

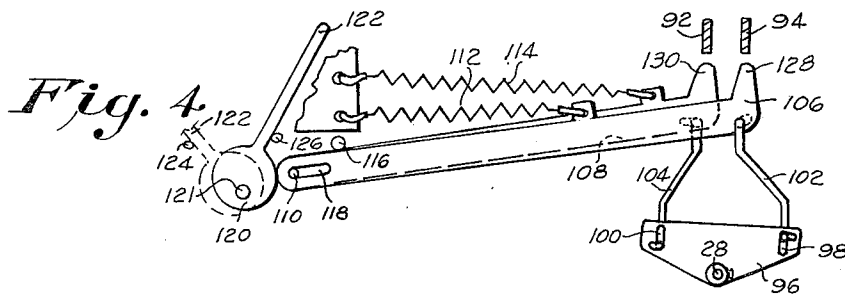
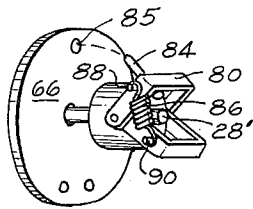
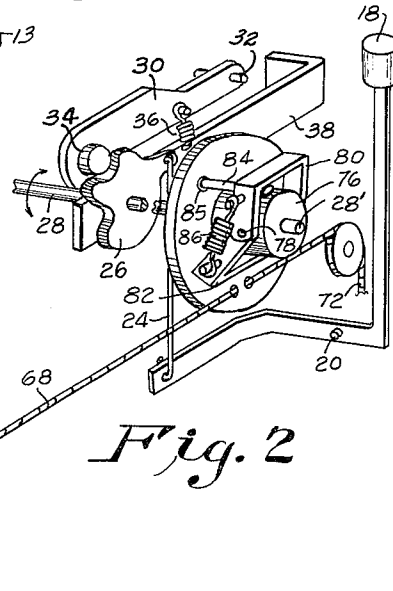
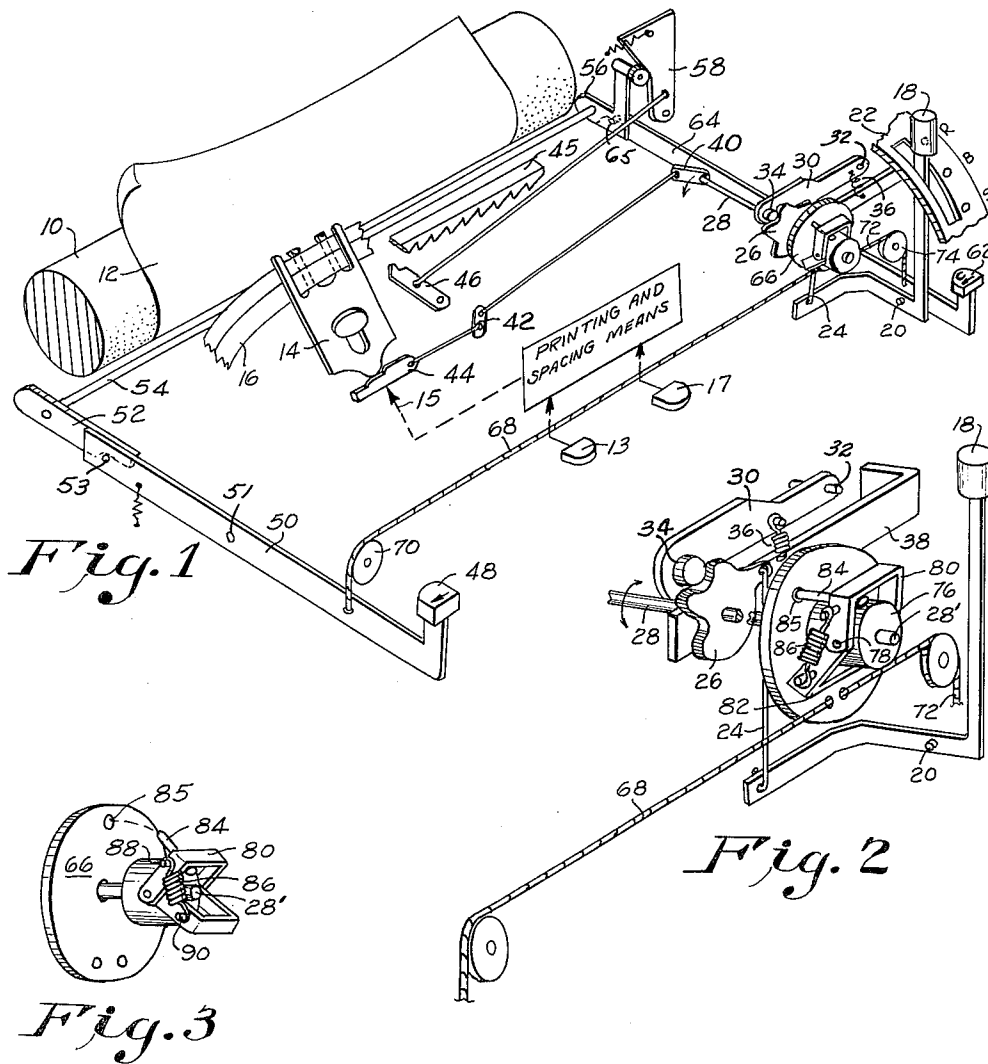
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ERROR-CORRECTING TYPEWRITER

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ERROR-CORRECTING TYPEWRITER

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This invention provides improvements in typewriters, by which they may be specially adapted for use with ribbons having two or more longitudinally-extending stripes or sections, one section being inked for impressing characters on a paper sheet, and another section being provided with a layer of correction or camouflage material adapted to cover up or conceal any erroneous impressions which may have been made.

Such multiple-use ribbons can be installed in a conventional typewriter and the selection as between (a) the "marking" or typewriting section of the ribbon, and (b) the camouflaging or obliterating section, may be made by the typist by manipulating the ribbon-field control lever in the same manner as is used to select between (for example) black and red imprints when a conventional bichrome ribbon was employed. With the error-correcting ribbon, however, the field-control lever selects as between a black, blue or other color inked section (for typing) and an opaque pressure-transferrable white pigment layer for covering up erroneous characters typed on a white paper or other impression sheet.

The normal sequence of operations in using a conventional typewriter with such an error-correcting ribbon is as follows. The typist, upon making an erroneous character selection, transposition or the like, backspaces the carriage to bring it to the position where the first error was made, then shifts the field-control lever to bring the correction strips of the composite ribbon into play, and strikes the key corresponding to the erroneous character or characters. This causes the deposition, precisely over the errors, of a deposit of the (usually white) camouflage material from the correction section of the ribbon; thus causing the erroneous imprints to disappear.

The typist then again backspaces the carriage the necessary number of steps, shifts the field-control lever to bring its inking section into play, and types the correct character or characters to deposit the correct ink imprints as desired. The nature of the (usually white) pigment applied over the erroneous characters is such as to accept the over-inked correct characters neatly.

It is found that the use of such composite error-correcting ribbons is greatly facilitated if the typewriter is equipped with two separate backspacing keys, one of these serving for backspacing the carriage for purposes other than error correction, and the other both backspacing the carriage and also automatically shifting the ribbon field-control mechanism to bring the correction stripe into use. The last-named or added backspace key will then be used by the typist solely for backspacing to make error corrections, and will eliminate one of the usual ribbon-field changing operations.

Since, after the error or errors has been obliterated by use of the correction stripe, correct imprints will thereafter usually be made, it has been additionally found that the second set of backspacing operations can be caused automatically to restore the ribbon-field selecting lever, or control, back into its normal printing or typing condition. Thus, the facility with which the typewriter can be employed in connection with an error-correcting ribbon is greatly augmented if the typewriter is provided with two separate and distinctively marked backspacing keys, as follows:

No. 1.—The regular or conventional backspace key, which moves the carriage in the backward direction a letter-space step at a time, and also according to the in-

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vention throws the ribbon field-control mechanism into printing position, and

No. 2.—The added or "special" backspace key which also moves the carriage in the backward direction a letter-space at a time, and throws the ribbon field-control mechanism into "obliterating" or correcting position.

The ribbon-field selector is detented in the usual way, so that it remains in the position which was last selected, even if either of the backspace keys is given several successive impulses, and until either the other backspace key is employed or until the field selector lever is manually moved to a different position (such as the non-printing or stencil-cutting position).

Typewriters equipped with two separate backspace keys, as above described, are perfectly satisfactory when employed with error-correcting composite ribbons. Sometimes, however, the typist wishes to use a black-and-red or other bichrome ribbon or even to put the field selector in non-print or stencil position. Any use of either of the backspace keys might then operate to change the imprint color from that which was originally selected by the typist, in an uncontrolled or undesired manner, or cause an imprint which was not desired, as in stencil cutting. The present invention therefore provides a design and construction for a typewriter to facilitate its use with error-correction composite ribbons, but in which the automatic ribbon-field selecting action may be selectively disabled or dispensed with when it is not desired. With such a construction, the typewriter itself is completely serviceable for use with either composite error-correcting ribbons, bichrome ribbons, or any other ribbons that the user may wish to employ.

Briefly, then the invention satisfies the foregoing objects by providing a typewriter (otherwise of any known or conventional construction) with two separate backspace keys which respectively operate also to shift the ribbon-field selecting mechanism between its respective field-selecting positions, together with means readily operable by the typist for selectively disabling this field-selecting operation or restoring it to use.

The invention will be disclosed herein in connection with certain preferred embodiments shown in the drawings, and in which:

FIG. 1 is a fragmentary diagrammatic perspective view of one form of the invention applied to a known form of typewriter,

FIG. 2 is an enlarged exploded perspective view of a portion of FIG. 1,

FIG. 3 is a view in perspective showing certain of the parts of FIG. 2 when the automatic ribbon-field selecting feature is disconnected.

FIG. 4 is a front elevation of a modified form of the invention.

In FIG. 1, those parts of a conventional office typewriter which are not important for an understanding of the invention have been omitted, and are to be understood as conventional. The usual roller platen 10 is provided, to feed and support the impression paper 12, and the usual ribbon vibrator 14 is connected to an operator 15 that is common to all of the impression keys such as 13 and 17 so as to lift the ribbon 16 into impression position as the type faces approach the platen and paper.

As is usual in typewriters designed for use with bichrome (for example, red and black) ribbons, the distance the ribbon vibrator is raised at each key stroke, is determined by the setting of a ribbon-field selector such as a lever 18. For example, with lever 18 in the position "B" shown in FIG. 1, the ribbon vibrator 14 will (on each key stroke) be raised the distance needed to bring the black section of a ribbon into printing position. If lever 18 is moved to the position indicated by "R," key strokes will cause the vibrator to rise to a higher position to bring the red ribbon

section or stripe into play. In the position marked "S," the ribbon vibrator will not be lifted at all, leaving the ribbon out of use, as when a duplicating stencil is to be cut.

There are many conventional ways of effecting such control of the ribbon vibrator, the one shown in FIGS. 1 to 3 being characteristic of the (Alpina) portable typewriter. In such a machine, lever 18 is pivoted as at 20 on the typewriter frame so as to project through a slot in the cover 22. The tail of lever 18 is connected by a link 24 to a detent cam 26 secured on a control shaft 28. A detent roller arm 30, also pivoted on the machine frame (at 32) has a free roller 34 cooperating with three notches or indents in cam 26 to hold it (and shaft 28) in the position selected by lever 18. The arm 30 is urged toward the cam by a spring 36 connected to the machine frame through a bracket 38 which also supports the bearing for shaft 28.

As its lower end, control shaft 28 has an arm 40 linked to lever 42 that is so connected to the mechanism 44 for lifting and lowering the ribbon vibrator 14, as to select the ribbon field (black or red) or to leave the vibrator stationary in its lower (stencil) position. The actual drive for the vibrator is conventional, and therefore is not shown in detail.

Platen roller 10 is mounted on the usual traveling carriage (not shown) to which is secured the rack bar 45 which is driven stepwise (left to right) by a backspacing pawl 46 each time the usual backspace key 48 is depressed. In the typewriter illustrated in FIGS. 1-3, the key 48 operates through its keylever 50 (pivoted at 51) to rock, by means of a pin 53 on lever 50, an arm 52 secured to a transverse shaft 54 pivoted in the frame. At its opposite end, shaft 54 has an arm 56 linked to a bell crank 58 in turn linked to the backspace pawl 46 to step the rack bar 45 (and the carriage) as described.

To accomplish the aims of the present invention, a second (auxiliary) backspace key 62 is provided at the opposite end of the keyboard, and its keylever 64 carries a pin 65 that cooperates with the arm 56 of a shaft 54 to operate the backspace pawl in the same way as backspace key 48. The two backspace keys differ, however, in the way in which they control the ribbon field-selection mechanism.

According to the invention, the control shaft 28 does not terminate at the detent cam 26, but is extended forward as at 28' and has loosely mounted on it a control disc 66 which is arranged to be rotated through a small angle, left or right, by the respective backspace keys 48 and 62. As shown, the keylever 50 is connected by a flexible cord or cable 68 (passing over a pulley 70) to the lower edge of disc 66, and a similar tube 72 passes over a pulley 74 and is likewise connected to disc 66. When either backspace key is depressed, disc 66 will be swung in the corresponding direction unless it was already in that position. That is, the first operation of either backspace key, following an operation of the other one, will shift the disc 66 and leave it in its new position until the other backspace key is again operated.

As stated, the disc 66 is loose on control shaft 28. To cause the ribbon field selection to be changed when the backspace keys are operated in alternation, disc 66 must rotate shaft 28 through a small angle, approximating the angle required to shift from "black" to "red" printing with the conventional bichrome ribbon. Also, the connection of disc 66 to shaft 28 must be disengageable by the typist at will, so that when a correction ribbon is no employed, the machine will not shift from "black" to "red" in an unintended manner; nor will an unintended imprint be made after backspacing during stencil cutting.

To accomplish this, the forward end 28' of shaft 28 has secured thereto a hub 76 which pivotally carries, as on a cross pin 78 in the hub, a pair of U-shaped bails or staples 80, 82, the former of which also fixedly mounts a clutch pin 84 engageable in a hole 85 in disc 66 when the bail 80 is in the position shown in FIG. 2. In that position of

bail 80, any depression of the auxiliary backspace key 62 will pull cable 72, and shift disc 66 counterclockwise (if it was not already in that position). Disc 66, through pin 84, bail 80, hub 76 and control shaft 28, will cause the ribbon field for "correction" to be brought into play.

If, thereafter, the normal backspace key 48 is operated one or more times, the first operation will pull cable 72 and shift disc 66 clockwise, similarly causing control shaft 28 to return to the position in which the ribbon vibrator will bring the "printing" stripe of the ribbon 16 into use. Since the shaft 28 is connected to field selection lever 18 by cam 26 and link 24, these operations of backspacing with the two backspace keys will cause the lever 18 to shift back and forth between the positions ordinarily corresponding to "black" and "red" printing.

To permit the typewriter, including the above feature, to be used with ordinary black-and-red (bichrome) ribbons, and other non-correcting ribbons, as well as for stencil or other non-printing operations rather than the special correction ribbon 16, the automatic shifting action must be made disengageable. The two bails 80, 82 permit this disconnection, as shown in FIG. 3.

The two bails are connected by a tension spring 86, the points of connection (for example, at pins 88, 90) being so located that the spring passes on opposite sides of the axis of pivoting of the bails; that is, the axis of cross pin 78 in hub 76. With the bails 80, 82 in the FIG. 2 position, pin 84 engages in the hole 85 in disc 66, clutching disc 66 to shaft 28, and spring 86 holds ball 80 in that position. To disconnect the action, the typist lifts bail 80 away from disc 66, and spring 86 snaps across-center (over-center) to bring the bails 80, 82 to the FIG. 3 position, withdrawing pin 84 from hole 85 and disconnecting disc 66 from control shaft 28. In either condition, the over-center spring 86 keeps the bails in their desired positions, and when the automatic feature is disabled, either backspace key 48 or 62 will be operable to backspace the carriage in the usual way, without altering the ribbon field.

An equivalent arrangement can easily be applied to different makes and models of conventional typewriters. For example, if the normal backspace keylever and the added or auxiliary backspace keylever are adjacent one another, for example at the right side of the keyboard, the arrangement of FIG. 4 may conveniently be employed.

In FIGURE 4, numerals 92 and 94 designate the shanks of two backspace keylevers analogous to the keylevers 64 and 50 of FIG. 1, being shown in section as they project forward in front of the usual front wall of a typewriter into the key bank area. The ribbon-field selecting shaft is again designated 28, since it may be the same in construction and function as shaft 28 of FIG. 1. Secured to shaft 28 is an operating plate 96 which when rocked back and forth about the axis of shaft 28 will cause the selection of one or the other of the ribbon fields, again by controlling the vertical motion of the ribbon vibrator as above described.

On opposite sides of its pivotal axis, the plate 96 has respective substantially vertical slots 98 and 100, into which slots pass the lower ends of two stiff control wires or rods 102 and 104, the ends of the rods being bent to retain them in connection with the plate, subject to the vertical play permitted by the slots. At their upper ends, these control rods are bent to pass through respective holes in a pair of interposer levers 106 and 108, both loosely pivoted to the machine framework as at 110. The upper ends of the rods are also bent to retain them in the holes of the interposer levers. Each interposer lever is urged upwardly by a spring 112, 114 also connected at their opposite ends to the machine frame, the limit of upward motion of the interposers being set by a stop pin 116 in the frame.

At the point where the interposers pivot on pin 110, they are slotted to permit a limited amount of endwise motion, the slots being indicated at numeral 118. Springs 112 and 114 are positioned so that they not only tend to raise the interposers, but they also urge them both to the

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left, the extent of leftward motion being set by a selector cam 120 also pointed as at 121 on the machine frame, and having an operating handle 122. The limits of motion of this cam 120 are established by stop pins 124, 126 in the machine frame. These end positions of the cam are such as to move the interposers in a generally horizontal path, to bring their terminal projections 128, 130 either beneath the respective key levers 92 and 94, for operation thereby, or to positions slightly to the left of the planes of such key levers, so that depression of the backspace keys will not operate the interposers.

The operation will be clear from the above, but will be briefly described, bearing in mind that the position of plate 96 as shown in FIG. 4 indicates that the last backspace key to have been depressed was the one connected to key lever 94, since plate 96 is tipped to the clockwise direction. After operation of that backspace key, its key lever 94 was restored upwards by the usual keylever spring, allowing interposer 106 to rise, but the plate 96 remained tipped clockwise because of the presence of slot 98. In this condition, for example, the ribbon field selector, controlled by shaft 28, may be in the "printing" or "inking" condition, and would remain in that condition until manually shifted, or until operation of the other backspace key. In the latter case, keylever 92 will be depressed, lowering interposer 108, and its control rod or wire 104, being at the bottom of slot 100, will tip the plate 96 into the opposite (counter-clockwise) condition, and will thus shift the field selecting shaft 28 to bring the "correction" field of the ribbon into play.

When it is desired to use the typewriter, so equipped, with an ordinary black-and-red, or even monochrome ribbon, or to cut stencils or otherwise perform non-print operations, the handle 122 has only to be shifted to the left, into the dotted-line position, which will allow both interposers to slide slightly to the left, where their projections 128 and 130 will not be engaged by the keylevers 92 and 94.

While the invention has been disclosed herein in connection with certain preferred embodiments thereof, it will be obvious to those skilled in the art that it may equally well be accomplished by other and different mechanisms, and all such variations are intended to be included herein, to the extent that they fall within the scope of the appended claims.

I claim:

1. A typewriter for use with ribbons providing a printing field and a print-obliterating field, said typewriter including character-printing mechanism, a paper support mechanism, printing control keys, spacing means for stepwise moving said mechanisms relative to one another in a forward direction to accomplish printing of a line of characters, a ribbon vibrator actuated by the printing control keys to bring a ribbon field momentarily into operative position upon actuation of each of said printing control keys, ribbon field-selecting means for controlling the extent of motion of the vibrator to select the particu-

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lar ribbon field that is thus brought into operative position, backspace drive means for stepwise moving said mechanisms relative to one another in the backward direction in letter-width increments, a pair of backspace keys both connected to operate said backspace drive means, connections between said backspace keys and said field-selecting means to shift the latter between position respectively corresponding to that backspace key which was last operated, and means for selectively disengaging said connections, to permit the use of said backspace keys without altering the ribbon-field selection.

2. A typewriter having a reciprocable paper carriage, typing keys, a ribbon vibrator actuated by the typing keys to bring a ribbon momentarily into marking position upon actuation of each of the typing keys, ribbon field-selecting means for controlling the extent of motion of the vibrator to select the particular ribbon field that is thus brought into marking position, backspace drive means for stepping said carriage reversely to the writing direction in letter-width increment, a pair of individual backspace keys both connected to operate said backspace drive means, a connection between said backspace keys and said field-selecting means to shift the latter to a position corresponding to that backspace key which was last operated, and means for selectively disengaging said last-named connection.

3. A typewriter for use with ribbons providing a printing field and a print-obliterating field, said typewriter including character-printing mechanism, printing control keys, a paper support mechanism, spacing means for stepwise moving said mechanisms relative to one another in a forward direction to accomplish printing of a line of characters, means actuated by the printing control keys to bring a ribbon field momentarily into operative impression position upon actuation of each of said printing control keys, ribbon field-selecting means to select the particular ribbon field that is thus brought into operative impression position, backspace drive means for stepwise moving said mechanisms relative to one another in the backward direction in letter-width increments, a pair of backspace keys both connected to operate said backspace drive means, and a selectively engageable connection between said backspace keys and said field-selecting means, operable, when engaged, to shift the field-selecting means between positions respectively corresponding to that backspace key which was last operated.

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