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RIBBON TAKE-UP DEVICE FOR COMPOSITION MACHINES

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FIG. 1

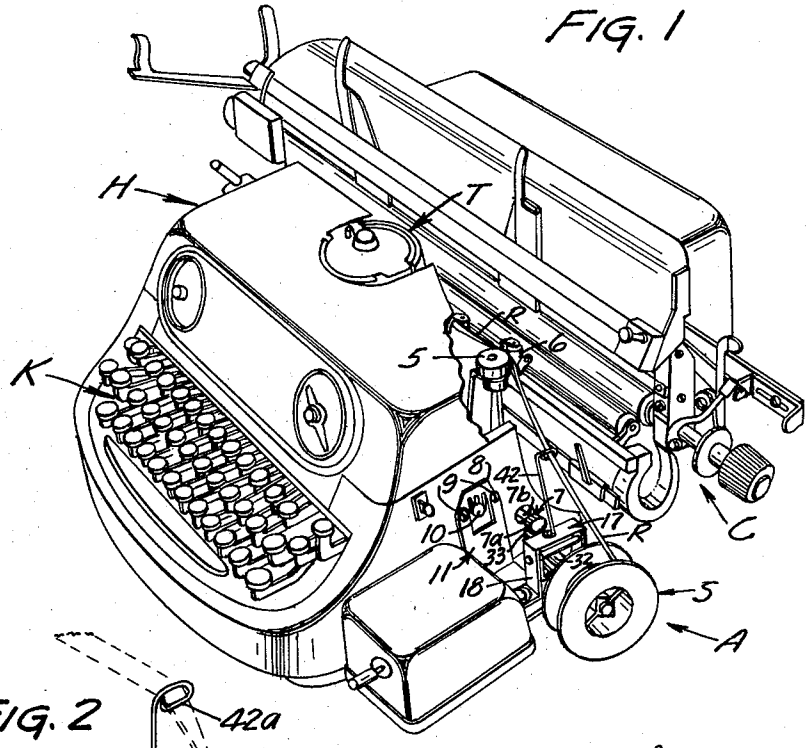


FIG. 2

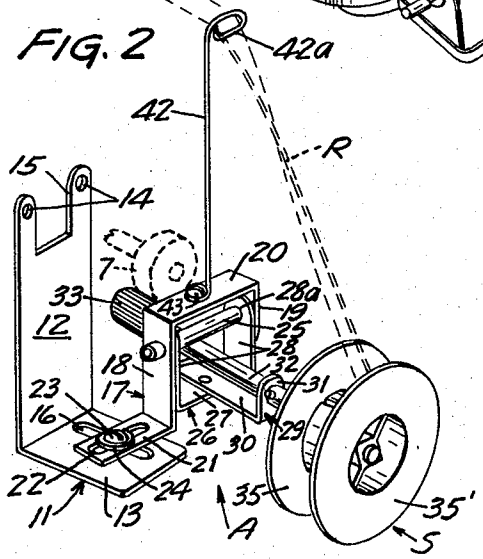


FIG. 3

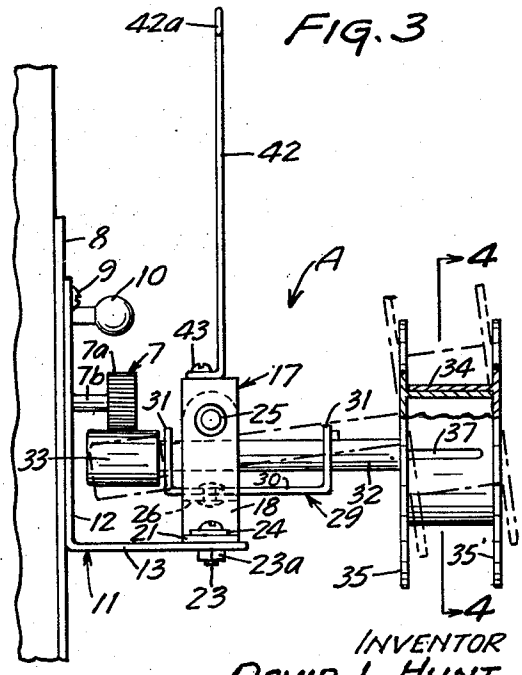
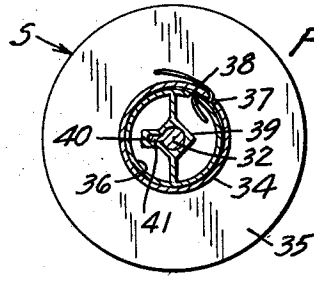


FIG. 4



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RIBBON TAKE-UP DEVICE FOR COMPOSITION MACHINES

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This invention relates in general to a ribbon take-up device and more particularly to a ribbon take-up device for type-composition machines.

There are certain composition machines now on the market which have no means for disposing of the used inked or carbon ribbon, which used ribbon leaves the machine in an unattended fashion to pile up about the machine or the area immediately adjacent thereto, and creates a cluttered unsightly appearance. In addition, this ribbon creates a nuisance, gets in the way and often times interferes with the operation of the machine by getting caught in and wrapping around various operational parts of the machine. This problem is typified by and particularly acute in a machine now on the market known as the "DSJ Vari-Typer Office Type-Composition Machine" distributed by the Vari-Typer Corporation. This machine has no means for disposing of the used ribbon and recently the problem of disposing of the used ribbon has become even more important than in the past because of the adoption of a new type of plastic ribbon which has a claying or clinging quality thereto which causes it to cling to various parts of the machine as it is discharged therefrom, the used ribbon materially interfering with the operation of the machine and causing the operator to have to frequently stop operation of the machine in order to dispose of the ribbon. Furthermore, the picking up and handling of the used ribbon causes soiling of the hands and resultant additional delay in operation of the machine due to the time required to clean the operator's hands.

Therefore, an object of this invention is to solve the foregoing problems by providing a novel ribbon take-up device which serves as an attachment for these machines, which device neatly collects the used ribbon as it leaves the machine, said attachment being capable of being readily mounted on the machine without any change in the design or construction of the machine and which can be readily mounted on machines already in use without any modification thereof.

Another object is to provide a ribbon take-up device of the type aforedescribed which is simple in design and operation and inexpensive in construction.

Still another object is to provide a ribbon take-up attachment of the type hereinbefore described having a spool for winding up the used ribbon thereon and means for turning said spool simultaneously and in synchronization with the operation of the machine and the travel of the ribbon through the machine by means of a rotary member forming a part of said machine, and which is designed to automatically adjust or vary the rate of winding of the used ribbon on the spool to prevent over-running of the machine's ribbon feed mechanism by the spool.

These and other objects and advantages of this invention will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to the same or similar parts throughout the several views, and in which:

FIG. 1 is a perspective view of a DSJ Vari-Typer office type-composition machine having one preferred embodiment of the ribbon take-up attachment of this invention mounted thereon;

FIG. 2 is a perspective view on an enlarged scale of the take-up attachment shown in FIG. 1;

FIG. 3 is a side elevational view of the attachment; and

FIG. 4 is a cross-sectional view through the spool taken on the line 4—4 of FIG. 3.

Reference is now made to the accompanying drawings for a more detailed description of this invention.

The Vari-Typer composition machine illustrated in FIG. 1 is of the same general type of construction as most conventional composition machines and includes a stationary housing H, a keyboard K and a movable carriage C mounted on said housing which carries the sheets to be typed, the details of construction of said machine being omitted except for those necessary to the understanding of the invention.

The machine also includes a pair of rotary feeder wheels 5 and 6 located on the extreme right side of said housing. A carbon ribbon R passes between and is engaged by the feeder wheels which pull the ribbon through the machine from left to right past the type anvil T and between the type and the paper and discharge same from the right side thereof, the feeder wheels being operated simultaneously and in conjunction with the operation of the keyboard keys by mechanism (not shown) located within the housing.

The machine also includes a circular rotary ribbon control knob 7 disposed outside the housing and below the feeder wheels which is operatively connected to said feeder wheels by mechanism (not shown) located within the housing for actuating or turning said feeder wheels by manually turning of said knob whenever the operator wishes to feed a small amount of ribbon through the machine. During normal operation of the machine, the feeder wheels are actuated as aforementioned by the striking of the keys of the keyboard, the ribbon control knob 7 rotating simultaneously with the feeder wheels during normal operation. The knob 7 has a knurled periphery 7*a* and a shaft 7*b* which extends laterally and horizontally from the right side of the machine housing, said knob 7 serving as the drive means for turning the ribbon spool in a manner hereinafter described.

The right side of the machine carries a slotted plate 8 which is mounted on the housing H by means of screw fasteners 9, the plate serving to control the setting or positioning of a horizontal spacing lever 10 which is shiftable between the slots of said plate.

The ribbon take-up attachment of this invention is mounted on the right side of the machine and is indicated in its entirety by the letter A and comprises a rotatable and tiltable spool unit and supporting structure for mounting said unit on the machine. The supporting structure of attachment A includes an angled mounting bracket 11 having a vertical leg 12 and a horizontal leg 13. The vertical leg 12 has a pair of laterally spaced apart fastening openings 14 formed in the upper end portion thereof, said openings having the same spacing therebetween as the openings in the plate 8 which receive the fasteners 9, said openings being adapted to receive the screw fasteners 9 which hold the slotted plate 8 whereby said screw fasteners can be utilized to simultaneously mount the attachment of this invention and the plate 8 on the side of the machine.

The upper end portion of the vertical leg 12 is cut out as at 15 between the openings 14 so as to leave the essential portions of the slotted plate 8 and the spacing lever 10 exposed for normal operation thereof.

The horizontal leg 13 is provided with an elongate slot 16 for laterally adjusting the spool unit of the attachment with respect to the side of the housing in a manner hereinafter described.

An adjustable bracket 17 for supporting the spool unit on the mounting bracket 11 is provided, which bracket includes vertical laterally spaced apart opposed parallel

portions 18 and 19, an upper horizontal portion 20 interconnecting said vertical portions and from which they depend, and a lower horizontal portion or foot 21 for mounting the bracket 17 on the bracket 11.

The foot portion 21 is provided with an elongate slot 22 for adjusting the spool unit of the attachment forwardly and rearwardly with respect to the machine. The foot portion 21 is secured to the horizontal leg 13 by means of a bolt 23, nut 23*a* and washer 24, the bolt extending through the slots 16 and 22. The bolt 23 provides a pivotal connection between the bracket 17 and the bracket 11 whereby the bracket 17 can be pivoted about a vertical axis for angularly adjusting the spool unit relative to the machine. Thus, by loosening the nut 23*a*, the bolt can slide in the slots 16 and 22 for laterally and forwardly and rearwardly adjusting the attachment, and the bracket 17 can pivot relative to the bracket 11 for angularly adjusting the attachment relative to the machine.

A shaft 25 extends between and is supported by the vertical portions 18 and 19 of bracket 17 for pivotally or swingably suspending the spool unit therefrom.

The spool unit includes a U-bracket 26 consisting of a horizontal base portion 27 and a pair of laterally spaced apart opposed upstanding portions or arms 28 which are pivotally mounted on and suspended from said shaft 25 for free swinging movement relative thereto, the shaft 25 extending between and passing through suitable openings 28*a* provided in said arms.

A second U-bracket 29 having a base 30 and upstanding opposed laterally spaced apart spindle supporting arms 31 is transversely mounted on the bracket 26 by securing base portion 30 to base portion 27. The upstanding arms 31 have concentrically aligned openings formed therein in which is rotatably journalled a spool supporting generally horizontally disposed shaft or spindle 32.

The inner end of the spindle 32 is provided with a peripherally knurled or slotted circular knob 33 for turning said spindle. The knob 33 underlies and freely rests against and releasably engages the ribbon control knob 7, whereby the peripheries of the knobs 7 and 33 are drivingly engaged and whereby the knob 33 and spindle 32 are driven and rotated by said control knob 7.

A ribbon take-up spool S is removably mounted on the outer end of said spindle 32 and rotated thereby. The spool shown is of the separable or break-apart type and includes an outer cylinder or drum 34 on which the ribbon is wound and spaced apart inner and outer flanges 35 and 35′ respectively for confining the ribbon in said drum. The outer flange 35′ is integrally formed with and carries the drum 34. The inner flange 35 is provided with and carries an inner cylinder 36 which is slightly smaller in diameter than the drum 34 and adapted to be telescopically and loosely and separably press fitted within the drum 34 during use. The drum 34 and cylinder 36 are slotted as at 37 and 38 respectively for receiving and anchoring the leading end of the used ribbon to the spool, the cylinders 34 and 36 being capable of being turned relative to one another when telescopically engaged for anchoring the ribbon to the spool in a manner described hereinafter. The spool also includes a center sleeve 39 mounted within and secured to the cylinder 36 for slidably receiving the outer end portion of the spindle 32 and a slot or keyway 40 communicating with the interior of the sleeve for receiving a key 41 carried by the outer end portion of the spindle 32 for holding and positioning the spool on the spindle for simultaneous rotation therewith, the outer end of the slot 40 being closed to limit the inward axial movement of the spool relative to the spindle. To anchor the ribbon to the spool the slots 37 and 38 are aligned and the leading end of the ribbon is inserted therethrough into the interior of the cylinder. The cylinders are then turned relative to one another, moving the slots out of alignment and locking the ribbon between the cylinders. The spool is mounted on the spindle by inserting the outer end of the spindle into the sleeve 39 and the key 41 into the slot 40 and sliding the spool inwardly on the spindle.

The spool unit is suspended in free swinging unbalanced relationship from the shaft 25, the outer end portion of the unit disposed outwardly or to the right of the shaft 25 being heavier than the inner end portion of the unit disposed inwardly or to the left of the shaft 25. Because of this unbalanced suspension, the spool unit is constantly biased in a clockwise direction (as viewed in FIG. 3) about the shaft 25, the outer end being constantly urged or biased downwardly and the inner end being constantly biased upwardly to hold the knob 33 in engagement with the knob 7.

The pivotal suspension of the spindle 32 from the shaft 25 is important not only because it enables the weight of the outer portion of the attachment suspended therefrom to hold the knob 33 in driven engagement with the knob 7, but also because it enables the spool unit to tilt or swing in the opposite direction (counterclockwise as viewed in FIG. 3) from that in which it is normally biased about the axis provided by the shaft 25 during use to permit automatic adjustment of the rate or speed of winding of the ribbon on the spool to the rate or speed at which the ribbon is being pulled through the machine by the feeder wheels, in order to prevent the spool over-running the feeder wheels. The rate at which the ribbon is wound on the spool will normally exceed the rate of travel of the ribbon through the machine and will progressively increase as the number of convolutions of ribbon on the spool increase. When the ribbon is being wound on the spool faster than it is being pulled through the machine by the feeder wheels, the portion of the ribbon between the spool and the feeder wheels becomes tensioned and resists winding thereof on the spool and effects an upward pull on the spool. Because of the spool's ability to yield and swing upwardly due to the pivotal suspension of the spool unit from the shaft 25, the spool is instantly and momentarily lifted in response to the resistance and upward pull of the ribbon, thereby causing reverse counterclockwise movement of the unit and downward movement of the knob 33 away from the knob 7 to a position such as the broken line position of FIG. 3, the knob 33 thereby becoming momentarily disengaged from the control knob 7 thereby momentarily interrupting and discontinuing the turning of the spool until the tension upon the portion of the ribbon between the feeder wheels and the spool is relieved, whereupon the spool units swings back to its normal operating position because of its unbalanced suspension and the knob 33 rises again into engagement with the knob 7 and the turning of the spool is resumed until tension again builds up in the ribbon, whereupon the previously described cycle of movement is repeated. This automatic adjustment prevents possible ribbon breakage and prevents the spool from pulling the ribbon through the machine at a rate faster than intended for normal operation.

An elongate upstanding ribbon guide arm or rod 42 is looped at its lower end for receiving and engaging a suitable fastener 43 for securing the guide arm to the horizontal portion 20 of the bracket 17. The upper end of the guide arm is looped as at 42*a*, the ribbon being threaded or trained through said loop for guiding the ribbon onto the spool.

In use, the attachment is mounted on the machine in the manner illustrated by securing the bracket 11 to the side of the machine by means of the fasteners 9 normally employed to secure the slotted plate 8 to the machine. The attachment is properly adjusted for position by adjusting the bracket 17 relative to the bracket 11 through the medium of the slots 16 and 22 and the pivotal connection provided by the bolt 23. When properly mounted, the knob 33 of the spindle 32 engages the underside of the ribbon control knob 7 and is rotated thereby, the knob 33 being held in driven engagement with the knob 7 by the unbalanced suspension and weight of the outer end

portion of the spool unit. The leading end of the used ribbon is then secured to the spool after the ribbon has been trained through the loop portion 42*a* and the machine and its attachment is ready for operation. As the keys of the keyboard are operated, the feeder wheels pull the ribbon through the machine and discharge it therefrom to the right side thereof in the manner shown. As previously described, the ribbon control knob 7 rotates simultaneously with the feeder wheels and the striking of the keys so that as the keys are struck and the ribbon is pulled through the machine by the feeder wheels, the control knob 7 rotates and simultaneously rotatably drives the spindle 32 through the medium of its knob 33, thereby causing the spool S to also rotate and wind up the used ribbon as it is discharged from the machine, the spool unit repeatedly swinging back and forth to automatically adjust the winding speed of the ribbon to the feed speed thereof. When the winding of the ribbon on the spool is completed, the entire spool and used ribbon can be removed and thrown away and replaced with another spool, or the used ribbon can be removed from the spool to permit the spool to be reused.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departing from the scope of my invention.

What I claim is:

1. A take-up device for ribbon and the like comprising a spool unit which includes an elongate spindle, spool means for winding ribbon thereon mounted on one end portion of said spindle for turning thereof by said spindle, circular driven means carried by the other end portion of said spindle adapted to underlie a circular rotatable driving element with the periphery of said driven means in driven engagement with said driving element for rotation of said spindle thereby, mounting means having a vertical portion adapted for mounting on supporting structure and a horizontal portion having an elongate slot formed therein, adjustable stationary supporting means having a horizontal attachment foot portion with an elongate slot formed therein, a bolt-type fastener for vertically extending through the slots of said mounting and supporting means for securing said supporting means to said mounting means, said fastener being slidable in said slots and said supporting means being pivotable about the vertical axis provided by said fastener, and spool unit carrying means pivotally suspended from and supported by said supporting means, said spindle being rotatably mounted on said carrying means for rotation about its longitudinal axis, said carrying means being swingable about a horizontal axis transverse to the longitudinal axis of said spindle and disposed between said driven means and said spool means, said spool unit and carrying means being in unbalanced relationship with respect to said transverse axis whereby said spool means is continuously biased downwardly and the driven means are continuously biased upwardly.

2. The device of claim 1, wherein said supporting means includes a pair of opposed depending shaft supporting members, a horizontal shaft extending between and supported by said depending members, and wherein said carrying means includes a U-shaped member, the upstanding legs of which are suspended from and supported by said shaft for swinging movement of said U-shaped member relative to said depending members about the longitudinal axis of said shaft, and wherein said carrying means also includes a second U-shaped member mounted on said first named U-shaped member transversely thereof, said spindle extending between and being journaled in the upstanding legs of said second member for rotation about its longitudinal axis.

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