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F. J. FURMAN ET AL

2,761,539

RE-INKING RIBBON SPOOL

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FIG. 1

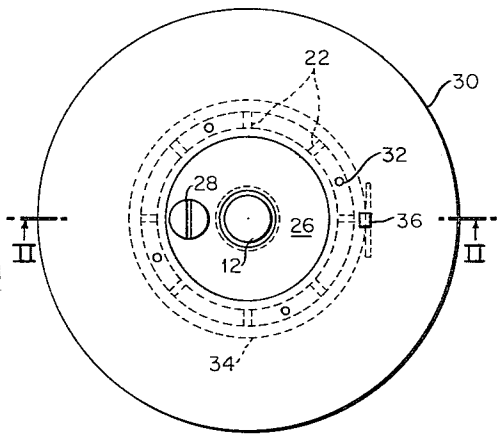


FIG. 2

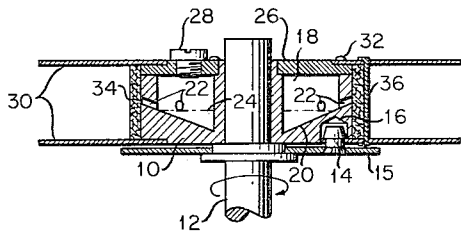


FIG. 3

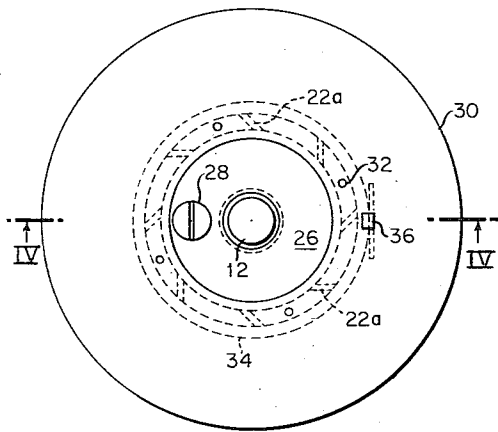
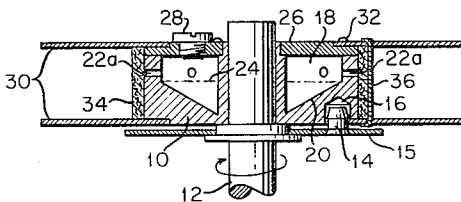


FIG. 4



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RE-INKING RIBBON SPOOL

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10 Claims. (Cl. 197—171)

This invention relates to a re-inking ribbon spool for use with typewriters, high speed printers, and the like.

As is well known, the use of an inking ribbon is usually terminated by a loss of ink or evaporation of the vehicle thereof rather than by injury to the fabric. Further, when such ribbons are used in high speed printers, it is desirable to rejuvenate them during their use in order to alleviate the need for frequent replacement.

Various devices have been proposed in the past for re-inking ribbons, but these have not proved satisfactory for a number of reasons. In some devices the ink was not transferred uniformly to the entire length of the ribbon, or there was a transfer of ink when the typewriter or printer was not operating, thus resulting in excess ink upon certain portions of the ribbon. In other devices complicated additional structure was required, e. g., involving wicks and a plurality of rollers as shown in U. S. Patent 2,588,548 issued to O. W. Markes on March 11, 1952.

Another device intended to overcome these difficulties is shown in U. S. Patent 2,549,196 issued to R. W. Harris on April 17, 1951, wherein a felt ring was disposed about the inner surface of one of the flanges of the ribbon spool and adjacent the periphery thereof, so that as the ribbon was unwound, an edge of it bore against the felt and the ink was then supposed to travel across the width of the ribbon by capillary action. However, this felt ring was impregnated manually by the use of an oil can filled with ink and thus could not, of course, supply sufficient ink for re-inking a ribbon used in a high speed printer without frequently stopping the operation and replenishing the ink manually. Further, the edge of the ribbon which bore against the felt ring would tend to accumulate more ink than that provided the remainder of the width of the ribbon by capillary action, and, further, ink deposits would tend to form at the edge of the portion of the ribbon bearing against the felt ring when the spool was at rest.

Accordingly, among the principal objects of the present invention are to provide a re-inking ribbon device which is free from the above disadvantages, which will distribute the ink automatically and uniformly to the entire length of ribbon, and in which no transfer of ink can occur from the ink reservoir to the ribbon except while the associated typewriter, high speed printer, or the like, is operating.

Other objects of the invention will be pointed out in the following description and claims and illustrated in the accompanying drawings, which disclose, by way of examples, the principle of the invention and the best mode which has been contemplated of applying that principle.

In the drawings:

Fig. 1 is a top plan view of one embodiment of a re-inking ribbon spool in accordance with this invention;

Fig. 2 is a generally cross-sectional view of the spool of Fig. 1 taken along section lines II—II;

Fig. 3 is a top plan view of a second embodiment of a

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ribbon re-inking spool in accordance with this invention; and,

Fig. 4 is a generally cross-sectional view of the spool of Fig. 3 taken along section lines IV—IV.

Referring now to the drawings, in Figs. 1 and 2 is shown a first embodiment of the invention comprising a re-inking ribbon spool. As shown, this includes a cylindrical hub 10 disposed about rotatable shaft 12 and detachably secured thereto by means of pin 14 fitting within recess 16 in the hub. Pin 14 is fastened to flange 15, which in turn is secured to shaft 12, and the spool is thus caused to rotate with the shaft. The portion of hub 10 between its inner and outer walls is removed to form a centrally-disposed ink reservoir 18, whose bottom 20 is inclined outwardly radially from the center of the spool. At least one, and preferably a plurality of channels 22 are provided in the outer wall of the hub, the number and diameter of these channels being selected with regard to the speed of rotation of the spool so as to obtain a desired amount of ink flow. These channels 22 are preferably equally disposed about the hub and extend radially thereof as well as being inclined outwardly from the center of the hub (see Fig. 2), and have their upper (and outer) ends lying slightly above the normal ink level 24 of the reservoir 18 when the spool is at rest, and not being rotated. A cover 26 overlies and is secured to the hub 10 to enclose the reservoir 18 and is provided with a suitable opening for filling the reservoir; the opening may be closed at other times as by means of machine screw 28. If desired, however, a thumb screw may be substituted for more convenient handling. Flanges 30 are provided on the top and bottom of the hub and may be secured thereto by conventional means such as rivets 32. Ink diffusing member 34 is disposed about the periphery of the hub 10 and may conveniently comprise a felt ring. At one point on the periphery of ring 34 is provided a conventional fastening means 36 for securing the end of the inking ribbon (not shown), which is then wound about the hub 10 and between flanges 30 in conventional manner, the innermost turn or coil of the ribbon being in contact with member 34 over its entire periphery.

When the shaft 12 and the spool are rotated, ink in the reservoir is forced toward the periphery of reservoir 18 and up through the channels 22 to saturate the ink diffusing member 34. The ink is then transferred by capillary action through the coils of the inking ribbon, which are maintained in re-inking relationship between the flanges 30. Note that ink is fed to ink diffusing member 34 only when required, i. e., when the spool is being rotated and the inking ribbon is actually being used in the associated device.

In Figs. 3 and 4 is shown a second embodiment of this invention, which is similar to the embodiment of Fig. 1 except that here the channels (now numbered 22a) are not inclined, but instead are disposed parallel to the top and bottom of the spool, as shown in Fig. 4, and each lie entirely just slightly above the normal ink level 24. Further, each channel 22a is disposed at an angle with respect to a radial line passing therethrough (see Fig. 3) so that more ink is forced into the ribbon in the rewind direction than in the normal or unwinding direction. The remaining elements of the spool are similar to those of the embodiment of Figs. 1 and 2 and hence are numbered similarly and need not be described in detail.

The operation of the embodiment of Figs. 3 and 4 is similar to that of the embodiment of Figs. 1 and 2, i. e., when shaft 12 and the spool fastened thereto are rotated, the ink within the reservoir 18 is forced toward the periphery thereof and out through the channels 22a to saturate the ink diffusing member 34. However, as

pointed out above, more ink is forced through the channels 22a into the member 34 and the inking ribbon in the rewind direction than in the unwinding direction. Further, two different spools (right and left) are now required, with the appropriate angular disposition of these channels in each.

While there have been shown and described and pointed out the fundamental novel features of the invention as applied to preferred embodiments, it will be understood that various omissions and substitutions and changes in the form and details of the devices illustrated and in their operation may be made by those skilled in the art without departing from the spirit of the invention. For example, the channels 22 in Fig. 1 may alternatively be angled as in Fig. 3, and the channels 22a in Fig. 4 may alternatively be inclined as in Fig. 2. It is the intention, therefore, to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. A re-inking ribbon spool comprising a rotatable cylindrical hub including a coaxial centrally-disposed ink reservoir having its bottom inclined outwardly from a point substantially adjacent the center of the spool to join the outer wall of the reservoir in a plane defining a normal level of ink in the reservoir, and at least one channel extending between the outer wall of said reservoir and the periphery of said hub and disposed such that its outer end lies slightly above the normal ink level of the reservoir when the spool is at rest.

2. A re-inking ribbon spool as in claim 1 including an ink diffusing member disposed about the periphery of said hub and engaging the outer end of said channel.

3. A re-inking ribbon spool as in claim 2, wherein said ink diffusing member comprises a felt ring.

4. A re-inking ribbon spool as in claim 1 including upper and lower flanges secured to said hub to maintain the ribbon coils therebetween in re-inking relationship.

5. A re-inking ribbon spool as in claim 1 wherein the bottom of said reservoir is inclined outwardly from its center.

6. A re-inking ribbon spool as in claim 1 wherein said channel is inclined outwardly of the spool.

7. A re-inking ribbon spool as in claim 1 wherein said channel is disposed radially.

8. A re-inking ribbon spool as in claim 1 wherein said channel is disposed at an angle with respect to a radial line passing therethrough.

9. A re-inking ribbon spool as in claim 1 including means for rotating said hub to force the ink to traverse said channel and to discharge from its outer end.

10. A re-inking ribbon spool comprising a rotatable cylindrical hub including a coaxial centrally-disposed ink reservoir having its bottom inclined outwardly from the center of the spool to join the outer wall of the reservoir in a plane defining a normal level of ink in said reservoir, a plurality of radial channels, each extending between the outer wall of said reservoir and the periphery of said hub and inclined outwardly of the spool so that its outer end lies slightly above the normal ink level of the reservoir when the spool is at rest, a felt ring disposed about the periphery of said hub and engaging the outer end of each of said channels, and upper and lower flanges secured to said hub to maintain the ribbon coils therebetween in re-inking relationship.

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