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SYSTEM OF OPERATION OF TRANSLATING MECHANISMS

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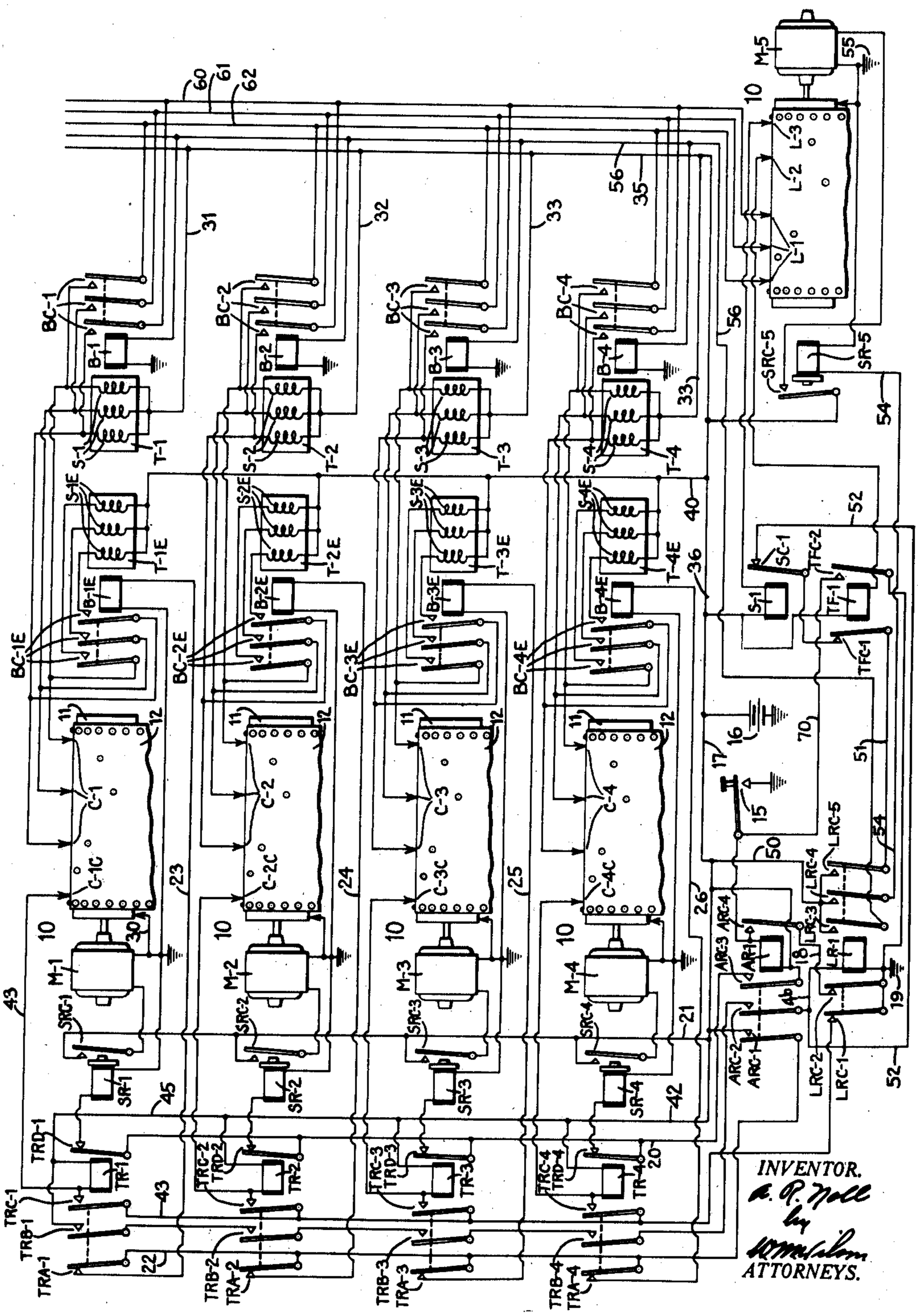

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SYSTEM OF OPERATION OF TRANSLATING MECHANISMS

Austin R. Noll, New York, N. Y., assignor to International Business Machines Corporation, New York, N. Y., a corporation of New York

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This invention relates to a system of operation of translating mechanisms, and more particularly to the operation of a plurality of translating mechanisms controlled by indicia record means, and provides broadly for indicia record control means to operate a plurality of translating mechanisms simultaneously so that the mechanisms are all operated in the same manner or in an independent manner individually.

A translating system of the type above referred to is disclosed in the application for U. S. Letters Patent Serial No. 753,254 filed November 16, 1934. In the said application one preferred form of translating system and mechanism is shown whereby several typewriting mechanisms are controlled and operated by several electrical sensing devices cooperating with several perforating master control sheets so that the mechanisms are operated individually and in succession, and upon the completion of this operation are then operated simultaneously in accordance with the perforated representations. One control sheet controls the individual operation of the mechanisms and provides for automatically rendering it inoperative when the second control sheet is rendered operative to control the simultaneous operation of the mechanisms.

However, with the system disclosed in the said prior application it is seen that during the individual operation of each mechanism the remaining mechanisms are idle and all remain idle with the exception of the controlled mechanism until automatically transferred to simultaneous operation of all the mechanisms. In the application of systems of this type, especially when a large number of mechanisms are operated, the idle time of the individual units proves to be a costly factor.

To illustrate the principle of operation of the present invention one form of indicia record control means will be described and comprises in part 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, one form of which as shown may be a conventional typewriter.

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 and at the same time, instead of operating each typewriter in succession for the addressing operation, and, too, provision is made for typing the addresses on the envelopes at the same time the individual addresses are typed on the letter sheets.

To accomplish this procedure automatically a plurality of perforated rolls are provided, preferably one roll for each typewriter, each roll controlling the individual typewriter so that all the typewriters may be operated at the same time to insert the individual addresses. Each of the perforated control rolls becomes inoperative upon completion of the type of the particular address, so that when all the addresses are typewritten the letter body control roll is automatically operated to control all the typewriters simultaneously so as to type the same letter body form.

Another feature of the present invention is the provision for the operation of an additional typewriter controlled by the individual address roll so that at the same time the addresses are typed for the letter, the same addresses may be typed on the envelope, and then rendered inoperative upon completion of the addressing when simultaneous typing of the letter form is initiated.

It is therefore an object of the present invention to provide individual control means for each mechanism to operate the mechanisms accordingly and simultaneously, and upon the completion of this individual and simultaneous operation, to operate all the mechanisms simultaneously in the same manner.

Another object of the present invention is to provide for automatically operating all the mechanisms in the same manner and at the same time upon completion of the independent operation of all the mechanisms.

Still another object of the present invention is to provide for additional mechanisms to be operated in a similar manner according to the representations on each of the individual control means and upon completion of such operation to be rendered inoperative during the simultaneous operation of controlling a selected number of mechanisms in the same manner.

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 I now consider to be the best mode in which I 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.

In the drawing is shown a schematic diagram embodying a preferred form of the invention by way of example to set forth the principle of operation of the system.

Sensing mechanism

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

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 the motor M, and when the particular brush C senses its corresponding character perforation, a solenoid S 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. In addition to the character sensing brushes C of which there are as many as character key bars to be operated by the solenoids S, control brush C—1C is provided for purposes understood as the description progresses.

All the individual sensing devices associated with the motors M—1 to M—5 are similar in every respect to the device just described with the exception that an additional control brush is provided in connection with the device operated by motor M—5, the purpose of which will become evident hereinafter.

Individual mechanism control and simultaneous operation thereof

It will be understood that the perforations on the sheets 12 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.

Referring to the drawing, let it be assumed that the perforated rolls 12 associated with the devices operated by motors M—1 to M—5 are placed on the corresponding feed rollers 11 so that when the motors M—1 to M—4 are energized the rolls associated therewith are introduced between their corresponding sensing brushes C and the conducting rollers 11 and that the perforations are located so that the typewriters T—1 to T—4 are operated in an independent manner simultaneously, and that upon the completion of this operation of the typewriters, the motors M—1 to M—4 will be deenergized and motor M—5 energized to feed its perforated roll to its corresponding brushes L to control the plurality of typewriters in the same manner and simultaneously.

Upon depression of the start key 15, current from grounded battery 16 is conducted to relay AR—1 by conductor 17, and through the closed contacts of key 15 to ground, energizing the said relay, to establish the following locking circuit from the grounded battery 16, conductor 17, relay AR—1, its now closed contact ARC—4, conductor 18, normally closed contact LRC—2 of relay LR—1 to ground 19. Relay AR—1 therefore remains energized until this circuit just traced is broken by operation of the normally closed contacts LRC—2 of relay LR—1, which will be fully explained hereinafter.

Energization of relay AR—1 also closes its associated contacts ARC—1, 2 and 3 to initiate the following operations:

Current is conducted from grounded battery 16 and conductor 17 to closed contact ARC—3 and common conductor 20 connected to the normally closed contacts TRD—1 to TRD—4 of relays TR—1 to 4 to energize the connected slow release relays SR—1 to SR—4, thereby causing their corresponding contacts SRC—1 to SRC—4 to be closed to conduct current from grounded battery 16 and conductors 17 and 21 through the said closed contacts SRC—1 to SRC—4 to the corresponding connected motors M—1 to M—4. It is evident from the description set forth that the motors M—1 to M—4 will operate the sensing devices and feed the corresponding perforated rolls 12 to the sensing brushes C until the SRC—1 to SRC—4 contacts of relays SR—1 to SR—4 are broken, that is until the corresponding TR relays are energized to open their normally closed contacts TRD to deenergize the SR relays.

Current is also conducted from grounded battery 16 and conductor 17 through the closed contact ARC—1, common conductor 22 to the normally closed contacts TRA—1 to 4 of relays TR—1 to 4 and by the corresponding conductors 23, 24, 25 and 26 to magnets B—1E, 2E, 3E and 4E, energizing these magnets until the TRA contacts are opened by virtue of energization of their corresponding TR relays. Energization of the B magnets closes the corresponding contacts BC—1E, 2E, 3E and 4E, the purpose of which will be explained later.

It was also mentioned that the contacts ARC—2 of relay AR—1 were closed by the energization of their relay the purpose of which will become evident later in the description.

It has been seen so far that the motors M—1 to M—4 have been energized to feed the corresponding perforated rolls 12 to the brushes C and that at the same time the B—1E, 2E, 3E and 4E magnets were energized closing the corresponding contacts BC—1E, 2E, 3E and 4E.

In order for the following description to be more comprehensive, the operation of one of the typewriters for example T—1 will be explained first, and is as follows: The feeding of the perforated roll 12 by the motor M—1 to the character sensing brushes C—1 permits the corresponding connected solenoids S—1 of typewriter T—1 to be energized when the said brush engages or senses its particular perforation via grounded brush 30 adapted to be in engagement with roller 11 continuously, conducting roller 11, brush C—1, the corresponding solenoid S—1 of typewriter T—1, common conductors 31, 35 and 36 to grounded battery 16.

It was mentioned hereinbefore that provision was made for the operation of an envelope addressing typewriter while the similar address was typed on the letter sheet. Let it be assumed

that the typewriter T—1 is used to type the addresses on the letter sheet and the typewriter T—1E used to type the envelope address. It is obvious then that the typewriter T—1E should be so adapted to be operated only during the addressing cycle and rendered inoperative during the typing of the common body form of the letter.

It is to be understood that the present system may be operated in a manner to be explained with or without the envelope typing feature whenever so desired.

It will be remembered that the magnet B—1E was energized to close its contacts BC—1E when the SR—1 relay was energized. Therefore when the corresponding solenoid S—1 of typewriter T—1 is energized by its sensing brush C—1 sensing the particular perforation in roll 12, to effect recording of the corresponding character, the same character will be recorded by typewriter T—1E, since the corresponding solenoid S—1E will be energized because grounded battery 16 is now connected by conductors 36 and 40 to the said solenoid and by virtue of the closed contacts BC—1E to the character sensing brushes C—1 and thence to ground. It is seen therefore that the typewriters T—1 and T—1E are operated simultaneously in accordance with the sensing operation of the perforated roll 12 operated by its motor M—1.

Similarly, motors M—2, 3 and 4 are adapted to feed their respective perforated rolls 12 to the sensing brushes C—2, 3 and 4 to control the typewriters T—2, 3 and 4, and T—2E, 3E and 4E in accordance with the respective perforated rolls. It is seen therefore that the typewriters T—1, 2, 3 and 4 are operated simultaneously to type the individual and corresponding addresses in accordance with the control rolls 12 and also that the typewriters T—1E, 2E, 3E and 4E may be operated simultaneously to type the envelopes or other material requiring the same addresses that are typed by the respective machines T—1, 2, 3 and 4, during the same addressing cycle.

Referring again to the individual operation of typewriters T—1 and T—1E, at the completion of sensing the perforations representative of the address type, control brush C—1C is adapted to engage a perforation to energize relay TR—1 as follows: Current from grounded battery 16 is conducted via conductors 17 and 42 to relay TR—1, and by conductor 43 to brush C—1C, conducting roller 11 and thence to grounded contact 30, energizing relay TR—1 and establishing the following locking circuit; grounded battery 16, conductors 17 and 42, relay TR—1, now closed contact TRC—1, conductor 43, normally closed contact LRC—1 of relay LR—1 and ground 19. Energization of relay TR—1 causes its contacts TRB—1 and TRC—1 to be closed and the normally closed contacts TRA—1 and TRD—1 to be opened.

Breaking of contact TRA—1 causes the magnet B—1E to be de-energized thereby opening its contacts BC—1E and opening the individual circuits to the character solenoids S—1E of typewriter T—1E. Contacts TRD—1 open the circuit to de-energize the slow release relay SR—1, so that its contacts SRC—1 are opened to disconnect the motor M—1 from the power source battery 16. The purpose of the slow release relay SR—1 is to insure the operation of the motor M—1 a timed interval of sufficient duration so that the said control perforation sensed on roll 12 is fed beyond the sensing position of brush C—1C.

In a like manner, control perforations on the rolls 12 fed by the motors M—2, 3 and 4, sensed by the corresponding control brushes C—2C, C—3C and C—4C cause the energization of relays TR—2, 3 and 4 whenever they are sensed, that is upon the completion of the typing of the perforated addresses on the said rolls. Slow release relays SR—2, 3 and 4 in turn are de-energized to cut out the operated motors M—2, 3 and 4 in a manner as just explained.

Therefore it is seen that all the TR relays are now energized and maintained in this condition due to the established locking circuits associated therewith, and that all the motors M—1 to M—4 are rendered inoperative, and that the magnets B—1E, 2E, 3E and 4E are de-energized, opening the circuits to the solenoids of typewriters T—1E to 4E, and that all the contacts TRB—1 to TRB—4 of the relays TR—1 to 4 are now closed to establish the following circuit: grounded battery 16, conductors 17, 42 and 45, contacts TRB—1 now closed, contacts TRB—2, 3 and 4 now closed, conductor 46, relay LR—1 to ground 19 to energize this relay.

Common mechanism control and simultaneous operation thereof

Energization of relay LR—1 causes the contacts LRC—3, 4 and 5 to be closed, establishing a locking circuit through contact LRC—5 as follows: grounded battery 16, conductors 17 and 50, contacts LRC—5, conductor 51, normally closed contacts TFC—1 and SC—1, conductors 52 and 46, relay LR—1 to ground 19.

Energization of the said relay also causes the contacts LRC—1 and 2 to be opened to open the locking circuits to the TR relays established through conductor 43 and previously described, and to open the locking circuit for relay AR—1 established through conductor 18 as described hereinbefore, de-energizing relays AR—1 and all the TR relays.

Current from grounded battery 16 is now conducted to closed contact LRC—4 of relay LR—1, conductor 54 to slow release relay SR—5 to ground 55, energizing this relay to conduct current from grounded battery 16, conductor 36 through its now closed contacts SRC—5 to motor M—5 and ground 55, energizing the said motor which is adapted to feed a similar perforated roll, as explained previously, to its character sensing brushes L—1.

Through the closed contacts LRC—3, current from grounded battery 16 is conductod to the magnets B—1 to 4 by common conductor 56, energizing the said magnets to close the corresponding contacts BC—1, 2, 3 and 4. It is seen that the operation of magnets B—1 to 4 connects the solenoids S—1 to 4 of the typewriters T—1 to 4 to the common conductors 60, 61 and 62.

Therefore, the character sensing brushes L—1 upon engaging perforations in the roll fed by the energized motor M—5, energize the connected common conductors 60, 61 and 62 to energize all the corresponding connected solenoids, operating the corresponding typewriters simultaneously and similarly, that is recording the same character representations on all the connected machines in accordance with the sensed perforations.

Upon completion of the common typewritten matter sensed by the brushes L—1, the device may be operated to again connect the typewriters T—1 to T—4 and the typewriters T—1E to 4E to the individual perforated rolls 12 to control the

machines in a different manner and operated simultaneously as previously described, or the device may be stopped at the completion of the common matter to be recorded to restore the apparatus to its normal condition.

The first operation set forth will now be described: A control perforation is sensed by control brush L—2 to energize the connected relay TF—1, causing the normally closed contacts TFC—1 to be opened to break the described locking circuit established through conductor 51 for relay LR—1 and the contacts TFC—2 now closed to energize the relay AR—1 by the connected grounded battery 16, through conductor 17, relay AR—1, conductor 70, to contacts TFC—2 to ground 19. The energized relay AR—1 establishes a locking circuit through its now closed contact ARC—4 through the now closed contact LRC—2 of de-energized relay LR—1 as previously explained.

The relay TF—1 then becomes de-energized since the motor circuit was continued to be established by virtue of the contacts SRC—5 of the slow release relay SR—5 so that the perforated roll was continuously fed by the said motor to feed the roll forward beyond the sensing position of the control brush L—2.

De-energization of relay LR—1 caused the contacts LRC—3 to be opened to de-energize the magnets B—1 to 4 to open the solenoid circuits to the common conductors 60, 61, and 62. Energization of relay AR—1 causes the motors M—1 to 4 to be operated to feed the associated perforated rolls 12 to the brushes C to operate the typewriters T—1 to T—4 simultaneously and in accordance with the separate control rolls, also to operate the typewriters T—1E to 4E in a similar manner and precisely as explained hereinbefore.

It is evident that in this manner a continuous simultaneous letter and envelope typing operation for the separate addresses may be established in conjuntcion with the simultaneous operation of the typewriters for the common body of the letters.

However, at the completion of the first complete cycle of operation, that is typing of the addresses and the common body of the letters, or at the completion of any complete cycle, it may be desired to stop the described system and restore the apparatus to normal and in condition for initiating later cyclic operations as described, which will now be described.

A control perforation is sensed by the control brush L—3 to energize the connected relay S—1 causing its contact SC—1 to be opened, breaking the locking circuit established for relay LR—1 through its contact LRC—5 and conductor 51. It was explained how the de-energization of relay LR—1 causes the de-energization of magnets B—1 to 4 to open the circuits to common conductors 60, 61, and 62, and the de-energization of slow release relay SR—5, which however, as explained hereinbefore, permits the motor M—5 to be energized long enough to feed the perforated roll associated therewith beyond the sensing position of control brush L—3 to cause de-energization of relay S—1, thus returning the apparatus to its normal position, and conditioned for further operations, as described, upon depression of the start key 15.

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 as follows:

1. A system of the class described comprising a plurality of translating mechanisms, a plurality of indicia record control means and arranged so that a translating mechanism is adapted to be controlled by an individual indicia record control means for reproducing the indicia represented thereon, circuit control means to initiate operation of the said record control means and their associated translating mechanisms simultaneously, so that each translating mechanism reproduces the indicia represented on the record control means associated therewith, an additional indicia record control means, and control means to connect automatically the translating mechanisms with said additional indicia record control means so that all the said mechanisms are operated simultaneously in accordance with the indicia represented on said common record control means.

2. A system of the class described comprising a plurality of translating mechanisms, a plurality of indicia record control means therefor, circuit control means to connect automatically the said translating mechanisms to a predetermined number of the said indicia record control means whereby the translating mechanisms individually and simultaneously reproduce the indicia represented on the associated indicia record control means, and circuit control means to connect automatically the same translating mechanisms to a different indicia record control means of said plurality of control means so as to reproduce simultaneously on all the said mechanisms the indicia represented on the said different indicia record control means.

3. A system of the class described comprising a plurality of translating mechanisms, a plurality of indicia record control means, circuit control means to connect automatically a predetermined number of said mechanisms to individual indicia record control means to reproduce at the same time the indicia represented on the associated indicia record control means, circuit control means to connect automatically all of the operated mechanisms to a common and different indicia record control means of said plurality of control means so as to reproduce simultaneously on the mechanisms the indicia represented on the said common record control means, and means to automatically effect the second named simultaneous operation upon completion of the first named simultaneous operation.

4. A system of the class described comprising a plurality of translating mechanisms, a plurality of indicia record control means, circuit control means to connect automatically groups of a predetermined number of said mechanisms to individual indicia record control means so that the said groups reproduce simultaneously the indicia represented on the associated record control means, a common and different indicia record control means, circuit control means to connect automatically a selected number of the said translating mechanisms to said common and different indicia record control, means so that the selected mechanisms simultaneously reproduce the indicia represented on the said common record control means, means to automatical-

ly effect the second named simultaneous operation upon completion of the first named simultaneous operation, and means to render the non-selected mechanisms inoperative upon the operation of the last named circuit control means.

5. A system of the class described comprising a plurality of translating mechanisms, a plurality of indicia record control means, circuit control means to connect automatically groups of a predetermined number of said translating mechanisms to individual indicia record control means so that the said groups of mechanisms reproduce the indicia represented on the associated individual record means simultaneously, and means operated automatically upon completion of the controlling function of each of the individual indicia control means to render the said indicia control means inoperative.

6. A system of the class described comprising a plurality of translating mechanisms, a plurality of indicia record control means, circuit control means to connect automatically groups of said translating mechanisms to individual indicia record control means to reproduce simultaneously the indicia represented on the associated record control means, and individual circuits including electromagnetic means associated with each record control means and energized individually upon the completion of the individual controlling function of the associated indicia record means, and means controlled by the operation of said electromagnetic means to render the individual indicia control means inoperative.

7. A system of the class described comprising a plurality of translating mechanisms, a plurality of indicia record control means, circuit control means to connect automatically groups of a predetermined number of said mechanisms to individual indicia record control means so as to reproduce the indicia represented thereon simultaneously by the associated mechanisms, a common and different indicia record control means, means controlled upon the completion of the operation of each of said indicia record control means to render said common and different record control means operative, means to connect automatically the said translating mechanisms to the common indicia record control means so as to reproduce simultaneously the indicia represented thereon, and means operated upon the completion of the controlling function of the said common control means to operate automatically the aforementioned individal indicia record control means and the said associated mechanisms.

8. A system of the class described comprising a plurality of translating mechanisms, a plurality of indicia record control means, circuit control means to connect automatically groups of said translating mechanisms to individual indicia record control means to reproduce simultaneously the indicia represented on the associated indicia record control means, and individual circuits including electromagnetic means associated with each indicia record control means and energized individually upon the completion of the individual controlling function of the associated indicia record control means, a common and different indicia record control means, circuits to render said common and different indicia record control means operative when all of said electromagnetic means are energized, and means to connect automatically certain of said translating mechanisms to the common indicia record control means to reproduce in unison the indicia represented thereon.

AUSTIN R. NOLL.