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RIBBON CARTRIDGE

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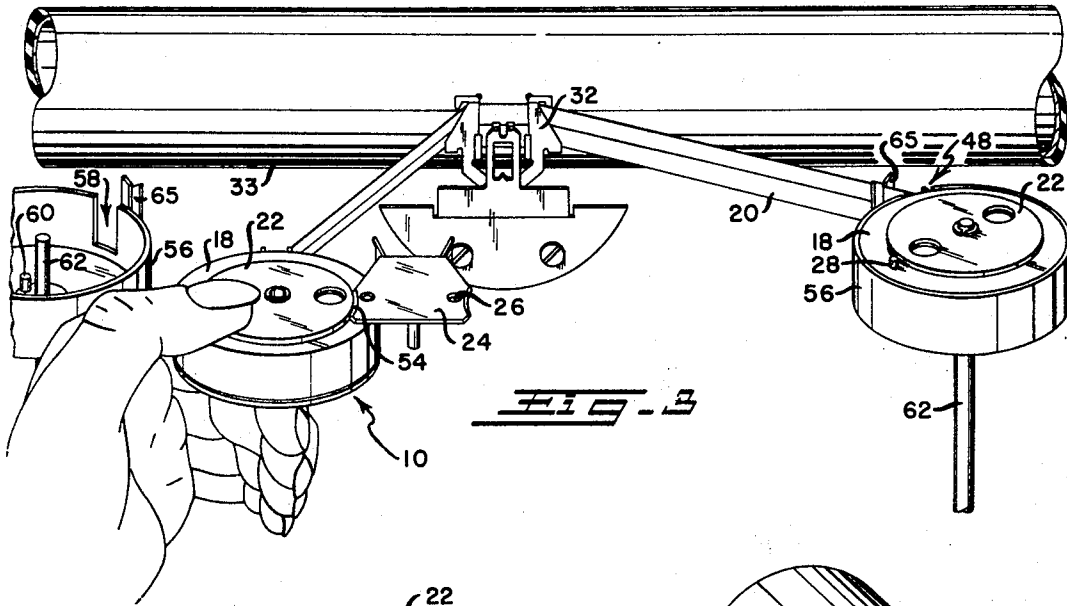


FIG. 3

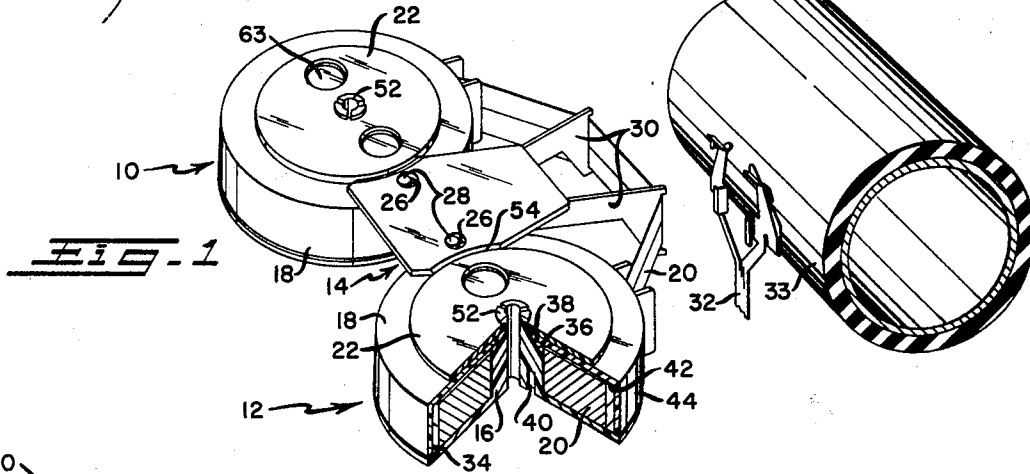


FIG. 1

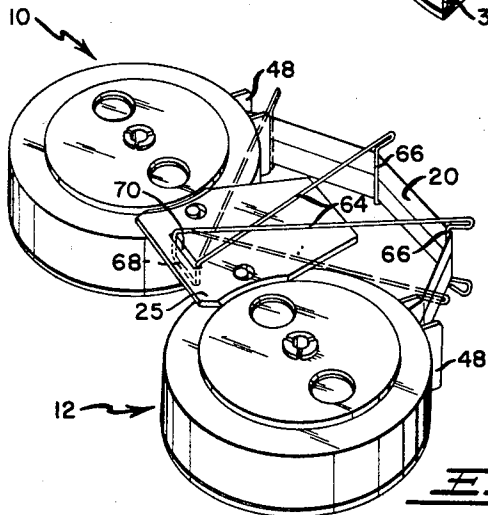


FIG. 4

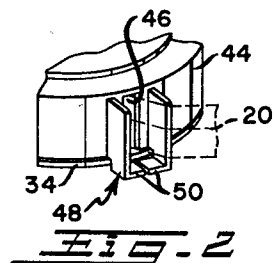


FIG. 2

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ABSTRACT OF THE DISCLOSURE

A ribbon cartridge for typewriters or like business machines having a pair of ribbon spools and a member rigidly joining the spools. Each spool has a hub for supporting a ribbon and a cup for enclosing the ribbon, the cup being rotatably supported on the hub. The joining member has a portion rigidly anchored to each hub to prevent rotation thereof and a center portion severable from each hub portion, the center portion having a pair of recesses therein to receive a projection from each cup to prevent rotation of the cups relative to the hub. The joining member has a pair of arms extending therefrom to tautly project the ribbon a distance from the spools for inserting the ribbon in a typewriter ribbon vibrator. After the ribbon has been inserted in the vibrator, the center portion is broken away from each hub portion thereby making the hub rotatable relative to the cup and the spools may be installed in the typewriter for normal use.

This invention relates to ribbon cartridges for typewriters or like printing machines and more particularly to an improved ribbon cartridge to provide a clean and convenient installation of the ribbon in the machine.

Known ribbon cartridges as shown in U.S. Patents to Landgraf 3,008,561 and Ross et al. 3,151,724, have the advantage that enables the operator to install the ribbon in the typewriter without physically touching the ribbon itself. This advantage insures the operator of a clean installation rather than the conventional inky finger method of installation. These prior ribbon cartridges also provide a compact unit which simplifies packing and shipping of the units. They do however, have a certain disadvantage that is also prevalent in most ribbon cartridges that causes inconvenience in their use. For example, most ribbon cartridges exist with the greatest amount of ribbon being on one spool and attached to the opposite spool. The disadvantage is that both the ribbon spools are rotatably retained within the cartridge and they are subject to possible rotation caused by rough handling or jarring during shipping and delivery. If the ribbon becomes slack and unwound it would necessitate a bothersome rewinding operation before it could be installed in the typewriter. Another disadvantage exists by reason of the spools being rotatably retained within the cartridge, in that it is necessary to hold the spools in such a manner that the ribbon remains taut to achieve the most efficient installation of the ribbon in the machine vibrator.

It is accordingly the object of this invention to provide a ribbon cartridge that enables quick, clean and convenient installation of the ribbon in the machine.

Another object of this invention is to provide an improved ribbon cartridge wherein the ribbon spools are not permitted to rotate until after the ribbon has been installed in the machine vibrator.

Another object of this invention is to provide a ribbon cartridge having a ribbon guiding means to assist installation of the ribbon in the machine vibrator.

Another object of this invention is to provide a ribbon cartridge having a ribbon guiding means that is disposable

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after installation of the ribbon in the machine vibrator.

A further object of this invention is to provide a ribbon cartridge having the above listed advantages as well as having a sufficiently economical construction so that the present ribbon spools may be completely discarded when installing a fresh ribbon.

Further novel features and other objects of this invention will become apparent from the following detailed description, discussion and the appended claims taken in conjunction with the accompanying drawings showing two preferred structures and embodiments in which:

FIGURE 1 is a perspective view of the ribbon cartridge oriented for installing the ribbon in the machine vibrator;

FIGURE 2 is a perspective view showing the opening of one of the ribbon spool assemblies for egress and ingress of the ribbon;

FIGURE 3 is a perspective view showing the ribbon being installed in the machine; and

FIGURE 4 is a perspective view of a second embodiment of a ribbon cartridge.

Referring to FIGURE 1, the novel ribbon cartridge includes a pair of ribbon spool assemblies 10 and 12, and a joining member 14, all of which are molded from a plastic material. The ribbon spool assemblies 10 and 12 have a hub 16 for supporting the ribbon and a cup 18 mounted on hub 16 for enclosing a ribbon 20 and for rotation with respect to hub 16. The joining member 14 has a hub attaching portion 22 rigidly assembled to each hub 16 and a severable center portion 24. Center portion 24 has a pair of openings 26 for receiving a respective projection 28 extending from the top of each cup 18 to provide a locking means to prevent the rotation of cup 18 with respect to hub 16 while installing the ribbon in the typewriter. A pair of arms 30 are integrally molded on center portion 24 and extended therefrom for tautly projecting the ribbon a pre-determined distance from the spool assemblies 10 and 12 for assisting in holding the ribbon in a convenient position while installing the ribbon in the machine vibrator 32 adjacent platen 33.

The hub 16 has a circular flange 34 at its lower end and two circular shelf portions 36 and 38 near its upper end. Hub 16 has a plurality of annularly spaced holes 40 at its underside adjacent to its axis. The cup 18 comprises a disc 42 and an annular skirt 44 extending therefrom. Referring to FIGURE 2, the skirt 44 has a slot 46 parallel with the axis of the annular skirt for egress and ingress of the ribbon 20. A ribbon guide structure 48 is rigidly assembled to skirt 44, flanking both sides of a slot 46, and has finger portions 50 extending perpendicularly from the flanking portions and toward each other to form a ribbon confining shelf below slot 46.

Referring back to FIGURE 1, to assemble the ribbon cartridge, the ends of the ribbon are rigidly assembled to each hub 16 by conventional means and the major portion of the ribbon is initially wound relatively tight on one hub such as the right hub 16 shown in FIGURE 1. Cup 18, having an axial opening, is assembled over an upper extension 52 of hub 16 and rested on shelf portion 36 in a rotatable relationship with respect to the hub. With each spool assembly 10 and 12 pre-orientated as shown in FIGURE 1, having projections 28 substantially in alignment with the centers of the spool assemblies and with the ribbon relatively taut, each hub attaching portion 22 of joining member 14 having an axial opening is assembled over upper extension 52 of hub 16 while simultaneously aligning projections 28 in opening 26 to rest on shelf portion 38. Upper extension 52 is then heat staked to rigidly assemble hub 16 to joining member 14. It is

realized that even though the ribbon is initially wound relatively taut on hub 16, the ribbon can be pulled a little more taut for spanning across the free ends of guiding arms 30.

This cartridge assembly provides a taut ribbon between the two hubs 16 by having joining member 14 rigidly assembled to hubs 16 and further provides an enclosed taut ribbon by locking cups 18 with joining member 14 thereby preventing the ribbon from becoming partially unwound during shipping and thereby providing an improved cartridge with the aid of guiding arms 30 for assisting in installing the ribbon in the machine.

To install the ribbon in the machine, reference is made to FIGURE 3. The ribbon cartridge is manipulated so the ribbon that is spanned between the two guiding arms 30 is directly above the ribbon vibrator 32. The ribbon is then placed down into the vibrator by lowering the ribbon cartridge while at the same time moving the cartridge from side to side. The right hand spool assembly 12 is then severed from the joining member center portion 24 by holding the left hand spool assembly 10 in the left hand with the left thumb on top of the joining member center portion 24 and pivoting the right hand spool assembly 12 upwards about a weakened portion 54 that is adjacent to center portion 24 of the joining member 14. The detached spool assembly 12 is then pulled towards its respective machine spindle cup 56, letting the ribbon unwind and is placed into the spindle cup so that the ribbon guide structure 48 extends through the opening 58 provided in the spindle cup 56. A ribbon feeding pin 60 carried by the spindle 62 is inserted in any one of the plurality of holes 40 in hub 16, and the ribbon is located within its reversing lever 65. The center portion 24 is then broken away from the left hand spool assembly 10 at the other weakened portion 54 and disposed of while the left hand spool assembly is placed into its respective spindle cup 56. While in their respective spindle cups, each cup 18 is held from rotating by the ribbon guide structure 48 being confined within its cooperating spindle cup opening 58, while their respective hubs 16 rotate with the ribbon feed spindles 62. It is sometimes desirable to wind the ribbon from one spool to the other generally after the ribbon has been in use in the machine. The circular openings 63 in hub attaching portions 22 are provided to permit the use of a pencil end or a like object for conveniently winding the ribbon.

Referring now to FIGURE 4, wherein there is shown another embodiment of the invention, the alternate ribbon cartridge is identical to the previously described ribbon cartridge with the exception of the pair of ribbon guiding arms that are attached to the joining member center portion 25.

The alternate embodiment provides a pair of guiding arms 64 that are formed from a single length of conventional spring wire. The guiding ends 66 of the arms 64 are channel-shaped to accept the ribbon 20 and the arms 64 cross each other while extending back to shape a rectangular form 68 that is pressed into a slot 70 in the center portion 25. The guiding arms 64 are shown in full lines as they exist in their relaxed state and are sprung back away from each other as shown in phantom lines before the ribbon cartridge is placed into its shipping box (not shown). The advantage of this ribbon cartridge is that it requires a smaller shipping box which enables more boxes to be packed within a carton as well as saving space when stocked in inventory. When the ribbon cartridge is removed from the box for installation in the machine, the guiding arms 64 snap into their relaxed state position to tauten the ribbon.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are 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 for printing machines comprising:
 - (a) a pair of hubs capable of supporting the ribbon and having the ribbon extend therebetween;
 - (b) a cup rotatably supported on each of said hubs for enclosing the ribbon wound on each of said hubs, each of said cups having an opening for ingress and egress of the ribbon;
 - (c) a joining member rigidly assembled to each of said hubs; and

(d) means for locking said cups with respect to joining member thereby preventing relative rotation between each of said cups and a respective hub.

2. A ribbon cartridge as defined in claim 1 further comprising a pair of arms extending therefrom, said arms being spaced from each other and having ribbon guiding portions at the free ends thereof tautly spanning the ribbon therebetween.

3. A ribbon cartridge as defined in claim 1 wherein said locking means comprises a projection on each of said cups extending into a respective opening in said joining member.

4. A ribbon cartridge as defined in claim 1 wherein said joining member includes a hub attaching portion for each of said hubs and a center portion, said center portion being a part of said locking means and being severable from each of said hub attaching portions for releasing said locking means thereby permitting said hubs to rotate with respect to said cups.

5. A ribbon cartridge as defined in claim 1 wherein said joining member includes a hub attaching portion for each of said hubs and a center portion, said center portion including a pair of arms extending therefrom, said arms being spaced from each other and having ribbon guiding portions at the free ends thereof tautly spanning the ribbon therebetween.

6. A ribbon cartridge as defined in claim 5 wherein said center portion is severable from said hub attaching portions for removing said pair of arms from the cartridge after the two hubs, ribbon and cups have been installed in the printing machine.

7. A ribbon cartridge as defined in claim 6 wherein said center portion includes a part of said locking means whereby said hubs are released for rotation with respect to said cups when said center portion is severed from said hub attaching portions.

8. A ribbon cartridge as defined in claim 1 further comprising a pair of resilient ribbon guiding arms normally standing in a first position in which the ribbon is guided in a path a predetermined distance from said pair of hubs, said arms being resiliently movable to a second position where the arms lie closely adjacent the hubs thereby compacting the size of said cartridge.

9. A ribbon cartridge as defined in claim 8 wherein said arms are supported on a severable portion of said joining member for removing said arms from said cartridge after the ribbon has been installed in the printing machine.

10. A ribbon cartridge as defined in claim 8 wherein said pair of resilient ribbon guiding arms is formed from a single piece of material.

11. A ribbon cartridge for a printing machine comprising:

- (a) a pair of ribbon supporting hubs;
- (b) a pair of cups, each of said cups being freely mounted on a respective one of said hubs and having a ribbon opening therein;
- (c) a bridge member rigidly mounted to each of said hubs; and
- (d) detent means comprising a portions of said bridge member and each of said cups for preventing said cups from rotating with respect to said hubs.

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