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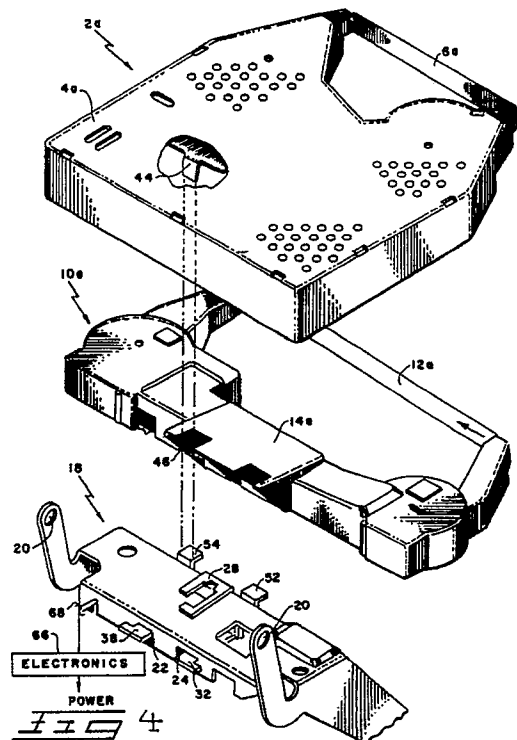
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(54) **Correction tape cassette having compatibility arrangement.**

(57) A correction tape cassette using an arrangement for assuring cassette compatibility in a device which utilises a first and second cassette in the operation thereof, the arrangement including engaging formations located on the first and second cassettes which ensure that the cassettes are functionally compatible with each other when inserted in the device.

The arrangement may be further configured, to assure cassette compatibility in a device having a switch means controlling the on-off condition thereof, so as to activate the on-off switch of the device only when functionally compatible cassettes are present therein.



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This invention is directed to correction tape cassettes used with devices such as typewriters which utilize at least two different cassettes, such as a typewriter ribbon cassette and a correcting cassette.

Related co-pending European patent applications are no. 88311368.0 entitled "Cassette Having Compatibility Arrangement", and no. entitled "System Including Ink Ribbon and Correction Tape Cassettes Having a Compatibility Arrangement" filed simultaneously herewith.

Various prior art devices disclose means by which the operability of a typewriter or printer is controlled by the condition or type of cassette present in the typewriter or printer. U.S. patent No. 4,636,097, for example, includes means for rendering the printer inoperable when the end of the typewriter ribbon in a cassette is sensed, or when there is no cassette in the printer. Another such device is disclosed in IBM Technical Disclosure Bulletin, Vol. 25, No. 4, September 1982. The cassette disclosed therein provides a signal to the device (such as a typewriter) which identifies the contents of the cassette, so that the device may adjust to the characteristics of the cassette contents. Still another such device is disclosed in U.S. Pat. No. 4,516,137 wherein the presence or absence of a thermal ribbon cassette is sensed by the printer. If a thermal ribbon cassette is present, the printer can print only unidirectionally, whereas when the ribbon cassette is not present, the printer prints bidirectionally.

Patent Abstracts of Japan, Vol. 10, No. 216 (M-502) [2272], re. JP-A1-6154975, describes a system wherein the presence or absence of a detector on an ink ribbon cassette in a device is used (via a selection switch 24) to select an appropriate printing pressure in that device.

Patent Abstracts of Japan Vol. 9, No. 98 (M-375) [1821], re JP-A-59222380, describes a system wherein a tab/pair of tabs is provided on each monocolour ribbon cassette of the system so as to activate switches when inserted into a device to identify to that device the colour of the ribbon in the inserted cassette.

There are, in addition, prior art devices which disclose means for connecting a ribbon cassette to a correcting cassette. Examples of such prior art devices are U.S. Pat. No. 4,239,107 and U.S. Pat. No. 4,302,118. The '118 patent discloses mating formations adapted to place a ribbon cassette in register with a correcting cassette, and also discloses means on the cassette which control the selection of the correct feed and ribbon lift mechanism.

Unlike the present invention none of the above described pieces of prior art discloses the provision of means for making certain that in devices

such as typewriters, which may utilize at least two different cassettes, such as a ribbon cassette and a correcting cassette, the cassettes are functionally compatible with each other.

In common practice, a typewriter ribbon cassette includes a plastic jacketing in which the ribbon and various components are conveniently housed. These components may include, among other things, a supply spool upon which a supply of typewriter ribbon is located, mechanism for assuring the uniform withdrawal of ribbon from the supply spool to the typewriter print point, and a take-up spool on which the typed ribbon is located. A typewriter drive mechanism rotates the take-up spool to cause fresh ribbon from the supply spool to advance to the print point. A typewriter ribbon cassette of this type is disclosed in U.S. Pat. No. 4,302,118.

Such typewriter ribbon cassettes may contain various types of ribbons. For example, the ribbon may be of the single-strike carbon ribbon type or of the multiple-strike carbon ribbon type. If the ribbon is a single-strike carbon ribbon, the ribbon is incrementally fed in such a manner that upon a single character being typed on a portion of the ribbon, the ribbon is advanced so that the next character is typed on a fresh portion of the ribbon.

If the ribbon is a multiple-strike ribbon, such as the "Multi-Strike" ribbon sold by Smith Corona Corporation, the ribbon is incrementally fed in such a manner that upon a character being typed on a ribbon, the ribbon is advanced a lesser distance so that the next character is typed on a ribbon portion comprising both a typed ribbon portion and a fresh ribbon portion. In this manner, significantly more characters may be typed on a multiple-strike ribbon than on a single-strike ribbon.

A typewriter correcting cassette may also include a plastic jacketing for conveniently housing a correcting tape and various components. As in the typewriter ribbon cassette, the components of a correcting cassette may include a supply spool, means for assuring the uniform withdrawal of correcting tape from the supply spool, and a take-up spool. Here too, the correcting tape may be of two types, namely, the type commonly referred to as "lift-off" tape, in which the tape, upon striking the unwanted character, removes the unwanted character from the paper, or the type commonly referred to as "cover-up" tape, in which, upon the tape striking the unwanted character, a powdered material on the tape is transferred to and covers up the unwanted character on the paper.

In the existing market, with few, if any, exceptions, lift-off correcting tape is only compatible with single-strike carbon ribbons, and cover-up correcting tape is only compatible with multiple-strike carbon ribbons. Each combination of cassettes having

compatible ribbon and correcting tapes may be termed a cassette combination or assembly. Therefore, in a typewriter which permits the use of both single-strike and multiple-strike ribbons as well as both lift-off and cover-up correcting tapes, it is desirable to provide means to assure that the lift-off correcting tape is used only with single-strike carbon ribbons and that the cover-up tape is used only with multiple-strike ribbons. The present invention is directed to means for providing a simple, reliable means to assure that the lift-off tape cassette can be used only with the single-strike ribbon cassette and that the cover-up tape cassette can be used only with the multiple-strike ribbon cassette.

That is achieved, in general, by providing the cassette with means for assuring that the cassette is functionally compatible with the corresponding second cassette of the combination or assembly upon the cassettes being inserted into a device, such as a typewriter in a system which utilizes the cassettes.

According to the present invention, if it is attempted to utilize a cassette having the foregoing means with a second cassette which is not compatible with that cassette, i.e., of a different cassette combination, the means for assuring cassette compatibility will prevent the first cassette from being properly placed in the device and indicating to the operator that an attempt is being made to place into the device a cassette which is not compatible with another being so placed.

The present invention provides a correction tape cassette for a system including a device utilizing a correction cassette and a ribbon cassette having an ink ribbon, the correction cassette comprising:

- a housing; and
- a correction tape substantially disposed within said housing; characterised in that there is further provided

- means on said housing for assuring compatibility between said correction tape and the ribbon, the location of said means on said housing corresponding to the type of said correction tape in said housing.

Cassette compatibility is also achieved, in general, by providing a switch means in the typewriter, printer, or the like, which controls the on - off condition of the typewriter, and means located on the ribbon cassette that activates the on-off typewriter switch means. According to the present invention, the ribbon cassette activating means will not activate the on-off typewriter switch when functionally incompatible cassettes are present in the typewriter. In other words, the ribbon cassette activating means will activate the on-off typewriter switch only when either a single-strike ribbon cas-

sette and a cover-up correction tape cassette are present in the typewriter or when a multiple-strike ribbon cassette and a lift-off correction tape cassette are present in the typewriter.

A further understanding of the present invention may be had when the following detailed description is read in conjunction with the accompanying drawings, in which:

FIG. 1 is an exploded top perspective view of the present invention showing a cassette combination including a first typewriter ribbon cassette, a first correction tape cassette, and a partial view of a shiftable bracket section which carries the ribbon cassette and correction tape thereon;

FIG. 2 is an exploded top perspective view of the present invention showing a cassette combination including a second typewriter ribbon cassette, a second correction tape cassette, and a partial view of a shiftable bracket section which carries the ribbon cassette and correction tape thereon;

Fig. 3 is an exploded top perspective view of the cassette combination of Fig. 1 used in a typewriter having an on-off switch mechanism with which the cassette combination may interact;

Fig. 4 is an exploded top perspective view of the cassette combination of Fig. 2 used in a typewriter having an on-off switch mechanism with which the cassette combination may interact;

Fig. 5 is an exploded top perspective view of the present invention used in a typewriter having an on-off switch mechanism and shows a partial view of the switch activating means located on the first typewriter ribbon cassette, a partial view of the shiftable bracket section which carries the ribbon cassette and correction tape thereon, and the on-off switch;

Fig. 6 is a side elevational view of the present invention used as in Fig. 5, showing an on-off switch in its normally closed position whereby power cannot be supplied to the device; and

Fig. 7 is a side elevational view of the present invention used as in Fig. 5, showing an on-off switch in its normally opened position whereby power can be supplied to the device.

There is shown in Fig. 1 a first typewriter ribbon cassette 2 having a housing 4 within which a first typewriter ribbon 6 (which may be of the single-strike carbon ribbon type), and various other components, are housed. A formation 8, such as a tab, extends from the right-hand portion of the bottom of the housing 4 for a purpose to be described hereinafter. As noted above, a single-strike carbon ribbon is of the type which is incrementally fed in such a manner that upon a character being typed on a ribbon portion, the ribbon is advanced so that the next character is typed on a fresh

portion of the ribbon. These components, not shown, may include, among other things, a supply spool upon which a typewriter ribbon supply is located, a mechanism for assuring the uniform withdrawal of ribbon from the supply spool to the typewriter print point, and a take-up spool on which the typed ribbon is located. Such a cassette is presently being sold by Smith Corona Corporation under its "H Correctable" mark.

Also in Fig. 1, there is disclosed a first correction tape cassette 10 which is functionally compatible with the first typewriter ribbon cassette 2, and within which a first correction tape 12 of, for example, the lift-off type, together with other components, is housed. The ribbon cassette 2 and the functionally compatible correction cassette 10 may be designated a cassette combination or assembly. In operation, to delete an unwanted typed character from a document, the lift-off tape is raised to the print point over the character, and the unwanted character on the type element is positioned to strike the lift-off tape. Typewriter actuating means causes the type element to strike the lift-off tape against the unwanted character on the paper, and the lift-off tape withdraws the unwanted character from the paper.

The components (not shown) in the first correction tape cassette 10 may include a supply roll of correcting tape, means for assuring the uniform withdrawal of correcting tape from the supply spool and a take-up spool. The first correction tape cassette 10 also includes a flat portion 14 having a formation 16 illustrated as an opening, in the right-hand portion, through which the tab formation 8 of the first typewriter ribbon cassette 2 extends when the cassettes are inserted into the typewriter.

Fig. 1 further discloses a shiftable bracket section 18 adapted to operationally accommodate the first typewriter ribbon cassette 2 and the first correction tape cassette 10 thereon. The shiftable bracket section 18 is pivotable about pivot points 20 by conventional typewriter means (not shown) for presenting either the first typewriter ribbon 6 or the lift-off first correction tape 12 to the typewriter print point. The engagement of the tab formation 8 of the ribbon cassette 2 with the opening formation 16 of the first correct tape cassette 10 ensures that the cassettes are compatible with each other. The cassettes 2 and 10 are configured so that unless the formations 8 and 16 are in operational engagement, the cassette assembly will not be capable of being inserted in the typewriter. Consequently, the typewriter will be inoperable.

Fig. 2 shows a second typewriter ribbon cassette 2a and a second correction tape cassette 10a which are generally similar in construction to the first typewriter ribbon cassette 2 and the first correction tape 10 shown in Fig. 1. Therefore, in large

part, the same numerical reference numerals will be used in Fig. 2 as were used in Fig. 1, except that the letter "a" will be added to the reference numerals of Fig. 2.

There is shown in Fig. 2 the second typewriter ribbon cassette 2a having a housing 4a within which a second typewriter ribbon 6a, which may be of the multiple-strike carbon ribbon type, and various other components are housed. A formation 44 such as a tab extends from the left-hand portion of the bottom of the housing 4a for the purpose to be hereinafter described. As noted above, a multiple-strike carbon ribbon is of the type which is incrementally fed in such a manner that upon a character being typed on a ribbon portion, the ribbon is advanced so that the next character is typed on a ribbon portion comprising both a typed ribbon portion and a fresh ribbon portion. These components (not shown) may include, among other things, a supply spool upon which a typewriter ribbon supply is located, mechanism for assuring the uniform withdrawal of ribbon from the supply spool to the typewriter print point, and a take-up spool on which the typed ribbon is located. Such a cassette is presently being sold by Smith Corona Corporation under its "H Multi-Strike" mark.

There is further shown in Fig. 2 the second correction tape cassette 10a which is functionally compatible with the second typewriter ribbon cassette 2a, and within which a second correction tape 12a of, for example, the cover-up type, together with other components, is housed. The ribbon cassette 2a and the functionally compatible correction cassette 10a may be designated a cassette combination or assembly. In operation, to delete an unwanted typed character from a document, the cover-up tape is raised to the print point over the character, and the unwanted character on the type element is positioned to strike the cover-up tape. Typewriter actuating means causes the type element to strike the cover-up tape against the unwanted character on the paper, and the cover-up tape is transferred to and covers up the unwanted character.

The components (not shown) in the second correction tape cassette 10a may include a supply roll of correcting tape, means for assuring the uniform withdrawal of correcting tape from the supply spool, and a take-up spool. The second correction tape cassette 10a also includes a flat portion 14a having a formation 46 illustrated as an opening in the left-hand portion, through which the tab 44 of the second typewriter ribbon cassette 2a extends when the cassettes are inserted into the typewriter. The shiftable bracket section 18 shown in Fig. 2 is the same bracket section shown in Fig. 1. The engagement of the tab formation 44 of the ribbon cassette 2a with the opening formation 46 of the

second correct tape cassette 10a ensures that the cassettes are compatible with each other. The cassettes 2a and 10a are configured so that unless the formations 44 and 46 are in operational engagement, the cassettes will not be capable of being inserted in the bracket section 18. Consequently, the typewriter will be inoperable.

In operation, downward movement of the tab formation 8, will only occur when the right-hand tab formation 8 can extend through the right-hand opening formation 16 in the flat portion 14 in compatible first correction tape cassette 10. If, however, instead of the first correction tape cassette 10 being present in the typewriter, an incompatible correction tape cassette, such as second correction tape cassette 10a, is present, which has no opening or only a left-hand opening formation 46 in the flat portion 14a, the tab formation 8 cannot extend downwardly through the opening, preventing seating of the first cassette 2 on the second correction tape, and immediately indicating to the operator, by the physical interference of tab 8 holding the first cassette 2 above and not squarely against correction tape cassette 10a, that an attempt has been made to place an incompatible cassette into the typewriter.

Similarly, with respect to the second typewriter ribbon cassette 2a, proper insertion of the cassette will only occur when the left-hand tab formation 44 can extend through the left-hand opening formation 46 in the flat portion 14a in compatible second correction tape cassette 10a. If, however, instead of second correction tape cassette 10a being present in the typewriter, an incompatible first correction tape cassette is present, such as in this case cassette 10, which has only the right-hand opening 16 in the flat portion 14, the tab formation 44 cannot extend downwardly through the opening formation 46, preventing the seating of the second ribbon cassette upon the second correction tape cassette 10a. Thus, it will be seen that with respect to the embodiment shown in Figs. 1 and 2, the typewriter will not be operable when either the first typewriter ribbon cassette 2 and the second correction tape cassette 10a, or the second typewriter ribbon cassette 2a and the first correction tape cassette 10 are present therein.

According to the present invention cassette compatibility may further be assured in a typewriter which has an on-off switch means as illustrated in Figs. 3-7.

Figs. 3, 5 and 7 show the first typewriter ribbon cassette 2 and the first correction tape cassette 10 of Fig. 1, thus in large part the same numerical reference numerals will be used in Figs. 3, 5 and 7 as were used in Fig. 1. Fig. 4 shows the second typewriter ribbon cassette 2a and second correction tape cassette 10a of Fig. 2, thus in large part

the same numerical reference numerals will be used in Fig. 4 as were used in Fig. 2.

As shown in Figures 3 and 5, the shiftable bracket section 18 has an opening 22 and an opening 24 in a front portion 26. A clip 28 is clamped to the shiftable bracket section 18. An on-off switch rocker 30 (the operation of which will be described hereinafter) is assembled to the shiftable bracket section 18 by means of a first finger 32 of the on-off switch rocker 30 extending through the opening 24 of shiftable bracket section 18. A notch 34 in switch rocker 30 receives a wall portion 36 of the opening 24. The first finger 32 seated against the wall portion 36 provides a first pivot point for the on-off switch rocker 30.

A second finger 38 of the on-off switch rocker 30 extends through the opening 22 in shiftable bracket section 18 and abuts against a wall portion 40 of the opening 22 to provide a second pivot point for the on-off switch rocker 30. The second finger 38 is integrally molded with the on-off switch rocker 30 in such a manner that the second finger 38 is biased against the wall portion 40 and causes the first finger 32 to be biased against the wall portion 36 for holding the on-off switch rocker 30 assembled to the shiftable bracket section 18. The first pivot point of the first finger 32 is substantially in alignment with the second pivot point of the second finger 38 to provide a common axis 42 for pivoting the on-off switch rocker 30 relative to the shiftable bracket section 18.

The shiftable bracket section 18 shown in Fig. 4 is the same bracket section shown in Fig. 3. The on-off switch rocker 30 shown in Fig. 5 includes a generally planar portion 48 having two rearwardly extending arms 50 on which an upwardly extending right-hand finger 52 and an upwardly extending left-hand finger 54 are located. A spring means 56 is connected at one end to the on-off switch rocker 30 and at its opposite end to the shiftable bracket section 18 at spring aperture 58. The spring 56 biases the on-off switch rocker 30 counterclockwise about the common axis 42.

A switch 60 has a first switch contact 62 and a second switch contact 64. The first switch contact 62 is securely mounted on the on-off switch rocker 30. The first switch contact 62 has an elongated contact surface with the elongation arranged substantially parallel relative to the common axis 42. The second switch contact 64 is securely mounted on the clip 28 which is assembled to the shiftable bracket section 18. The second switch contact 64 has an elongated contact surface with the elongation arranged substantially perpendicular relative to the first switch contact 62. Although the contacts may be of different shapes, it has been found desirable to make the shapes elongated to reduce the manufacturing tolerances required to have the

first switch contact 62 efficiently contact the second switch contact 64 during initial assembly and during continual typewriter operation thereafter. The first and second switch contacts 62 and 64 are connected to electronics 66 mounted in the typewriter by lead lines 68. The electronics 66 is connected to a power source for controlling the flow of electricity to the typewriter.

Referring to Fig. 6, the spring 56 biases the on-off switch rocker 30 counterclockwise relative to the shiftable bracket section 18 to bias the first switch contact 62 in contact with the second switch contact 64 for closing the switch 60. The switch 60 is closed when neither the first typewriter ribbon cassette 2 nor the second typewriter ribbon cassette 2a is inserted in the typewriter. The electronics 66 senses that the switch 60 is closed and thereby prevents the flow of electricity to the typewriter.

Referring to Fig. 7, when the first typewriter ribbon cassette 2 is inserted into the typewriter, the tab 8 contacts the right-hand finger 52 and pivots the on-off switch rocker 30 clockwise relative to the shiftable bracket section 18 to open the switch 60. Likewise, when the second typewriter ribbon cassette 2a is inserted into the typewriter, the tab 44 contacts the left-hand finger 54 and pivots the on-off switch rocker 30 clockwise to open the switch 60 (Fig. 4). When the electronics 66 senses that the switch 60 is open, it permits the flow of electricity to the typewriter.

Downward movement of the tab 8, and thus the flow of electricity to the typewriter, will only occur when the right-hand tab 8 can extend through the right-hand opening 16 in the flat portion 14 in compatible first correction tape cassette 10. If, however, instead of the first correction tape cassette 10 being present in the typewriter, incompatible second correction tape cassette 10a is present, which has only a left-hand opening 46 in the flat portion 14a, the tab 8 cannot extend downwardly to pivot the on-off switch rocker 30 clockwise, and the flow of electricity to the typewriter cannot occur.

Similarly, with respect to the second typewriter ribbon cassette 2a, the flow of electricity to the typewriter will only occur when the left-hand tab 44 can extend through the left-hand opening 46 in the flat portion 14a in compatible second correction tape cassette 10a. If, however, instead of second correction tape cassette 10a being present in the typewriter, incompatible first correction tape cassette 10 is present, which has only the right-hand opening 16 in the flat portion 14, the tab 44 cannot extend downwardly to pivot the on-off switch rocker 30 clockwise and the flow of electricity to the typewriter cannot occur. Thus, it will be seen that with respect to the embodiment shown in Figs. 3 to 7, the flow of electricity will not occur when either the first typewriter ribbon cassette 2 and the sec-

ond correction tape cassette 10a, or the second typewriter ribbon cassette 2a and the first correction tape cassette 10 are present in the typewriter.

Claims

1. A correction tape cassette (10/10a) for a system including a device utilizing a correction cassette (10/10a) and a ribbon cassette (2/2a) having an ink ribbon (6/6a), the correction cassette (10/10a) comprising:
 - a housing; and
 - a correction tape (12/12a) substantially disposed within said housing; characterised in that there is further provided means (16/46) on said housing for assuring compatibility between said correction tape (12/12a) and the ribbon (6/6a), the location of said means (16/46) on said housing corresponding to the type of said correction tape (12/12a) in said housing.
2. The correction tape cassette as defined in claim 1, wherein said assuring means is an opening (16/46).
3. The correction tape as defined in claim 2, wherein said opening is on the upper surface of the housing.
4. The correction tape cassette as defined in claim 2 or 3, wherein said opening (16/46) is positioned in a specific side portion of said housing and is adapted to accommodate in use a tab formation (8/44) extending from a corresponding side portion of the ribbon cassette (2/2a) for assuring functional compatibility between said correction tape (12/12a) and the ink ribbon (6/6a) and, in the event that the tab (8/44) is not aligned with, and accommodated by said opening (16/46), for indicating the functional incompatibility of the ink ribbon (6/6a) and said correction tape (12/12a).
5. The correction tape cassette as defined in claims 3 or 4, wherein said opening (16) is located on the right side of said upper surface to indicate the presence of a lift-off type of correction tape (12) within said housing.
6. The correction tape cassette as defined in claim 3 or 4, wherein said opening (46) is located on the left side of said upper surface to indicate the presence of a cover-up type of correction tape (12a) within said housing.
7. The correction tape cassette as defined in any one of claims 1 to 6, for use in a system

including a device operating on a flow of electricity and including a switch (60) for controlling the flow of electricity thereto, the ribbon cassette (2/2a) and correction tape cassette (10/10a) being inserted in the device for operation thereof, wherein the compatibility means (16/46) on said correction tape cassette (10/10a) is adapted to enable, in use, means (8/44) on said tape cassette (2/2a) to condition the switch (60) to control the flow of electricity to the device.

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