ABSTRACT

In a typewriter, a member carries and conceals normally an ink ribbon supply, such as a roll, in a flatly contiguous relation to one side of the machine, and is supported on a structure so that it can be elevated and then swung outwardly from the machine for facilitating replacement of the ribbon supply in a horizontally flat and elevated posture thereupon. Said member carries the supply roll by an arbor which has a device associated with it which as the ribbon is drawn off the supply roll, energizes a spring in order to oppose or cancel out resiliently excessive pay-off of ribbon from the supply roll.

10 Claims, 4 Drawing Figures
RIBBON SUPPLY SUPPORTING STRUCTURE IN
TYPEWRITERS AND SIMILAR MACHINES

BACKGROUND OF INVENTION

The invention pertains to supporting and receiving structures for inked ribbon supply devices in typewriters or similar machines and particularly also to receiving structures for ink-coated paper or plastic ribbon which is in roll form and is installable from a side into the machine.

The invention pertains further to provision which automatically opposes or cancels out resiliently, excessive pay-off of ribbon.

Because ink-coated ribbons are instrumental to production of better impressions, they more and more replace the ink-saturated fabric ribbons which are passed through the machine reversely many times. As opposed to the fabric ribbons, the ink coated ribbons are used only once, and thus must be replaced frequently. They have been supplied in plain roll form or in containers or cartridges for application to the machines. Also, the introduction of the ribbon supply has been made more convenient by providing therefor outwardly tiltable receiving devices.

During typing operations the ribbon is pulled through the machine and off the ribbon supply roll in sudden stepwise movements by a drive system. The ribbon supply roll has considerable mass and consequently it has a tendency to overrun by the force of momentum, so that the ribbon extending through the machine is apt to become slack and the effective feed movements at the printing point become erratic in magnitude. Also, consequently to the slackness, the ribbon may become entangled in the machine causing it to become fractured. The ribbon may also become deformed and may fold lengthwise in the guides therefor. To avoid such behavior of the ribbon, it has been the practice to take up the slack in the ribbon by leading it over resilient guides. Efforts have also been made to prevent excessive rotation of the ribbon supply roll, through use of a resilient finger pressing against the supply roll to brake its motion. This has been unsatisfactory because of the liability of damage to the inked surface of the ribbon and detrimental deflecting effect on the ribbon. Any extra fingers cooperative with the ribbon, of course, complicate the threading of the ribbon.

SUMMARY OF INVENTION

It is one object of the invention to provide an efficient ribbon supply receiving facility which is manipulative to an outwardly reaching and elevated position to make placement of the ribbon supply thereunto extremely convenient, and with a minimum of chance of damage to the ribbon. Moreover, it is an object of the invention to incorporate on such facility a turnable arbor for receipt of ribbon in simply wound up form or contained in a cartridge.

It is a still further object of the invention to provide simple, efficient means so active on the arbor that as the arbor is turned in ribbon draw-off direction, such means will be resiliently effective on the arbor to cancel out or oppose excessive pay-off of ribbon.

For attaining the above and other objects, the machine of the invention has a ribbon supply receiving member or facility which is normally supported on the machine in flatly contiguous relation to a side of the machine and is elevatable first above its normal position to be then given a laterally outreaching position to facilitate the convenient loading of a ribbon supply thereon.

More specifically the ribbon supply receiving member has a pivotal support which is carried on an elevatable structure which is at the side of the machine. After being elevated by said structure, said member is swingable to a laterally outreaching position in which it is an appreciable distance above the surface on which the machine stands. In conventional typewriter desks, the ribbon supply receiving member is then adapted to overlie the main desk top surface which is at a higher level than the surface on which the machine stands.

The said ribbon supply receiving member has a rim which faces upwardly when said member is swung to said outreaching position, so that the ribbon supply is then easily placeable thereon. Also, such ribbon supply receiving member may have a turnable arbor upon which a roll of ribbon is placeable. Said member when swung into contiguous side relation to the machine, forms a ribbon supply housing with a wall that is afforded by the elevatable structure.

Interposed between the ribbon supply supporting member and said arbor is a spring means and a slip drag connection which together are instrumental to control the arbor to oppose or cancel out excessive draw-off of ribbon and thereby to keep the ribbon taut and thus accurately feeding.

Reference is now made to the form of the invention which is illustrated in the drawings:

FIG. 1 is a front perspective view showing the ribbon supply receiving facility of the invention in an elevated and outwardly swung condition with a supply roll received therein;

FIG. 2 shows in side elevation a portion of a supporting bracket and a detenting device thereon;

FIG. 3 is a sectional front elevation showing the ribbon supply receiving facility in a closed condition and downwardly moved into a well or recess; and

FIG. 4 is a sectional view of a ribbon roll arbor having a spring element thereon to retain a supply roll when it is placed thereon.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The ribbon supply receiving facility of the invention, see FIGS. 1 and 3, comprises a ribbon mounting cover member 10 which by a hinge 11 is given pivotal support at 11' on a carrier plate structure 12. The latter is slidable on support means in the form of a frame-supported bracket 13 through the medium of three pins 14 on the carrier plate structure 12 which pins extend through guide slots 15 provided in the support bracket 13. Said pins 14 have opposite heads 16 to retain the carrier plate structure 12 slidably associated on the support bracket 13. Two of the slots 15 are at the front portion of the support bracket 13 and the other is at a more rearward location. As is shown in FIG. 1, the support bracket 13 is supported on a wall 17, by three screws 18, the wall 17 being the right hand one of a usual inner frame structure of a typewriter otherwise not shown. The support bracket 13 includes at the bottom of a lateral outward reach 20 another
support means in the form of an upreaching extension 21 ending in a short outwardly reaching shelf or stop rest 22. Said outward reach 20 and extension or other support means 21, in conjunction with said bracket 13, affords a well or recess 23, wherein the lower portion of the slideable carrier plate structure 12 is normally disposed at a ribbon supply station as shown in FIG. 3, the ribbon mounting cover member 10 then being in a flatly contiguous position to the machine framework. Lower and upper sliding limits for the carrier plate structure 12 on the support bracket 13 are established by the ends of the slots 15 in conjunction with the pins 14.

In FIG. 2 there is shown a detent element 25 of flexible material cooperative with the inner head 16 of the pin 14 which extends through the rearwardly located slot 15 in the support bracket 13. Such detent element 25 has two detent noses 26 and further has bent ends mounting it on pins 30 carried on the support bracket 13. In said FIG. 2, the upper detent nose 26 is cooperative with the shown pin head 16 to hold the carrier plate structure 12 resiliently in an elevated position. If the carrier plate structure 12 is moved to the lowered position at the ribbon supply station seen in FIG. 3, the pin head 16 will move below the lower detent nose 26.

In order to place the ribbon mounting cover member 10 into a ribbon supply receiving position at a ribbon loading station, it is first lifted or elevated along with the carrier plate structure 12 which is slidably carried on the support bracket 13, as before stated. Then the ribbon mounting cover member 10 is swung to the outreaching position at the ribbon loading station seen in FIG. 1, wherein it rests or abuts upon the shelf or stop rest 22. Upon arrival in such position the ribbon mounting cover member 10, by its weight, is reacting against said shelf or stop rest 22 and further reacts upwardly on the carrier plate structure 12 to keep it moved to its upper limit position, as shown. Thus the ribbon mounting cover member 10 becomes arrested and supported in its extended and easily accessible position at the ribbon loading station seen in FIG. 1 for receipt thereupon of a supply of new ribbon.

Office desks are usually constructed to support typewriters adjacent to the main desk top at a lower level and the ribbon supply receiving facility of the invention is such that when the ribbon mounting cover member 10 of the invention disposed above the level of the main desk top and is in conveniently accessible position.

The ribbon mounting cover member is preferably of generally circular form, as shown in FIG. 1, and preferably also has a rim 32 which together with the member 10 forms a shallow ribbon supply receiving cup. Said ribbon mounting member 10, see FIG. 3, is preferably of molded material and carries imbedded therein a centrally extending stud 33 wherein an arbor 34 is rotatively carried in endwise restrained relation. A ribbon supply roll 35 is receivable by said arbor 34 when the ribbon mounting cover member is at the ribbon loading station in the position seen in FIG. 1. Furthermore, such supply roll is retained on the arbor, turnable therewith, by a generally U-shaped leaf spring 36 which is carried in an inner recess 37 of the arbor 34 and has ends which take a biting hold on the interior of the ribbon roll as the roll is being applied. The end of the ribbon 35' is led through an opening 38 in the rim 32 whereat there is a ribbon guide roll 40.

After the ribbon supply is placed upon the arbor 34 the ribbon mounting cover member 10 is simply lifted to the vertical position at the ribbon supply station wherein the stud 33 thereon contacts the plate structure 12, and then it is pushed down to recede into the well 23 to its normal position. Then the extending end of the ribbon is guided over the diagonal guide 41 seen in FIG. 1 and is threaded through the machine to be pulled stepwise therethrough and vibrated incidentally to typing operations, by conventional means.

The ribbon supply roll 35 has considerable mass and when the ribbon 35' is drawn from it stepwise the roll tends to override, so that it is liable to feed in uneven steps past the printing point and may also become subject to entanglement.

To the end of overcoming this trouble in a simple and efficient manner, see FIG. 3, there is arranged concentrically with the arbor 34 on its supporting stud 33 a friction disk 43 for cooperation with a friction plate 44 on the inside of the cover member 10. Disposed between the friction disk 43 and the arbor 34 there is a cone-wound spring 45, the larger diameter end of which has anchorage on the said disk 43 and the smaller diameter end of which has anchorage in the arbor 34. Such spring 45 is axially of the stud 33 under compression between the friction plate 44 and the arbor 34 and therefore is pressing the friction disk 43 against said plate 44. Moreover, the spring 45 serves as a torsion spring so that whenever ribbon 35' is drawn from the ribbon supply roll 35, the spring 45 is strained in the torsion sense in view of the friction drag effect which is exerted on the friction disk 43. If due to sudden ribbon pull and the mass of the ribbon roll, such roll then overrides, the energy which has become stored in the spring 45 asserts itself to turn the arbor and the ribbon roll thereon impositively in a ribbon take-up direction to eliminate ribbon slack.

It is obvious that the arrangement of the torsion spring 45 and the friction disk 43 may be reversed in their positions relatively to the member 10 and the arbor 34.

What is claimed is:
1. A ribbon supply arrangement for a typewriter or similar machine, the combination comprising:
   support means for supporting said ribbon supply arrangement in the machine,
   a ribbon mounting member for supporting a supply of ribbon in a ribbon feeding position at a ribbon supply station in the machine,
   a carrier mounted on said support means for supporting said ribbon mounting member at the ribbon supply station in the machine,
   said carrier being slidably mounted on said support means for movement to an elevated position thereon to carry said ribbon mounting member from the ribbon feeding position at the ribbon supply station to an elevated position,
   said ribbon mounting member being pivotally connected to said carrier, and
   said ribbon mounting member being pivotally movable at the elevated position to a ribbon loading station for receiving thereon a supply of ribbon.
2. The invention defined in claim 1, and further comprising:
an arbor for a ribbon supply roll turnably carried on said ribbon receiving member, brake means including resilient biasing means located between said arbor and said member for exerting a force thereagainst in a slip-drag contact, and said resilient biasing means being flexed through rotation of said arbor in a ribbon pay-off direction to subject said arbor to a resilient force which tends to drive it in ribbon winding direction, the extent of flexure of said resilient biasing means being limited by slippage of the slip-drag contact each time a given extent of flexure of said resilient biasing means is reached.

3. A ribbon supply arrangement according to claim 1, the combination further comprising detent means associated with said support means for engaging and releasably holding said slidably mounted carrier at the elevated position.

4. A ribbon supply arrangement according to claim 1, the combination further comprising: another support means associated with said support means and located in laterally spaced-apart relation therefrom adjacent said ribbon supply station for engaging said ribbon mounting member at the ribbon supply station as movement of said carrier brings said ribbon mounting member to the supply station to prevent pivotal movement of said ribbon mounting member from the ribbon feeding position.

5. A ribbon supply arrangement according to claim 1, wherein said ribbon mounting member has a rim formation with an upreaching posture upon said ribbon mounting member being pivotally moved to the elevated ribbon loading station for receiving thereon a supply of ribbon within said rim.

6. A ribbon supply arrangement according to claim 1, the combination further comprising: limit means associated with said support means for engaging said slidably mounted carrier at the elevated position to limit further upward movement thereof, a stop rest associated with said support means and located in horizontally spaced-apart relation therefrom for being engaged by said ribbon mounting member upon pivotal movement of said ribbon mounting member to the ribbon loading position, and said stop rest engaging said ribbon mounting member at a location adjacent said pivotal connection to said carrier for enabling the downward force exerted by the weight of said ribbon mounting member to act about said stop rest to urge said slidably movable carrier against said limit means at the elevated position on said support means.

7. In a typewriter or similar machine, the combination comprising: an arbor for a ribbon supply roll turnably supported in said machine, a member located in said machine and being stationary relative to said arbor, brake means including resilient biasing means located between said arbor and said member for exerting a force thereagainst in a slip-drag contact, and said resilient biasing means being flexed through rotation of said arbor in a ribbon pay-off direction to subject said arbor to a resilient force which tends to drive it in ribbon winding direction, the extent of flexure of said resilient biasing means being limited by slippage of the slip-drag contact each time a given extent of flexure of said resilient biasing means is reached.

8. In the invention defined in claim 7, said brake means comprising a friction disk concentrically arranged with said arbor, and said resilient biasing means being a torsion spring connected with said friction disk.

9. In the invention defined in claim 8, said torsion spring being of cone-wound shape having one end connected with said friction disk and together therewith being situated axially of said arbor in compression between said arbor and said member.

10. In the invention defined in claim 9, said friction disk being in slip-drag contact with said member and the other end of said cone-shaped torsion spring being connected with said arbor.
UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,710,915
DATED : January 16, 1973
INVENTOR(S) : Friedrich Teichmann and Hans-Georg Hengelhaupt

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

In The Heading:

After item [21], insert --Foreign Application Priority Data
November 27, 1969 Germany....1959553.0--.

Signed and sealed this 6th day of May 1975.

(SEAL)
Attest:
RUTH C. MASON
Attesting Officer

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