S5 holds relay R5 in energized condition, while relay contact 2S5 connects contact Z5 through line L2 and amplifier 52 to slide ring 29. In this manner the circuit of contact Z5 is prepared. Since flip-flop amplifier 18 remains in its circuit making condition when contact arm 11 places contact 16 on contact T6, relay R6 is also energized, and the relay contacts 1S6 and 2S6 close, preparing the circuit of contact Z6.

Contact arm 16 now moves to a position in which contact 16 begins to leave contact T6. In this moment, the trailing portion of line 6 of column 5a of printing form 5 moves to a position illuminated by lamp 10, and marking 50 produces an impulse in photocell FIV which is supplied to the flip-flop amplifier 18 and switches the same to a circuit breaking condition so that the following relays R6 to R12 are not energized when contact 16 passes over contact T7 to T12. Only relay contacts 1S5, 1S6, 2S5 and 2S6 are closed at this moment.

In the meantime, contact 27 of contact arm 11 has passed over contacts Z1 to Z4 without any effect since the corresponding relay contacts 2S1 to 2S4 are open. When the fifth text line section of the printing form 5 moves into the printing plane C-D, contact 27 arrives at contact Z5, and since the corresponding relay contact 2S5 is closed, a current flows through line L2 and amplifier 52, which is connected to the source of voltage, so that electromagnetic means 28 is energized, and lever means 36 operated to move counterpressure roller 30 from its inoperative position spaced from printing roller 1 to a printing position in close proximity with printing roller 1. A copy sheet 21 supplied by transporting means 23, 24 to the gap between rollers 1 and 30, is pressed by counterpressure roller 30 against the fifth text line section and a corresponding imprint is made.

When contact 27 of contact arm 11 leaves contact Z5, electromagnetic means 28 is deenergized and spring 38 retracts counterpressure roller 30 to its inoperative position. However, since relay contact 2S6 is also closed, the operation is repeated when contact 27 arrives at contact Z6, and the sixth text line section of printing form 5 is also imprinted on the copy sheet. When contact 27 leaves contact Z6, electromagnetic means 28 is deenergized, and remains in this condition since relay contacts 2S7 to 2S12 are opened.

Before printing roller 1 arrives again in its initial position after performing a revolution, cam 40 engages terminal switch 41 and opens the same so that all relays are disconnected from the voltage source, and the two energized relays R5 and R6 are deenergized so that relay contacts 1S5, 1S6, 2S5 and 2S6 open.

If the machine is left with selector switch 19 on contact 21, the same two lines will be printed on a series of copy sheets during following revolutions of the printing roller. If a second selection of text line sections is to be made, the operator shifts selector switch 19 to contact 42 so that photocell FII is connected into the circuit and column 6B of program sheet 6 is sensed, together with column 5a of printing form 5. A new copy sheet is supplied by transporting rollers 23, 24 to the printing plane A-D. Contact arm 11 rotates as described above, and when contact 16 engages contact T2, marking 43 is sensed in the leading portion of the second line of the program sheet by photocell FII, and a corresponding impulse passes through switch 20, 42 to the flip-flop amplifier 18 which is placed in a circuit making condition so that relay R2 is energized and closes relay contact 1S2 and 2S2, holding itself by contact 1S2. Contact 2S2 prepares the circuit of electromagnetic means 28 with contact Z2. Since flip-flop amplifier 18 remains in the circuit making condition while contact 16 passes over contacts T3 and T4, relays R3 and R4 are energized and switches 2S3 and 2S4 are also closed establishing a circuit to contacts Z3 and Z4.

Marking 44 in the trailing portion of the sixth line of printing form 5 is now sensed by photocell FIV which produces an impulse causing switching of flip-flop amplifier 18 to the circuit breaking condition so that the following relays R5, R6, R7 and R8 are not energized when contact 16 passes over the corresponding contacts T5 to T8.

When the second, third and fourth text line sections of printing form 5 pass through the printing plane, contact 27 engages contacts Z2, Z3, and Z4 closing the circuit of electromagnetic means 28 through the respective closed relay contacts, line 2, amplifier 52, slide ring 29 and contact 27a so that counterpressure roller 30 moves three times to its printing position to print the respective text line sections of the printing form on copy sheet 22.

When contact 16 arrives at contact T9, photocell FII senses the marking 45 in the leading portion of line 9 of column 6b of program sheet 6 so that an impulse is supplied through switch 20, 42 to flip-flop amplifier 18 which establishes a circuit for energizing relay R9 so that relay contacts 1S9 and 2S9 close whereby the circuit of contact Z9 is prepared. When contact 27 of contact arm 11 arrives during further rotation of the printing roller 1 in a position engaging contact Z9, electromagnetic means 28 is energized at the moment in which the ninth text line section of printing form 5 passes through the printing plane so that a corresponding imprint is made on the copy sheet. While contact 27 still passes over contact Z9, photocell FIV senses the marking 46 in column 5a of printing form 5 and produces an impulse which switches flip-flop amplifier 18 so that the following relays R10 to R12 are not energized and counterpressure roller 30 is not operated during passage of contact arm 11 over the remaining contacts Z10 to Z12. The clamping device 47, see FIG. 1, holds the copy sheet 22 immovable during passage of the fifth to eighth text section

lines of the printing form through the printing plane, so that the imprint of the ninth text line section appears on the copy sheet adjacent the imprint of the fourth text line section.

Before printing roller 1 arrives again in its initial position after one revolution, cam 40 opens terminal contact 41 so that all previously energized relays are deenergized and the corresponding relay contacts open. Conventional ejecting rollers, not shown, are used for ejecting the printed copy sheet in the retracted position of the counterpressure roller.

When the operator decides to produce copies with text line sections selected in accordance with the program determined by the third column 6c of program sheet 6, he shifts selector switch 20 to contact 48 so that photocell FIII is now effective to sense column 6c with which it is associated. Printing roller 1 is started, and a new copy sheet is transported by transporting rollers 23 and 24 into the printing plane C-D. Contact arm 11 rotates in synchronism with the printing roller, and when contact 16 arrives at contact T7, photocell FIII senses marking 49 and produces an impulse which shifts flip-flop amplifier to its circuit making condition so that a current flows through line L3, slide ring 17, contacts 16a, 16 and contact T7 to relay R7 which closes its relay contacts so that contact Z7 is connected by contact 2S7 to amplifier 52 and electromagnetic means 28. Relay R7 holds itself by relay contact 1S7 when contact 16 moves onto contact 8. Since photocell FIII senses no marking in the leading portion of the eighth text line section of printing form 5, no impulse is supplied to flip-flop amplifier 18 and the same remains in its circuit making condition so that relay R8 is energized and contacts 1S8 and 2S8 are closed. Contact 2S8 prepares the circuit of contact Z8, and contact 1S8 holds relay R8 energized together with relay R7 when photocell FIV senses marking 50 in the trailing portion of the eighth text line section of printing form 5 and produces an impulse which switches the flip-flop amplifier 18 to its circuit breaking condition in which no further relay is energized while contact 16 passes over contacts T9 to T12.

When contact 27 passes over contact Z7 and Z8, the seventh and eighth text line sections of the printing form 5 pass through the printing plane, and since the circuit of the electromagnetic means 28 is closed during engagement of contact 27 with contacts Z7 and Z8, counter-pressure roller 30 is twice moved to its printing position and the respective text line sections are printed on the copy sheet. At the end of the last line, cam 40 opens terminal contact 41, and since all relays are disconnected from the source of voltage, the energized relays R7 and R8 are deenergized and the corresponding relay contacts open so that the initial condition of the machine is again restored. If switch 19, 20 is left in the position connected to contact 48 during the following revolutions of the printing roller, the same selected text line section will be printed during each following revolution on a supplied copy sheet.

If the operator decides that on one or several copy sheets, one or several additional text line sections, not previously selected by markings, are to be printed, the operator depresses one or several of the manually operated selector switches T81 to T812 whereby the respective relay is energized in addition to the relays automatically energized under the control of the sensed markings, and the circuits of the respective contacts Z1 to Z12 are prepared by the closed relay contacts of the respective manually energized relays. Terminal switch 41 deenergizes also the manually energized relays at the end of the revolution of the printing roller, so that if the same or another additional line is to be added to the program selected lines, the respective switches Ta1 to Ta12 have to be again actuated by the operator before the next revolution of the printing roller. If an error occurs in the manual selection of additional text line sections, the

operator actuates the clearing switch **Ta0** which is connected in series with terminal clearing switch **41** and deenergizes all relays, including the erroneously energized relay, so that another relay can be manually selected before the next revolution of the printing roller is started.

The second embodiment of the invention illustrated in FIGS. 5 to 8 corresponds mechanically as well as electrically to the embodiment of FIGS. 1 and 4, and consequently like elements are indicated by the same reference numerals. Referring to FIG. 5, it will be seen that a printing roller **1** cooperates with a counterpressure roller **30** which is operated by electromagnetic operating means to move to and from a printing position. A contact arm **11** rotates in synchronism with printing roller **1** and has contacts **16** and **17** respectively cooperating with contacts **T1** to **T12** and **Z1** to **Z12**. Transporting rollers **23** and **24** transport the moistened copy sheet **22** into the region of the printing plane C-D so that text line sections of printing form **5** are printed on the copy sheet when electromagnetic means **28** moves counterpressure roller **30** to the printing position. As best seen in FIG. 8, the fashion in which the markings are applied to the record carrier is different from the system described with reference to FIG. 4. No markings are made on the printing form, and all markings are made in three or more columns of the program sheet **55** which is clamped by clamping means **7** to the periphery of the printing roller in a position adjacent to printing form **5**, as described with reference to FIG. 1. The start and stop markings are both provided in the same column of the program sheet, for example in column **55a** a first start marking **59** is marked in the leading portion of line **5**, and a second stop marking **60** is marked in the trailing portion of line **6**. Lines **5** and **6** are selected as described with reference to FIG. 4, but the second marking is not made on the printing form but on the program sheet.

Markings **62** and **63** are provided in lines **2** and **4** of the second column **55b** to start and stop a printing operation by which the second, third and fourth text line section is printed, and in the same column markings **64** and **65** provided at the leading and trailing ends of line nine will start and stop the printing operation by which line nine is printed on the same copy sheet since markings **62**, **63**, **64** and **65** are all provided in the same column **55b**.

Markings **67** and **68** in the third column **55c** will cause printing operations by which the seventh and eighth text line sections will be printed.

Since no markings are provided on the printing form, the sensing means **55** do not include a photocell and lamp cooperating with the printing form. As best seen in FIGS. 6 and 7, sensing means **55** include a lamp **9** directing a beam of light on all columns **55a**, **55b**, **55c** of the program sheet, and three photocells **FI**, **FII**, **FIII** are disposed to receive light reflected from markings in the three columns, respectively. A selector switch **19**, **20** can be manually operated to connect any selected photocell to the flip-flop amplifier **57**, the other terminals of the photocells being also connected to the flip-flop amplifier **57**, and the arrangement is similar as described with reference to FIG. 3 inasmuch as an impulse created by any photocell and supplied to flip-flop amplifier **57** will switch the same between a circuit making and a circuit breaking condition. At the beginning of a printing operation, the flip-flop amplifier **57** is in its circuit breaking condition, so that when any of the photocells **FI**, **FII**, **FIII** senses a marking, the impulse created thereby will switch flip-flop amplifier to its circuit making condition, while sensing of a second mark by the same photocell will cause a second impulse which will switch flip-flop amplifier **57** to its circuit breaking condition.

The circuit of FIG. 7 corresponds otherwise to the circuit described in detail with reference to FIG. 3. Line

L3 which is alternately connected to, or separated from the source of voltage by flip-flop amplifier **57**, is connected to slide ring **17** and by contact arm **11** to contacts **T1** to **T12** which control the energization of relays **R1** to **R12**. Relay contacts **2S1** to **2S12** are respectively connected to contacts **Z1** to **Z12** connected to electromagnetic means **28** by which counterpressure roller **30** is operated.

The embodiment of FIGS. 5 to 8 operates as follows:

When the operator decides that a copy sheet, or a first series of copy sheets is to be imprinted with a fifth and sixth text line section of the printing form **5**, he marks the leading portion of line **5** with marking **59** and the trailing portion of line six with markings **60** in column **55a** of program sheet **55**. The imprints on a second copy sheet or series of copy sheets are selected by applying start markings **62** and **64**, and stop markings **63** and **65** in the second column **55b** of program sheet **55** so that the second, third and fourth, and ninth text line sections will be printed. A third copy sheet, or series of copy sheets will be imprinted by the seventh and eighth text line sections only, and this is determined by the operator by applying start marking **67** and stop marking **68** in the third column **55c** of program sheet **55**. If a greater number of different copy sheets is to be printed, additional columns may be provided on program sheet **55**, and further contacts added to selector switch **19**, **20** and connected to additional photocells sensing the additional columns of program sheet **55**. Generally, however, three columns will be sufficient, and further variations of the selection can be obtained by closing one or several selected manually operated switches **Ta1** to **Ta12**.

The first series of copy sheets is to be printed in accordance with the program represented by column **55a**, and consequently the operator sets switch **19**, **20** to a position engaging contact **53** so that photocell **FI** senses column **55a**, while the other photocells are inoperative.

The revolution of the printing roller **1** is started so that contact **16** of contact arm **11** moves along contacts **T1** to **T5**, and in this position, photocell **FI** senses marking **59** and produces an impulse which places flip-flop amplifier **57** in its circuit making condition so that a current-flowing over contact **T5** energizes relay **R5** whereby relay contacts **1S5** and **2S5** are closed. Relay **R5** remains energized when contact **16** moves to contact **T6**, since relay contact **1S5** is a holding contact. Contact **Z4** is now connected through contact **2S5** to line **L2** and amplifier **52** to electromagnetic means **28**. Since photocell **FI** senses no marking in the leading portion of the sixth line of the program sheet, flip-flop amplifier **57** receives no impulse and remains in its circuit making condition when contact **16** establishes a circuit through contact **T1** whereby relay **R6** is energized and holds itself whereby the contact **Z6** is connected by relay contact **2S6** to electromagnetic means **28**. When the fifth and sixth text line sections pass through the printing plane, contact **27** engages contact **Z6** and **Z8**, completing the circuit so that electromagnetic means **28** are twice energized and the respective text line sections are printed on a copy sheet. When photocell **FI** senses the stop marking **60** in the trailing portion of line six of program sheet **55**, an impulse is created in photocell **FI** and supplied to the flip-flop amplifier **57** which is switched to its circuit breaking condition so that no relay is energized when contact **16** passes over the following contacts **T7** to **T12**.

At the end of each revolution, cam **40** opens terminal clearing switch **41** so that all relays are deenergized and the machine is ready for the next following printing operation which will result in printing the same selected lines if selector switch **19**, **20** is left on the same contact **58** connected to photocell **FI**. If the program according to the second column **55b** is desired for printing, switch **19**, **20** is shifted to contact **61** and photocell **FII** is connected to the flip-flop amplifier **57** so that successive im-

pulses received from photocell FII will switch the amplifier between its two conditions.

The printing roller is started, and when photocell FII senses marking 62, the circuit of contact Z2 is prepared when contact 16 arrives at contact T2, the circuit of contact Z3 is prepared when contact 16 arrives at contact T3, and the circuit of contact Z3 is prepared when contact 16 arrives at contact T4, flip-flop amplifier 57 remaining in its circuit making condition to which it was switched by the impulse produced by photocell FII sensing marking 62 so that relays R2, R3, R4 are energized.

When during the continuing rotation of printing roller 1, stop marking 63 is sensed for photocell FII, the impulse applied to flip-flop amplifier 57 will shift the same to a circuit breaking condition so that line L3 is interrupted and the following relays R5, R6, R7, R8 are not energized. When the leading portion of line nine of the program sheet 55 is sensed by photocell FII, an impulse is created which switches flip-flop amplifier 57 to the circuit making condition so that relay 9 is energized when contact 16 arrives at contact T9, and contact Z9 is connected by relay contact 2S9 to amplifier 52 and electromagnetic means 28 when contact 27 arrives at contact Z9. Counterpressure roller 30 is moved to the printing position, and the ninth text line section of the printing form is printed on the same copy sheet as the second, third and fourth text line sections.

For the next series of copy sheets, switch 19, 20 is shifted to the position connected to contact 66 so that photocell FIII is operative to sense the third column 55c so that start marking 67 will switch flip-flop amplifier to its circuit making condition and stop marking 68 will switch flip-flop amplifier 57 back to its circuit breaking condition so that only the seventh and eighth text line sections will be printed during one revolution of printing roller 1 and contact arm 11. At the end of each revolution, cam 40 will open terminal clearing switch 41 so that all energized relays are deenergized.

As in the embodiment of FIGS. 1 to 4, the manually operated selector switches Ta1 to Ta12 can be actuated by the operator to energize additional relays whereby additional text line sections will be printed so that the automatic selection determined by markings on the printing form can be modified.

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 program controlled selective duplicating machine, 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 characteristics 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. Program controlled selective printing machine comprising, in combination, rotary printing roller means; record carrier means including a printing form located on the periphery of said printing roller means and composed of a series of circumferentially adjacent text line sections, and program sheet means located on the periphery of said printing roller means and composed of a series of line sections respectively axially aligned with corresponding text line sections, said record carrier means having first and second markings in said line sections

for identifying the first and the last text line sections of a group of adjacent text line sections; means connecting said record carrier means with said printing roller means for rotation in synchronism with the same; rotary counterpressure roller means forming a gap with said printing roller means; means for moving copy sheets into said gap; operating means including electromagnetic means for moving said counterpressure roller means in a translatory movement between a printing position in the proximity of said printing roller means in which successive text line sections are printed on a copy sheet during each revolution of said printing roller means, and an inoperative position; sensing means for sensing said markings during rotation of said printing roller means, said sensing means including photoelectric means producing first and second impulses when sensing said first and second markings; and control means controlled by said sensing means to actuate said operating means and including a first circuit connected with said electromagnetic operating means including a series of circuit preparing switches and a series of first contact means respectively connected in series with the same, and correlated with said text line sections, and actuating means operating in synchronism with said printing roller means to successively close said first contact means when the correlated text line section passes through said gap, and a second circuit including a series of second contact means and, respectively in series with the same, a series of switch operating elements for controlling said circuit preparing switches, and switching means responsive to said first impulse received from said sensing means to make, and to said second impulse to break said second circuit, said actuating means successively closing said second contact means before closing corresponding first contact means so that said second circuit is closed and said switch operating elements close and hold successive circuit preparing switches when said sensing means produces said first impulse upon sensing a first marking until said sensing means produces said second impulse upon sensing said second marking whereby said actuating means closes said first circuit whenever closing a first contact means in series with a closed circuit preparing switch so that the group of text line sections between said first and second markings is printed on a copy sheet.

2. Program controlled selective printing machine comprising, in combination, rotary printing roller means; record carrier means including a printing form located on the periphery of said printing roller means and composed of a series of circumferentially adjacent text line sections, and program sheet means located on the periphery of said printing roller means and composed of a series of line sections respectively axially aligned with corresponding text line sections, said record carrier means having first and second markings in said line sections for identifying the first and the last text line sections of a group of adjacent text line sections; means connecting said record carrier means with said printing roller means for rotation in synchronism with the same; rotary counterpressure roller means forming a gap with said printing roller means; means for moving copy sheets into said gap; operating means including electromagnetic means for moving said counterpressure roller means in a translatory movement between a printing position in the proximity of said printing roller means in which successive text line sections are printed on a copy sheet during each revolution of said printing rollers means, and an inoperative position; sensing means for sensing said markings during rotation of said printing roller means, said sensing means including photoelectric means producing first and second impulses when sensing said first and second markings; and control means controlled by said sensing means to actuate said operating means and including a first circuit connected with said electromagnetic operating means including a series of circuit preparing switches and a series of first contact means respectively connected in series

with the same, and correlated with said text line sections, and actuating means including a contact arm rotating in synchronism with said printing roller means to successively close said first contact means when the correlated text line section passes through said gap, and a second circuit including a series of second contact means and, respectively in series with the same, a series of switch operating elements for controlling said circuit preparing switches, and flip-flop amplifier means responsive to said first impulse received from said sensing means to make, and to said second impulse to break said second circuit, said rotary contact arm successively closing said second contact means before closing corresponding first contact means so that said second circuit is closed and said switch operating elements close and hold successive circuit preparing switches when said sensing means produces said first impulse upon sensing a first marking until said sensing means produces said second impulse upon sensing said second marking whereby said rotary contact arm closes said first circuit whenever closing a first contact means in series with a closed circuit preparing switch so that the group of text line sections between said first and second markings is printed on a copy sheet.

3. Program controlled selective printing machine comprising, in combination, rotary printing roller means; record carrier means including a printing form located on the periphery of said printing roller means and composed of a series of circumferentially adjacent text line sections, and program sheet means located on the periphery of said printing roller means and composed of a series of line sections respectively axially aligned with corresponding text line sections, said record carrier means having first and second markings in said line sections for identifying the first and the last text line sections of a group of adjacent text line sections; means connecting said record carrier means with said printing roller means for rotation in synchronism with the same; rotary counterpressure roller means forming a gap with said printing roller means; means for moving copy sheets into said gap; operating means including electromagnetic means for moving said counterpressure roller means in a translatory movement between a printing position in the proximity of said printing roller means in which successive text line sections are printed on a copy sheet during each revolution of said printing roller means, and an inoperative position; sensing means for sensing said markings during rotation of said printing roller means, said sensing means including photoelectric means producing first and second impulses when sensing said first and second markings; and control means controlled by said sensing means to actuate said operating means and including a first circuit connected with said electromagnetic operating means including a series of circuit preparing switches and a series of first contact means respectively connected in series with the same, and correlated with said text line sections, and actuating means operating in synchronism with said printing roller means to successively close said first contact means when the correlated text line section passes through said gap, and a second circuit including a series of second contact means and, respectively in series with the same, a series of relays for controlling said circuit preparing switches and including holding contacts, a clearing switch operated in synchronism with said printing roller means to clear said relay means after each revolution of said printing roller means, and switching means responsive to said first impulse received from said sensing means to make, and to said second impulse to break said second circuit, said actuating means successively closing said second contact means before closing corresponding first contact means so that said second circuit is closed and said relay close and hold successive circuit preparing switches when said sensing means produces said first impulse upon sensing a first marking until said second impulse upon sensing said second marking whereby said actuating means closes said

first circuit whenever closing a first contact means in series with a closed circuit preparing switch so that the group of text line sections between said first and second markings is printed on a copy sheet group of text line sections between said first and second markings is printed on a copy sheet.

4. Program controlled selective printing machine comprising, in combination, rotary printing roller means; record carrier means including a printing form located on the periphery of said printing roller means and composed of a series of circumferentially adjacent text line sections, and program sheet means located on the periphery of said printing roller means and composed of a series of line sections respectively axially aligned with corresponding text line sections, said record carrier means having first and second markings in said line sections for identifying the first and the last text line sections of a group of adjacent text line sections; means connecting said record carrier means with said printing roller means for rotation in synchronism with the same; rotary counterpressure roller means forming a gap with said printing roller means; means for moving copy sheets into said gap; operating means including electromagnetic means for moving said counterpressure roller means in a translatory movement between a printing position in the proximity of said printing roller means in which successive text line sections are printed on a copy sheet during each revolution of said printing roller means, and an inoperative position; sensing means for sensing said markings during rotation of said printing roller means, said sensing means including photoelectric means producing first and second impulses when sensing said first and second markings; and control means controlled by said sensing means to actuate said operating means and including a first circuit connected with said electromagnetic operating means including a series of circuit preparing switches and a series of first contact means respectively connected in series with the same and correlated with said line sections, and actuating means including a contact arm rotating in synchronism with said printing roller means to successively close said first contact means when the correlated text line section passes through said gap, and a second circuit including a series of second contact means and, respectively in series with the same, a series of relays for controlling said circuit preparing switches and including holding contacts, a clearing switch operated in synchronism with said printing roller means to clear said relay means after each revolution of said printing rollers means, and flip-flop amplifier means responsive to said first impulse received from said sensing means to make, and to said second impulse to break said second circuit, said rotary contact arm successively closing said second contact means before closing corresponding first contact means so that said second circuit is closed and said relay close and hold successive circuit preparing switches when said sensing means produces said first impulse upon sensing a first marking until said second impulse upon sensing said second marking whereby said rotary contact arm closes said first circuit whenever closing a first contact means in series with a closed circuit preparing switch so that the group of text line sections between said first and second markings is printed on a copy sheet.

5. Program controlled selective printing machine comprising, in combination, rotary printing roller means; record carrier means including a printing form located on the periphery of said printing roller means and composed of a series of circumferentially adjacent text line sections, and program sheet means having a plurality of circumferentially extending columns correlated with successive revolutions of said printing roller means and located on the periphery of said printing roller means and composed of a series of line sections respectively axially aligned with corresponding text line sections, said record carrier means having first and second markings in said line sections for identifying the first and the last text line sections of a

group of adjacent text line sections; means connecting said record carrier means with said printing roller means for rotation in synchronism with the same; rotary counterpressure roller means forming a gap with said printing roller means; means for moving copy sheets into said gap after each revolution of said printing roller means; operating means including electromagnetic means for moving said counterpressure roller means in a translatory movement between a printing position in the proximity of said printing roller means in which successive text line sections are printed on a copy sheet during each revolution of said printing roller means, and an inoperative position; sensing means for sensing said markings during rotation of said printing roller means and being operable to sense different columns of said program means during successive revolutions of said printing roller means, and including a plurality of photocells respectively located opposite said columns, said photocells including photoelectric means producing first and second impulses when sensing said first and second markings; and control means controlled by said sensing means to actuate said operating means and including a first circuit connected with said electromagnetic operating means including a series of circuit preparing switches and a series of first contact means respectively connected in series with the same, and correlated with said text line sections, and actuating means operating in synchronism with said printing roller means to successively close said first contact means when the correlated text line section passes through said gap, and a second circuit including a series of second contact means and, respectively in series with the same, a series of switch operating elements for controlling said circuit preparing switches, and flip-flop amplifier means responsive to said first impulse received from said sensing means to make, and to said second impulse to break said second circuit, manually operable switch means for selectively connecting said flip-flop amplifier means with said photo cells after a selected number of revolutions, said actuating means successively closing said second contact means before closing corresponding first contact means so that said second circuit is closed and said switch operating elements close and hold successive circuit preparing switches when said sensing means produces said first impulse upon sensing a first marking until said sensing means produces said second impulse upon sensing said second marking whereby said actuating means closes said first circuit whenever closing a first contact means in series with a closed circuit preparing switch so that the group of text line sections between said first and second markings is printed on a copy sheet and including circuit means responsive to said impulses to energize said electromagnetic means to move said counterpressure roller means, said circuit means including a flip-flop amplifier switched between two conditions when said sensing means senses said first and second markings, and making a circuit for said electromagnetic means in said first condition, and breaking the last-mentioned circuit in said second condition, and selector switch means for selectively connecting during successive revolutions of said printing roller means said photocells with said flip-flop amplifier.

6. Program controlled selective printing machine comprising, in combination, rotary printing roller means; record carrier means including a printing form located on the periphery of said printing roller means and composed of a series of circumferentially adjacent text line sections, and program sheet means located on the periphery of said printing roller means and having a plurality of circumferentially extending columns correlated with successive revolutions of said printing roller means and composed of a series of line sections respectively axially aligned with corresponding text line sections, said record carrier means having first and second markings in said line sections for identifying the first and the last text line sections of a group of adjacent text line sections; means connecting said record carrier means with said printing roller means

for rotation in synchronism with the same; rotary counterpressure roller means forming a gap with said printing roller means; means for moving copy sheets into said gap after each revolution of said printing roller means; operating means including electromagnetic means for moving said counterpressure roller means in a translatory movement between a printing position in the proximity of said printing roller means in which successive text line sections are printed on a copy sheet during each revolution of said printing roller means, and an inoperative position; sensing means for sensing said markings during rotation of said printing roller means and being operable to sense different columns of said program means during successive revolutions of said printing roller means, said sensing means including photoelectric means producing and for producing first and second impulses when sensing said start and stop markings, respectively markings and including a plurality of photocells respectively located opposite said columns; and control means controlled by said sensing means to actuate said operating means and including a first circuit connected with said electromagnetic operating means including a series of circuit preparing switches and a series of first contact means respectively connected in series with the same, and correlated with said text line sections, and actuating means including a contact arm rotating in synchronism with said printing roller to successively close said first contact means when the correlated text line section passes through said gap, and a second circuit including a series of second contact means and, respectively in series with the same, a series of relays for controlling said circuit preparing switches and including holding contacts, a clearing switch operated in synchronism with said printing roller means to clear said relay means after each revolution of said printing roller means and flip-flop amplifier means responsive to said first impulse received from said sensing means to make, and to said second impulse to break said second circuit, manually operable switch means for selectively connecting said flip-flop amplifier means with said photocells after a selected number of revolutions, said rotary contact arm successively closing said second contact means before closing corresponding first contact means so that said second circuit is closed and said relays close and hold successive circuit preparing switches when said sensing means produces said first impulse upon sensing a first marking until said sensing means produces said second impulse upon sensing said second marking whereby said rotary contact arm closes said first circuit whenever closing a first contact means in series with a closed circuit preparing switch so that the group of the text line sections between said first and second markings is printed on a copy sheet.

7. A program controlled selective printing machine as set forth in claim 6 and including a cam rotating in synchronism with said printing roller means for operating said clearing switch.

8. A program controlled selective printing machine as set forth in claim 6 wherein said program sheet has a plurality of circumferentially extending columns respectively associated with different selections of text line sections, and each adapted to receive a first start marking and a second stop marking; and wherein each of said photocells senses a start marking and a stop marking in the column sensed thereby to switch said flip-flop amplifier first to its circuit making condition and then to its circuit breaking condition.

9. A program controlled selective printing machine as set forth in claim 6 and including a set of manually operated switches respectively connected with said relay means and adapted to cause, when selectively actuated by the operator, energization of the respective relay means so that said electromagnetic operating means is energized under control of said contact arm when the respective text line section is located opposite said counterpressure roller means,

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10. A program controlled selective printing machine comprising, in combination, printing means movable between a printing position and an inoperative position and including a rotary printing roller; electromagnetic operating means for moving said printing means between said positions; program means having a plurality of columns and being movable in the direction of said columns in synchronism with the rotation of said printing roller, said columns being adapted to have start and stop markings; sensing means for sensing said markings and for producing first and second impulses when sensing said start and stop markings, respectively; means for controlling said sensing means to sense different columns during different revolutions of said printing roller; and switching means controlled by said sensing means and including a first circuit connected with said electromagnetic operating means including a series of circuit preparing switches and a series of first contact means respectively connected in series with the same, and correlated with said text line sections, and actuating means operating in synchronism with said printing roller to successively close said first contact means when the correlated text line section passes through said gap, and a second circuit including a series of second contact means and, respectively in series with the same, a series of switch operating elements for controlling said circuit preparing switches, and switching means responsive to said first impulse received from said sensing means to make, and to said second impulse to break said second circuit, said actuating means successively closing said second contact means before closing corresponding first contact means so that said second circuit is closed and said switch operating elements close and hold successive circuit preparing switches when said sensing means produces said first impulse upon sensing a first marking until said sensing means produces said second impulse upon sensing said second marking whereby said actuating means closes said first circuit whenever closing a first contact means in series with a closed circuit preparing switch whereby said printing means is in said printing position only between the sensing of a start marking and the sensing of a stop marking by said sensing means.

11. A program controlled selective printing machine comprising, in combination, printing means movable between a printing position and an inoperative position and including a rotary printing roller; electric operating means for moving said printing means between said positions; record carrier means including a printing form located on said printing roller and composed of a series of circumferentially adjacent text line sections and program sheet means located on said printing roller and composed of a series of line sections respectively axially aligned with corresponding text line sections, said record carrier means having start and stop markings in said line sections for identifying the first and the last text line sections of a group of adjacent text line sections; sensing means for sensing said markings and for producing first and second impulses, respectively, when sensing said start and stop markings; control means including a first circuit for actuating said electric operating means and including a series of circuit preparing switches and means for successively connecting said circuit preparing switches with said electric operating means; and a second circuit including a series of switch operating elements for controlling said circuit preparing switches, switching means controlled by said sensing means to make and break, respectively, said second circuit when receiving said first and second impulses, and means for actuating said switch operating elements only while said second circuit is made by said switching means so that selected circuit preparing switches are closed between said first and second impulses whereby said printing means is in said printing position only between the sensing of a start marking and the sensing of a stop marking by said sensing means.

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12. A printing machine as set forth in claim 11 wherein said switch operating elements are relays including holding contacts, wherein said switching means is a flip-flop amplifier, and wherein said sensing means includes a source of light and a photocell.

13. A printing machine as set forth in claim 11 wherein said record carrier means has a plurality of circumferentially extending columns, each of said columns being adapted to have start and stop markings; wherein said sensing means includes means for independently sensing the markings in each of said columns; and means for controlling said sensing means to sense different columns during different revolutions of said printing roller.

14. A program controlled selective printing machine comprising, in combination, printing means movable between a printing position and an inoperative position and including a rotary printing roller; electric operating means for moving said printing means between said inoperative and printing positions; record carrier means including a printing form located on the periphery of said printing roller and composed of a series of circumferentially adjacent text line sections, and program means composed of a series of line sections aligned with corresponding text line sections, said record carrier means having start and stop markings in said line sections for identifying the first and last text line sections of a group of adjacent text line sections; sensing means for sensing said markings and for producing first and second impulses when sensing said start and stop markings, respectively; and control means including a first circuit connected with said electric operating means and including a series of circuit preparing switches and a series of first contact means respectively connected in series with the same, and correlated with said text line sections, and actuating means rotating in synchronism with said printing roller to successively close said first contact means when the correlated text line sections passes through said gap, and a second circuit including a series of second contact means and, respectively, in series with the same, a series of switch operating elements for controlling said circuit preparing switches, and switching means responsive to said first impulse received from said sensing means to make, and to said second impulse to break said second circuit, said actuating means successively closing said second contact means before closing corresponding first contact means so that said second circuit is closed and said switch operating elements close and hold successive circuit preparing switches when said sensing means produces said first impulse upon sensing a start marking until said sensing means produces said second impulse upon sensing a stop marking whereby said actuating means closes said first circuit whenever closing a first contact means in series with a closed circuit preparing switch whereby said printing means is in said printing position only between the sensing of a start marking and the sensing of a stop marking by said sensing means.

15. A program controlled selective printing machine comprising, in combination, printing means movable between a printing position and an inoperative position and including a rotary printing roller; electric operating means for moving said printing means between said positions; record carrier means including a printing form located on said printing roller and composed of a series of circumferentially adjacent text line sections and program sheet means located on said printing roller and composed of a series of line sections respectively axially aligned with corresponding text line sections, said record carrier means having start and stop markings in said line sections for identifying the first and the last text line sections of a group of adjacent text line sections; sensing means for sensing said markings and for producing first and second impulses, respectively, when sensing said start and stop markings; control means including a first circuit for actuating said electric operating means and including a series of circuit preparing means and means for successively connecting said circuit preparing means with said electric oper-

ating means; and a second circuit including switching means controlled by said sensing means to make and break, respectively, said second circuit when receiving said first and second impulses, and means for actuating said circuit preparing means only while said second circuit is made by said switching means so that selected circuit preparing means are closed between said first and second impulses whereby said printing means is in said printing position only between the sensing of a start making and the sensing of a stop marking by said sensing means.

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