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R. SALTO

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INTERLOCKING DEVICE FOR ELECTRIC TYPEWRITERS

Original Filed Feb. 19, 1964

2 Sheets-Sheet 1

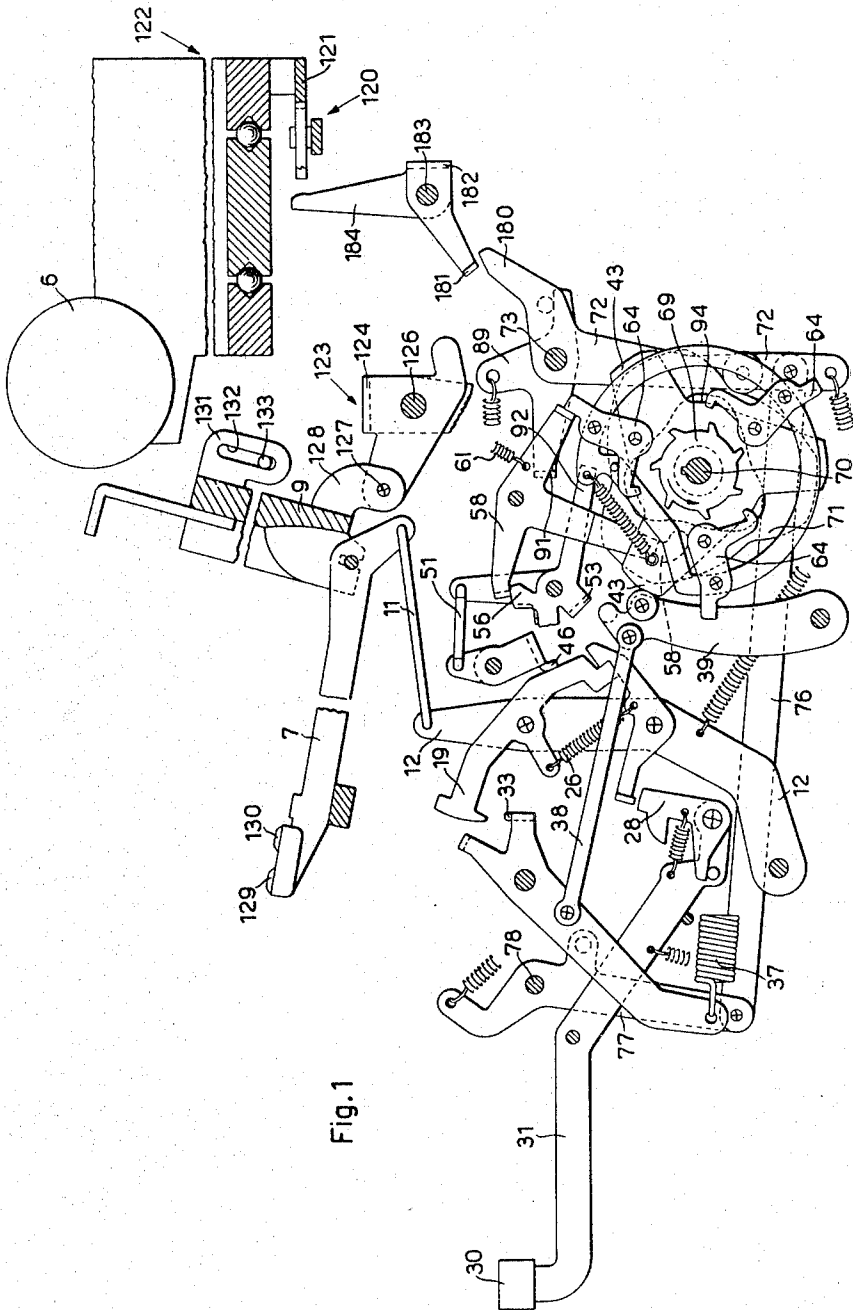


Fig. 1

INVENTOR.
RINALDO SALTO
BY *John Taggenburger*
AGENT

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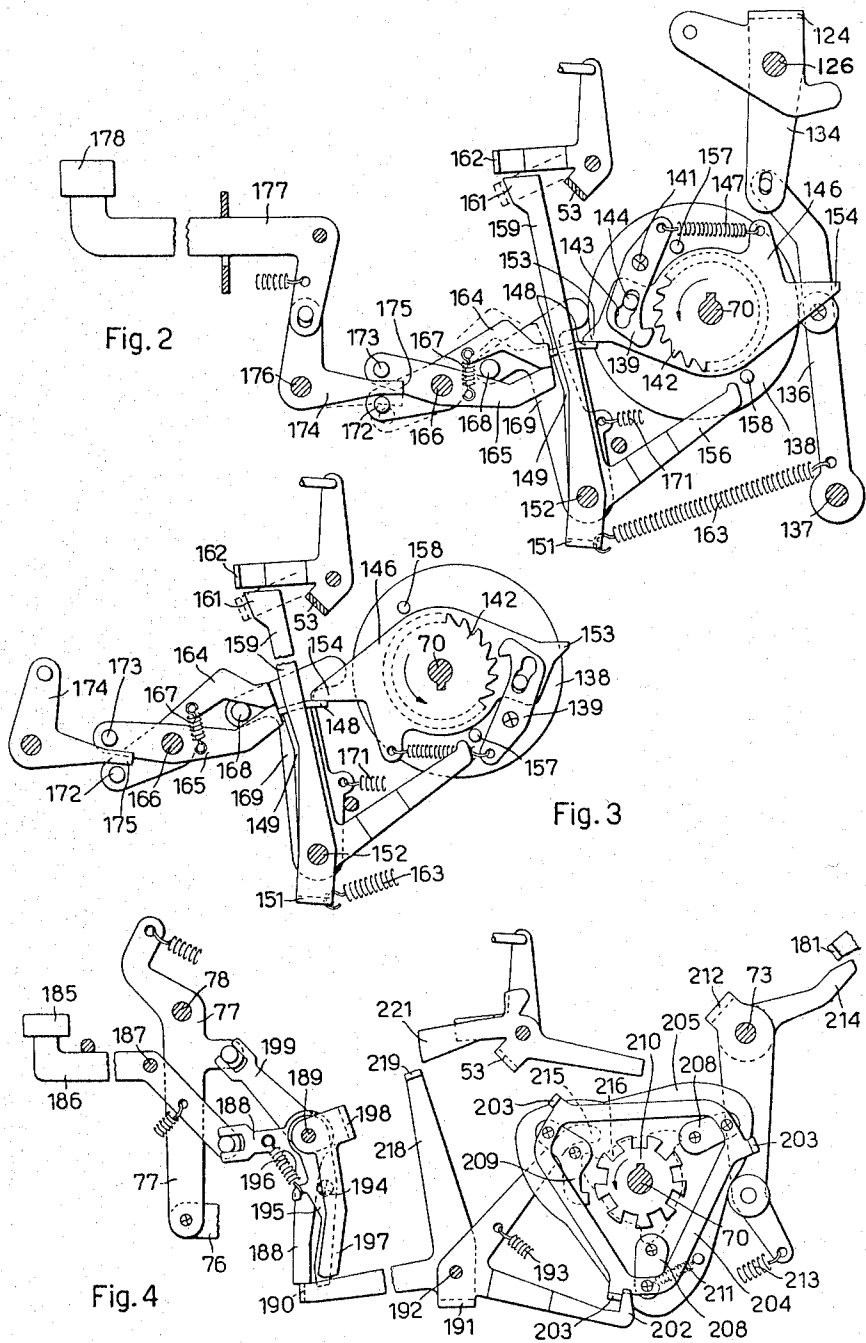
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INVENTOR.

RINALDO SALTO

BY

John Taggenburger
AGENT

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INTERLOCKING DEVICE FOR ELECTRIC TYPEWRITERS

Rinaldo Salto, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy, a corporation of Italy
 Continuation of abandoned application Ser. No. 346,010, Feb. 19, 1964. This application Jan. 13, 1966, Ser. No. 532,026

12 Claims. (Cl. 197-74)

The inventive coverage herein embraced constitutes a continuation of my earlier application Serial No. 346,010 filed February 19, 1964, now abandoned.

The invention relates to electric typewriters in general, such as for example embodying a set of typebars pivotally mounted on a basket, a set of operating actions therefor which are individually conditionable for operating said typebars selectively, a paper carriage, and mechanism conditionable for relatively displacing said basket and said carriage. More particularly, the invention relates to an interlocking device for said type actions and mechanism, whereby operations thereof are enforced to occur appropriately spaced in time to facilitate good typed results.

Generally, in the known typewriters the type actions may be operated during a relative displacement of the basket with respect to the paper carriage, for example during the case shifting of the basket, or the spacing of the carriage, controlled by related controls or keys, whereby imprints are liable to be effected in incorrect locations on the work sheet.

There are known devices for locking the printing keys during the carriage movements which require a relatively long time, for example during a tabulating stroke or a carriage return. However, such devices are unsuitable because whenever a printing key is operated too closely in sequence to the case shift key or the space bar, the printing keys become objectionally locked, whereby the productivity of the typist is reduced. Furthermore, these known devices are particularly unsuitable for high-speed typing operations because the typist must carefully avoid quick successions of operations of keys.

The primary object of the invention is to provide an interlocking device between the type actions and other mechanisms of the machine which is simple, efficient and reliable in operation and allows a maximum of freedom for key operations.

Another object is to provide efficiently operating interlocking devices between the type actions and other key-controlled mechanisms without locking the keys for the control of said type actions and said mechanism against operation.

A further object is to provide an efficiently operative interlocking device between a power-operation control mechanism for the type actions and a power-operation control mechanism for a spacing device which is non-obstructive to the control keys for such mechanisms.

With the above objects in view there is provided in an electric typewriter of the above stated kind, an interlocking device between operation-control mechanism for type actions and operation-control mechanisms for carrying out other functions, comprising in combination, a universal member which responsively to the depression of any printing key is impositively urged toward an operated position for conditioning the corresponding one of said type actions, a first element movably associated with said universal member for urged movement thereby along a first path, and a second element which responsively to a function key is impositively urged along a second path, the paths of said elements being intersecting each other so that each one of said two elements when moved along

its path is adapted to block or intercept the other element against operation.

Other objects, characteristics and advantages of the invention will become apparent from the following detailed description of two preferred embodiments thereof, and from the accompanying drawings, wherein:

FIG. 1 is a right-hand partial longitudinal sectional view of an electric typewriter embodying an interlocking device according to the invention;

FIG. 2 is a right-hand longitudinal sectional view of a first embodiment of the interlocking device according to the invention in the typewriter of FIG. 1;

FIG. 3 is a detail of FIG. 2 in an operated position;

FIG. 4 is a right-hand longitudinal sectional view of a second embodiment of the interlocking device according to the invention in the typewriter of FIG. 1.

The interlocking device according to the invention is embodied in an electric typewriter of the kind described in the applicant's United States patent application, Serial No. 311,709, now Patent No. 3,151,722 dated October 6, 1964, which will be now briefly described.

The typewriter comprises a set of printing keys 30 (FIG. 1), a set of typebars 7 pivotally mounted on a body or basket 9, and individual operating actions 12, 11, which are individually conditionable for operating said typebars 7. At the depression of a control or key 30, a corresponding key lever 31 through a trip lever 28, releases a corresponding enabling element or interponent 19, which then is rocked impositively counterclockwise by the urge of a suitable spring 26. The enabling element 19, on one hand, is urged to become coupled with a common actuator or bar 33 to condition the corresponding type action 12, 11 for operation, and further is urged to rock a universal member or bar 46 counterclockwise. Thus the bar 46, through a link 51, rocks a bail 53, which therefore is impositively urged from a first to a second position. An arm 56 of the bail 53 consequently releases a lever 58 for counterclockwise movement by a spring 61 and thereby causes a clutch 64, 69 to become engaged, whereby a group of cams 43, 71 and 94, comprising part of a cyclically operable power-means becomes rotated by a continuously rotating motor operated shaft 70 for a cycle of 120 degrees.

At the beginning of the cycle, the cam 43 releases a lever 39 which is connected to the bar 33 through a link 38, whereby the bar 33 becomes suddenly power-rocked counterclockwise by a spring 37. The bar 33 draws now the coupled enabling element 19 forwards (leftwards in FIG. 1), whereby the corresponding operating action 12, 11 rocks the typebar 7 clockwise to effect an impression against a conventional platen 6.

Substantially at the end of the forward movement of the enabling element 19, the cam 94 engages and rocks the lever 58 clockwise to release the arm 56 and render the bail 53 restorable. Simultaneously the cam 71 rocks counterclockwise a lever 72 fulcrumed at 73. The lever 72 is connected by a link 76 to a lever 77 fulcrumed at 78, which is thus rocked in synchronism with the lever 72. Said lever 72, when rocked, is resiliently followed by a lever 89 fulcrumed at 73. The lever 89, in so following, causes a lug 91 to engage another arm 92 of the bail 53. This returns the latter to its first, normal position and in turn returns the bar 46 to its normal FIG. 1 position.

Furthermore, the lever 72, through an arm 180, when operated, engages a lug 181 of a bail 182 pivoted at 183. In turn another arm 184 of the bail 182 operates a step-feeding device in the form of an escapement mechanism generically indicated by the numeral 120, which cooperates in a known manner with a rack 121 secured to a conventional paper carriage 122. Said carriage embodies a usual platen 6 and is spring-urged leftwards in a con-

ventional manner. Therefore, the escapement mechanism 120 may be stated to be operable by a power-mechanism for relatively displacing the body 9 and the carriage 122. The escapement mechanism 120 when operated causes the carriage 122 to be step-fed by the usual carriage feed spring, but due to the inertia of the carriage, the step-feed motion takes place only after the bail 53 upon momentary power operation becomes restored.

After the impact of the typebar 7, the cam 43 rocks the lever 39 counterclockwise, whereby the bar 33 is restored and the spring 37 is again tensioned. By this time the cam 94, as clearly evident from said Patent No. 3,151,722, has allowed the lever 58 to restore, so that the clutch part 64 through encounter of the lever 58, disengages the clutch 64, 69 and the cams 43, 71 and 94 are arrested after being rotated 120 degrees.

A first embodiment of the interlocking device according to the invention, as applied to the case shift mechanism of the electric typewriter summarized above, will now be described.

Each typebar 7 is provided with a lower case type 130 and an upper case type 129 and the types of either shift case are selectable for potential printing coaction with the platen by means of a conventional case shift mechanism generically indicated by the numeral 123. Therefore the case shift mechanism 123 represents a mechanism conditionable for relatively displacing the basket 9 or type system in respect to the carriage 122. To this end the basket 9 is provided with a pair of projections 131 of which the left projection only is shown in FIG. 1. Each projection 131 is provided with a slot 132 slidable on a stationary guide pin 133.

Furthermore, the basket 9 is provided with another projection 128 connected at 127 to a bail 124 fulcrumed on a stationary shaft 126. An arm 134 (FIG. 2) of the bail 124 is pin-and-slot connected to a lever 136 pivoted at 137. The lever 136 cooperates with a case-shift cam 138 rotatably mounted on the motor-driven shaft 70 and adapted to be rotated thereby for a cycle of 180 degrees by closure of a clutch having a pair of rest locations associated with the upper and the lower case of the basket 9.

More particularly, said clutch comprises a dog 139 pivoted at 141 on the case shift cam 138, and a toothed wheel 142 secured to the shaft 70. The dog 139 is further provided with a cam slot 143 engaging a pin 144 of a control plate 146 rotatably mounted on the shaft 70. A spring 147 connecting the dog 139 and the plate 146 normally urges the plate counterclockwise on the cam 138, and therefore tends to engage the dog 139 with the wheel 142.

A control member for the control plate 146 is yieldably movable counterclockwise from a first to a second position, and is in the form of a bail 151 pivoted on a stationary shaft 152. The bail 151 is provided with a first arm 149 having a lug 148, which in the first position of the bail shown in FIGS. 2 and 3 is adapted to open the clutch 139, 142 disengaged through arresting either one of a pair of diametrically opposite projections 153 and 154 on the control plate 146. Normally the basket 9 is in its raised lower case position and the lug 148 arrests the projection 152, as shown in FIG. 2.

A spring 163 connecting the lever 136 and the bail 151, on one hand urges the lever 136 to contact the cam 138, and on the other hand urges the bail 151 to contact its lug 148 with the ends of either one of two levers 164 and 165 which are independently fulcrumed on a common pivot 166. The levers 164 and 165 are urged by a spring 167 toward each other and are adapted to latch alternately the control member 151 upon movement to its first position (FIGS. 2 and 3). The two levers 164 and 165 are provided respectively with a pin 172, and a pin 173, which are adapted to be engaged by a nose 175 of a lever 174 respectively through operation and restoration of a case shift lever 177 bearing a key 178. The

lever 177 is pivoted at 176 and has a pin-and-slot connection with the lever 177.

There are provided means power-shiftable by the cam 138, synchronously with the basket 9, for alternating the levers 164 and 165 into holding relation with the lug 148, so that in the lower-case and the upper-case position of said basket respectively the levers 164 and 165 come into holding relation with the lug 148. Said shiftable means comprise a pin 168 secured to a lever 169 which is fulcrumed on the shaft 152 and is normally urged by a spring 171 to contact the case-shift cam 138.

Furthermore, the bail 151 is provided with a second arm 156 adapted to be engaged by either of a pair of pins 157 and 158 which are secured to the cam 138 at diametrically opposite positions for returning the bail 151 transitorily to its first position each time the cam 138 nears the end of the half return shifting operation.

Integral with the bail 53, which becomes operated in each instance as any one of the type-action enabling elements 19 moves the bail 46, is a first element or lug 162 having a right hand intercepting face and a lower abutting edge movable along a first path. Integral with an arm 159, which is part of the bail 151, is a second element or projection 161, which has an upper intercepting edge and a left hand abutting edge and is movable along a second path intersecting the stated first path along which said lug 162 moves.

The case shift mechanism operates as follows.

When the case shift key 178 is depressed, the lever 177 rocks the lever 174 clockwise. The nose 175 of the lever 174 engages the pin 172 of the lever 164, which is rocked counterclockwise to the position shown by broken lines in FIG. 2 and releases the lug 148 of the bail 151. Now the spring 163 rocks the bail 151 counterclockwise to its second position, thus placing the projection 161 into the path of the lug 162 of the bail 53. The projection 153 of the plate 146 is thus released by the lug 148, and the spring 147 through the plate 146 and the pin 144 causes the dog 139 to engage the wheel 142.

The dog 139 is now rotated counterclockwise together with the cam 138 and the plate 146. The cam 138 by means of the lever 136 rocks the bail 124 counterclockwise, whereby the bail 124 shifts the basket 9 (FIG. 1) downwards to the upper case position. Simultaneously, the cam 138 (FIG. 2) causes the lever 169 to be rocked clockwise by the spring 171, and the pin 168 is brought to contact the rocked lever 164. The lever 165 is now urged counterclockwise by the spring 167, but it is temporarily arrested by the lug 148.

Near the end of the cycle of 180 degrees of the clutch 139, 142, the pin 157 of the cam 138 engages the arm 156 and returns the bail 151 positively to its first position. The bail 151 thus brings its projection 161 out of the path of the lug 162. Simultaneously, the lug 148 of the bail 151 releases the lever 165 which is suddenly brought to the position of FIG. 3 to lock the lug 148 again in its first position. Finally the lug 148 arrests the projection 154 of the plate 146, whereby the clutch 139, 142 is disengaged and the case shift basket or body 9 now resides in upper case lowered position.

When the case shift key 178 (FIG. 2) is released, the lever 174 is returned counterclockwise and its nose 175 engages the pin 173 of the lever 165, which is returned clockwise and releases the lug 148. The bail 151 is now rocked again by the spring 163 and places its projection 161 into the path of the lug 162 of the bail 53. Furthermore the bail 151 releases the projection 154 of the clutch control plate 146 from the lug 148, whereby the clutch 139, 142 is engaged again.

The cam 138 is now further rotated through 180 degrees from the position of FIG. 3 to the position of FIG. 2, and causes the lever 136 to be rocked counterclockwise. The lever 136 by means of the bail 124 now shifts the basket 9 upwards to its lower case position. Simul-

taneously, the cam 138 rocks the lever 169 counterclockwise, whereby the pin 168 contacts the lever 165 to move it and hold it in the position shown in FIG. 2, while the lever 164 descends idly to overlie temporarily the lug 148. Near the end of the cycle, the pin 158 of the cam 138 transitorily acts on the arm 156 of the bail 151 to cause the end of the lever 164 to become held by the lug 148 as shown in FIG. 2. Thus, the projection 161 stands now out of the path of the lug 162, while the lug 148 is in position to arrest the plate 146 by its projection 153 in the position of FIG. 2, thereby to open the clutch 139, 142.

From the foregoing it will now be seen that if the bail 53 has been rocked counterclockwise by the depression of a printing key 30 to cause a type action 12, 11 to be operated, the lug 162 is placed in the path of the projection 161, as shown in FIGS. 2 and 3 by broken lines. If with this condition prevailing the case shift key 178 is now either depressed or released the bail 151 becomes freed by the lever 164 or the lever 165, whichever has held it, and thus tends to become moved clockwise by the spring 163, but the lug 162 blocks the projection 161 and thus the bail 150, so that at such time no case shift will ensue. However as the typing operation progresses beyond the printing place, the bail 53 becomes automatically returned clockwise to its first, normal position, so that the lug 162 moves to its FIG. 2 position, out of blocking relation of the lug 161. It follows now that at such time the bail 151 is delayedly permitted to become operated by its spring 163 to cause a cyclic operation of the case shift cam 138 and the mechanism controlled thereby.

The situation will now be described wherein, with the bail 53 standing in normal position, the bail 151 has been rocked counterclockwise in response to depressing or releasing the case shift key 178, and then a type key 30 is depressed before the case shift operation is completed. In such situation the bail 151 becomes spring rocked to place the projection 161 thereon into the path of the lug 62 of the bail 63. If now through a depression of a printing key 30, its associated type-action enabling element 19 is released to the urge of its spring 26, the projection 161 will stand blockingly in the way of the lug 162, to prevent the bail 53 from being rocked counterclockwise by the universal member 46, so that the clutch 64, 69 (FIG. 1) cannot engage. The bail 53 becomes rocked by the spring 26 of the released interponent 19, only when the bail 151 (FIG. 2) becomes automatically restored clockwise by either the pin 157 or 158, that is at the end of the operation of the case shift mechanism. The operation of the corresponding type action is thus delayed until the basket 9 reaches either the upper case or the lower case position, but the type key is not affected by said delay.

It is thus clear that each one of the two elements, constituted by the lug 162 of the bail 53 and the projection 161 of the bail 151, when moved out of their rest position is adapted, for the duration of its operation, to block the other element against operation but the keys to which said elements may respond are free to be operated.

A second embodiment of the interlocking device according to the invention, applied to the space bar controlled spacing mechanism of the electric typewriter summarized above, will now be described.

The escapement mechanism 120 (FIG. 1) for the carriage 122 may be conditioned for operation independently of the lever 72, at the depression of a conventional space bar 185 (FIG. 4). The bar 185 is secured to a lever 186 which is pivoted at 187 and is pin-and-slot connected to a lever 188, which is pivoted on a stationary shaft 189. The lever 188 is normally contacted by a pin 194 of another lever 195 pivoted on the shaft 189 and connected to the lever 188 by a spring 196. The lower end of the lever 188 is normally contacted by a lug 190 of a control member or bail 191 which is fulcrumed

at 192 and urged clockwise by a spring 193. The bail 191 is provided with a projection 202 normally arresting any one of three lugs 203 of a clutch controlling ring 204. The latter is connected by two levers 208 and a dog 209 to a cam 205 rotatably mounted on the shaft 70. A spring 211 urges the ring 204 counterclockwise and the dog 209 tends to engage a toothed wheel 210 secured to the shaft 70. A bail 212 pivoted on the shaft 73 is normally urged by a spring 213 to contact the cam 205 and is provided with an arm 214 adapted to engage the lug 181 of the bail 182 (FIG. 1) for operating the escapement mechanism 120 similarly as the arm 180 of the lever 72 is capable to operate it.

The bail 191 is further provided with an arm 215 adapted to cooperate with a cam 216, which is bodily rotatable with the cam 205. Integral with the bail 53 is a first element or projection 221 having a left hand intercepting edge and a lower abutting edge movable along a first path. A second element comprising a lug 219 is integral with an arm 218 of the bail 191 and has an upper intercepting face and a right hand abutting edge movable along a second path intersecting said first path. Finally, fulcrumed on the shaft 189 is a bail 198 having an arm 199 pin-and-slot connected to the lever 77 and another arm 197, which is adapted to cooperate with the lug 190 of the bail 191.

At the depression of the space bar 185, the lever 186 rocks the lever 188 clockwise and releases the lug 190 of the bail 191, while the lever 195 is urged by the spring 196 to contact the lug 190. Now the spring 193 rocks the bail 191 yieldably clockwise and places its lug 219 into the path of the projection 221 of the bail 53. The bail 191 in being rocked moves the projection 202 toward the lug 203 of the ring 204, whereby the spring 211 causes the dog 209 to engage the wheel 210, and the cams 205 and 216 are responsively rotated counterclockwise for a cycle of 120 degrees. Now the cam 205 rocks the bail 212 counterclockwise, whereby the arm 214 engages the lug 181 and operates the escapement mechanism 120 (FIG. 1) to step-feed the carriage 122.

Near the end of the cycle the cam 216 (FIG. 4) operates the arm 215 to rock the bail 191 counterclockwise, thus returning the lug 219 out of the path of the projection 221, and, furthermore, moving the projection 202 to intercept the clutch-controlling ring 204 by one of its lugs 203 to cause the clutch 209, 210 to open. If at that time the operator has released the space key 185, then the lever 188 will assume its normal FIGURE 4 position. Should the operator prolongedly hold the space key operated, the lever 195 springs into a position to overlie the lug 190 to temporarily lock the bail 191 in its restored position pending the release of the space key, thereby to prevent repeat spacing cycles.

If at the instant when a printing key 30 (FIG. 1) is depressed, the bail 191 (FIGURE 4) stands rocked clockwise due to a depression of the space bar 185, then the type action enabling element 19, although released by its latch, will stand blocked by the universal member 46 in view of the latter being movably tied to the bail 53, which by its projection 221 stands blocked by the lug 219 (FIG. 4) of the operated bail 191. Then the enabling element 19 related to the operated type key is able to cause a typing operation only when the cam 216 returns the bail 191 counterclockwise.

Conversely, if at the instant when the space bar or key 185 is depressed, the bail 53 stands rocked counterclockwise, in response to a depression of a printing key (FIG. 1), then the lug 219 of the bail 191 stands blocked by the projection 221 on the bail 53 and the lug 203 will not release the clutch control ring 204, so that an escapement operating cycle cannot take place at this time.

The bail 53 is returned at the end of the printing stroke of the type action, by the counterclockwise rotation of the lever 72 which is substantially before the spacing step of the carriage accompanying a typing operation can

occur, through the lever 180 which is power actuated by the cyclic cam 71 associated with the typing mechanism. It will thus be seen that so far as the projection 22 (FIG. 4) on the bail 53 is concerned it would allow a too early release of the bail 191 by the space key 185 to institute a carriage escapement operation through cycling action of the space actuating cam 205. Obviously, it is desirable to suppress the cycling action of the space operating cam 205 until the carriage incidental to a typing operation has executed its step. To this end the bail 198 is provided, which through counterclockwise actuation of the lever 77, by the lever 72 (FIG. 1) and the link 76 becomes rocked and places the arm 197 (FIG. 4) of said bail 198 into the path of the lug 109 of the bail 190, thus holding it. When thereafter cam 71 associated with the typing mechanism concludes its cyclic advance and the lever 72 restores, the arm 197 moves from over the lug 190. In this manner, it is made certain that the space key 185 cannot trip the bail 191 to operated position while the carriage takes a step as a result of a typing operation.

It will now be clear that responsively to the depression of any type key 30, the universal member 46 becomes impositively urged toward operated position, that responsively to the depression or release of the case shift key 178 the member 151 becomes impositively urged toward operated position, and that responsively to the depression of the space key 185 the member 191 becomes impositively urged toward an operated position. However of the members 46 and 151, only one at a time can move to operated position, and this applied in respect to the members 46 and 191. In reference to the members 46 and 151 means controlled by these said members and cooperative therebetween is provided so that always that one of such member which precedingly to the other becomes urged toward operated position causes instantly and for the duration of its automatically timed interval of operation, the blocking of the other member against operation. If the member 46 is operated there will be a power typing operation. If the member 151 is operated there will be a power case-shift-operation from lower case to upper case, or vice versa, depending on whether the case shift key was operated or released. In the course of such power operation, whether it be a power typing or a power case shifting operation, the member 46 or 151, whichever was operated, will be automatically restored after the given time interval of operation. The blocking ceases when the operated member restores and the other member will automatically become operated, if it is then under urge to do so. From this it follows that the operations of the type keys 30 in reference to the operation or the restoration of the case shift key 178 need not be carefully spaced in time to assure non-conflicting operations of the mechanisms controlled thereby. Moreover, there is no interference between depressions of the keys 30 and 178.

Between the members 46 and 191 which respectively in response to operations of the typing keys 30 and the spacing key 185 come under impositive operating urge, there is a means 212, 219 cooperative therebetween and controlled thereby, so that always that one of the members 46 and 191 which precedingly to the other is urged toward operated position causes instantly the blocking of the other member against operation. The purpose is similar as explained in reference to typing and case shifting, namely the operation of the member 46 blocks the operation of the member 191, and vice versa.

However, incidental to a typing operation, the member 191 preferably should be blocked beyond the time which the universal member 46 is restored. This is accomplished by means including the bail 198, which is controlled by the power means for effecting power typing operations, to render the member 191 for a while blocked against operation each time the universal member 46 is restored in the course of a typing operation.

It is intended that modifications, improvements and addition of parts may be made to the described device without departing from the scope of the invention.

What I claim is:

1. In an electric typewriter having a set of type levers pivotally mounted on a basket, a set of type actions individually conditionable for operating the corresponding one of said type levers, a paper carriage, a depressible case shift key, and a mechanism operable for case shifting said basket with respect to said carriage between an upper case and a lower case thereof, and interlocking device for said type actions and said mechanism, comprising in combination:

- (a) a universal member normally yieldably movable from a first to a second position at the depression of each printing key of conditioning the corresponding one of said type actions for operation,
- (b) means for returning said universal member to said first position at the end of said operation,
- (c) a clutch having a pair of rest locations associated with said upper and lower case, said clutch being engageable for power operating said mechanism,
- (d) a control member normally located in a first position to hold said clutch disengaged in either of said locations,
- (e) yieldable means for moving said control member from said first position to a second position to cause said clutch to be engaged,
- (f) a pair of levers fulcrumed on a common pivot and adapted to alternately lock said control member in said first position, said pair of levers being operated by said case shift key for releasing said control member,
- (g) means comprised in said mechanism for returning said control member to said first position at the end of its shifting operation,
- (h) means shiftable simultaneously with said basket for alternating said pair of levers in locking said control member,
- (i) a first element integral with said universal member, and having an intercepting portion and an abutting portion movable along a first path,
- (j) and a second element integral with said control member and having an intercepting portion and an abutting portion movable along a second part intersecting said first path,
- (k) each one of said two elements when located in the corresponding second position placing the intercepting portion into the path of the abutting portion of the other element to lock said other element.

2. In a power operated typewriter, the combination with two mechanisms capable of operation to carry out different functions:

- (a) two normally idle, cyclically operable power means individual to said two mechanisms to cause them to carry out their functions,
- (b) means to call each of said two cyclically operable power means individually into operation, comprising for each said power means,
 - (b¹) an individual member related to each one of said two power means and movable from a normal to an operated position to facilitate a cyclic operation of its related power means,
 - (b²) an actuatable control related to one member,
 - (b³) an actuatable control related to the other member,
 - (b⁴) and means individually responsive to said controls to urge instantly the related movable member impositively toward the operated position,
- (c) means controlled by each cyclically operable power means during its operation to restore its related member automatically after a given time interval of operation,
- (d) and blocking means controlled by said members to permit normally movement of either of such mem-

bers from normal to operated position but being instantly conditionable by initial, urged movement of either of said members from normal toward operated position to block instantly the other member against movement from normal position, either of said members when upon operation becoming automatically restored by said restoring means, restoring also said conditionable blocking means, whereby responsively the other of said members becomes automatically unblocked and moved to operated position if the control related to such other member has been operated.

3. In combination with a power operated typewriter comprising a system of individually operable typebars, a typebar supporting body, a platen, individually operating actions for said typebars, and a power mechanism adapted to be called into operation to effect a relative displacement between said body and said platen:

- (a) means to cause selectively power strokes of said actions, comprising,
- (a¹) an enabling element for each action operable impositively from a normal to a typing-stroke-causing position,
- (a²) selectively operable control means related to said enabling elements,
- (a³) and means responsive to selective operations of said control means to urge said enabling elements selectively but impositively toward typing-stroke-causing positions,

(b) a universal member operable from a normal to an operated position through operation of any of said enabling elements toward their typing-stroke-causing positions,

(c) means to call said power mechanism into operation, comprising:

- (c¹) another member movable from a normal to an operated position,
- (c²) an actuatable control means,
- (c³) and means adapted to respond instantly to said actuatable control means to urge said movable member impositively toward operated position,

(d) means to restore each of said members to its normal position after an automatically timed interval of operation,

(e) and blocking means controlled by said members to permit normally movement of either of said members from normal to operated position, but being instantly conditionable by initial, urged movement of either of said members from normal toward operated position to block instantly the other member against movement from normal position for the duration of its automatically timed interval of operation.

4. In combination with a power operated typewriter having a system of individually operable type bars a supporting body for said type bars, a platen, operating actions for said type bars, and a power mechanism operable for effecting a relative case shift displacement between said body and said platen,

(a) means to cause selectively power operations of said actions, comprising:

- (a¹) an enabling element for each said action impositively movable from a normal to a typing stroke causing position,
- (a²) selectively actuatable control means related to said enabling element,
- (a³) and means responsive to selective actuations of said control means to urge said enabling elements selectively but impositively toward typing-stroke-causing positions,

(b) a universal member subject instantly to impositively urged operation from a normal to an operated position by said impositively urged movement of any of said elements to its typing-stroke-causing position,

(c) means to cause a power operation of said mechanism, comprising:

(c¹) another member movable from a normal to an operated position, to cause a power operation of said mechanism,

(c²) an actuatable control means related to said other member,

(c³) means responsive to said actuatable control means to urge instantly said other movable member impositively toward operated position,

(d) means to restore each of said members automatically to its normal position after a timed interval of operation,

(e) and blocking means controlled by said universal member and said other member to permit normally movement of either of such members from normal to operated position but being instantly conditionable by initial, urged movement of either of said members from normal toward operated position to block instantly the other member against movement from normal position, but without blocking either of said control means, either of said members when upon operation becoming automatically restored by said restoring means, restoring also said conditionable means to its normal condition, whereby responsively the other of said members becomes automatically unblocked and is moved to operated position by its related urging means if the control means related to such other member has been operated.

5. In combination with a power operated typewriter having a system of individually operable typebars, a supporting body for said typebars, a platen, operating actions for said typebars, and a mechanism operable for effecting a relative case shift displacement between said body and said platen,

(a) means to cause selectively power operation of said actions, comprising:

(a¹) an enabling element of each said action impositively movable from a normal to a typing-stroke-causing position,

(a²) an individual latch for each enabling element and detaining it normally against movement to a typing-stroke-causing position,

(a³) resilient means individually related to said enabling elements to urge each toward its typing-stroke-causing position,

(a⁴) and a type key to release each latch and thereby to cause its related enabling element to be urged toward typing-stroke-causing position by its related resilient means,

(b) a universal member subject instantly to urged operation impositively from a normal to an operated position by any of said enabling elements being urged by its resilient means to its typing-stroke-causing position,

(c) means to cause a power operation of said mechanism, comprising,

(c¹) another member movable from a normal to an operated position, to cause a power operation of said mechanism,

(c²) another latch related to said other member and detaining it normally in normal position,

(c³) resilient means related to said other member to urge it toward its operated position, and

(c⁴) a key to release the latch related to said other member to render the latter capable of instant operation by its related resilient means,

(d) means to return each of said members automatically to normal position after a timed interval of operation,

(e) and blocking means controlled by said universal member and said other member to permit normally movement of either of such members from normal to operated position but being instantly conditionable by

initial, urged movement of either of said member from normal toward operated position to block instantly the other member against movement from normal position, but without blocking either of said key or keys, either of said members when upon operation becoming automatically restored by said restoring means, restoring also said conditionable means to its normal condition, whereby responsively the other of said members becomes automatically unblocked and is moved to operated position by its related resilient urging means if a key related to such member has been operated to release the latch therefor.

6. In a power-operated typewriter having a system of individually operable typebars, a supporting body for said typebars, a platen, operating actions for said typebars, power means to operate said actions and power case-shift means capable alternately of operation to shift said body relatively to said platen to occupy in respect thereto alternately one or another of two case shift positions:

- (a) an enabling element for each of said actions, impositively movable from a normal to an operated position to cause said power means to operate the related action,
- (b) selectively operable control means related to said enabling elements,
- (c) means responsive to selective operations of said control means to urge said enabling elements selectively toward typing-stroke-causing positions,
- (d) a universal member subject to impositively urged operation from a normal to an operated position by the urged movement of any of said elements to operated position,
- (e) means to return said universal member automatically to normal position after a timed interval of operation,
- (f) another member operable from a normal to an operated position and controllingly associated with said power case-shift means so that each operation of such other member to operated position causes the power case-shift means to effect a relative case-shift between said body and said platen, said relative case-shift being alternately between said two case-shift positions,
- (g) means associated with said power case-shift means, to restore said other member to normal position automatically as an incident to each said relative case-shifts,
- (h) case-shift control means related to said other member and being actuatable and restorable,
- (i) means mutually controlled by said case-shift control means and said power case-shift means so that incident to each actuation and each restoration of said case-shift control means, the said other member is impositively urged toward operated position for trying to cause a relative case-shift position, by said power case-shift means respectively to said one or said other of said two case-shift positions,
- (j) and means cooperative between said universal member and said other member, so that on one hand for the duration of the operation of said universal member, the other member is blocked against operation and so that on the other hand for the duration of operation of said other member the said universal member is blocked against operation, whereby as soon as either of said members upon operation becomes automatically restored, the other of said members, if already under urge toward operated position, will then responsively become moved to operated position.

7. The invention set forth in claim 6, said mutually controlled means comprising,

- (i¹) a spring tending to move said other member to its operated position,
- (i²) a first latch conditionable by said power-case-shift means in effecting a case shift to said one case-

shift position, to detain said other member automatically in normal position upon movement thereto, (i³) a second latch conditionable by said power-case-shift means in effecting case shift to said other case-shift position, to detain said other member also automatically in normal position upon movement thereto, (i⁴) and means controlled by said case-shift control means in being respectively actuated and restored, to release respectively said first latch and said second latch.

8. In combination with a power-operated typewriter having a platen, a system of types, means correlating said platen with said system of types for relative step-feed travel, and a device operable to cause relative step-feed travel between said platen and said system of types;

- (a) power-means adapted to be rendered selectively operative to effect movement of different of said types to print against said platen at a printing point which is common to said system of types,
- (b) means to render said power-means selectively operative, comprising,
 - (b¹) a series of elements selectively movable to cause said power means to effect movement of different types of said printing point,
 - (b²) and control means selectively operable to urge selective movements of said elements,
- (c) a universal member normally adapted to be moved from a normal to an operated position by the urged movement of any of said elements to its typing-stroke-causing position,
- (d) another power means to operate transitorily said step-feeding device and being normally idle,
- (e) another member movable from a normal to an operated position to cause an operation of said step-feeding device by said other power means,
- (f) a control related to said step-feeding device,
- (g) means responsive to the operation of said control to urge said other member impositively toward operated position,
- (h) means to render said universal member after each instance of its operations, automatically restored to its normal position after a timed interval of operation in which said power means has become selectively operative,
- (i) means to render said other member after each instance of its operation, automatically restored to its normal position after a timed interval of operation,
- (j) and means controlled by said members and cooperative therebetween so that always that one of such members which precedingly to the other becomes urged toward operated position is instantly and for the duration of its automatically timed interval of operation, instrumental to block the other member against operation, whereby when either of said members becomes restored after its timed interval of operation, it will cease to block the other against operation.

9. The invention set forth in claim 8,

(k) means to operate said step-feeding device automatically by operation of said first power means each time after it has effected a movement of a type against said platen,

(k¹) said means to render said universal member restored comprising said first power means and being effective each time before said step-feeding is operated by an operation of such first power means,

(l) and means controlled by said first power means during each of its operations to render said other member for a whole further blocked after said universal member is restored.

10. In combination with a power-operated typewriter having a system of typebars, operating actions individual to said type-bars, a platen, means movably correlating said system of type-bars and said platen for relative step-

feed travel, and a device operable to cause relative step-feed between said system of typebars and said platen;

- (a) power means to operate said operating actions but being normally ineffective,
- (b) means to cause power operations of said operating actions by said power means, comprising,
 - (b¹) an enabling element for each said operating actions adapted for movement from a normal to a typing-stroke-causing position,
 - (b²) selectively operable control means for said enabling elements,
 - (b³) means responsive to selective operations of said control means to urge selectively said elements toward typing-stroke-causing positions,
- (c) a universal member normally adapted to be moved from a normal to an operated position by any of said elements being urged to its typing-stroke-causing position,
- (d) another power means to operate transitorily said step-feeding-device and being normally idle,
- (e) another member movable from a normal to an operated position to cause an operation of said step-feeding-device by said other power means,
- (f) a control related to said step-feeding device,
- (g) means responsive to the operation of said control to urge said other member impositively toward operated position,
- (h) means to render said universal member after such instance of its operation, automatically restored to its normal position after a timed interval of operation in which said power means has become selectively operative,
- (i) means to render said other member after each instance of its operation, automatically restored to its normal position after a timed interval of operation,
- (j) and means controlled by said members and cooperative therebetween so that always that one of such members which precedingly to the other becomes urged toward operated position is instantly and for the duration of its automatically timed interval of operation, instrumental to block the other member against operation, whereby when either of said members becomes restored after its timed interval of operation, it will cease to block the other against operation.

11. In combination with a power operated typewriter comprising a system of typebars, operating actions individual to said typebars, a platen, means correlating said system of typebars and said platen for relative letter-feed travel, a device operable for relatively letter-feeding said platen in respect to the system of typebars, and means to operate said device in accompaniment with each typebar operation,

- (a) a means to cause selectively power-operations of said actions, comprising:
 - (a¹) an enabling element for each of said actions, impositively movable from a normal to a typing-stroke-causing position,
 - (a²) selectively actuatable control means related to said enabling elements,
 - (a³) and means responsive to selective actuations of said control means to urge said enabling elements selectively but impositively toward typing-stroke-causing positions,
- (b) a universal member subject to impositively urged operation from a normal to an operated position by any of said elements to typing-stroke-causing position,
- (c) a normally inactive power mechanism adapted to operate said letter-feeding device,
- (d) means to cause a power-operation of said power mechanism, comprising,
 - (d¹) another member movable from a normal to

an operated position, thereby to cause a power operation of said device,

- (d²) another actuatable control means related to said other member,
- (d³) and means responsive to actuation of said other control means to urge said other member impositively toward operated position,
- (e) means to return each of said members automatically to its normal position after a timed interval of operation,
- (f) and blocking means controlled by said universal member and said other member to permit normally movement of either of such members from normal to operated position but being instantly conditionable by initial, urged movement of either of said members from normal toward operated position to block instantly the other member against movement from normal position, but without blocking either of said control means, either of said members when upon operation becoming automatically restored by said restoring means, restoring also said conditionable means to its normal condition, whereby responsively the other of said members becomes automatically unblocked and is moved to operated position by its related urging means if the control means related to such other member has been operated.

12. In combination with a power-operated typewriter having a platen, a system of types, spacing device correlating said platen with said system of types for relative step-feed travel, and a device operable to cause relative step-feed travel between said platen and said system of types;

- (a) power-means adapted to be rendered selectively operative to effect movement of different of said types to a printing point which is common to said system of types,
- (b) means to render said power means selectively operative, comprising:
 - (b¹) a series of selector elements related to said types,
 - (b²) individual latches associated with said selector elements to detain them normally in ineffective, normal positions,
 - (b³) resilient means individually urging said selector elements impositively to effective positions,
 - (b⁴) and control means to release said latches selectively and thereby normally adapted to cause movements of said selector elements by said resilient means selectively to effective positions to cause said power means to effect movements of said types selectively to said printing point,
- (c) a universal member normally free for movement from a normal to an operated position through any of said elements when being urged to effective positions,
- (d) means to restore said universal member automatically after a timed interval of operation and thereby adapted to restore any previously released selective element to its latch,
- (e) another member normally free for movement from a normal to an operated position,
- (f) a latch associated with said other member to detain it normally in normal position,
- (g) resilient means to urge said other member to operated position,
- (h) a key operable to release the latch which is associated with said other member, whereby normally said other member will be urged to assume its operated position,
- (i) another power-means,
- (j) means responsive to the movement of said other member to operated position to render said other power means effective first to operate said spacing

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device and then adapted after a timed interval to restore automatically the other member to its latch, (k) and means controlled by said two members and cooperative therebetween so that always that one of of such members which precedingly to the other becomes urged toward operated position causes instantly and for the duration of its automatically timed interval of operation, the blocking of the other member against operation, whereby when either of said members becomes automatically restored, the other will become operated if it is under urge to do so.

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ROBERT E. PULFREY, *Primary Examiner.*E. S. BURR, *Assistant Examiner.*

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,295,653

January 3, 1967

Rinaldo Salto

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

In the heading to the printed specification, after line 8, insert -- Claims priority, application Italy, Feb. 21, 1963, 3741/63 --.

Signed and sealed this 3rd day of October 1967.

(SEAL)

Attest:

ERNEST W. SWIDER

Attesting Officer

EDWARD J. BRENNEI
Commissioner of Patents