United States Patent

Anderson et al.

[15] **3,643,777**

[45] **Feb. 22, 1972**

[54] TYPEWRITER RIBBON CARTRIDGE

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[73] Assignee: **SCM Corporation,** New York, N.Y.

[22] Filed: **July 23, 1970**

[21] Appl. No.: **64,058**

Related U.S. Application Data

[63] Continuation of Ser. No. 710,185, Mar. 4, 1968, abandoned.

[52] **U.S. Cl.**.....**197/151,** 197/159, 197/168, 197/170, 242/198

[51] **Int. Cl.**.....**B41j 33/14,** B41j 35/10, B41j 35/04

[58] **Field of Search**.....197/151, 172, 175, 168, 153, 197/153.5, 170, 162, 159; 242/198, 199, 55.13, 71.1

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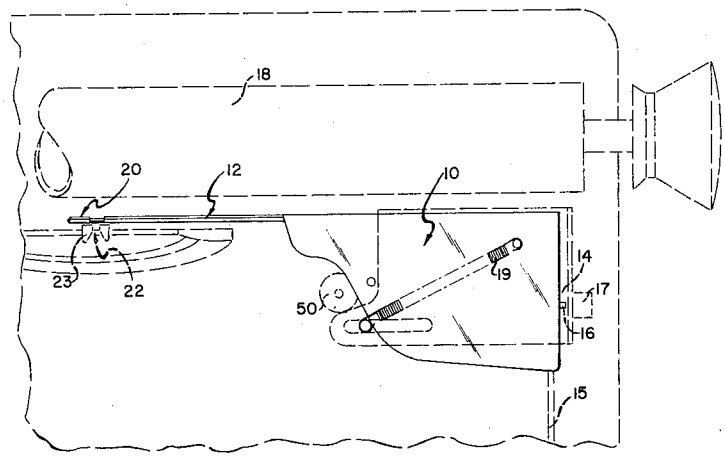
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[57] **ABSTRACT**

A cartridge for housing a supply of ribbon for typewriters or like machines. The cartridge includes an arm extending therefrom to guide the ribbon from the cartridge to the typewriter print point and to reverse the direction of the ribbon for guiding the ribbon back to the cartridge which is supported on a machine rigid frame on one side of the print point. The arm being capable of carrying the ribbon from a point adjacent the print point to the print point as a ribbon vibrator.

22 Claims, 9 Drawing Figures



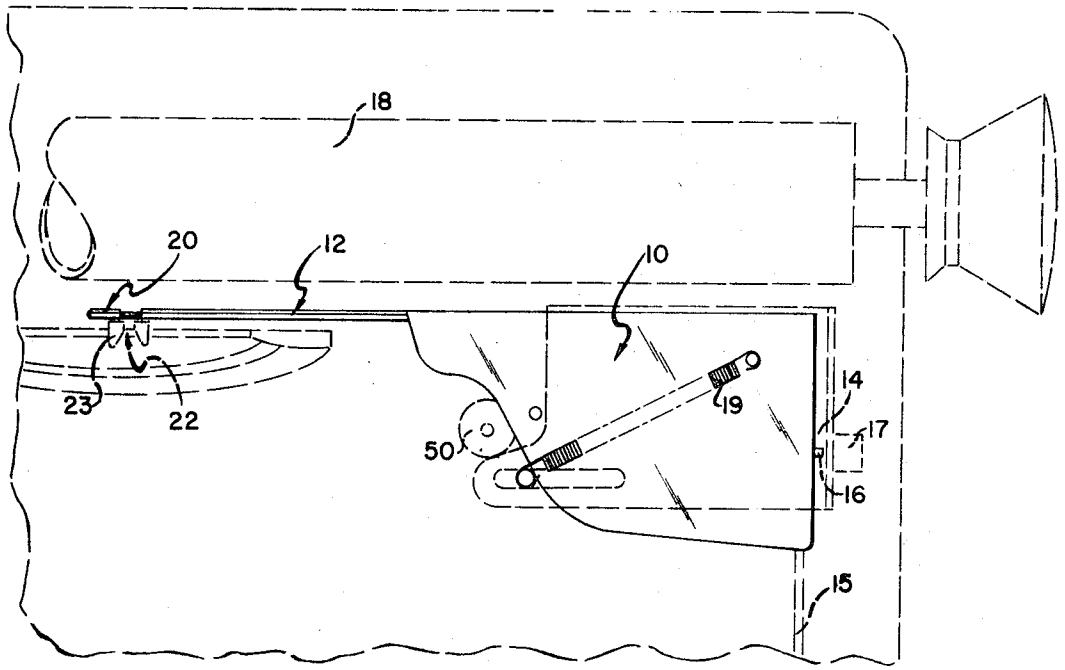


FIG. 1

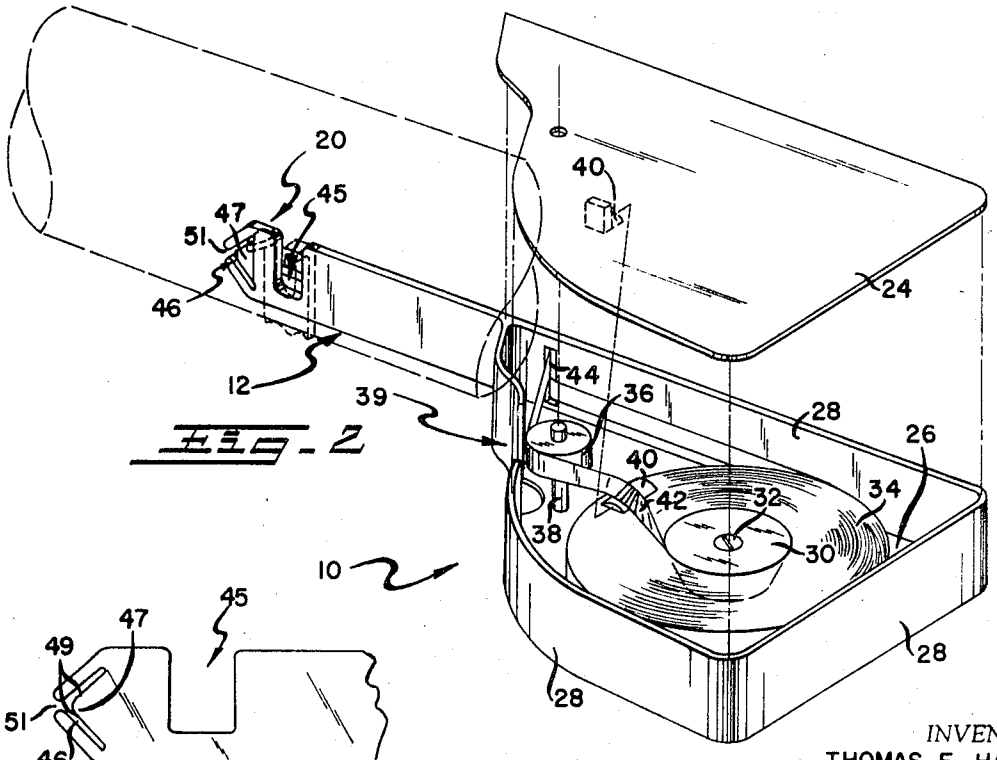


FIG. 2

FIG. 8

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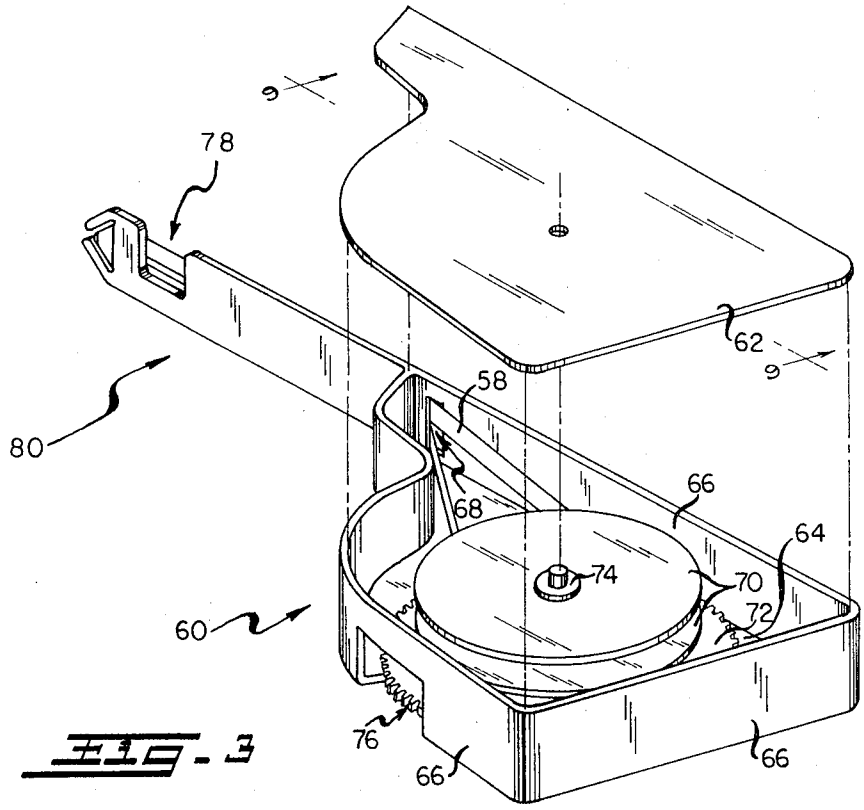


FIG. 3

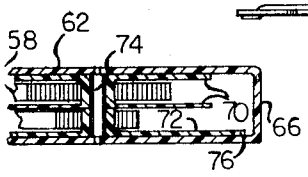


FIG. 9

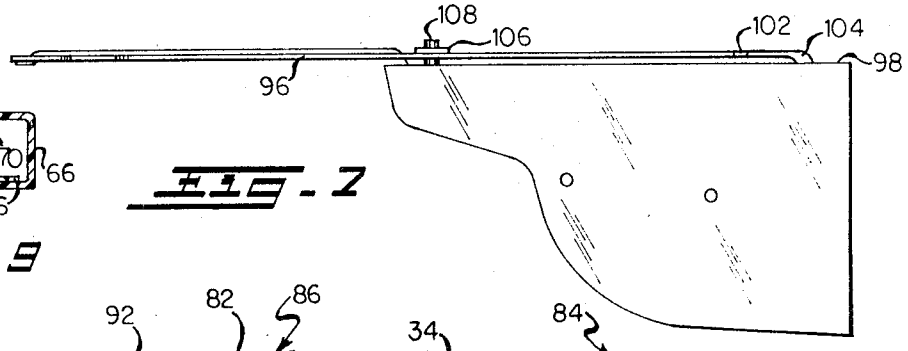


FIG. 7

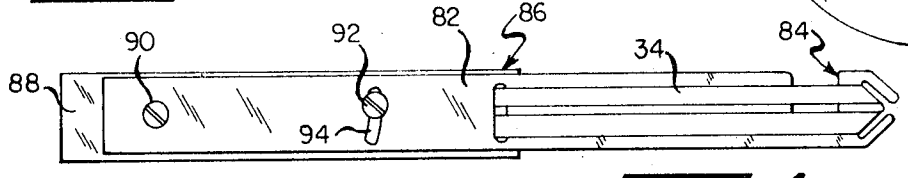


FIG. 4

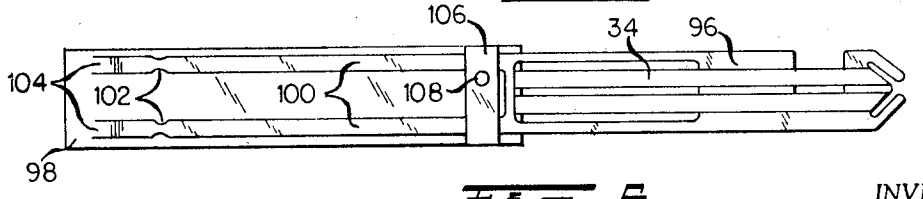


FIG. 6

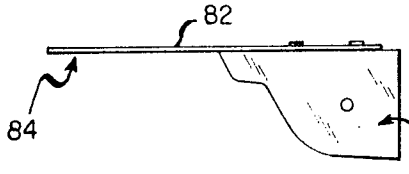


FIG. 5

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TYPEWRITER RIBBON CARTRIDGE

This is a continuation of application Ser. No. 710,185, filed Mar. 4, 1968, now abandoned.

BACKGROUND OF THE INVENTION

This invention relates to ribbon cartridges, and more particularly to a cartridge for housing the ribbon in a typewriter or like printing machine.

Most ribbon spool cartridges for typewriter or like printing machines are of the two-spool type wherein separate housings are provided for the spools but are joined in a side-by-side relationship either integrally or by a separate member. The integral joint or the separate joining member is usually provided with a weakened section for separating the spool housing so they may be placed in their respective machine supports after the ribbon is inserted in the machine vibrator.

Although the type of ribbon cartridge does provide a somewhat expedient method of typewriter ribbon installation, it is still time consuming and bothersome to the operator.

SUMMARY OF THE INVENTION

The present invention is comprised of a cartridge having two main portions, the first portion comprises a substantially enclosed housing which supports a supply of ribbon either an endless-loop type or a coaxially mounted double-spool type. The other cartridge portion comprises an arm having means for first directing the ribbon from the housing to the print point and secondly for changing the direction of the ribbon to guide the ribbon back to the housing.

Therefore, the present ribbon cartridge, by providing a single unit for housing a supply of ribbon and directing the ribbon to and from a print point, need only be positioned within a suitable support in the machine to effect a ribbon installation thereby eliminating the aforementioned time consuming and bothersome steps needed for the separable-type cartridge installation.

DESCRIPTION OF THE DRAWING

FIG. 1 is a top plan view of the present ribbon cartridge illustrating its position when in the typewriter;

FIG. 2 is a right front perspective view of the cartridge having the top exploded therefrom illustrating its use with an endless-type ribbon;

FIG. 3 is a view similar to FIG. 2 illustrating use of the cartridge with a double coaxially mounted spool for a conventional ribbon;

FIG. 4 is a rear elevational view on a reduced scale of the cartridge showing a second embodiment of the cartridge arm;

FIG. 5 is a top plan view of FIG. 4 to a reduced scale;

FIG. 6 is a view similar to FIG. 4 but showing a third embodiment of the cartridge arm;

FIG. 7 is a top plan view of FIG. 6;

FIG. 8 is a front elevational view to an enlarged scale of the free end of the arm which is common to each arm embodiment; and

FIG. 9 is a partial front elevational view taken along line 9—9 of FIG. 3 showing a double-spool construction.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. 1, the ribbon cartridge is preferably of a molded plastic construction and is mainly comprised of a housing portion **10** and an integral arm portion **12**. A ribbon cartridge support **14** is mounted on a right side frame **15**. The support **14** is the subject of U.S. Pat. application Ser. No. 710,064, filed on the same date as this application by Carl P. Anderson and assigned to the assignee of the present application. The housing **10** is inserted between an upper flange **118** shown in phantom and a lower flange. A suitable locking finger **16** engages the cartridge housing portion **10** to hold the cartridge in an installed position. A lever **17** is operable to release the locking finger **16** for removing the cartridge from the machine. A spring **19** is suitably connected to anchor **126** on the support flange **118** and post **122** in elongated slots **116** in upper support flange **118** and the lower flange (not shown) for biasing the cartridge in the cartridge removable direction to assist in removing the cartridge from the machine. The cartridge, when in the installed position, is located just in front of the platen **18** and substantially within the confines of a conventional typewriter configuration. The arm **12** extends from the housing **10** to the left to a terminal end **20** just beyond the print point **22** defined by a type guide **23**. The terminal end **20** guides the ribbon sufficiently stable to act as a ribbon vibrator. A vibrator must necessarily confine the ribbon to retain the ribbon during normal rapid, oscillating movements. Thus the cartridge guides the ribbon by way of the arm **12** to the print point **22** and eliminates the need of threading the ribbon into a vibrator and thereafter placing separate spools into the machine ribbon spool support cups as encountered with the more conventional cartridge systems.

Referring now to FIG. 2, the housing **10** is comprised of a top cover **24**, a bottom cover **26**, and a perimetric wall **28**. An endless ribbon hub **30** which is shaped as a partial cone having its smaller diameter adjacent the bottom cover **26**, is rigidly mounted to the bottom cover **26** by a screw **32** for supporting an endless ribbon **34** at its inner convolution. A roller **36** is pivotally mounted on a post **38** which in turn is rigidly mounted at its ends to the top and bottom covers **24** and **26** respectively. The roller **36** is in close proximity to an opening **39** in the perimetric wall **28**.

A semicircular finger **40** is molded to the under side of the top cover **24** for the purpose of guiding the ribbon portion **42** out from its inner convolution when it is pulled from the periphery of hub **30**. An opening **44** is provided within the rear portion of the parimetric wall **28** near the point at which the arm **12** joins the housing **10**. The arm **12** has an opening **45** slightly inward from the terminal end **20** and in vertical alignment with the print point **22** (see FIG. 1) when the cartridge is positioned in the machine. The arm **21** also has a V-shaped aperture **46** to provide a guide **47** having two substantially 45° surfaces **49***a* and **49***b* and has an opening **51** at the extreme end thereof leading into aperture **46**.

The ribbon loop, which extends from its inner convolution over the finger **40**, lies against a portion of the periphery of roller **36** and egresses from within the housing **10** through the upper portion of the perimetric wall opening **44**. Thereafter it extends along the upper rear surface of arm **12** and behind the arm opening **45**, forward and around the upper surface **49***a*, downward and rearward around the lower surface **49***b*, back to the housing **10**, along the lower portion of arm **12**, through the lower portion of opening **44** and on to the outer convolution of the ribbon supply **34**. The ribbon **34** can be incrementally advanced along this path by an appropriately driven feed roller **50** sandwiching the ribbon **34** against roller **36**.

The opening **45** in the arm **12** provides access to the ribbon **34** for a conventional typebar as it enters the type guide **23** (FIG. 1) in response to a normal machine-operated typing action.

Referring now to FIG. 3, a second housing embodiment is shown to accommodate a double ribbon spool system for supporting a conventional ribbon **58**. The housing **60** is substantially the same in construction as the housing for the endless ribbon system as it has top and bottom covers **62** and **64** respectively and a perimetric wall **66** with a ribbon egress-ingress opening **68**. The supply spool **70** and the takeup spool **72** are coaxially and pivotally mounted on a hub **74** which is rigidly mounted between the top and bottom covers **62** and **64** respectively. The lower or takeup spool **72** is provided with teeth **76** on the periphery of its lower flange for mating with a suitable drive gear (not shown) when the cartridge is inserted into the machine cartridge support.

The upper and lower spools **70** and **72** respectively are pivotal with respect to each other and ribbon **58** is guided from the housing **60** to the print point **78** near the terminal end of the arm **80** in the same manner as in the endless ribbon system cartridge embodiment.

It will be evident that the drive gear (not shown), which may incrementally rotate clockwise in response to typing actions, will effect a like counterclockwise rotation of the takeup spool **72** and the ribbon **58** will in turn be incrementally fed from right to left behind the arm opening **78** and past the print point **22** of the typewriter.

FIGS. **4** and **5** illustrate an alternate embodiment of the cartridge arm which may be employed with either the endless loop or double-spool ribbon system. The arm **82** is constructed the same at its terminal end **84** and extends from the housing **86** the same distance as the previously described arm **12**. However, the arm **82**, instead of being molded integrally to the housing **86**, extends behind the housing rear wall **88** and is pivotally mounted to this wall **88** by a shoulder screw **90**. The arm **82** is guided for oscillating movement about the screw **90** with respect to the housing wall **88** by a pin **92** which is rigidly mounted to the housing wall **88** and extends through an arcuate arm slot **94**. It will be evident that, when the cartridge is positioned within the machine, the arm **82** may be oscillated in response to typing actions by any suitable mechanism as would be common in oscillating a conventional machine ribbon vibrator.

FIGS. **6** and **7** illustrate still another arm embodiment wherein the arm **96** is integrally molded with the housing rear wall **98** by way of a pair of fingers **100**. The fingers **100** are each provided with substantially necked down portions **102** near their joining point **104**. The cartridge is molded from a material such as polypropylene for providing each finger **100** with a commonly known living hinge at the necked down portion **102**. The living hinge feature of each finger **100** provides the arm **96** with the ability of being oscillated at its terminal end by the same conventional typewriter mechanism as would be used in accordance with the pivotal arm shown in FIG. **4**. The arm **96** (FIGS. **6** and **7**) is guided for oscillation by a plate **106** which is spaced slightly away from the housing rear wall **98**, by a pin **108** which is rigidly mounted to the plate **106** and the rear housing wall **98**. The pin **108** also provides the limit for the oscillation movements.

It can be seen from the aforementioned detailed description in reference to the accompanying drawings that the present invention provides a typewriter ribbon cartridge which clearly overcomes the disadvantages of the more commonly known separable-type ribbon cartridges. More specifically, the present invention provides a ribbon cartridge which, to effect a ribbon installation within the machine, eliminates the need of having to thread the ribbon into the machine vibrator. This is accomplished by providing a cartridge with an arm for guiding the ribbon to a print point and back to the housing when the cartridge is positioned in the machine.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by Letters Patent is:

1. A ribbon cartridge adapted to be removably mounted on a typewriter, the typewriter having a ribbon cartridge support mounted on a rigid frame thereof and a print point, the ribbon cartridge comprising:

a. a housing;

b. means within the housing for supporting a ribbon;

c. an arm carried by the housing for guiding the ribbon from the housing on one side of the print point to expose the ribbon at a predetermined point adjacent the print point and thereafter guide the ribbon back to the housing on the same side of the print point when the cartridge is positioned in the support; and

d. means connecting the arm to the housing for movement relative thereto from the predetermined point to the print point for exposing the ribbon at the print point and wherein the connecting means includes a flexible relatively thin wall section integrally connecting the arm to the housing for rendering the arm moveable relative to the housing.

2. A ribbon cartridge as defined in claim **1** further comprising abutment means supported on said housing for limiting the travel of said arm when moved to said print point.

3. A ribbon cartridge adapted to be removably mounted on a typewriter, the typewriter having a ribbon cartridge support adapted to laterally receive a ribbon cartridge, the ribbon cartridge comprising:

a. a housing

b. means within the housing for supporting a ribbon;

c. arm means laterally extending from said housing enabling said cartridge to be laterally inserted into said cartridge support for guiding the ribbon from the housing on one side of the print point to the print point and thereafter guiding the ribbon back to the housing on the same side of the print point when the cartridge is positioned on the support; and

d. said arm means having means thereon for exposing a portion of said ribbon in alignment with the print point.

4. A ribbon cartridge as defined in claim **3** wherein said arm means laterally extending from said housing comprises an arm movable with said ribbon during operation of said typewriter from a first position removed from said print point to a second position wherein a portion of said ribbon is in alignment with said print point and back to said first position.

5. A ribbon cartridge as defined in claim **4** further including means connecting said arm to said housing for movement of said arm relative to the housing.

6. A ribbon cartridge as defined in claim **5** wherein said connecting means includes an element for pivotally supporting said arm.

7. A ribbon cartridge as defined in claim **4** further including means for maintaining said arm at a lateral orientation with respect to said housing during the insertion of said cartridge into said cartridge support.

8. A ribbon cartridge as defined in claim **4** wherein said means exposing a portion of said ribbon is an opening in said arm for exposing a portion of the ribbon an alignment with the print point in said second position.

9. A ribbon cartridge as defined in claim **3** wherein the ribbon supporting means includes a hub for supporting an endless coil of ribbon at the coil inner convolution.

10. A ribbon cartridge as defined in claim **3** wherein the ribbon supporting means includes a hub adapted for pivotally supporting a ribbon supply spool and a ribbon takeup spool coaxially thereon.

11. A ribbon cartridge as defined in claim **3** wherein said arm means laterally extending from said housing includes a V-shaped portion for effecting a direction reversal of the guide ribbon.

12. A ribbon cartridge as defined in claim **4** further comprising abutment means supported on said housing for limiting the movement of said arm when moved to said print point.

13. A ribbon cartridge as defined in claim **3** wherein said housing includes an upper and a lower wall and a wall extending at least partially around the periphery thereof; and said arm means laterally extending from said housing extends from the rear portion of said wall extending around the periphery of said housing.

14. A ribbon cartridge as defined in claim **13** wherein said wall extending around the periphery of said housing has an aperture therein; and means mounted within said housing and adjacent to said aperture for cooperation with a drive means mounted on said typewriter external to said housing for feeding said ribbon from said housing to said print point and for returning said ribbon to said housing.

15. A ribbon cartridge as defined in claim **14** wherein said means mounted within said housing for feeding said ribbon is a friction roller.

16. A cartridge as defined in claim 13 wherein said arm means laterally extending from said housing consists of an arm; means pivotally connecting said arm to said rear portion of said wall extending around the periphery of said housing; and means for guiding said arm for pivotal movement in the plane in which said ribbon extends from said housing to said print point and back to said housing.

17. A ribbon cartridge as defined in claim 16 wherein said means for guiding said arm comprises a pin on said rear portion of said wall extending around the periphery of said housing and an arcuate slot in said arm.

18. A ribbon cartridge as defined in claim 3 wherein said housing includes an upper and a lower wall and a wall extending at least partially around the periphery thereof: and means pivotally connecting said arm means laterally extending from said housing to the rear portion of said wall extending around the periphery of said housing.

19. A ribbon cartridge as defined in claim 18 wherein said wall extending around the periphery of said housing has an aperture therein; and means mounted within said housing and adjacent to said aperture for cooperation with a drive means external to said housing for feeding said ribbon from said housing to said print point and for returning said ribbon to said housing.

20. A ribbon cartridge as defined in claim 19 wherein said means mounted within said housing for feeding said ribbon is a friction roller.

21. A ribbon cartridge adapted to be removably mounted on a typewriter the typewriter having a ribbon cartridge support adapted to laterally receive a ribbon cartridge, the ribbon cartridge comprising:

a. a housing

b. means within the housing for supporting a ribbon;

c. arm means rigid with said housing and laterally extending therefrom enabling said cartridge to be laterally inserted into said cartridge support for guiding the ribbon from the housing on one side of the print point to the print point and thereafter guiding the ribbon back to the housing on the same side of the print point when the cartridge is positioned on the support; and

d. said arm means having means thereon for exposing a portion of said ribbon in alignment with the print point.

22. A ribbon cartridge as defined in claim 21 wherein said arm means laterally extending from said housing comprises an arm which moves with said ribbon during operation of said typewriter from a first position removed from said print point to a second position wherein a portion of said ribbon is in alignment with said print point and back to said first position.

* * * * *