United States Patent [19]

Becker

[11] **3,802,545**

[45] **Apr. 9, 1974**

[54] **INPUT/OUTPUT MECHANISM FOR KEYBOARD PRINTER UNIT**

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[73] Assignee: **Datel Corporation,** McLean, Va.

[22] Filed: **Sept. 28, 1970**

[21] Appl. No.: **75,982**

[52] **U.S. Cl.** **197/19**

[51] **Int. Cl.** **B41j 5/30**

[58] **Field of Search** 197/17, 18, 19, 20

[56] **References Cited**

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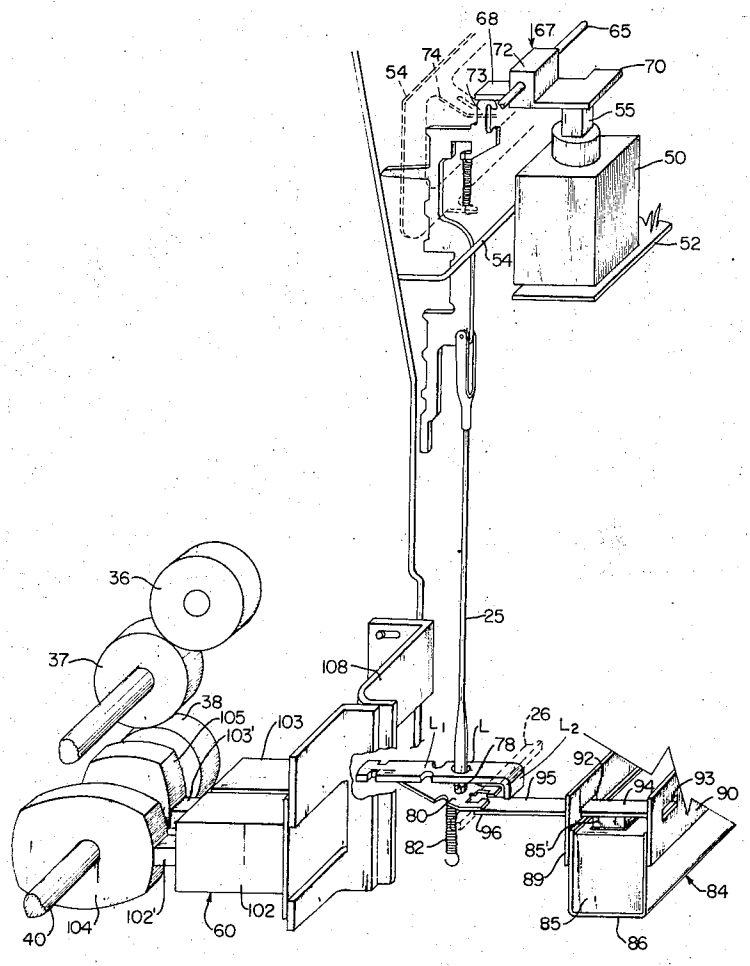
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[57] **ABSTRACT**

The present invention is intended for use in keyboard printers or typewriters wherein operation of the character type levers is translated by selection control linkage including different combinations of a limited number of latches through a displacement mechanism to select the character on a print head to be printed. The characters selected for printing can be converted simultaneously into coded electrical signals for transmission to a remote station, and the latches also can be electromagnetically actuated in response to receiving coded electrical signals from a remote station. Rocker-type activators are associated with the selection control linkage to selectively open or close electrical switching members in different combinations to generate coded electrical signals representing each character being printed. Further, when coded electrical signals are transmitted back for automatic operation of the typewriter, the electromagnetic actuating means will operate directly on the selector latches through the displacement mechanism over a limited part of each print cycle independently of the rest of the selection control linkage.

6 Claims, 9 Drawing Figures



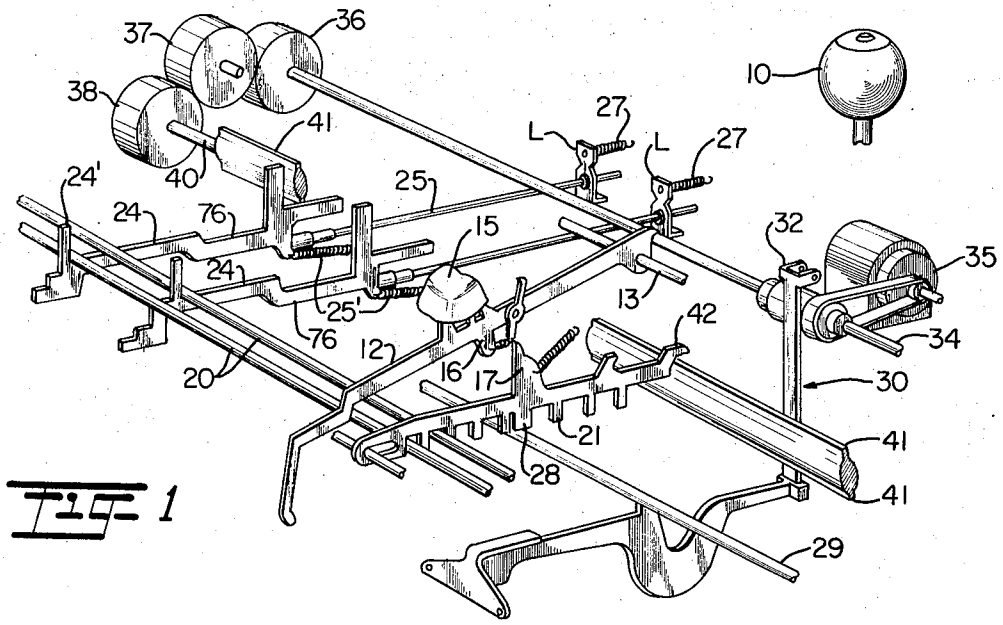


FIG. 1

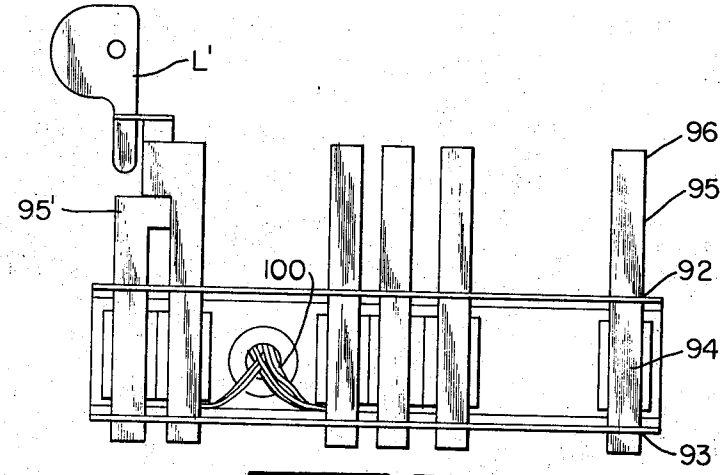


FIG. 7

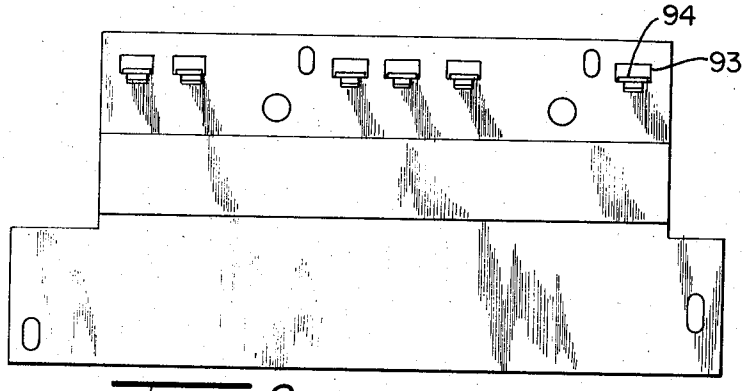


FIG. 8

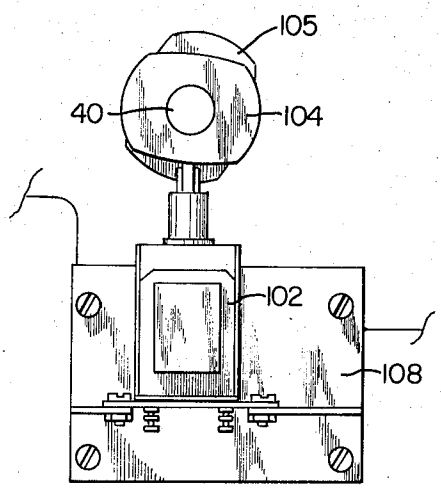


FIG. 6

FIG. 2

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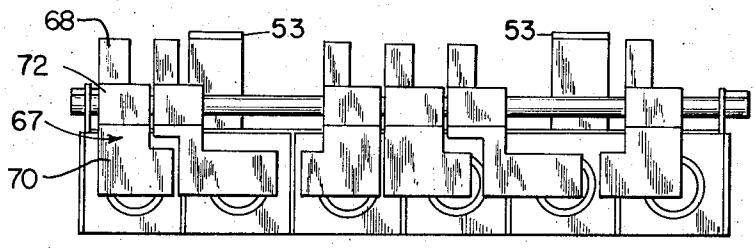


FIG. 4

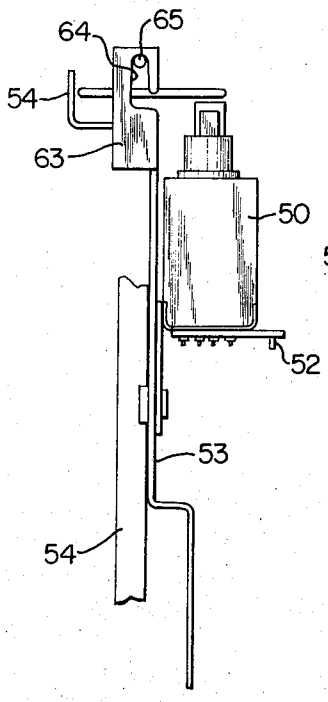


FIG. 5

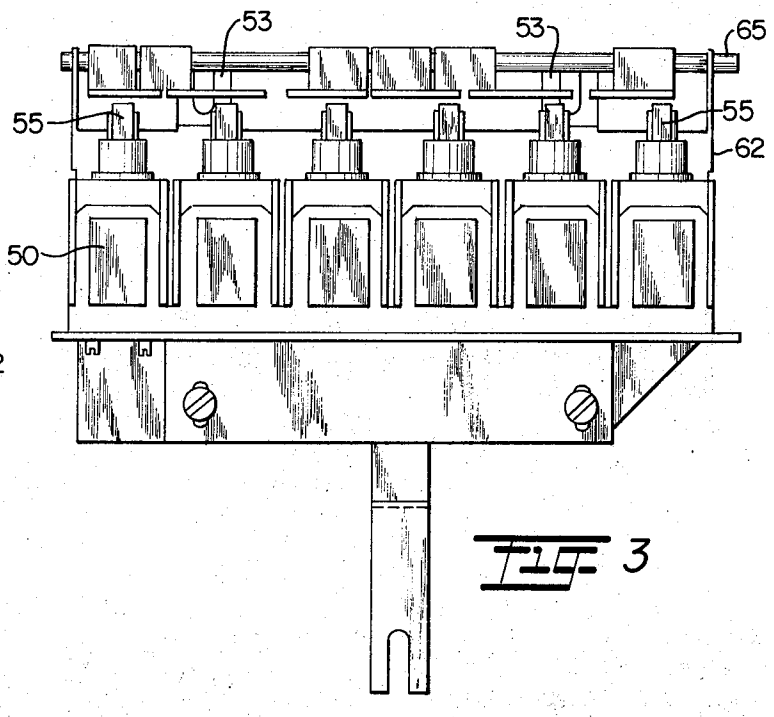


FIG. 3

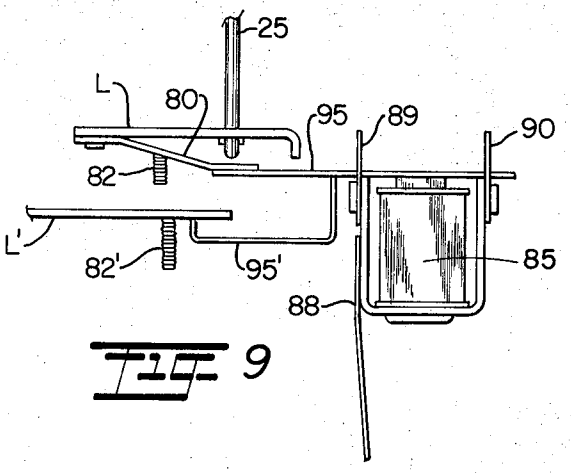


FIG. 9

INPUT/OUTPUT MECHANISM FOR KEYBOARD PRINTER UNIT

This invention relates to novel and improved keyboard printer units, and more particularly relates to novel and improved means in an input/output typewriter for translating characters into coded electrical signals as well as for translating the coded signals back into characters in the automatic operation of the typewriter.

In the operation of input/output typewriters, as the characters are manually typed on the typewriter they are simultaneously converted into coded electrical signals that are recorded or stored at a remote station. In addition, the same or other signals may be transmitted back to the typewriter and through mechanism responsive to the signals cause automatic operation of the typewriter to print each character represented by a signal. Typical input/output typewriters of the type described are those set forth and described in United States Letters Pat. No. 2,919,002 to L. E. Palmer or No. 3,260,340 to H. C. Locklar et al. wherein a spherical print head bearing columns and rows of characters is selectively rotated and tilted by a displacement mechanism to present the desired character for printing. The displacement mechanism is responsive to actuation of selector latches or coupling elements, limited in number with respect to the number of characters on the keyboard, which are actuated in different combinations through selection control linkage set in motion by depression of each key lever in the printing of each character. The linkage will determine in each case those latches to remain in the path of an actuating bail which is advanced in each printing cycle to establish the degree of rotation and tilt of the print head and the character on the print head to be typed.

In positioning the selector latches, the selection control linkage simultaneously may control opening and closing of electrical switches for the conversion of each character into a coded electrical signal. In this connection it is advantageous to provide the most compact assembly and arrangement which will afford quick, accurate response to limited movement of the linkage within each printing cycle with a minimum of adjustment or maintenance required under repeated, high-speed operations. Additionally, coded electrical signals may be transmitted back to the typewriter to electromagnetically actuate the same latches whereby to control the degree of rotation and tilt of the print head in selecting each character for printing in an automatic printing cycle. Most desirably, the electromagnetic means are associated directly with the selector latches of the displacement mechanism in order to position the latches without the aid of the selection control linkage employed in the manual typing operation and over a very limited part of each print cycle.

It is therefore an object of the present invention to provide for a novel and improved means for translating characters being printed in a typewriter into coded electrical signals in a rapid dependable manner for transmission to another location.

It is another object of the present invention to provide means for converting manual operations performed on a typewriter, keyboard printer and the like into coded electrical signals which is compact and requires a minimum number of parts and elements in

mounting and disposition in direct association with the control linkage and circuitry of the typewriter.

It is a further object of the present invention to provide rocker-type activator elements releasably attachable in the path of movement of the control linkage employed for the selection of each character for printing whereby the activators are quickly and accurately responsive to movement of the linkage to control opening and closing of electrical switches for coding the information printed, the activator and switch assembly being conformable for use with different types of typewriter or keyboard printer units, and easily adjustable and servicable once in place.

It is an additional object of the present invention to provide novel and improved means for automatically actuating the displacement mechanism of a typewriter and the like in response to receiving coded electrical signals which is characterized by its ability to accelerate the speed of selection of printing each character automatically in response to signals received from a remote location.

It is a still further object of the present invention to provide compact electromagnetic character selection means directly attachable to a typewriter and energizable in response to receiving remotely applied coded electrical signals to activate the displacement mechanism of the typewriter for printing each character represented by a signal, said means being so disposed and arranged as to operate directly on the displacement mechanism and avoid activation through the manual control linkage of the typewriter thereby greatly accelerating response time and requiring operation over a limited part of the printing cycle.

It is an additional object of the present invention to provide for a novel and improved means for converting characters printed on a typewriter into coded electrical signals and for activating the typewriter in response to receipt of coded electrical signals with switching means to closely time and regulate the time duration within each printing cycle for coding the characters as they are printed and for energizing the electromagnetic actuating means in printing each character.

In accordance with the present invention, the preferred form is adaptable for use in a typewriter of the type wherein depression of each key lever is translated through activation of a selected combination of interposers in a selection control linkage to determine the character to be printed. The number of interposers is limited with respect to the number of characters since the interposers can be actuated in different selected combinations to represent all of the characters on the typewriter. In accordance with the present invention, rocker-type activators are aligned in the path of each of the interposers to be movable in response to advancement of the interposers to control the opening or closing of a corresponding number of switching elements wherein the switch elements are provided with contact arms engageable by the activators. As a result, a combination of switches may be opened or closed corresponding to the combination of interposers advanced upon depression of each key lever whereby to generate the same combination of electrical signals for transmission to a remote location. In a similar manner, electromagnetic actuating means is mounted in direct association with each of the selector latches to effect displacement of the latches in response to receipt of coded electrical signals when transmitted back from a

remote location to operate the displacement mechanism in the same manner as the character interposers. The electromagnetic actuating means is so arranged with respect to selector latches associated with the interposers as to require energization over a minimal time period in each printing cycle so that the latches can be restored to their original disposition in ample time for each next cycle in succession without use of other restoring means. Hall-effect switches are preferably employed as the switching elements for coding each character into an electrical signal as well as for the timing switch which closely regulates the timing of the signals for transmission to the remote location and energization of the electromagnetic actuating means in each cycle, the switches being characterized by their rapid response time and lack of bounce or vibration.

The above and other objects, advantages and features of the present invention will become more readily understood and appreciated from the following description of a preferred form when taken together with the accompanying drawings, in which:

FIG. **1** is a top, fragmentary perspective view parts of a conventional input/output typewriter utilized in manual keyboard operations.

FIG. **2** is a bottom, fragmentary perspective view illustrating from the underside of the typewriter unit the selection control linkage for printing characters on the typewriter together with means for coding each character into electrical signals and for automatically printing characters in response to coded electrical signals.

FIG. **3** is an elevational view of a preferred form of switch assembly utilized in the formation of coded electrical signals, in accordance with the present invention.

FIG. **4** is a plan view of the switch assembly shown in FIG. **3**.

FIG. **5** is a side view of the switch assembly shown in FIGS. **3** and **4**.

FIG. **6** is a side view in detail of a filter or timing switch assembly.

FIG. **7** is a plan view of electromagnetic actuating means used in automatic printing operations.

FIG. **8** is a front view in elevation of the electromagnetic actuating means; and

FIG. **9** is a side view of the electromagnetic actuating means.

Referring in detail to the drawings, there is represented for the purpose of illustration in FIG. **1** a conventional printer unit in which a spherical print head **10** is provided with rows and columns of characters, not shown. The pivot head **10** is selectively advanced into position for printing by a displacement mechanism which is actuated in response to depression of one of a plurality of key levers, one such key lever being designated at **12** which is pivotal about a shaft **13.** Whenever a key lever **12** is pivoted by its key button **15,** a pawl **16** on key lever **12** advances a character interposer **17** into alignment with a plurality of selector bails **20,** the latter being disposed for engagement by lugs **21** on the character interposer. Each character interposer has a different lug spacing so that different combinations of selector bails are aligned with a character interposer **17** in response to depression of each key lever; and each combination of any one or more of the selector bails aligned with an interposer **17** is representative of the character displayed on the related key button. Each of the selector bails **20** will control movement of an associated latch interposer **24,** and of the latch interposers shown in FIGS. **1** and **2** it will be noted that each has a pivotal rod **25** to control movement of a selector or check latch, designated L, out of the path of a common actuating latch bail **26.** Each latch interposer is normally urged in a rearward direction by a spring **25'**, and each selector latch is biased rearwardly into the path of the bail **26** by a spring **27.** The latch bail **26** is caused to be moved downwardly against those latches L not removed from its path by the latch interposers **24,** and those latches engaged will operate through the displacement mechanism, not shown, to advance the desired character, corresponding to the key lever depressed, into position for printing.

In order to correlate advancement of the actuating bail **26** with movement of the latches L, each character interposer **17** has a special lug **28** which when depressed will strike a cycle bail **29** forcing the bail **29** to move downwardly and, through suitable control linkage represented at **30,** actuate a clutch member **32** for rotation of a cycle shaft **34** by a motor drive **35.** In each print cycle, the cycle shaft **34** will rotate 180° and through intermeshing gears **36, 37** and **38** is operative to rotate a filter shaft **40** through 180°. The filter shaft **40** has diametrically opposed blades **41** positioned beneath the character interpose **17** so that in each 180° print cycle a blade **41** is engageable with the shoulder **42** on the character interposer **17** to slidably advance and drive the lugs **21** and the aligned selector bails **20** with the bails engaging lugs **24'** to advance their respective interposers **24** in a direction lifting their associated latches L out of the path of the bail **26.**

In FIG. **2** the underside of the typewriter is viewed standing on end with the latches L at the bottom and the latch bail **26** is represented in dotted form. In a conventional manner, not shown, when the cycle shaft **34** is rotated through each print cycle cams on the shaft will engage rollers on a pivotal frame for the bail **26** to force the bail **26** to pivot downwardly, or to the right in the relation viewed in FIG. **2,** causing displacement of those latches L not moved out of position to actuate the displacement mechanism. Conventionally, in the unit herein described, a limited number of bails **20,** character interposers and latches L are required in relation to the number of characters on the typewriter unit, that section of the typewriter between the key levers and displacement mechanism herein referred to as the selection control linkage, and the latches L being the principal selection control members. For the purpose of describing the features of the present invention a set of six interposers **24** and associated latches L are given as an example of the number which may be actuated in different related combination to represent all of the characters on a standard typewriter unit. Of course other parts and elements are associated with the unit hereinbefore described to insure proper correlation between the latches L, latch bail **26,** cycle shaft **34** and filter shaft **40** in the printing of each character, it being understood that the foregoing description of a typical typewriter or printer unit is intended as a setting for the following description of a preferred form of the present invention.

It is customary to convert each character typed into coded electrical signals by positioning a plurality of electrical switches in direct association with the interposers **24** and to operate the switches in response to movement of the interposers. Specifically, movement

of an interposer **24** will operate an associated switch and through a logic circuit, signals are transmitted in the same combination as the combination of interposers **24** that were activated. In accordance with the present invention and having specific reference to FIGS. **2** and **5** a plurality of switches **50** are attached to a common mounting plate **52** which is affixed by spaced brackets **53** behind the typewriter frame portion **54.** The switches are mounted in closely spaced, parallel relation to the direction of travel of the interposers **24,** each with a spring-loaded plunger or movable contact member **55** facing in the direction of travel of an associated interposer when activated. In the preferred form, the switches are solid-state, Hall-effect switches and are normally open so that the depression of the plunger will close the switches, into a logic circuit on a printed circuit board represented at **56,** for transmission of an electrical signal to a remote station, such as, a recording unit. Filter switch **60,** to be hereinafter described in more detail, is operative through a suitable clock circuit to synchronize transmittal of each combination of signals generated in response to activation of the latch interposers **24** in printing a character.

In order to transmit movement of the interposers **24** to the switches **50,** opposite ends **62** on the plate **52** extend beyond the plungers **55** and are provided with terminal carrier brackets **63,** each bracket having a bayonet slot **64** to receive and support the end of a rocker shaft **65.** Rocker-type activators or arms **67** are mounted on the common shaft **65,** each activator having a rearwardly extending, flat arm **68** extending across the path of movement of the end of an interposer **24** and a forwardly extending, flat contact arm **70** disposed to engage the terminal end of a plunger **55** on each switch **50.** The intermediate body portion **72** of each activator **67** is provided with a bore for insertion of the shaft **65,** the activators being independently pivotal on the shaft. It will be seen that the interposers **24** have generally C-shaped end portions **73** passing through slots in extensions **74** of the frame **54,** shown dotted in FIG. **2,** and the activators are so aligned that the rocker arms are normally resting on the end portions **73** in order to closely follow interposer movement and to impart same in the opposite direction of movement against plungers **55.** In addition, as noted from FIG. **4,** the forward arm portions **70** are formed to compensate for the unequal spacing of the interposers **24** and the equal spacing of the switching whereby to extend over the plunger which is to be responsive to each respective latch interposer **24.**

In each printing cycle, depression of each key lever is transmitted through the selection control linkage, including selected latch interposers **24,** and in turn movement of the latch interposers will cause the associated activators **67** to be pivoted about the shaft to depress the plungers of the aligned switches. At the end of each printing cycle, the interposers are restored to their original disposition by the return springs **25'** shown in FIG. **1,** and the outwardly biased, spring-loaded plungers **55** on the switches **50** will cause the activators to return to their original positions in preparation for the next printing cycle. From the foregoing, the switch and activator assembly is characterized by its compact mounting and ease of installation so as to be closely sensitive to movement of the latch interposers **24** without direct attachment or connection thereto; and any necessary adjustment can be made through the mounting brackets **53.**

In automatically printing characters on the typewriter, in accordance with the present invention, the operations are carried out without manipulating the selection control linkage, except for the latches L which are lifted or displaced independently of the interposer rods **25.** Here, it will be noted that each latch L which has a body L_1 with a catch or lip L_2 at one end thereof is slidably supported on a stop member **78** at the lower extremity on each interposer rod **25** and each latch includes a downwardly and forwardly divergent extension plate **80** spaced from the body L_1 and beneath the end of the rod **25** so as to define a passage between the body L_1 and the extension plate in which a bail **26** is free to move against the catch L_2. A spring return element **82** normally holds the latch downwardly against the stop **78.**

It will be evident that the print head can be advanced to print selected characters under the control of the displacement mechanism by the transmission of electrical pulses to electromagnetic actuating means generally designated at **84** which is operative to displace a combination of latches L according to the coding of electrical signals applied to the means **84.** Specifically, in the form shown in FIGS. **2, 7** and **8,** and as viewed in the upright position shown in FIG. **2,** the means **84** takes the form of a series of solenoids **85** arranged in juxtaposed relation to one another within a common, generally U-shaped frame **86** in substantial alignment with the latches L. The U-shaped mounting frame is attached by mounting brackets **88** to the typewriter frame **54** with spaced extension plates **89** and **90** projecting upwardly from opposite sides of the frame. The extension plates are provided with a plurality of slots **92** and **93,** a pair of slots being aligned at opposite sides of each solenoid to receive the forward end portion **94** of an elongated armature plate **95.** It will be seen that the end portion **94** extends across the exposed end or pole piece **85'** of a solenoid **85,** and the inner end portion **96** of each plate **95** is situated behind a latch extension **80** on each of the latches L. The slots **92** and **93** are generally rectangular in configuration and slightly overlap the side edges of the frame **86,** the slots being slightly enlarged with respect to the cross-sectional size of the armature plates **95** whereby each plate **95** is free to move a limited distance within its respective pair of slots toward and away from its solenoid. Thus, each plate **95** is free to undergo movement in its slots from a normal position at rest away from its associated solenoid to an inward position, when the solenoid is energized, against the side edges of the frame. When each plate **95** is drawn toward its solenoid, it will rock about the inner side edge of the frame by the slot **92** under sufficient force to overcome the urging of the return spring **82** and to displace the latch extension **80** and latch L a sufficient distance along the interposer rod to withdraw it from the path of the actuating bail **26.** When the solenoid is deenergized, the return spring **82** will exert sufficient force on the latch extension **80** to return the latch L to its original position against the end of the interposer rod **25** and to rock the armature plate **95** in an opposite direction about the inner side edge of the frame and away from the solenoid. The guide slots **92** and **93** in cooperation with the side edges of the frame will limit movement of the armature plates **95** within very close tolerances but will permit sufficient

movement of the plate **95** to effect the necessary displacement of a latch L into and out of the path of the actuating bail. The armature plates **95** are readily adjustable by bending or shaping the inner end portions **96** in order to align the armature plate properly between the solenoid frame and latch.

The solenoids **85** are selectively energized through magnet drivers, not shown, and which may be conveniently mounted beneath the solenoid assembly with electrical leads **100** extending through the solenoid frame **86** for connection into each of the solenoids. Generally, the magnet drivers may tie in with suitable logic circuitry on a printed circuit board, not shown, which contains the necessary controls to interface the operational and character elements on the typewriter. Most desirably, while forming no part of the present invention, the logic control circuitry will provide the necessary switch-whetting and low impedance ties to a specified logic voltage as well as to provide the necessary amplification and suppression to operate the solenoids under logic control. Thus, a magnet driver is provided for each solenoid to apply the necessary voltage in operating each solenoid in response to an applied pulse to the driver from a remote point, such as, from a recording unit; and of course the pulses or signals applied may be the same as those transmitted through the switch assembly **50** hereinbefore described.

As represented in FIGS. **7** to **9** the solenoid assembly comprises a combination of six solenoids **85** operative to control actuation of six latches L, and the spacing between solenoids as well as armatures is regulated to correspond with the spacing between the selector latches. In addition, it will be noted that one of the latches L′ is offset and accordingly, one of the armature plates **95** is provided with an offset **95′** to engage the offset latch portion so as to effect proper movement of the latch L′ without interfering with movement of the other latches. Although not shown, an additional solenoid may be provided to control movement of a seventh latch which activates a conventional cycle bail and cycle clutch, not shown, for rotation of the cycle shaft **34** through each print cycle.

In each printing cycle, the solenoids are energized upon receiving a coded electrical signal over a time duration controlled by the filter or timer switch **60.** As best seen from FIGS. **2** and **6,** the filter switch assembly **60** comprises a pair of switches **102** and **103** mounted on an extension **108** of the frame **54** where the opening and closing of each switch is controlled by separate cam elements **104** and **105,** respectively. The cam elements **104** and **105** are mounted for rotation on the filter shaft **40** and are rotationally offset from one another, as illustrated, a predetermined number of degrees to control the period of energization of the solenoids within each 180° print cycle. Thus for example the cam **104** may be set to close its switch **102** by depression of plunger **102′** at some point approximating 30° into each printing cycle to energize the solenoids, and the cam **105** may be set to deenergize the solenoids within 10° to 30° later by depressing the plunger **103′** on switch **103** to close the switch and deenergize the solenoids well in advance of the next printing cycle. Thus the solenoids can be accurately picked or energized over but a limited portion of the cycle to remove a selected combination of latches L from the path of the bail **26,** and thereafter may be deenergized to remove any residual magnetism and restore the latches L in advance of each next cycle in succession. This achieves close accurate control over the movement of the latches while permitting high-speed printing in a reliable efficient manner. In order to further minimize residual magnetism, preferably the pole pieces are covered with a Mylar tape and the duty cycle within each print cycle may be closely set to energize or deenergize the solenoids over 10° to 30° of the print cycle, since the armature plates will operate directly on the selector latches and not through the interposer rods **25.**

In a typical printing operation, each character to be printed is coded through the switch assembly **50** as hereinbefore described. When the typewriter is set for automatic operation, the automatic printing of the characters progresses by application of the coded signals which may be applied serially in the form of bits into a shift register. After the last bit representing a character is clocked into the shift register, the bits may be loaded in parallel into a storage register and a clock circuit simultaneously activated to set or reset a bistable device controlling a second clock circuit, such as, a one-shot delay. If the printer mechanism is in condition to receive, as controlled by an interlock switch on the printer, the one-shot delay is activated in the solenoid for the cycle shaft where the cycle shaft is energized to initiate the print cycle by releasing the cycle shaft for rotation of the filter shaft **40** and associated blades. The terminal leads, not shown, on the switches **102** and **103** are connected into the second clock circuit to regulate the period of energization of the solenoids **85** in each cycle. Thus, when the one-shot delay is activated in the second clock circuit, energizing pulses are not gated to energize the magnet drivers **100** until the filter switch is permitted to close at the desired point into the cycle; and further, the magnet drives are not deenergized until the switch is opened at the selected point later in the cycle as regulated by the second filter switch **103.** If for any reason the filter switch **103** should fail to function properly in each cycle, the second clock circuit or delay may "time out" at the end of the cycle to deenergize the solenoids. The energizing pulses are applied only to selected magnet drivers **100** corresponding to the combination of pulses in the storage register for each print cycle and will activate only those latches corresponding to the combination of pulses applied to displace the latches out of the path of the actuating bail. The actuating bail **26** will engage those latches remaining in its path to effect selective rotation and tilt of the print head through a conventional displacement mechanism, not shown, to print the desired character.

Thus there has been provided in accordance with the present invention a novel and improved electromagnetic input mechanism for controlling a single element print head to advance different characters into printing position by selective actuation of different combinations of a limited number of latches associated with the selection control linkage. The solenoids in cooperation with the armature plates are able to actuate the latches over a limited time interval within each print cycle under the control of the filter switch which is controlled in opening and closing through the cycle shaft. The electromagnetic input mechanism will operate directly on the selector latches L without disturbing the rest of the selection control linkage; and conversely the selection control linkage may operate in the same manner upon the selector latches L for selection of each

character through the same displacement mechanism without disturbing the electromagnetic input mechanism and the activators and switch assembly will respond to movement of the selection control linkage in response to manual depression of the key lever independently of the operation of the electromagnetic input mechanism. However, the selection control linkage and electromagnetic input mechanism will operate through the same displacement mechanism to control printing of each character.

It is to be understood from the foregoing that various modifications and changes may be made in the construction and arrangement of elements comprising the preferred form of the present invention, such as, for use in other forms of printer apparatus than that described, without departing from the spirit and scope of the present invention.

What is claimed is:

1. In an input/output typewriter having a plurality of interposers arranged in side-by-side relation to one another for independent movement of selected ones of said interposers by advancement means at one end of the interposers in response to depression of a key lever between an inactive position and an active position in advancing different selected characters on a print head into printing position through a corresponding number of selector latches, each latch having a body with a catch for selective engagement by a latch bail in the typewriter and disposed on an interposer to follow movement of each respective interposer, and each of the latches being slidable in one direction independently of said interposers and operative in combination to advance different selected characters of the print head into printing position, the combination therewith comprising:

electromagnetic actuating means for each of said selector latches,

a frame assembly mounting said electromagnetic actuating means in adjacent spaced relation to said selector latches,

each selector latch including an extension portion extending away from the body thereof in spaced relation to the catch and to the interposer associated with the latch and defining a passage between the body and the extension portion in which the latch bail is free to move against the catch,

an armature plate associated with each of said electromagnetic actuating means and movable in response to energization of its electromagnetic actuating means into engagement with said extension portion on the respective selector latch to slidably displace said selector latch independently of its respective interposer, and

spring return means to restore each latch to its original position upon deenergization of each respective electromagnetic actuating means.

2. In an input/output typewriter according to claim **1,** said frame assembly being of generally U-shaped configuration for mounting of said actuating means in spaced parallel relation to said interposers, said frame assembly having opposite side portions extending beyond said actuating means with aligned slots in the sides of said frame assembly for insertion of said armature plates, said plates being movable within the slots in response to energization of the actuating means to selectively displace an aligned selector latch.

3. In an input/output typewriter according to claim **2,** each of said actuating means being defined by a solenoid responsive to an applied electrical signal to be energized for displacing an associated latch, and a timer switch common to said solenoids to selectively control the period of energization of said solenoids in each printing cycle.

4. In an input/output typewriter according to claim **1,** wherein the end of said interposers opposite to said one end extends through an associated latch, and wherein said extension portion of each latch is disposed on the opposite side of the body of the latch from the said one end of said interposers.

5. In an input/output typewriter according to claim **13,** said extension portion of each latch being connected to the body of the latch at one end and inclining away therefrom whereby the opposite end of the extension portion is spaced from the body of the latch and said opposite end of the interposer and disposed for engagement by an armature plate, and further including stop means on said opposite end of the interposer for engaging the body of the latch when said interposer is moved by the advancement means to prevent said latch bail from engaging the catch on the latch.

6. In an input/output typewriter wherein selection control linkage is provided with a plurality of interposers disposed in side-by-side relation to one another, selected interposers being independently movable in response to depression of a key lever, a corresponding number of selector latches, each latch disposed at the end of an interposer to follow movement of its respective interposer and being slidable in one direction independently of its interposer, said latches being operative in combination to advance different selected characters of the print head into printing position, the improvement comprising:

signal generating means for generating electrical signals representative of each character selected in response to movement of selected interposers, said generating means including an electrical switch member aligned in closelyspaced relation to one end of a respective interposer opposite to the end adjacent to said latch, each switch member having a movable plunger operative to open and close each switch member.

activator means comprised of a unitary plate-like structure having opposite substantially flat faced arm portions extending between the one end of the interposer and movable plunger of each switch member, an enlarged intermediate body portion between the flat faced arm portions, a shaft passing through the intermediate body portion about which the activator means can pivot, said activator means being responsive to movement of each interposer against a flat face of an arm portion of the activator means to cause said activator means to pivot about the shaft and engage its respective plunger to effect closing of its respective switch member for generation of an electrical signal; electromagnetic actuating means associated with each of said selector latches including a control arm associated with each of said actuating means and movable in response to energization of said actuating means to displace an aligned selector latch independently of its respective interposer, and

spring return means to restore each latch to its original position against the end of its interposer upon deenergization of each respective actuating means.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,802,545 Dated 9 April 1974

Inventor(s) Harold D. Becker

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the Specification:

Column 4, line 26, cancel "interpose" and substitute --interposer--

In the Claims:

Column 10, line 15, cancel "13" and substitute --4--

Signed and sealed this 30th day of July 1974.

(SEAL)
Attest:

McCOY M. GIBSON, JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents