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COMBINED RIBBON SPOOL AND RE-INKER

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FIG. 1.

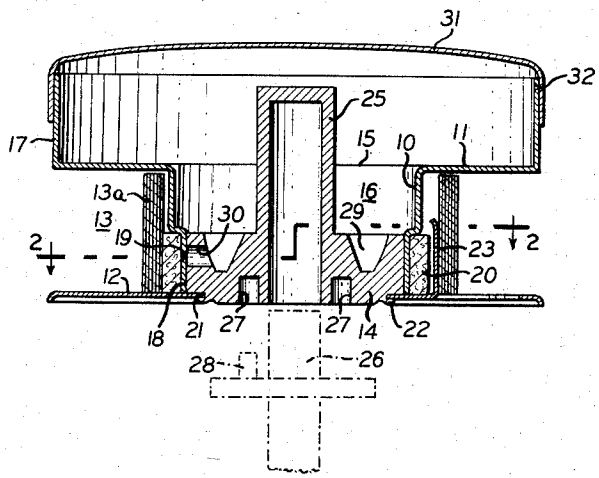
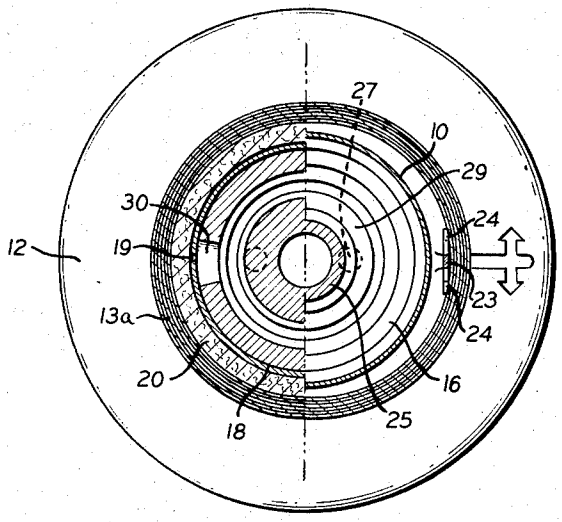


FIG. 2.



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COMBINED RIBBON SPOOL AND RE-INKER

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10 Claims. (Cl. 197—171)

The present invention relates to a combined ribbon spool and re-inker for use on typewriters, business machines, Teletypewriters, Teletype page printers and other high speed printers.

Ribbon re-inkers of many forms have been heretofore proposed, but for various reasons none have come into commercial use. Among the reasons for such lack of approval of prior proposed devices may be mentioned: (1) they have been inefficient or unreliable; (2) they required frequent refilling of ink reservoirs, with the concomitant uncleanliness to both the machine and the hands of the operator; and (3) they did not function to uniformly distribute the ink over the ribbon, with the result that the imprintings made thrugh the ribbon were not of uniform density.

Combined ribbon spools and re-inkers have also been proposed in the past but in all such devices which have come to my attention, in addition to one or more of the reasons for lack of approval thereof set forth in the preceding paragraph, none of such spools provided a unitary device in which a single charge of ink would last for the useful life of the ribbon and thus completely overcome the necessity of refilling the ink reservoir.

It is an object of the present invention to overcome the above described deficiencies and shortcomings in ribbon re-inkers.

A further object of the invention is to provide a combined ribbon spool and re-inker, the ink supply of which will be sufficient to re-ink the ribbon throughout the useful life thereof, after which the spool and re-inker may be discarded.

A still further object of the invention is to provide an expendable combined ribbon spool and re-inker which can be economically produced, assembled, filled, shipped and when stored in inverted position will have an unlimited shelf life.

The foregoing and other objects and advantages of the invention, not specifically enumerated, are achieved by providing a combined ribbon spool and ink receptacle of large capacity which extends down into the hub of the spool, the wall of said hub being formed with one or more bleed openings above the bottom of the hub, an annulus of absorbent material engaging over the bleed opening or openings for receiving and applying ink to the ribbon from the innermost convolution thereof outwardly while the machine carrying the spool is in operation and wherein the ink in the receptacle may be sealed therein against leakage therefrom onto the ribbon when the combined spool and re-inker are stored in inverted position.

The invention and the novel combination of parts embodied therein will be better understood from the detailed description which follows, when considered in connection with the accompanying drawings, wherein:

Figure 1 shows a diametrical section through a combined ribbon spool and re-inker embodying the invention.

Fig. 2 shows a section taken along the planes of the broken line 2—2 of Fig. 1.

Referring to the drawings, the combined ribbon spool and re-inker includes a hollow cylindrical hub **10** having a pair of axially spaced flanges **11** and **12** extending outwardly at the ends of the hub to provide a ribbon-receiving channel **13**, the hub **10** being provided with a closed bottom **14** and an open top **15** providing an ink reservoir **16**. Preferably, the flange **11**, which may be termed the upper flange, is formed at its outer edge with an annular wall **17** extending axially outward relatively to the ribbon channel **13** and which serves to greatly increase the volumetric capacity of the reservoir **16**.

The hub **10** is preferably formed with an external annular groove **18** extending from the flange **12**, which may be termed the lower flange, to approximately half the axial dimension of the hub, and the base of the annular groove is formed with one or more bleed openings **19** to provide for ink transfer from the reservoir **16** to an annulus of absorbent material **20** formed of felt or the like. Preferably, the annulus **20** is of a size to completely fill the external annular groove **18** and has a radial dimension larger than the depth of the annular groove so that the peripheral wall of the annulus will project slightly beyond the peripheral wall of the hub **10** and permit compression of the annulus and transfer of ink therefrom to the ribbon during operation of a machine upon which the ribbon is being used.

The upper flange **11** is preferably formed integrally with the hub **10** and the annular wall **17**, while the lower flange **12** may be conveniently formed as a separate disc which may be secured to the closed bottom **14** of the hub in any desired manner, such, for example, by engaging over a shoulder **21** on said closed bottom and being held thereon by swaging portions of the closed bottom over said flange, as shown at **22**.

Any suitable means may be provided on the spool for anchoring the end of a ribbon **13***a* thereto to facilitate winding such ribbon onto the spool and, as herein shown, said anchoring means is in the form of a tongue **23** having oppositely directed spear prongs **24**, which tongue may be struck up from the body of the lower flange **12** to lie in substantially contacting relation with the outer periphery of the annulus of absorbent material **20**.

The bottom **14** of the hub is preferably force-fitted into the lower portion of the hollow hub **10** and is formed with a hollow, axial journal **25** closed at its top and provides a bearing for a spool-supporting shaft **26** on the machine, and with circumferentially spaced sockets **27** for engaging a driving pin **28** on the supporting shaft **26**. The peripheral wall of the bottom **14** has an axial dimension substantially equal to the axial dimension of the annular groove **18** so that when force-fitted into the hub it will provide adequate support for the ribbon which is wound under tension on the hub. It is apparent, however, that the axial dimension of the bottom **14** need not be greater than an axial distance above the flange **12** sufficient not to obturate the bleed opening **19**. However, where in the construction as illustrated, the axial dimension of the peripheral wall is greater than the axial distance of the bleed opening **19** above the flange **12**, it is apparent that means must be provided for permitting the ink from the reservoir **16** reaching the bleed opening. Accordingly, the upper face of the bottom **14** is formed with an annular groove **29** extending downwardly below the bleed opening **19** and a circumferential slot **30** is formed in the peripheral wall to establish ink communication between said annular groove **29** and the bleed opening **19**.

Assembly.—The combined ribbon spool and re-inker may be conveniently assembled by first securing the lower flange **12** on the hub bottom **14**. The annulus of absorbent material **20** is then positioned over the bottom of the annular groove **18** and the hub bottom is then force-fitted into the hub so that the circumferential slot **30** will

be in registry with the bleed opening **19**. As the bleed opening is exceedingly small and may not be readily seen in positioning the parts for assembly, an index mark may be provided on the outer periphery of the upper portion of the hub **10** substantially diametrically opposite the bleed opening, which index will serve as a locating point whereat the tongue **23** is to be positioned over the hub. The reservoir **16** may then be filled with ink and a closure cap **31** mounted over the annular wall **17**. Where the ribbon spool and re-inker charged with ink is to be made and sold as a complete unit, leakage or absorption of ink from the reservoir by the annulus of absorbent material **20** may be prevented and the storage life of the unit prolonged indefinitely by forming in the side wall of the closure cap **31** a vent hole **32** for permitting escape of air during the force-fitting the cap onto said annular wall **17**. When the vent hole overlies said wall and is obturated thereby, inverting the filled unit will bring the top surface of the ink in the reservoir below the bleed opening **19**, yet prevent leakage of ink.

Operation.—Where a single ribbon spool and re-inker is mounted on a machine, ink will be applied to the innermost convolution of the ribbon through the bleed opening **19** as the machine is operated and the ink, in turn, will be distributed through adjacent portions of the ribbon by capillary action and to successive overlying convolutions of the ribbon by surface contact. Where a single unit is employed it is preferable to have two bleed openings diametrically spaced apart to insure adequate supply of ink to the ribbon. It is preferable, however, to use similar ribbon spools and re-inkers at the opposite sides of the machine so that, when the ribbon is being paid off by one spool and wound up on the other spool, one spool will be inking the innermost portion of the ribbon which is being wound thereon, while the other spool will be inking the innermost convolution of the ribbon being paid off. In this manner ink will be supplied to each end of the ribbon and transferred therefrom to overlying convolutions of the ribbon so that adequate inking of the entire length of the ribbon will be assured.

It will be noted that ink is supplied to the lower section only of the ribbon, which, in turn, is communicated to the upper portion thereof by capillary action, and in this manner it has been found that there is never an excess of ink at the portion of the ribbon at which imprinting takes place and the imprints, therefore, are of substantially uniform density. Where two similar spools are employed, it has been found that a single bleed opening having a diameter of about .015 of an inch is sufficient to adequately supply the re-inking requirements of the ribbon.

It has also been found that with devices of the character described and using a nylon ribbon of approximately 12 yards in length, that a Teletype page printer may be continuously operated for approximately three months at the end of which period the ribbon will have become so worn as to have served its useful life and also the ink supply from the reservoir will then be substantially used up, so that the spools and the ribbon may be discarded. It will thus be realized that a considerable saving in time and trouble, as well as producing imprinting of substantially uniform density, is thus achieved.

Although there has been shown and described a preferred embodiment of the combined ribbon spool and re-inker, it is to be understood that changes in details of construction and arrangement of parts and sizes thereof may be resorted to without departing from the spirit of the invention as hereinafter claimed.

What I claim is:

1. A device of the character described, comprising a ribbon spool including a hollow hub and a pair of axially spaced flanges extending outwardly from the hub providing a ribbon receiving channel, the hub being closed at its bottom and open at its top and having a bleed opening through its side wall, an annulus of absorbent material engaging over the bleed opening in contact with the periphery of the hub and an annular wall extending upwardly beyond the upper flange and providing with the hollow hub an ink reservoir.

2. A device according to claim 1, wherein the annular wall which extends upwardly beyond the upper flange has a diameter greater than that of the hub.

3. A device according to claim 1, wherein the annular wall which extends upwardly beyond the upper flange is at substantially the periphery of said upper flange.

4. A device according to claim 1, wherein the wall of the hub, the upper flange and the annular wall are formed of a single piece of material.

5. A device according to claim 1, wherein a closure member covers the open end of the reservoir.

6. A device of the character described, comprising a ribbon spool including a hollow cylindrical hub and upper and lower axially spaced flanges extending outwardly from the hub providing a ribbon receiving channel, the hub having a closed bottom to provide an ink reservoir, the peripheral wall of the hub being formed with an external annular groove extending from the lower flange to approximately half the axial dimension of the ribbon channel and having a bleed opening through the base of the annular groove, an annulus of absorbent material seated in said groove, said annulus being of somewhat larger radial dimension than the depth of the annular groove, and means within said channel overlying the periphery of the hub for anchoring the end of a ribbon to permit said ribbon to be wound on the spool in contact with the periphery of the annulus of absorbent material.

7. A device according to claim 6, wherein the closed bottom of the hub is forced-fitted into the peripheral wall of the hub.

8. A device according to claim 6, wherein the means for anchoring the ribbon is a tongue struck up from the lower flange and bent up over the periphery of the annulus of absorbent material.

9. A device according to claim 8, wherein the tongue is located substantially diametrically opposite the bleed opening.

10. A device of the character described, comprising a hollow closed bottom ink receptable having upper and lower axially spaced flanges extending outwardly from the receptacle providing a ribbon guide channel, the peripheral wall of the receptacle being formed with an external annular groove extending from the lower flange to approximately half the axial dimension of the ribbon guide channel and having a bleed opening through the base of the annular groove and an annulus of absorbent material seated in said groove, said annulus being of somewhat larger radial dimension than the depth of the annular groove but of less radial dimension than the flanges.

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