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INK RIBBON CARTRIDGE FOR A TYPEWRITER, TELEPRINTER OR SIMILAR OFFICE MACHINES
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4 Claims

ABSTRACT OF THE DISCLOSURE
An ink ribbon cartridge for a typewriter, teleprinter or similar machine comprising: a substantially C-shaped box open on its lower side and positionable with the opening of the C embracing a typecarrier; a ribbon guide secured across the opening of the C; a top wall of the box having two pivots to carry ribbon spools; two members each mounted on one of said pivots and each having three arms lying in substantially the same plane carrying respectively a tension spring, means to engage a ribbon reversing mechanism, and a ribbon guide whereby ribbon tension can rotate one of the members against the spring actuating the reversing mechanism; two manipulative levers, fulcrumed scissor-fashion, each urged by a spring to contact ribbon on respective spools and having means to block the rotation of the respective member until ribbon thickness on the respective spool is below a predetermined value. Normally the cartridge is secured to a plate on a typing machine or printer in which a cam is arranged to vibrate the plate on pivots, thus vibrating the cartridge so as to locate a ribbon in and out of position between a typecarrier and platen.

BACKGROUND OF THE INVENTION
This invention relates to an ink ribbon cartridge for a typewriter, teleprinter or similar office machine, adapted to be removably mounted on the machine, said cartridge being formed of a box mounting a pair of spools.

There are already known ink ribbon cartridges of the above mentioned type, containing the ink ribbon wound in a pair of spools. In a known cartridge the spools are directly mounted on the cartridge, which is to be replaced each time the ink ribbon is changed, whereby the ribbon becomes relatively expensive. Furthermore the ribbon has to be inserted into the conventional ribbon vibrator carried by the machine, whereby the ribbon requires a relatively long time to be changed.

SUMMARY OF THE INVENTION
These disadvantages are obviated by the ink ribbon cartridge according to the invention, which is characterized in that said box is opened at its lower side facing the machine, a ribbon guiding member being secured to said box and being vibrated bodily therewith, said spools being pivotally mounted on a pair of pivots secured to said box and being locked thereto by a pair of manipulative levers fulcrumed like a scissors and spring urged to contact the ribbon on both said spools, whereby the ribbon may be changed upon temporarily removing said box from the machine, capsizing said box, and pinching said levers.

These and other characteristics of the invention will become apparent from the following description of a preferred embodiment thereof and from the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING
FIG. 1 is a left-hand partial longitudinal sectional view of a printing device incorporating an ink ribbon cartridge according to the invention;
FIG. 2 is a plan view of the printing device of FIG. 1, wherein the cartridge has been removed; and
FIG. 3 is the cartridge of FIG. 1 removed from the machine and capsized.

DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION
With reference to FIG. 1, the numeral 4 indicates the conventional main shaft of the printing device. The shaft 4 is adapted to be cyclically rotated 180 degrees counterclockwise for each printing cycle. The printing device comprises a set of typewheels 6 individually selectable and selectively rotatable for printing a predetermined character on a conventional platen 7. Furthermore the printing device comprises a plate 8 provided with a pair of bent lugs 9 secured to a pair of pivots 10 rotatably mounted on the stationary machine frame. Secured to the plate 8 is also an arm 11 normally urged by a spring 12 to contact a cam 13 of the shaft 4.

Secured to the plate 8 is a further pair of pivots 14 (FIG. 2) pivotally mounting a pair of ratchet wheels 16. Each wheel 16 is provided with a pair of pins 17 adapted to engage a pair of holes 51 (FIG. 3) provided on a conventional ink ribbon spool 49. Each wheel 16 (FIG. 1) is adapted to cooperate with a lug 18 of a corresponding pawl 19 having a second lug 21 directed downwards and fulcrumed with a predetermined clearance on a pivot 22 secured to a crank lever 23. The two levers 23 are secured to a shaft 24 rotatably mounted on two bent lugs 25 of the plate 8. Secured to the shaft 24 is also a third crank lever 26 connected by a link 27 to a lever 28. This latter is fulcrumed on a stationary pivot 29 and is normally urged by a spring 30 to contact a cam 31 of the shaft 4.

The two lugs 21 (FIG. 2) are connected by a spring 32 which urges the two lugs 18 toward the wheels 16. Each pawl 19 is provided with a cam edge 33 adapted to cooperate with a corresponding pin 34 of a ribbon reverse lever 36. The lever 36 is fulcrumed on a pivot 37 secured to the plate 8 and is provided with a pin 38 engaged by an end of a torsional spring 39 partially helically wound, the other end of the spring 39 engaging a notch 41 of the plate 8.

The plate 8 is provided with a further pair of lugs 42 bent upwards and each one adapted to engage a recess 43 (FIG. 3) formed in each one of a pair of side walls 44 of an ink ribbon cartridge, generally indicated by the numeral 45. The cartridge 45 is associated with the machine, that is it represents a part of the machine equipment and thus does not have to be replaced when the ribbon 60 is to be changed.

The cartridge 45 is made with a transparent plastic material and is substantially C-shaped, so as to embrace the typewheels 6 (FIG. 1). The cartridge 45 is open at its lower side facing the machine and is provided with a top wall 46, secured to which is a pair of pins 47 (FIG. 3) supporting a suitably bent iron wire 48 representing the conventional ribbon vibrator.

Furthermore, secured to the wall 46 is a pair of pivots 50 rotatably mounting the spools 49. Secured to a projection 53 of the cartridge 45 is a pivot 52 mounting like a scissor a pair of levers 54 made with a plastic material. The levers 54 are normally urged in opposite directions by a torsional spring 55, so as to contact the ribbon 60 wound on each spool 49, thus normally locking the spools 49 on the cartridge 45. Each lever 54 is provided with a corresponding lug 56, the two lugs 56 being...
3,513,957

adapted to be pinched by two fingers for disengaging the levers 54 from the spools 49. The upper flange of each spool 49 may contact a projection 57 (FIG. 1) provided on each lever 54.

A cam-shaped notch 79 on each pivot 50 (FIG. 3) is a three-armed lever 58, a spring 59 tensioned between the two levers 58 urging them to contact a corresponding pin 61 secured to the cartridge 45. Each lever 58 is provided with a roller 62 guiding the ribbon 60.

Secured to the cartridge 45 is a pair of pins 67 each one carrying a corresponding bracket 68 for guiding the ribbon 60. This latter also passes between the side walls 44 of the cartridge 45 and a flat projection 69 (FIG. 1) integral with the cartridge 45.

Near each roller 62, the lever 58 carries a pin 63 adapted to be engaged together with the roller 62 by the conventional ribbon clip for causing the ribbon 60 to be reversed. Each lever 58 is also provided with a pin 64 adapted to cooperate with a lug 65 of the corresponding lever 54 and with a lug 66 (FIG. 2) of the lever 36.

Finally the cartridge 45 is provided with a snap knob 71 (FIG. 1) secured to a pivot 72 rotatably mounted on the rear end of the corresponding pin 64. A plate 73 (FIG. 3) provided with two shoulders 74 adapted to cooperate with a pin 76 secured to the wall 46. An elastic tongue 77 of the plate 73 is adapted to cooperate with the same pin 76 for causing the knob 71 to snap from the one to the other of a pair of positions. Furthermore secured to the pivot 72 is a prismatic element 78 having a pair of cam shaped notches 79 (FIG. 1) adapted to cooperate with a pin 81 crossing the pivot 37 and therefore secured to the plate 8.

The ribbon controlling device operates as follows.

Normally the cartridge 45 is secured to the plate 8 by the cam shaped notches 79, which engage the pin 81. If now the knob 71 being in the position shown in FIGS. 1 and 3. One of the lugs 18 (in FIG. 2 the right-hand lug 18) engages the corresponding wheel 16, while the other lug 18 is disengaged from the other wheel 16. At each cycle of 180 degrees of the shaft 4, the cam 13 causes the spring 12 to rock the plate 8 bodily with the cartridge 45 about the pivots 10 to locate the ink ribbon 60 between the wheels 6 and the plate 7. Simultaneously the cam 31 rocks the lever 28 clockwise and through the link 27 and the lever 26 rocks in the same direction the shaft 24 bodily with the levers 23. The two paws 19 (FIG. 2) are thus displaced forwards whereby engaged lug 18 slides over the teeth of ratchet 16. Thereafter the spring 30 (FIG. 1) restores the lever 28 bodily with the two paws 19, whereby the engaged lug 18 (FIG. 2) rotates the corresponding wheel 16 together with the spool 49 to feed the ribbon 60 (FIG. 3). Normally upon feeding the ribbon 60 both levers 58 are urged to rock against the urge of the spring 59, but the lug 65 of the lever 54 contacting the ribbon 60 on the spool 49 arrests the pins 64 thus preventing the levers 58 from being accidentally rocked. When the thickness of the ribbon 60 on the unwinding spool 49 (in FIG. 3 the right-hand spool 49) becomes less than a predetermined value, the lug 65 moves the corresponding pin 64. If now the lever 58 is rocked its pin 64 engages the corresponding lug 66 (FIG. 2) of the lever 36. The lever 36 is thus rocked from the one to the other of its angular positions, wherein it is held by the spring 39, and by means of the pins 34 and the cam edges 33 alternates the paws 19 with the wheels 16. In this case the lever 58 is not rocked by the tension of the ribbon 60, when the clip (not shown) secured to the end of the ribbon 60 which in fact is unable to pass between the roller 62 and the pin 63, encounters the pin 62, the lever 58 is positively rocked to cause the feeding of the ribbon 60 to be reversed.

For replacing the exhausted ribbon spool 49, at first the knob 71 (FIG. 1) is rotated 90 degrees to cause the notches 79 to release the pin 81. The cartridge 45 is now removed from the plate 8 and capsized on a table as shown in FIG. 3. By pinching the lugs 56 of the levers 54 by means of two fingers, the levers 54 are rocked in opposite directions against the urge of the spring 55 so as to release the spools 49 which may so be removed from the cartridge 45.

Now the end of the ribbon 60 hooked to the empty spool is removed therefrom and the end of the ribbon 60 of the new spool 49 is hooked thereto. The ribbon 60 is now inserted between the rollers 62 and the pins 63, and between the pins 67 and the brackets 68, as well as into the vibrator 48. Thereafter the spools 49 are mounted on the pivots 50, after having pinched again the lugs 56 of the levers 54. Now the levers 54 are released and bear against the ribbon 60 to lock the spools 49 on the cartridge 45. This latter is now capsized again and mounted on the plate 8 (FIG. 1), inserting the recesses 43 on the lugs 42 thus causing the notches 79 to engage the pin 81. Finally the knob 71 is rocked 90 degrees, whereby the notches 79 lock the pin 81, whereby the cartridge 45 is locked into position.

What is claimed is:

1. A removable ink ribbon cartridge for a typewriter, teleprinter or similar office machine, said cartridge being formed of a box mounting a pair of spools having a ribbon thereon, characterized in that said box is open at its lower side facing the machine, a ribbon guiding member being secured to said box and, said spools being pivotally mounted on a pair of pivots secured to said box and being locked thereinto by a pair of manipulative levers fulcrumed like a scissor and spring urged to contact the ribbon on both said spools, whereby the ribbon may be changed upon temporarily removing said box from the machine, capsizing said box, and pinching said levers.

2. A cartridge according to claim 1, characterized in that each one of said pivots pivotally mounts a three armed member in which the three arms lie substantially in the same plane, each said three armed member being urged to be rocked by said ribbon upon being fed, and being prevented from being rocked by the corresponding lever of said pair of manipulative levers till the thickness of the ribbon wound on the corresponding spool is less than a predetermined value.

3. A cartridge according to claim 1, characterized in that said box is locked on a plate carried by the machine through a cam slot provided on an element rotateably mounted on said box and engaging a pin secured to said plate, a snap operating knob secured to said element being manually rotatable to unlock said box and remove same from the machine.

4. A removable ink ribbon cartridge for a typewriter, teleprinter or similar office machine comprising:

(a) a substantially C-shaped box open on its lower side and having locating means for positioning on an office machine with the opening of the C embracing a type-carrier;

(b) ribbon guiding means secured across the opening of said C to support an ink ribbon for impact by said type-carrier;

(c) a top wall secured to said box;

(d) first and second pivots for ribbon spools secured to said top wall;

(e) first and second members, each having a first arm, a second arm and a third arm lying in substantially the same plane, rotatably mounted on said first and second pivots respectively;

(f) a tension spring connected at each end to a respective said first arm;

(g) means to engage a ribbon reversing mechanism secured to each said second arm;

(h) a ribbon guide carried on each said third arm whereby tension of a ribbon being wound on a spool in said cartridge bears against each said ribbon guide tending to rotate said first and second members
against the tension of said spring and thereby actuate said ribbon-reversing mechanism;
(i) first and second manipulative levers fulcrumed like a scissor and urged by a spring to contact ribbon on respective spools mounted in said cartridge; and
(ii) means provided on each of said first and second manipulative levers for blocking the rotation of said first and second members until ribbon thickness on respective spools in said cartridge becomes less than a predetermined value.

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