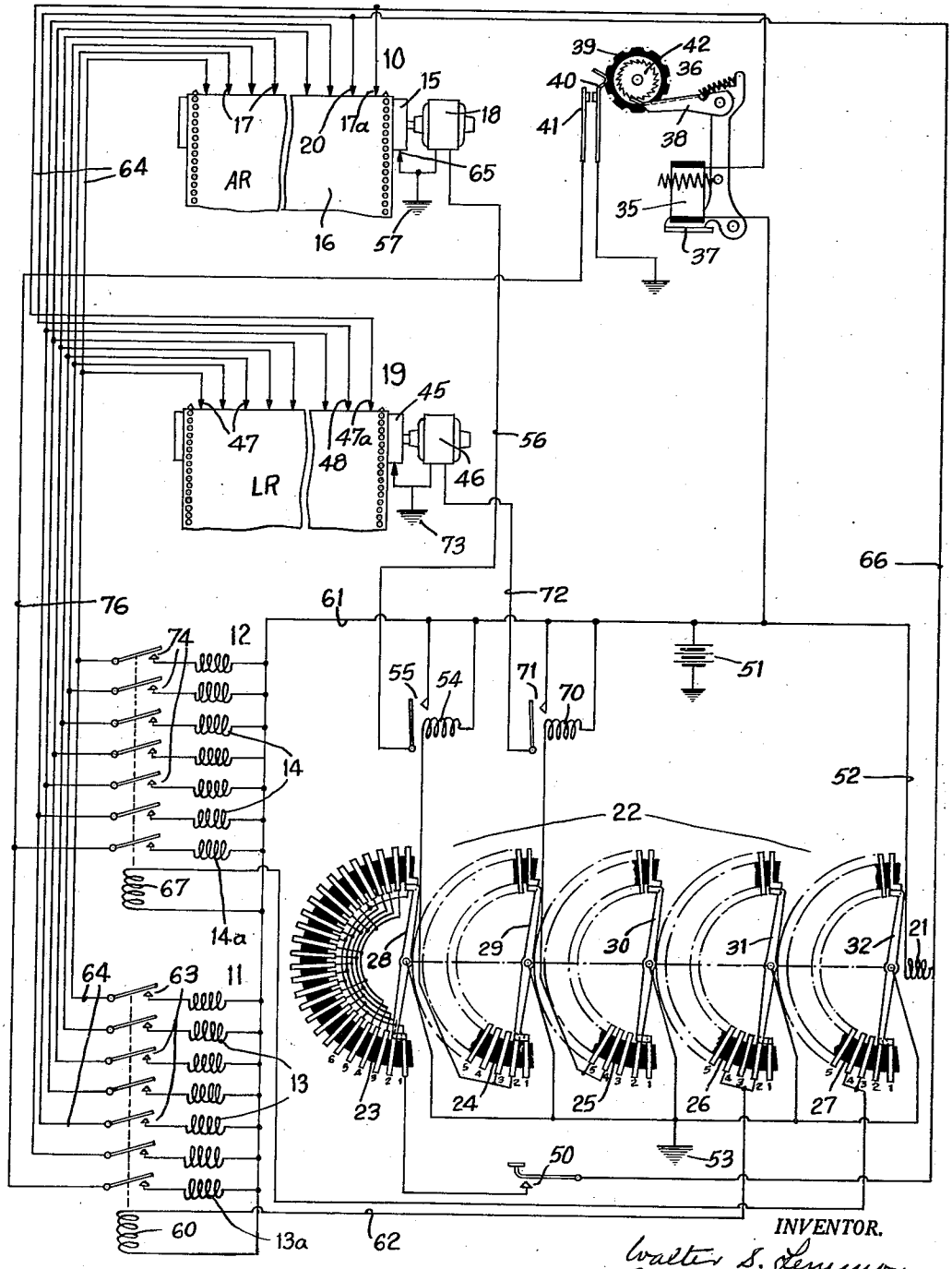
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SYSTEM OF OPERATION OF TYPEWRITERS

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SYSTEM OF OPERATION OF TYPEWRITERS

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This invention relates to a system of operation of typewriters, and more particularly to the operation of a plurality of typewriters controlled by indicia record means.

The system broadly provides for indicia record control means to operate the plurality of typewriters or similar translating mechanisms simultaneously or to operate one or all typewriters independently and in succession.

In the disclosure of the present invention for purposes of illustrating the principle of operation, one type of indicia record control means will be embodied, and which is in part in the form of a tape, sheet, or ribbon on which characters or other indicia to be reproduced are represented by perforations to selectively operate the particular associated translating mechanisms.

The present system is particularly applicable to automatic letter writer systems whereby individual letters having similar body forms may be typewritten and in addition have the addresses of the particular letters typewritten automatically instead of typing them manually, which at present is the usual method.

To accomplish this procedure automatically two perforated rolls or sheets are provided, one which may be termed the address roll and the other the letter roll. The address roll controls the independent operation of the individual typewriter so that upon completion of the particular address, another individual typewriter is operated to type a corresponding address whereupon at the completion of typing the individual addresses the letter roll becomes effective to control the operation of the bank of typewriters simultaneously to type the common part of the letter on all the machines.

It is an object of the present invention to provide for independent operation of the individual machines and simultaneous operation of all the machines.

Another object of the present invention is to provide for operation of the machines independently and automatically operate all the machines at the completion of the independent operation.

Still another object is to provide for operation of all the machines simultaneously and to render inoperative all the other machines when one is selected for independent operation thereof.

Still another object is to provide for a plurality of indicia record control means for controlling the machines and rendering one inoperative when another is operative.

Further and other objects of the present invention will be hereinafter set forth in the accompanying specification and claims and shown in the drawing which by way of illustration is what we now consider to be the best mode in which we have contemplated applying that principle. Other embodiments of the invention employing the same or equivalent principle may be used and structural changes made as desired by those skilled in the art without departing from the present invention and within the spirit of the appended claims.

The invention is fully disclosed by way of example in the following description and in the accompanying drawing which shows a diagrammatic view of the system.

Sensing mechanism

Referring to the drawing, 10 indicates generally the preferred form of sensing device for controlling the typewriters 11 and 12 which may be of any conventional form whereby the character key bars and the corresponding type bars (not shown) are controlled by the associated solenoids 13 and 14 to effect printing the characters. The following brief description of the sensing device 10 will be sufficient, since a more complete disclosure is made in our copending application Serial No. 743,208, filed September 8, 1934, and which as shown is provided with a horizontal transverse conducting roller 15 which supports and feeds the elongated perforated sheet 16, this sheet or roll being wide enough to contain a longitudinal series of perforations for the control of each corresponding sensing brush 17.

It is adapted so that the position of a single perforation on the sheet indicates the particular character representation. Therefore when the sheet is fed continuously to the sensing device by suitable means, such as motor 18, and when the particular brush 17 senses its corresponding character perforation, a solenoid 13 or 14 is energized to depress a corresponding key bar and type bar to record the character corresponding to the character perforation sensed. A complete description of this operation will be set forth hereinafter.

Rotary relay

In addition to the character sensing brushes 17, a similar brush 20 is provided to control the magnet 21 of the rotary switch or relay indicated generally at 22, which is a type well known to those skilled in the art, and consisting of a plurality of arcuate banks of contacts 23 to 27 adapted to be engaged by the individual rotary brushes 28 to 32 which are provided to be stepped from

one set of contacts to the adjacent set upon energization of the associated magnet 21.

Each arcuate bank of contacts in the preferred type of rotary relay as shown consists of 26 individual contacts. It will be seen from the description that five contacts are employed for each cycle of independent and simultaneous operation of the machines, therefore the remaining contacts are divided in groups of five and connected in multiple to contacts 1, 2, 3, 4, and 5 in each independent bank and thus permit the continuous operation of the independent cycles to be described herein.

Double step relay

One of the character sensing brushes 17*a* for controlling the key shift solenoid 13*a* or 14*a* of the typewriters is provided to energize magnet 35 of the double step relay 36 when sensing its corresponding perforation in the roll 16. In order to type in both upper and lower cases, it is obvious that the key shift key bar must be maintained in its respective position for the particular typing desired.

Therefore provision to depress the shift key bar must be made so that the depression is maintained for the period selected for that particular type form. This is accomplished by using a double step relay similar to the type described in application Serial No. 746,489 filed October 2, 1934, the following brief description of which will be sufficient.

Energization of magnet 35 causes its armature 37 and the associated arm 38 to rotate cam wheel 39 so that its high surface forces contact blade 40 into engagement with contact 41, keeping the said contacts closed to energize the shift solenoid 13*a* or 14*a* (the method of selecting the individual solenoid to be described hereinafter) depending on the particular typewriter operated. The solenoid 13*a* or 14*a* or both depending on the selected operation remain energized so long as contacts 40 and 41 are closed, obviously printing the records in the same case during this period.

Engagement of the sensing brush 20 with another corresponding perforation energizes the magnet 35 thereby stepping the cam wheel 39 ahead to permit the contact blade 40 to engage a lower surface of the cam wheel to disengage the contacts 40 and 41 deenergizing the particular key bar solenoid 13*a* or 14*a*. The slotted cam wheel 39 is provided with half the number of slots as there are teeth in ratchet 42; for example, if the ratchet 42 has twenty teeth and cam wheel 39 half that number of high surfaces, it is obvious that a single operation of the magnet 35 will close and maintain the contacts 40 and 41 closed and a second energization of the magnet will permit the contacts to resume the position shown in the figure.

Individual typewriter operation

The sensing devices 10 and 19 are similar mechanisms therefore the description of one hereinbefore need not be repeated for the device 19.

It is understood that the perforations are formed by any suitable means and are provided on a sheet or roll wide enough to contain a longitudinal series of perforations for the control of each element of the machine to be operated and used in connection with the translating procedure, that is the type bars and their associated solenoids to actuate the corresponding type bars.

Let it be assumed that the perforated rolls AR and LR are positioned on the corresponding feed rollers 15 and 45 so that when the motor 18 is energized the perforated roll AR is introduced between its corresponding sensing brushes 17 and 20 and the conducting roller 15 and that the perforations are located so that the typewriters 11 and 12 are operated independently and in succession. Upon the completion of the independent operation of the typewriters the motor 18 will be deenergized and motor 46 energized to feed its perforated roll LR to the corresponding brushes 47 and 48 to control the plurality of typewriters simultaneously.

The method of controlling the independent operation of the typewriters is as follows: Depression of the start key 50 supplies current from grounded battery 51 to magnet 21 via conductor 52, through the closed contacts of key 50 depressed momentarily, contact of the arcuate bank 23, brush 28 to ground 53, energizing magnet 21 to step the brushes 28 to 32 ahead to the next set of adjacent contacts in the arcuate banks 23 to 27.

Brush 29 now engaging contact 2 of bank 24 permits current from grounded battery 51 to energize relay 54, contact 2, brush 29 and ground 53 completing the circuit, closing its associated contact 55 conducting current from the grounded battery 51, through the said contact 55, conductor 56, motor 18 and ground 57, starting the motor and address roll feeding operation.

At the same time brush 31 engages contact 2 of arcuate bank 26 to energize control solenoid 60 by current from grounded battery 51, through common conductor 61, solenoid 60, return conductor 62, contact 2, brush 31 to ground 53. The typewriter control contacts 63 now closed, in conjunction with the operation of motor 18 feeding the perforated address roll AR, now permit the operation of typewriter 11 in accordance with the perforations sensed by brushes 17.

It was mentioned hereinbefore that a perforation position is provided for each character to be recorded by the associated typewriters, each of the said positions have a corresponding sensing brush 17 to control the energization of the connected and corresponding type bar solenoid 13 by the current flow from grounded battery 51, common conductor 61, the particular solenoid 13, the corresponding contact 63 now closed, the associated conductor 64, corresponding brush 17, conducting roller 15, common contact 65 to ground 57.

Upon completion of recording the address or controlling operation of the typewriter 11, a perforation is sensed by a control brush 20 to energize magnet 21 by establishing a circuit from grounded battery 51 through conductor 52, magnet 21, conductor 66, brush 20, roller 15, contact brush 65 and ground 57.

Energization of magnet 21 advances the associated brushes 28 to 32 to contacts 3 of the arcuate banks 23 to 27 similarly as mentioned hereinbefore.

Brush 29 now engages contact 3 of bank 24 to energize relay 54 maintaining the operation of the address roll motor, as previously described, to continue feeding the perforated roll AR.

Brush 32 now engages contact 3 of bank 27 to energize control solenoid 67 associated with typewriter 12 by completing the circuit from grounded battery 51, through common conductor 61, sole-

noid 67, contact 3, brush 32 to ground 53 to condition typewriter 12 for operation from the roll AR because of the now closed contacts 74 of solenoid 67.

Advancing the brushes 28 to 32 to contact 3 position, obviously deenergized solenoid 60 by opening its circuit at contact 2, thus rendering the typewriter 11 inoperative during the period of operation of typewriter 12.

The sensing brushes 17 engaging the perforations in the advancing roll AR operate the typewriter similarly as described for the operation of typewriter 11.

Simultaneous typewriting operation

Upon the completion of the previously described operation, control brush 20 sensing a perforation energizes magnet 21 again to advance its brushes to contacts 4, whereupon brush 30 completes a circuit from grounded battery 51 through relay 70, contact 4, brush 30 to ground 53 energizing this relay to operate the motor 46 to advance the letter roll LR to its associated brushes 47 and 48 by virtue of the now closed contact 71 conducting current from battery 51 through said contact 71, conductor 72, motor 46 to ground 73.

At the same time brushes 31 and 32 engage their respective contacts 4 to energize the solenoids 60 and 67 in a manner previously described to close their contacts 63 and 74 rendering both the associated typewriters sensitive to the character impulses transmitted by the sensing brushes 47. In this manner it is seen that the prepunched perforations of the letter roll LR control the operation of typewriters 11 and 12 simultaneously. Advancement of the brushes 28 to 32 from contacts 3 to 4 of the banks 23 to 27 deenergized the relay 54, causing its contact 55 to break the established circuit to motor 18, thereby preventing any further feeding of the perforated roll AR.

It is well to note at this point that when the control brushes 20 and 48 sense their corresponding perforations to energize the magnet 21 and advance the brushes to the adjacent contacts in the arcuate banks to render the circuits to the motors 18 and 46 inoperative by the deenergization of the relays 54 and 70 to open their respective contacts 55 and 71, these said contacts are adapted to be slow break contacts to insure sufficient operation of the motors to properly advance their corresponding perforated rolls AR and LR to the extent that the control perforations are beyond the sensing position so that the brushes 20 and 48 are clear of the respective perforations, thereby preventing the said brushes from continuing to energize the said magnet 21.

During the selective operation of the typewriters, that is either the operation of the typewriters independently or operating all of them simultaneously the sensing of a perforation by the brushes 17*a* or 47*a* designating a case shift, controls the corresponding case shift solenoid 13*a* or 14*a* as mentioned hereinbefore. Sensing this particular perforation energizes magnet 35 to close the associated contacts 40 and 41 to energize the solenoids that are in an operative or closed circuit, namely the circuit established from grounded battery 51 through common conductor 61 to solenoid 13*a* or 14*a* or both depending on the position of the contacts 63 and 74 and previously explained, then through the common return conductor 76, contacts 40 and 41 now closed to ground.

Further energization of magnet 35 by the brushes 17*a* or 47*a* sensing a perforation causes the contacts 40 and 41 to open deenergizing the established circuits just described.

At the completion of the simultaneous operation of the typewriters the magnet 21 is energized by the circuit completed by the control brush 48 as explained hereinbefore to advance the brushes 28 to 32 from contacts 4 to 5, and brush 30 engaging contact 5 of bank 25 keeps relay 70 energized to further advance the roll LR. The transmission of another impulse through control brush 48 energizes magnet 21 to advance the brushes 28 to 32 from contacts 5 to 6.

Advancement of the said brushes from contacts 4 to 5 cuts out the energized solenoids 60 and 67, and further advancement of the brushes from contacts 5 to 6 cuts out the motor 46 and relay 70 to restore the system to a normal position to enable a complete operation of the entire cycle described by the depression of the start key 50.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention therefore to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. In a system of the class described, a plurality of typewriters, a plurality of perforated record control sheets, individual sensing means cooperating therewith, typewriter selecting means, a rotary control switch comprising banks of individual contacts and associated brushes adapted to cooperate with the corresponding contacts, said typewriter selecting means associated with certain of said contacts, and means under control of one of the said sensing means and control sheets to position said brushes to select certain of said typewriters in accordance with the sensed perforations.

2. In a system of the class described, a plurality of typewriters, a plurality of perforated record control sheets, individual sensing means cooperating therewith, typewriter selecting means, a rotary control switch comprising banks of individual contacts and associated brushes adapted to cooperate with the corresponding contacts, circuits associated with certain of said contacts to control said typewriter selecting means, means under control of one of said control sheets to position said brushes to engage certain contacts to effect the selection of certain of said typewriters in sequence, and also to position said brushes to engage other contacts to effect the selection of the said typewriters in unison.

3. In a system of the class described, a plurality of typewriters, a perforated record control sheet, sensing means cooperating therewith, a rotary control switch comprising banks of individual contacts and associated brushes adapted to cooperate with the corresponding contacts, typewriter selecting means associated with certain of said contacts, and means under the control of one of said sensing means to position the said brushes step by step to control the operation of the said typewriter selecting means in succession.

4. In a system of the class described, a plurality of typewriters, a plurality of perforated record control sheets, individual sensing means cooperating therewith, typewriter selecting means, a rotary control switch comprising banks of individual contacts and associated brushes adapted to cooperate with the corresponding contacts, circuits associated with certain of said contacts to control said typewriter selecting means, other circuits associated with certain other of the said contacts, switching means included in the last named circuits to control the positioning of said brushes to engage certain of said contacts to effect the selection of certain of said typewriters, means under control of one of said sensing means and control sheets to position said brushes to engage certain other contacts to effect the selection of certain other of said typewriters and also to position the brushes to engage other contacts to effect the selection of said typewriters in unison, and means under control of another of said sensing means and control sheets to position the brushes to engage the said contacts associated with the circuits including the said switching means.

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