

[54] **APPARATUS FOR SUPPLEMENTING THE OPERATION OF THE RIBBON SELECTING AND BACKSPACING MEANS OF A TYPEWRITER**

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[52] U.S. Cl. **197/181; 197/91**

[51] Int. Cl.² **B41J 29/16**

[58] Field of Search 197/151, 156, 181, 91, 197/172, 180

[56] References Cited UNITED STATES PATENTS

3,149,711	9/1964	Wolowitz	197/91
3,154,183	10/1964	Wolowitz	197/91
3,204,745	9/1965	Wolowitz	197/91
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3,270,852	9/1966	Fondiller.....	197/91
3,397,767	8/1968	Hobbs.....	197/156 X
3,595,362	7/1971	Wolowitz.....	197/91 X
3,729,081	4/1973	Ozimek.....	197/181 X
3,799,316	3/1974	Davidge et al.....	197/181
3,834,512	9/1974	Haugen.....	197/181

Primary Examiner—Wm. H. Grieb
Attorney, Agent, or Firm—Hall & Myers

[57] **ABSTRACT**

A typewriter has two separate ribbons, at least one of which has two printing fields. An attachment for the typewriter has keys, or other manually operable members, selects any desired one of the three ribbon fields and at the same time backspaces the typewriter. The aforesaid arrangement permits one of the ribbon fields to be a "correcting" field so that the typewriter may be easily operated as a correcting typewriter.

A separate feature is that part of the attachment may be in the form of a cassette.

8 Claims, 10 Drawing Figures

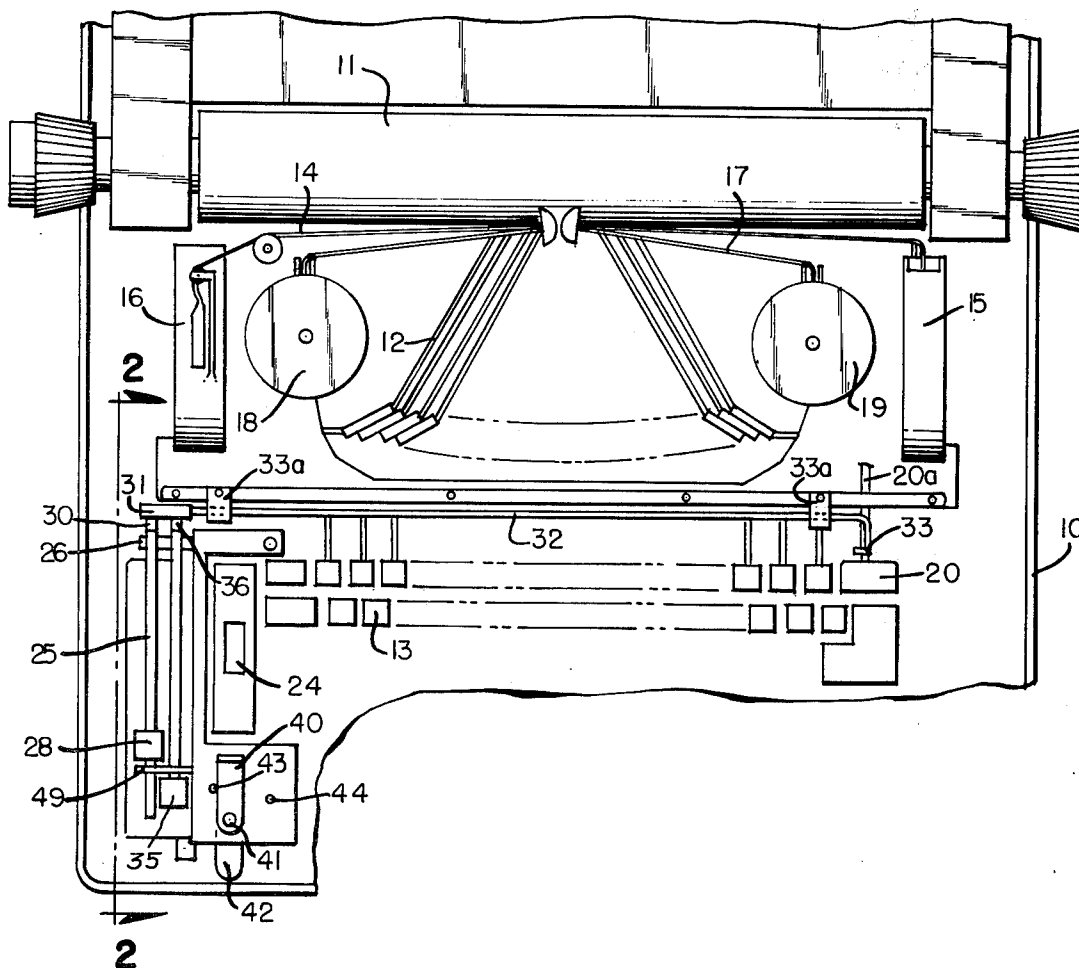


FIG. 1.

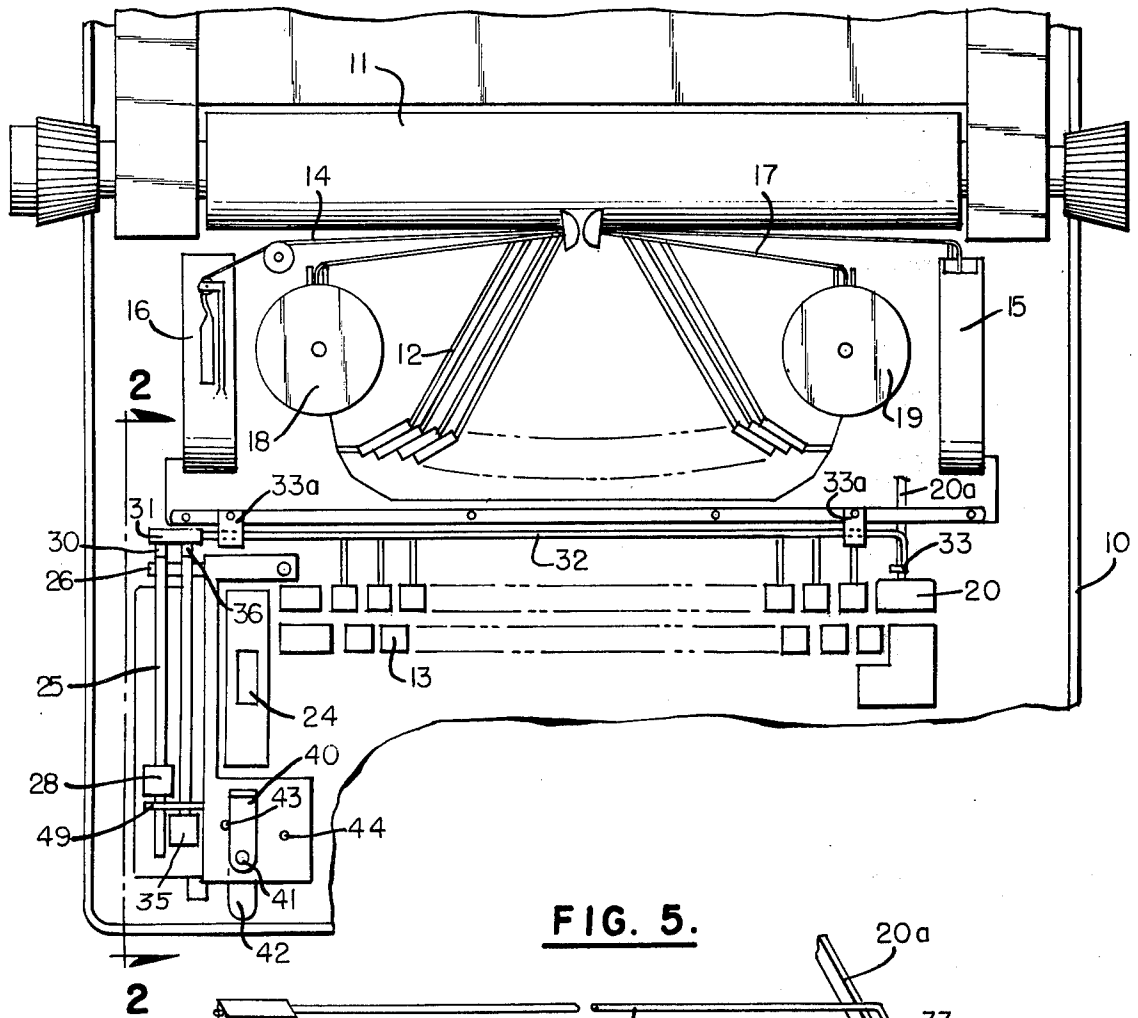


FIG. 5.

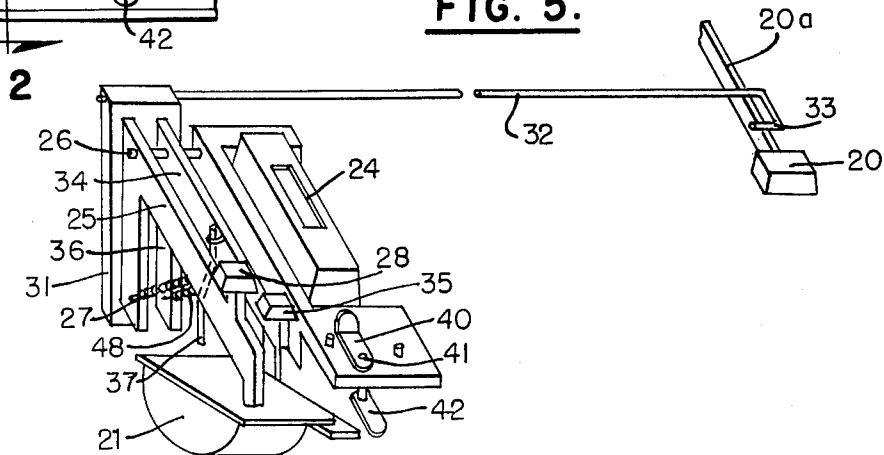


FIG. 2.

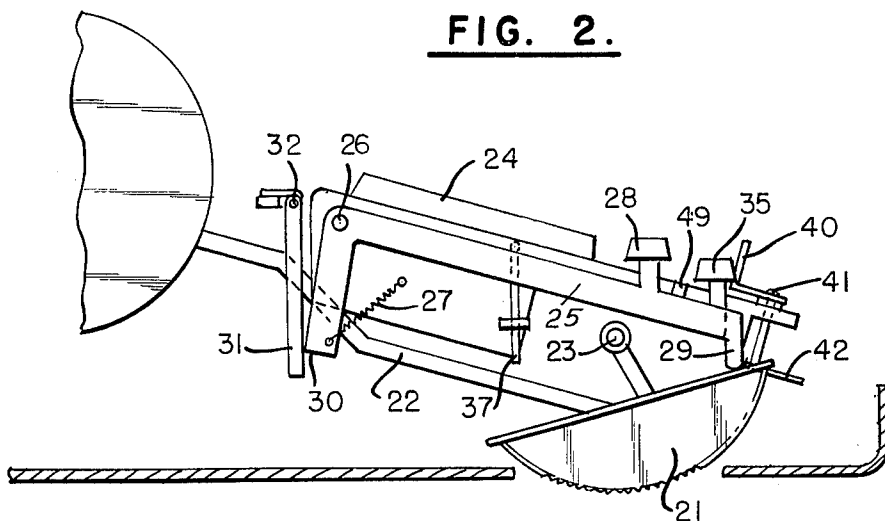


FIG. 3.

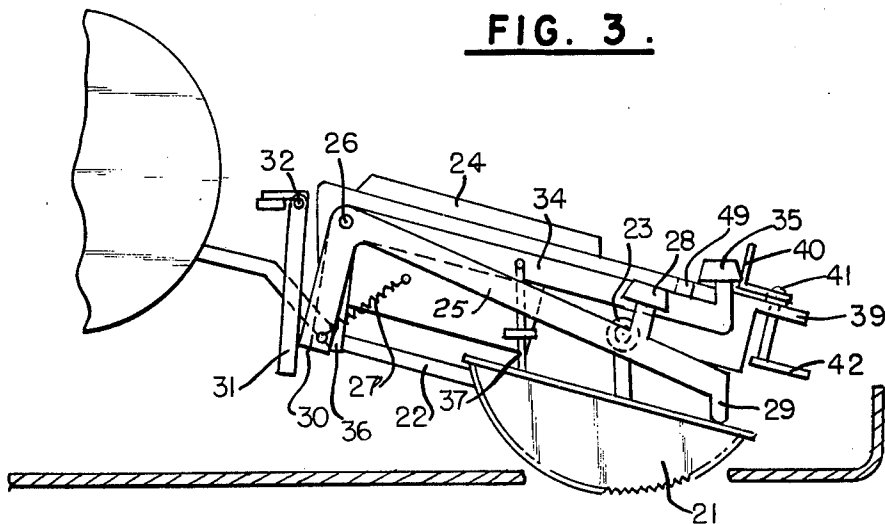


FIG. 4A.

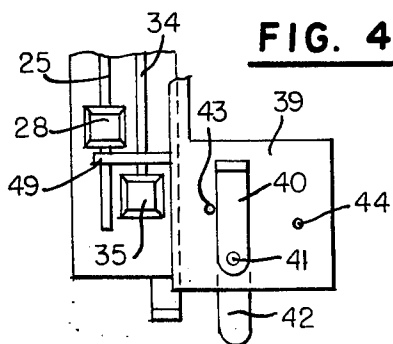
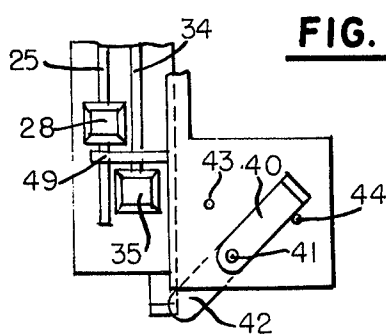


FIG. 4B.



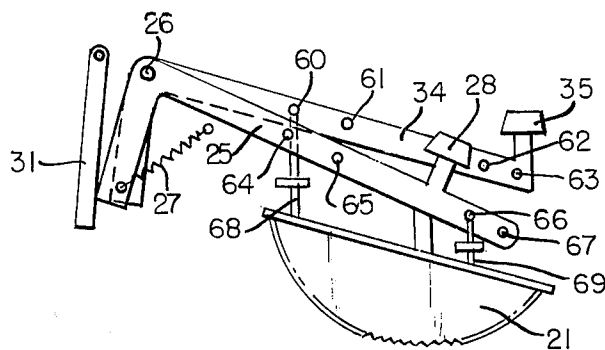


FIG. 6.

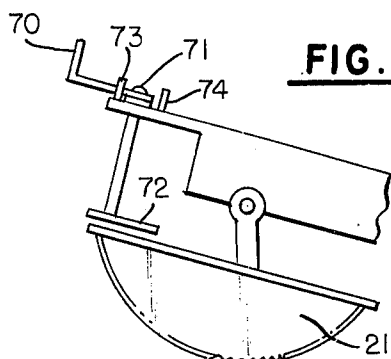


FIG. 7.

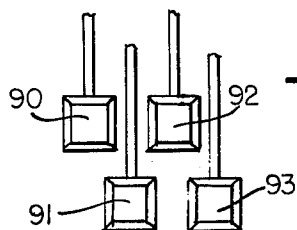


FIG. 9.

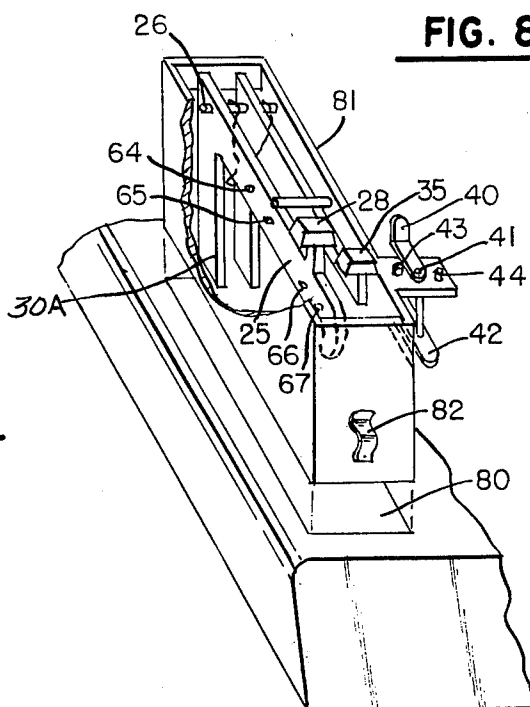


FIG. 8.

APPARATUS FOR SUPPLEMENTING THE OPERATION OF THE RIBBON SELECTING AND BACKSPACING MEANS OF A TYPEWRITER

RELATED APPLICATION

This application is related to my prior copending application Ser. No. 470,476, filed May 16, 1974, entitled "Attachment for Typewriters."

BACKGROUND OF THE INVENTION

It is now old and well known to employ a typewriter with two ribbon fields, one of which is made of correcting or erasing material, and keys for selecting either of the ribbons and at the same time backspacing the typewriter. For example, see my U.S. Pat. No. 3,149,711, issued Set. 22, 1964, for "Error-Correcting Typewriter", 3,154,183, issued Oct. 27, 1964, for "Ribbon Shift for Error-Obliterating Typewriters," 3,204,745, issued Sept. 7, 1965, for "Error Correcting Typewriter," and 3,595,362, issued July 27, 1971, for "Typewriter Backspace and Ribbon-Field Control."

However, there are some typewriters with two separate and totally independent ribbons, one of which may be a dual color ribbon. For example, one ribbon may be a carbon ribbon and the other may be a nylon ribbon, one half of which may be a black printing field and the other half of which may be a white or erasing field. For making preliminary typed drafts of documents, the black nylon ribbon field may be used, and the carbon ribbon may be used for final copies of important documents.

It is an object of this invention to provide an improved way of applying the teachings of the aforesaid prior patents to a typewriter having three ribbon fields.

It is another object of this invention to provide an attachment for existing typewriters which enables the typist to convert the typewriter into a self-correcting one without impairing the ability of the typist to continue the unimpaired use of the backspace key and the means for selecting the printing ribbon field of the existing typewriter.

SUMMARY OF THE INVENTION

The invention contemplates the addition of at least two keys, or other manually operable elements, to a conventional typewriter. Each key operates the backspace means of the typewriter and also selects a particular field of the three or more fields available.

Since normally the typist wishes to use only one ribbon field for writing and one such field for correcting, the invention in its preferred form contemplates only two keys, one of which selects the correcting field. The other key selects the ribbon field to be used for writing. Since there are at least two fields that may be used for writing, the invention contemplates manually operable means to control the travel of said "other" key and thereby determine which of the two or more writing fields it will select.

The apparatus comprising my invention may be in the form of an attachment for existing typewriters. It may be attached in such a manner that it does not impair operation, by the typist, of the backspace key of the typewriter or of the selection of any desired printing ribbon field by operation of the ribbon field selector of the typewriter.

Furthermore, in one form of the invention, the keys and certain other parts of the attachment may be embodied in a cassette that may be easily interchanged with or replaced by another cassette, to enable the typist to continue to use keys in the same location to achieve the same ultimate operations even if the ribbon fields are interchanged.

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BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top view of a conventional typewriter with the attachment comprising my invention added thereto.

FIG. 2 is a side view of the attachment along line 2—2 of FIG. 1.

FIG. 3 is the same side view shown in FIG. 2, but illustrating the attachment as it would appear during depression of key 28.

FIG. 4A is a detailed top view of the forward portion of the attachment shown in FIGS. 2 and 3 in one position of lever 40.

FIG. 4B is a detailed top view of the forward portion of the attachment shown in FIGS. 2 and 3 in the other position of lever 40.

FIG. 5 is a perspective view of the attachment for the typewriter of FIG. 1.

FIG. 6 is a side view similar to the side view of FIG. 2, but shows a modified form of the attachment.

FIG. 7 is a detailed view of the apparatus that may be added to the left end of the apparatus shown in FIG. 6.

FIG. 8 is a perspective view of a modified form of the attachment.

FIG. 9 is a top view of the keys in a still further modification of the attachment.

DETAILED DESCRIPTION OF THE INVENTION

In FIG. 1, the typewriter has the following conventional parts: frame 10, platen 11, type bars 12, writing keys 13, carbon ribbon 14, carbon ribbon take-up spool 16, carbon ribbon feed spool 15, two color ribbon 17, ribbon spools 18 and 19 for ribbon 17, backspace key 20, multi-position ribbon selector 21 which operates control lever 22 to select the desired ribbon, and pivot 23 for lever 22 and selector 21. The indicating mechanism 24 indicates to the typist which of the available ribbon portions is in use. The ribbon selector 21 has three printing positions and one stencil position. The most counterclockwise of these four positions (FIG. 2) selects the carbon ribbon 14 and is hereinafter referred to as the "first" position. The "second" position is about 15° clockwise of the first position and selects the lower half of ribbon 17. The "third" position (FIG. 3) is about 10° to 15° clockwise of the second position, that is, the most clockwise of the three printing positions, and selects the upper half of ribbon 17. The "fourth" position is still further clockwise of the third position and is a non-printing position and may be used when the typist wishes to cut a stencil. This is the particular arrangement in the typewriter selected for the purpose of this description and the order of ribbon selection in other typewriters may well be different.

When indicating mechanism 24 has rotated as far as possible counterclockwise, to the position shown in FIG. 2 (referred to herein as the first position), it has moved lever 22 forward (toward the typist) as far as possible, thus causing the carbon ribbon 14 to be raised to typing position by the ribbon vibrator when one of the writing keys 13 is depressed. The ribbon 17 is not operated by its ribbon vibrator upon depression of a writing key 13 when ribbon selector 21 is in the most counterclockwise of its three printing positions. If now

the ribbon selector 21 is rotated clockwise to its middle (second) position, the lever 22 moves rearward (away from the typist) and in this position the ribbon vibrator for the carbon ribbon 14 is deactivated and does not raise the carbon ribbon when a writing key 13 is depressed, but the ribbon vibrator for ribbon 17, which was previously deactivated, becomes operative and raises the ribbon 17 the maximum amount when a writing key 13 is depressed. Thus, when selector 21 is in its second position, the lower half of two color ribbon 17 is in use. When the ribbon selector 21 is rotated further clockwise to the angular position shown in FIG. 3, the lever 22 is moved further in a rearward direction and assumes a position (referred to herein as third position) wherein the ribbon vibrator for carbon ribbon 14 remains deactivated and the ribbon vibrator for ribbon 17 moves that ribbon, when a writing key 13 is depressed, so that the top half of the ribbon is used. Everything described in this paragraph is old and well known and is in use in typewriters commercially available.

My improvement resides in the addition of parts 25 to 45 to the prior art arrangement described in the immediately preceding paragraph.

Lever 25, which is pivoted at 26 and biased for counterclockwise rotation by spring 27, has a key 28 which permits the front end of lever 25 to be depressed causing protuberance 29 to engage ribbon selector 21 and rotate it to its most clockwise (third) printing position. This moves lever 22 rearward, activating the ribbon vibrator for ribbon 17, selects the top half of ribbon 17 for use, and deactivates the ribbon vibrator for carbon ribbon 14. At the same time the free end 30 of lever 25 engages arm 31 which is attached to rod 32 which is mounted for clockwise (FIG. 2) rotary motion about its axis causing the right hand end 33 of this rod to depress the lever 20a that carries the backspace key 20. Thus depression of key 28 operates lever 22 to activate the ribbon vibrator for ribbon 17 (particularly the top half thereof), and also backspaces the typewriter. Thereafter, spring 27 returns lever 25 to its normal position as shown in FIG. 2.

The rod 32 is mounted for rotation in bearings 33a.

The lever 34 carried key 35 and is pivoted for rotation about rod 26. It has a depending arm 36 which engages arm 31 and rotates rod 32 to backspace the typewriter when the key 35 is depressed. Lever 34 also has a depending rod 37 which engages ribbon selector 21 and rotates it counterclockwise when key 35 is depressed. This selects ribbon 14 and deactivates the ribbon vibrator for ribbon 17. If lever 40, which is pivotally mounted on stationary bracket 39 at 41, is in the position shown in FIG. 4A, that is, if the lever 40 is in contact with stop pin 43 and out of contact with stop pin 44 so that the arm 42 is out of the path of the ribbon selector 21, then the depression of key 35 effects maximum counterclockwise rotation of ribbon selector 21 (to its first position), thus selecting the carbon ribbon 14 and deactivating the ribbon vibrator for ribbon 17. Return spring 48 returns lever 34 to its normal position.

If, however, the lever 40 has been rotated to the position shown in FIG. 4B, and the ribbon selector is in the full clockwise position of FIG. 3, when key 35 is depressed, the ribbon selector 21 is moved counterclockwise only to its second position thus selecting the bottom half of ribbon 17 as well as rotating rod 32 to depress the lever 20a to backspace the typewriter.

The lever 34 has a return spring 48, and a stationary stop-bar 49 limits the upward movement of levers 25 and 34 so as to position keys 28 and 35 in their normal positions.

If it is desired to use the above-described apparatus as a self-correcting typewriter, the two-color ribbon 17 may have a white (or camouflaging) upper half and any desired color on its lower half, for example red.

If now one desires to write with the carbon ribbon 14, the key 35 is depressed, or alternatively the typist manually moves ribbon selector 21 to its farthestmost counterclockwise (first) position (with lever 40 in the position shown in FIG. 4A). If the typist makes an error, key 28 is depressed to not only backspace the typewriter, but also select the white (upper) half of ribbon 17 (third position). If the writing key 13 representing the erroneous letter is depressed, the error is erased. If next key 35 is depressed, the typewriter is again backspaced and normal typing with carbon ribbon 14 may proceed.

If it is desired to use the lower (red) half of ribbon 17 for normal writing, the ribbon selector 21 is moved to its second position, and lever 40 is rotated to the position shown in FIG. 4B. If the typist then makes an error, key 28 is depressed to change the throw of the ribbon vibrator of ribbon 17 to the white (top) half (third position). The key 13 representing the erroneous letter is depressed to erase the error. Next key 35 is depressed and this rotates ribbon selector 21 counterclockwise until the forward end thereof strikes arm 42 which stops the ribbon selector 21 in its second position. At the same time rod 32 was rotated to effect backspacing. Normal typing, using the lower half of ribbon 17, may then be resumed.

When lever 40 is switched to the position of FIG. 4B, the ribbon selector 21 is limited to two positions: (1) its most clockwise printing (third) position in which the upper half of ribbon 17 is used, and (2) its second position in which the lower half of ribbon 17 is used. If, therefore, the upper half of ribbon 17 is white and the lower half is black or red, the typewriter is self-correcting. If while typing with the lower half of the ribbon, the typist makes an error, the typist presses key 28 to rotate selector 21 to its most clockwise printing (third) position, thus selecting the white half of the ribbon and backspacing via parts 30 to 33 inclusive. If now the writing key 13 representing the erroneous letter is depressed, the error will be erased. Upon depression of key 35, the ribbon selector 21 will be returned to its second position, the lower half of ribbon 17 will be activated and the typewriter will be backspaced. Normal typing may therefore resume using the lower half of ribbon 17.

FIGS. 6, 7, 8 and 9 illustrate a modified form of the invention, which enables the invention to be more universal in its application.

In FIG. 6, the key levers 34 and 25 respectively have keys 35 and 28 and are the same as the corresponding keys and levers of FIGS. 1 to 5, except as follows: Instead of having fixed, built-in projections on the key levers for engaging ribbon selector 21, the lever 34 has holes 60, 61, 62 and 63 and the lever 25 has holes 64, 65, 66 and 67. Arms such as 68 and 69 of any desired length can be affixed to the key lever at the position of any of said holes as necessary to produce any desired degree of rotation of ribbon selector 21 upon the depression of any given key.

Similarly, there is a stop means for limiting the rotation of ribbon selector 21 at either or both ends of its travel. Just as stop means 40, 41, 42, 43 and 44 of FIG. 4A limits the counterclockwise rotation of ribbon selector 21, a similar stop means 70, 71, 72, 73 and 74 limits the clockwise rotation of ribbon selector 21 in FIG. 7. In the position shown in FIG. 7, stop 72 limits clockwise travel of selector 21 to its third ribbon position. If stop 72 is moved out of the path of selector 21, then selector 21 can continue its clockwise travel to the fourth (stencil) position, if key 28 is depressed, or if selector 21 is moved manually. In FIG. 7, the handle 70 rotates about pivot 71 to move stop arm 72 in or out of the path of ribbon selector 21, and stop pins 73 and 74 limit the angular motion of handle 70 in counterclockwise and clockwise directions respectively.

As shown in FIG. 8, the typewriter may be provided with a socket 80 for receiving a cassette 81 which will hold all of the parts of my attachment except 31, 32, 33 and 33a. The cassette 81 holds the parts 40-44 which are the same as the corresponding parts of FIGS. 4A and 4B. The cassette holds at least two key levers 25 and 34 with their respective keys 28 and 35 and the rear end of the cassette is open to allow levers such as 30A to move rearwardly to engage arm 31 which is mounted independently of the cassette 81. The levers, such as 25, have four holes 64, 65, 66 and 67 to permit arms of any desired length to be affixed to the lever for the purpose of driving ribbon selector 21 to a desired position when a key, such as 28, is depressed. As indicated in FIG. 9, as many as four keys with associated key levers, all of which keys and levers are built according to the description of key 28 and lever 25 of FIG. 8, may be employed in the cassette 81. As a result, a very wide range of selections may be made to achieve desired results. For example, in a typewriter having two separate ribbons, one of which has two fields and the other of which has only one field, one of the three fields may be a white field for making corrections and the other two fields may be for printing in black, red or some other color. Two of the keys 90 and 91 may be used to shift between the white field and one of the other fields and keys 92 and 93 may be used to shift between the white and the remaining field. Any desired permutation or combination can be arranged by placing the proper length arms such as 68 and 69 in the correct holes such as 64 to 67. Moreover, proper limits may be placed on the movement of ribbon selector 21 by operating stop arms 40-44 or 70-74.

A spring 82 may hold cassette 81 in socket 80.

My attachments of FIGS. 1 to 8 inclusive may be added to existing typewriters without destroying the ability of the typist to manually operate the backspace key 20 the same as before and without destroying the ability of the typist to manually move the ribbon selecting mechanism 21 to any printing ribbon field position the same as before. In explanation of the foregoing it is noted that element 33 is located above the key lever 20a of backspace key 20 and therefore will not interfere with downward travel of lever 20a when the backspace key 20 is depressed. Similarly, if stop means 40-44 and 70-74, are moved to positions outside the path of travel of ribbon selector 21, the latter may be freely moved manually to any desired position. To facilitate this, the underside of ribbon selector 21 projects downwardly from the underside of the typewriter and may have a roughened surface to permit the typist to easily move the same.

I claim to have invented:

1. In a printing machine, printing means including a printing medium having first, second and third printing fields, selecting means for selecting which of said three printing fields will be used at any particular time, said selecting means being movable in first and second opposite directions and having at least first, second and third positions to which it is movable, one for each of said ribbon fields, the second one of said three positions being a mid-position and the other two positions being in said first and second opposite directions respectively from the mid-position, said printing means including operable means for performing the printing operation in steps across the object being printed and including backspace means for backspacing the operable means one step, a first key for moving said selecting means in said first direction to said first position to select one of said three fields, means for operating said backspace means when said first key is depressed, and means for selecting either said second or said third position of said selecting means, said means comprising a second key for moving said selecting means in said second direction
2. A printing machine as defined in claim 1 including means for operating said backspace means when said second key is depressed.
3. A printing machine as defined in claim 1 in which said selecting means and said backspace means are manually operable independently of said control means.
4. A printing machine as defined in claim 3 in which the printing means, the selecting means, the operable means and the backspace means comprise a typewriter, said two keys comprising an attachment for said typewriter that may be applied thereto without precluding the typist from manually operating the backspace means and without precluding the typist from manually operating said selecting means to select any of the printing ribbon fields.
5. A printing machine as defined in claim 4 in which said two keys are mounted in a cassette, and which includes movable means outside the cassette for operating said backspace means, means in the cassette which, in response to depression of either key, operates said movable means to in turn operate the backspace means, and means in the cassette controlled by said keys for operating said selecting means.
6. A printing machine as defined in claim 1, in which said means for selecting either said second or said third position includes means operable by the typist to prevent the selecting means from moving past the second position to the third position when the second key is depressed.
7. An attachment for a typewriter, said typewriter having a keyboard, a ribbon selector at one end of the keyboard, and backspace means including a key that forms a part of the keyboard, comprising: movable means adapted for mounting on the typewriter and which, when so mounted, includes a movable element adjacent said ribbon selector and means operated by given movement of said element for operating the backspace means,

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and attachment means, adapted to be attached to the typewriter adjacent said ribbon selector, and including first and second keys,

said attachment means, when attached to the typewriter adjacent said ribbon selector, also including means for operating said movable element to in turn operate the backspace means when either of said keys is depressed and which insures that after one of said keys is depressed the ribbon selector is in one ribbon selecting position and when the other

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key is depressed the ribbon-selector is in another ribbon-selecting position.

8. An attachment for a typewriter as defined in claim 7, in which said attachment means comprises means which when attached to the typewriter does not preclude the typist from manually operating the backspace key of the typewriter and also does not preclude the typist from manually operating the ribbon selector to select a desired one of the printing fields of any printing ribbon means that may be on the typewriter.

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