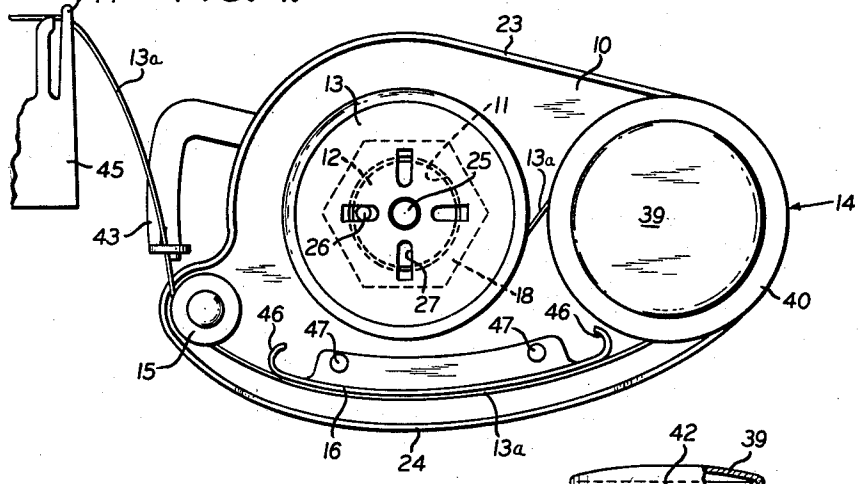
Sept. 29, 1959 J. W. H. BISHOP 2,906,389

RIBBON RE-INKER

Filed Feb. 14, 1957

FIG. 1.



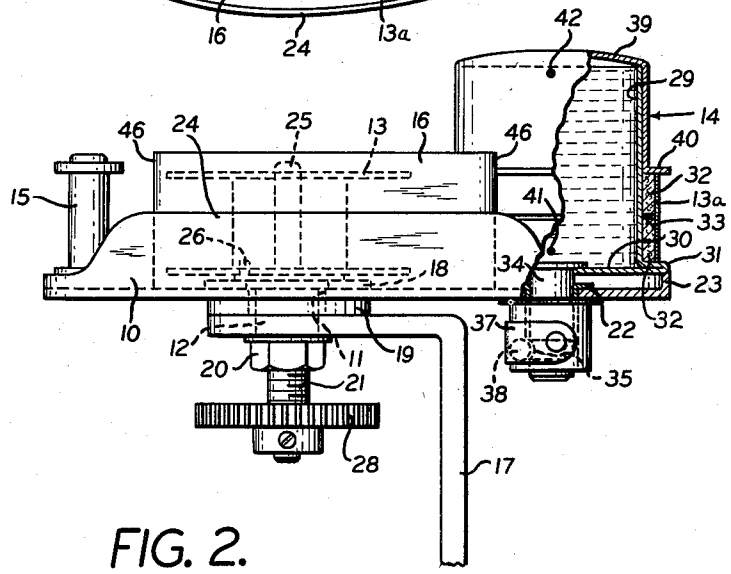


FIG. 2.

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RIBBON RE-INKER

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6 Claims. (Cl. 197—171)

The present invention relates to re-inker means for ribbons used on typewriters, business machines, Teletype writers, Teletype page printers and the like.

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 imprintings made through the ribbon were not of uniform density.

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

A further object of the invention is to provide a re-inker device having an ink supply which will be sufficient to re-ink a ribbon for a month or more of continuous use on a Teletype page printer or analogous machine.

A still further object of the invention is to provide a re-inker device which, when its ink supply has been expended, can be discharged and replaced by a fresh device or refill.

A still further object of the invention is to provide an expendable re-inker which can be economically produced, assembled, filled, shipped, and when stored in inverted position will have a long shelf life without loss of its efficiency.

A still further object of the invention is to provide a re-inker device and means for attaching said device to existing typewriting machines of the character described whereby the ink reservoir will have a capacity sufficient for re-inking the ribbon during the useful life thereof and which device may be confined within the limited space on such machines adjacent the ribbon spool spindle without modifying the machine structure.

The foregoing and other objects and advantages of the invention, not specifically enumerated, are achieved by providing a re-inker unit comprising a cylindrical receptacle having one or more bleed openings through its wall above the bottom thereof, means for rotatably mounting the receptacle on its axis, and an absorbent transfer roll engaging over the bleed opening or openings and in contact with the outer surface of the wall of the receptacle. Preferably, the receptacle is of large capacity, non-refillable, and in which an ink supply is sealed in against leakage therefrom when the receptacle is stored in inverted position, and which receptacle is disposable when the ink therein is used up. The invention also contemplates an attachment for mounting a re-inker as above specified, on a typewriting machine, such attachment comprising a supporting plate having an ink distributor over which an inked ribbon is caused to pass for distributing the ink taken up by such ribbon as it is wound on or payed off from a ribbon spool while the machine is in use.

The invention, which comprises the re-inker roller per se and the component elements of the attachment, will be better understood from the detailed description which follows, when considered in connection with the accompanying drawings, wherein:

Figure 1 is a top plan view of a re-inker device and attachment embodying the present invention mounted on a typewriting machine.

Fig. 2 is a front elevation of the device shown in Fig. 1, with parts broken away to better illustrate detailed constructional features of the invention and with parts of the machine shown in Fig. 1 omitted.

Referring to the drawings, the re-inker device may be said to consist of a supporting plate **10** having an opening **11** for engagement over a driving spindle **12** for a ribbon spool **13**; a re-inker unit **14**; an idler roller **15** and an ink distributor **16**.

The supporting plate **10** is adapted to be clamped to a part of a typewriter machine frame **17** by said plate being positioned between a flanged bushing **18** extending through the opening **11** and a washer **19** and clamped by a nut **20** engaging over a threaded portion **21** of the ribbon spool spindle **12** and the machine frame, as best shown in Fig. 2. The supporting plate **10** is also formed with a bearing **22** for rotatably supporting the re-inker unit **14** and with a peripheral, upstanding flange **23** which is of substantially uniform height except for a portion **24** of greater height which extends between the re-inker unit **14** and the idler roller **15** in substantially parallel, spaced relation to the ink distributor **16**.

The driving spindle **12** is formed with a reduced axial projection **25** which acts as a shaft for the ribbon spool **13** and with an eccentric pin **26** adapted to engage in any one of the radial openings **27** in the end flanges of the ribbon spool for driving the spool. A pinion **28** is mounted on the driving spindle **12** for driving the latter through cooperation with other means (not shown).

The ribbon spool **13** according to the present invention is made of considerably smaller diameter than the standard ribbon spool so as to permit the re-inker unit **14** to be made of larger diameter and thus provide a receptacle having an ink capacity sufficiently large to re-ink the ribbon **13***a* throughout its useful life. By using a ribbon formed of nylon or the like which is substantially thinner, stronger and has a longer life than a conventional ribbon, the length of the ribbon may be reduced to from four to six yards, as compared with a conventional ribbon which is twelve yards in length.

The re-inker unit **14**, according to the present invention, consists of a cylindrical shell **29**, the base **30** of which is formed with an external flange **31** to provide a support for a pair of felt rings **32** which are axially separated by a spacing ring **33** such as disclosed in the Roggenburger Patent No. 2,760,464. Axially mounted in the base **30** of the receptacle **29** is a spindle **34** formed near its free end with an annular groove **35**, said spindle being rotatably mounted in the bearing **22** mounted in the supporting plate **10**. To hold the re-inker unit in removable, rotatable engagement with the supporting plate, there is mounted on the bearing **32** an arcuate leaf-spring **37** which holds a ball **38** within the annular groove **35**. To provide maximum capacity for the receptacle **29**, it is made of substantially greater axial dimension than the combined axial dimensions of the felt rings **32**, and to provide a guide for the inked ribbon **13***a* a closure cap **39** having a flange **40** is mounted on the receptacle. Preferably, the closure cap is force-fitted over the wall of the receptacle so as to be non-removable therefrom so that when the ink supply within the receptacle has been used up or expended, the re-inker unit may be removed and discarded and replaced by a new unit or refill. As in the case of the Roggenburger patent above referred to, the receptacle **29** above its bottom is formed

with at least one or two diametrically spaced bleed openings 41 through which ink from the receptacle may bleed onto the lower felt ring 32 and, in turn, transfer ink to the ribbon as it is wound on or payed from the spool 13 when the machine is in use. To insure that the unit will have a long shelf life when not in use and will not bleed ink to the felt ring when stored in an inverted position, the ink is preferably sealed within the receptacle by the closure cap 39 which is formed with a vent opening 42 near the closed end of the cap so that as the cap is force-fitted over the receptacle 29 substantially filled with ink, air will escape through the vent opening 42 until said opening passes over the outer wall of the receptacle and is obturated thereby. The volume of the air space above the ink in the filled and sealed receptacle is preferably somewhat greater than the volume of the receptacle below the bleed opening 41, so that when the re-inker unit 14 is stored in inverted position, the level of the ink will not be above the bleed opening and hence will not bleed onto the felt ring and saturate it.

The idler roller 15 may be of any desired construction and serves, in conjunction with the spool, to guide and constrain the ribbon 13*a* to engage around the re-inker and the ink distributor in the course of its movement through a guide in a reversing lever 43 and a ribbon guide 44 carried by a stationary clip 45 which serves as a guide for the type bars of the machine.

The ink distributor 16 is preferably in the form of an arcuate plate having arcuate ends 46, the said plate being preferably concentric with the spindle 12 and riveted to the supporting plate, as shown at 47. The height of the ink distributor plate 16 is preferably slightly greater than the width of the ribbon 13*a*, which is adapted to pass over said plate.

The re-inker device may be attached to any typewriting machine and, where used with a Teletype page printer or the like which is subject to continuous use, it will be appreciated that by having the ink capacity of the re-inker unit 14 as large as possible, the ink supply therein may last throughout the useful life of the ribbon and may be discarded, together with the ribbon, when the latter has outlived its usefulness. Accordingly, the supporting plate 10, in order to accomplish this, must be of a size as large as practicable consistent with the available clearance for its mounting without interfering with the operation of the machine. If desired, a re-inking device of the type described may be mounted on each side of the machine.

Operation.—Where a single re-inking device is mounted on a machine, the ribbon 13*a* will be guided, as shown in Fig. 1, first past the guide on the reversing lever, then past the roller 15 and over the ink distributor 16, thence around the re-inker unit 14 and thence onto the spool 13. Ink will be applied to the lower felt ring 32 through the bleed opening 41 as the ribbon passes thereover and it is preferable, where a single unit is employed, to have two bleed openings diametrically spaced apart so that ink will be supplied to the felt ring 32 continuously throughout its movement in view of the ribbon encompassing the felt rings of the re-inker unit to an arcuate distance of more than 180°. When the ribbon is being payed off from the spool 13, the ribbon will again be re-inked as it passes over the unit 14. It will be noted that ink is supplied to the lower section only of the ribbon, and as the ribbon passes over the ink distributor 16 the latter serves to longitudinally and more uniformly spread the ink over the ribbon so that the capillary action thereof toward the upper section of the ribbon, which is engaged by the type bars, will be more uniformly transferred to the upper portion of the ribbon. In this manner it has been found that there is never an excess of ink at the type striking portion of the ribbon at which imprinting takes place and the imprints are therefore of substantially uniform density. In view of the fact that a predetermined length of ribbon at each end thereof does not pass over the re-inker unit because of the eyelet ribbon reversing means thereon, it will be apparent that where a single re-unit inker device is employed, said end portion of the ribbon remote from the re-inker may not be properly re-inked during operation of the machine. However, if two re-inker devices are employed, this defect is remedied because said respective end portions of the ribbon will be re-inked as the ribbon is being wound onto the spools. Where two devices are employed, it has been found that a single bleed opening in the re-inker is sufficient to adequately supply the requisite ink supply for re-inking purposes.

It has been found that with a re-inking device of the type described, and using a nylon ribbon, that a Teletype page printer may be continuously operated for more than a month without changing the ribbon or re-charging or replacing the re-inker unit. A tremendous saving in time and trouble, as well as producing imprinting of substantially uniform density, is thus achieved.

Theoretically, it would appear, in view of the fact that the re-inker unit has no vent opening to admit air to replace the ink supplied to the ribbon, that the device would be inoperative. I have found, however, that ink is withdrawn from the ink reservoir by the felt ring through the bleed opening 41 during operation of the machine due probably to the capillarity of the fibers of the felt ring, the repeated subjection to compression and tension of the felt ring by the ribbon passing thereover, and the vibration of the re-inker unit in use. In fact, in view of the vibration and the centrifugal force created by the rotation of the re-inker, all of the ink in the receptacle may be expended notwithstanding that the bleed opening 41 is spaced above the bottom of the receptacle 29.

Although there has been shown and described a preferred embodiment of the re-inker device, 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 ribbon re-inker comprising a closed receptacle having a bleed opening through its wall above the bottom thereof, means for mounting the receptacle for rotation on its axis, an annulus of absorbent material engaging over the bleed opening and in contact with the outer surface of the wall of the receptacle and a liquid ink supply sealed in said receptacle against leakage therefrom when the receptacle is inverted by a closure cap at one end of the receptacle, said closure cap having a vent opening therein which permits the escape of air from the receptacle as the cap is applied thereto and which vent opening is obturated and sealed when the cap is mounted on the receptacle.

2. A ribbon re-inker according to claim 1, wherein the receptacle is cylindrical, the closure is a non-removable cap having a cylindrical wall with said vent opening therein near its closed end, and said cap is force-fitted onto the receptacle to a position where said vent opening is obturated by the wall of the receptacle.

3. A ribbon re-inking attachment comprising a supporting plate having mounted thereon a rotatable linking roller, means for rotatably supporting a ribbon spool on said plate, a non-absorbent ink distributor over which a ribbon is adapted to pass and means for constraining a ribbon to move in contact with both the inking roller and the ink distributor as a ribbon is wound on or payed off a ribbon spool.

4. A ribbon re-inking attachment according to claim 3 wherein the ink distributor is an arcuate member disposed in substantially concentric relation to the means for supporting a ribbon spool, the ribbon of which is to be re-inked.

5. A ribbon re-inking attachment according to claim 4 wherein the inking roller is mounted in proximity to

one end of the arcuate member and an idler roller over which a ribbon is adapted to pass is mounted in proximity to the other end of the arcuate member.

6. The combination, with a teletypewriter page printer machine, of a ribbon reinking attachment which comprises a supporting plate having an opening engaging over the driving spindle for a ribbon spool, the ribbon of which is to be re-inked, a ribbon spool of substantially smaller diameter than and having a ribbon length substantially less than a spool conventionally used on such machine mounted on the driving spindle, a rotatable inking roller comprising an ink receptacle and an annulus of absorbent material engaging over said receptacle adapted to receive ink therefrom through a bleed opening therein and over which annulus the ribbon is constrained to move as the machine is operated, a non-absorbent ink distributor over which the ribbon is adapted to pass, and means for constraining the ribbon to move in contact with both the inking roller and the

ink distributor as the ribbon is wound on or payed off the ribbon spool the size of the supporting plate being as large as practicable consistent with the available clearance for its mounting without interfering with the operation of the machine, the receptacle having an ink capacity sufficient to re-ink the ribbon throughout its useful life and a diameter as large as practicable for cooperation with the ribbon spool, yet being confined within the boundary of the supporting plate.

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