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TELETYPE MACHINE RIBBON CONTROL

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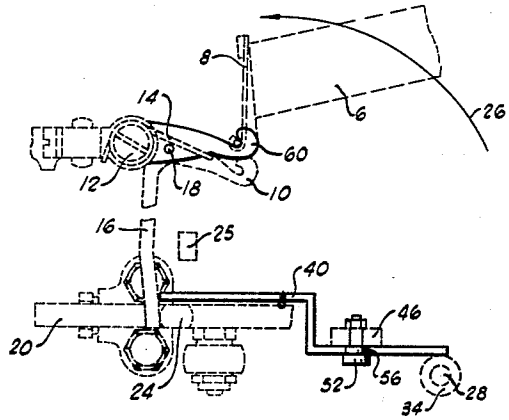


Fig. 1

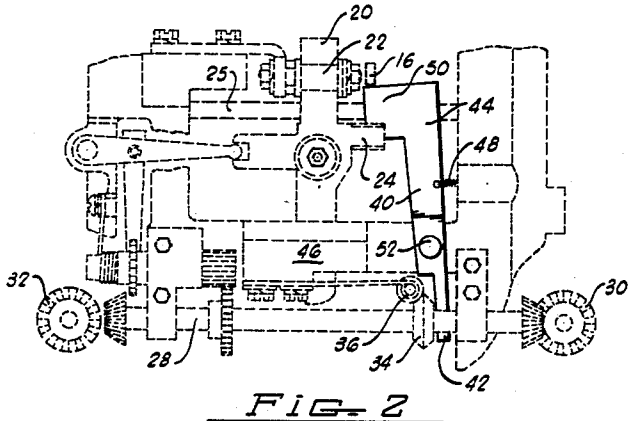


Fig. 2

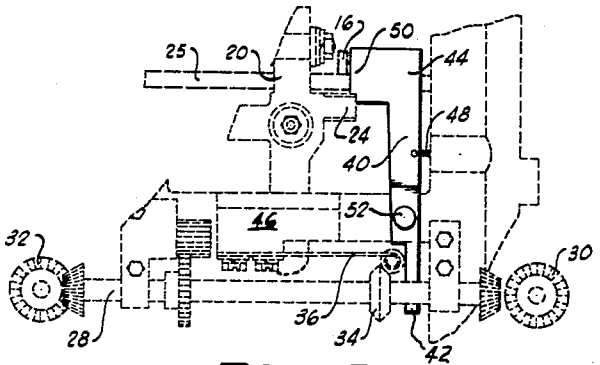


Fig. 3

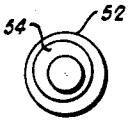


Fig. 4

INVENTOR.
M. I. Smallwood
BY Jerry J. Dunlop
ATTORNEY

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TELETYPE MACHINE RIBBON CONTROL

Marion I. Smallwood, 1345 Campbell Road, Oklahoma City, Okla.

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5 Claims. (Cl. 197—158)

This invention relates generally to improvements in teletypewriter machines, and more particularly, to means for controlling the movement of the ribbon of a teletypewriter machine to utilize the maximum surface area of the ribbon.

In present day teletypewriter machines the ribbon is supported on two rolls and extends through a ribbon carrier positioned between the rolls. One of the rolls is driven for lengthwise movement of the ribbon until substantially the entire length of the ribbon has passed through the ribbon carrier; whereupon the opposite roll is driven to reverse the lengthwise direction of movement of the ribbon through the carrier. The ribbon carrier is reciprocated vertically during operation of the teletypewriter machine for raising the ribbon to a printing level when a key is depressed, such that the type will strike the ribbon and form a letter or symbol. When the teletypewriter key is released to lower the type, the ribbon carrier moves downwardly to expose the letter or symbol previously typed. Although the ribbon is of sufficient width to accommodate at least two rows of type, the ribbon carrier in a present day machine is raised only sufficiently that the top half portion of the ribbon is contacted by the type and the lower half portion of the ribbon is normally unused. As a result, the service life of teletypewriter ribbons is limited, which in turn requires frequent replacement of the ribbons.

The ribbon rolls of a present day teletypewriter machine may be turned over, such that the unused half portion of a ribbon may be used in a subsequent operation of the machine. However, the reversal or turning over of the ribbon rolls is a time consuming and messy operation, and is normally not performed in most organizations using any appreciable number of teletypewriter machines.

The present invention contemplates the use of both the upper and lower half portions of a teletypewriter ribbon, without the necessity of changing the ribbon rolls. This invention contemplates a novel lever engaged by the mechanism used in driving the ribbon lengthwise, for pivotal movement of the lever upon each reversal in the lengthwise direction of movement of the ribbon. The lever is so positioned on a teletypewriter machine as to limit the upward movement of the ribbon during lengthwise movement of the ribbon in one direction, such that one half portion of the ribbon will be raised to a printing level for contact by the type during lengthwise movement of the ribbon in one direction, and the ribbon will be moved to such a height that the other half portion will be contacted by the type during movement of the ribbon in an opposite direction. The present mechanism is completely automatic in operation, such that the maximum surface area of a ribbon will be used without any manipulations of the ribbon by the teletypewriter operator.

An important object of this invention is to decrease the cost of operating teletypewriter machines.

Another object of this invention is to utilize the maximum surface area of a teletypewriter ribbon, without the necessity of interrupting the operation of a teletypewriter machine.

Another object of this invention is to utilize the maximum surface area of a teletypewriter ribbon, without the necessity of interrupting the operation of a teletypewriter machine.

A further object of this invention is to minimize the time during which teletypewriter machines are out of operation.

A still further and more specific object of this invention is to utilize one half portion of a teletypewriter ribbon during lengthwise movement of the ribbon in one direction and to utilize the other half portion of the ribbon during lengthwise movement of the ribbon in an opposite direction.

Another object of this invention is to adaptt an existing teletypewriter machine for use of both the upper and lower half portions of a ribbon, with a minimum of change or alteration of the existing teletypewriter machine structure.

Other objects and advantages of the invention will be evident from the following detailed description, when read in conjunction with the accompanying drawings which illustrate my invention.

In the drawings:

Figure 1 is a side elevational view of a portion of the type basket of a teletypewriter machine incorporating the present invention, wherein the existing structure is shown in dashed lines and the new structure is shown in solid lines.

Figure 2 is a bottom view of the type basket of a teletypewriter machine incorporating the present invention, wherein the existing structure is again shown in dashed lines and the new structure is shown in solid lines.

Figure 3 is a view similar to Fig. 2 illustrating a second position of the lever of the present invention.

Figure 4 is an end view of the eccentric bolt used for supporting the lever shown in Figs. 1, 2 and 3.

In the detailed description of the present invention, only those portions of an existing teletypewriter machine which cooperate with the new structure will be described, to more clearly illustrate the invention. Referring to Fig. 1, it will be observed that the ribbon **6** of a teletypewriter machine is extended through a ribbon carrier **8** between the ribbon rolls (not shown). The ribbon carrier **8** is in turn pivotally connected to a ribbon oscillator **10** pivotally supported by a shouldered screw **12** and biased by a spring **14** for upward pivotal movement of the outer end of the oscillator about the screw **12**. An extension **16** is secured by a suitable bolt **18** to the ribbon oscillator **10** and extends generally vertically for pivoting the oscillator **10** about the screw **12** and raising and lowering the ribbon carrier **8**. The lower end portion of the oscillator extension **16** extends into the path of movement of a pull bar bail plunger **20**, as more clearly shown in Fig. 2.

The plunger **20** is mounted in the lower portion of a teletypewriter machine and reciprocates fore and aft through suitable rollers **22** during operation of the teletypewriter machine. A shoulder **24** on the pull bar bail plunger **20** contacts the lower end portion of the oscillator extension **16** during forward movement of the plunger for pivoting the ribbon oscillator **10** in a clockwise direction (as viewed in Fig. 1) and lowering the ribbon carrier **8**. The plunger **20** is operated by a conventional mechanism (not shown) for a rearward movement when a key (not shown) on the teletypewriter machine is depressed and for forward movement when the key is released. In a normal operation of a teletypewriter machine, the shoulder **24** of the plunger **20** is moved rearwardly to a position behind a stationary frame cross bar **25** when a key of the machine is depressed, such that the

spring 14 raises the carrier 8 until the extension 16 contacts the bar 25, and the carrier 8 is raised to printing level. The arrow 26 shown in Fig. 1 is provided to illustrate the path of movement of the type of the teletypewriter machine. In this normal operation of the machine, the ribbon 6 is moved upwardly by the carrier 8 to such a position that the upper half portion of the ribbon 6 is contacted by the type when the plunger 20 is in its rearmost position and the extension 16 is in contact with the cross bar 25, as illustrated in Fig. 3. As the plunger 20 moves forwardly, the shoulder 24 contacts the oscillator extension 16 and lowers the carrier 8 and ribbon 6 to a level below the printing level, such that the operator of the machine may observe the material which has been typed. The detailed construction and operation of the mechanism used for moving the plunger 20 fore and aft forms no part of the present invention and is therefore not described in detail herein.

The ribbon 6 is driven lengthwise by a standard drive system which includes a ribbon feed shaft 28 extending transversely across the teletypewriter machine rearwardly of the plunger 20, as illustrated in Figs. 2 and 3. The ribbon feed shaft 28 is shifted lengthwise as illustrated by the positions in Figs. 2 and 3 to alternately engage bevel gears 30 and 32 for driving the ribbon 6 lengthwise in opposite directions. In other words, when the ribbon feed shaft 28 is in such a position to engage the bevel gear 30 as in Fig. 2, the ribbon 6 is moved lengthwise through the ribbon carrier 8 in one direction. When the shaft 28 is shifted in its opposite position to engage the bevel gear 32 as shown in Fig. 3, the ribbon 6 is driven lengthwise in an opposite direction. The shifting of the ribbon feed shaft 28 is automatically performed when the ribbon 6 has been moved throughout substantially its entire length through the carrier 8. It will also be observed in Figs. 2 and 3 that a detent 34 is formed around a medial portion of the ribbon feed shaft 28 which normally cooperates with a spring 36 for holding the shaft 28 in its shifted positions.

In accordance with the present invention, a lever 40 is pivotally secured across the lower portion of the teletypewriter machine type basket to position the rearward end 42 of the lever adjacent the detent 34 of the ribbon feed shaft 28 and the forward end 44 of the lever adjacent the cross bar 25 above the path of movement of the shoulder 24 of the pull bar bail plunger 20. As shown most clearly in Fig. 1, the lever 40 is pivotally secured to a stationary cross bar 46 of the teletypewriter machine and is then bent upwardly to extend above the path of movement of the shoulder 24 of the plunger 20. A spring 48 is anchored between a stationary portion of the frame of the teletypewriter machine and the lever 40 forwardly of the pivot point of the lever, such that the rear end 42 of the lever is urged into contact with the detent 34 and the forward end 44 of the lever is urged away from the plunger 20. It will also be observed in Figs. 2 and 3 that a finger 50 is extended transversely from the forward end 44 of the lever 40 for movement in and out of the path of movement of the oscillator extension 16, as will be more fully hereinafter set forth.

The lever 40 is pivotally secured to the cross bar 46 by a novel bolt 52 shown in detail in Fig. 4. The bolt 52 is provided with an eccentric shoulder 54 adjacent the head of the bolt which is fitted in a complementary aperture 56 (Fig. 1) extending transversely through the lever 40. It will thus be apparent that when the bolt 52 is turned, the lever 40 is shifted fore and aft to position the fore and aft location of the lever finger 50. This adjustment in turn controls the height to which the ribbon 6 is raised when the finger 50 is in the path of movement of the extension 16, as will be described.

The present invention also contemplates the replacement of the existing ribbon oscillator 10 with a new ribbon oscillator 60 shaped in substantially the same manner as the existing oscillator 10, but having slightly differently located bolt holes for reception of the screw 12 and bolt 18 for relocating the outer end portion of the oscillator. The new oscillator 60 is positioned with respect to the extension 16 such that when the bar 25 stops the extension 16, the ribbon 6 will be raised higher than when using the existing oscillator 10. The increase in height is substantially equal to the height of the type used in a teletypewriter machine. In other words, when the extension 16 moves into contact with bar 25, the existing oscillator 10 raises the ribbon 6 to such a height that the type will contact the upper half portion of the ribbon; whereas the oscillator 60 will raise the ribbon 6 to such a height that the type will contact the lower half portion of the ribbon. It will be apparent that the bolt holes in the existing oscillator 10 may be changed to accomplish this result, although I prefer to replace the oscillator 10 with the new oscillator 60 to minimize the alteration required in an existing teletypewriter machine by the mechanic or operator installing the present invention.

In operation of a teletypewriter machine having the present invention incorporated therein, let it first be assumed that the ribbon feed shaft 28 is in its left hand position as illustrated in Fig. 3 and the ribbon 6 is being driven in one direction through the ribbon carrier 8. In this position of the shaft 28, the detent 34 will be moved to the left of the lever 40 and the spring 48 will have moved the finger 50 of the lever 40 out of the path of movement of the oscillator extension 16. When a key of a teletypewriter machine is depressed, the plunger 20 is moved rearward from the position shown in Fig. 1 to the position shown in Fig. 3, such that the spring 14 raises the oscillator 60 and pivots the oscillator extension 16 counter-clockwise with the lower end portion of the extension 16 being moved into contact with the cross bar 25. In the rearmost position of the plunger 20, the ribbon carrier 8 is raised to where the lower half portion of the ribbon 6 is at printing level as indicated by the arrow 26 shown in Fig. 1. As the key on the teletypewriter machine is released, the plunger 20 is moved forwardly until the shoulder 24 of the plunger engages and forces the oscillator extension 16 in a clockwise direction to the position shown in Fig. 1. This movement of the extension 16 pivots the oscillator 60 back downwardly to such a position that the ribbon 6 is moved to below the printing level and the operator of the machine can observe the typed material.

When the ribbon feed shaft 28 is shifted to the right to engage the bevel gear 30 as illustrated in Fig. 2, the detent 34 contacts the rear end 42 of the lever 40 and moves the finger 50 of the lever into the path of movement of the extension 16 against the action of the spring 48. It will be observed in Fig. 2 that the finger 50 will then be positioned slightly forward of the cross bar 25. It may also be noted that the lever 40 will be shifted when no key on the teletypewriter machine is depressed, such that the plunger 20 will be in its forward position as shown in Fig. 1, and the finger 50 may move freely into the path of movement of the extension 16 without interferring with either the plunger 20 or the extension 16.

When a key on the teletypewriter machine is then depressed, the plunger 20 will again be moved rearwardly to the position shown in Fig. 2. However, prior to reaching the cross bar 25, the extension 16 will contact the finger 50 of the lever 40 and will prevent any further upward movement of the ribbon carrier 8 and ribbon 6. In this position of the extension 16, the ribbon 6 will be raised to such a height that the top half portion of the ribbon is at printing level and will be contacted by the type of the teletypewriter machine. When the teletypewriter machine key is released, the plunger 20 will again move forwardly and the shoulder 24 will be moved into contact with the extension 16 to again pivot the extension 16 clockwise and lower the ribbon 6 to below printing level. This operation is continued until the ribbon feed shaft 28 is again shifted lengthwise and the lever 40

is pivoted in a clockwise direction (when viewed as in Figs. 2 and 3) to remove the finger 50 from the path of movement of the extension 16.

Minor fore and aft adjustments of the lever 40 may be provided by rotation of bolt 52, as previously indicated. It will be apparent that the fore and aft positions of the lever 40 will control the height to which the ribbon 6 is raised when the finger 50 is in the path of movement of the extension 16. Thus, the lever 40 may be adjusted to assure that the ribbon 6 will be moved to the desired position and the maximum surface area of the ribbon 6 will be used.

From the foregoing it will be apparent that the present invention will materially extend the service life of teletypewriter ribbons and will minimize the down time of teletypewriter machines presently required for changing ribbons. The present mechanism is automatically operated to utilize one half of the ribbon when the ribbon is moved in one direction through the ribbon carrier, and the other half of the ribbon is used during movement of the ribbon in the opposite direction. It will be further apparent that the present mechanism is extremely simple in construction and will require a minimum alteration of an existing teletypewriter machine.

Changes may be made in the combination and arrangement of parts or elements as heretofore set forth in the specification and shown in the drawings, it being understood that changes may be made in the precise embodiment disclosed without departing from the spirit and scope of the invention as defined in the following claims.

I claim:

1. In a teletypewriter machine having a ribbon, a ribbon carrier for moving a portion of the ribbon upwardly during printing and downwardly between printings, means for moving the ribbon lengthwise through the ribbon carrier first in one direction and then in an opposite direction, a ribbon oscillator supporting the ribbon carrier and being spring biased to raise the ribbon, an extension on the ribbon oscillator arranged to contact a stationary cross bar of the machine and limit upward movement of the ribbon, and a pull bar bail plunger movable between a first position and a second position, said plunger being arranged in the path of movement of the oscillator extension for contacting said extension and lowering the ribbon upon movement toward said first position and releasing said extension for the upward movement of the ribbon in said second position; the improvement which comprises a lever secured to the machine for movement in and out of the path of movement of the oscillator extension between said first position of the pull bar bail plunger and said stationary cross bar, said lever being extended into engagement with the ribbon moving means for movement upon a reversal in the direction of lengthwise movement of the ribbon, whereby the ribbon is raised to a lower level when the ribbon is moving in one direction than when moving in the opposite direction.

2. A teletypewriter machine as defined in claim 1 wherein the means for moving the ribbon lengthwise includes a ribbon feed shaft having a detent thereon, said ribbon feed shaft being shiftable lengthwise to reverse the direction of movement of the ribbon, and wherein

said lever is pivotally supported on the machine and is spring-loaded for pivotal movement in one direction to extend into contact with one side of the ribbon feed shaft detent for pivotal movement upon lengthwise shifting of the ribbon feed shaft.

3. In a teletypewriter machine having a ribbon, means for moving a portion of the ribbon upwardly to a printing level during printing and downwardly below printing level between printings, said means including a generally vertically extending ribbon oscillator extension supported for pivotal movement and spring biased in a direction for raising the ribbon, said extension being movable into contact with a stationary cross bar on the machine for limiting the upward movement of the ribbon, a pull bail bar plunger movable fore and aft on the machine in the plane of movement of the ribbon oscillator extension for lowering the ribbon upon forward movement and releasing said extension for raising of the ribbon upon rearward movement, and said machine having drive means for moving the ribbon lengthwise first in one direction and then in an opposite direction, said drive means including a ribbon feed shaft rotatably mounted transversely across the machine aft of said plunger and shiftable lengthwise for reversing the lengthwise direction of movement of the ribbon and having a detent thereon; the improvement which comprises a lever having a front end and a rear end and a finger extending transversely from the forward end thereof, means for pivotally supporting the lever on the machine for movement in a horizontal plane with the rear end thereof adjacent said detent, and a spring anchored to the lever and to the machine urging the rear end of the lever against said detent for pivotal movement of the lever upon each reversal in the lengthwise direction of movement of the ribbon, the forward end of the lever being positioned for movement of said finger in and out of the path of movement of the oscillator extension forward of said stationary cross bar on the machine to limit the upward movement of the ribbon during lengthwise movement of the ribbon in one direction.

4. A teletypewriter machine as defined in claim 3 wherein said means for pivotally supporting the lever comprises a bolt extending through an aperture in the lever, said bolt having an eccentric shoulder thereon positioned within said aperture for adjusting the fore and aft position of the lever and adjusting the height to which the ribbon is raised when said finger is moved into the path of movement of the oscillator extension.

5. A teletypewriter machine as defined in claim 3 characterized further to include a ribbon oscillator connected to said extension positioned to raise the lower half of the ribbon to printing level when said finger on the lever is out of the path of movement of said extension and to raise the upper half of the ribbon to printing level when said finger is in the path of movement of said extension.

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