

[72] Inventor **Walter Albrile**
Torino, Italy
 [21] Appl. No. **764,174**
 [22] Filed **Oct. 1, 1968**
 [45] Patented **June 15, 1971**
 [73] Assignee **Inq. C. Olivetti & C., S.P.A., Ivrea**
Torino, Italy
 [32] Priority **Oct. 14, 1967**
 [33] **Italy**
 [31] **53349-A/67**

1,820,066	8/1931	Handley	197/157
1,864,594	6/1932	Hokanson et al.	197/159 X
2,312,314	3/1943	Bordonaro	197/158
3,151,722	10/1964	Salto	197/17
3,174,611	3/1965	LaPointe	197/158
3,237,747	3/1966	Frechette et al.	197/157 X
3,346,090	10/1967	Goff et al.	197/158
3,348,650	10/1967	Meinherz et al.	197/158 X
3,349,888	10/1967	Page	197/158

Primary Examiner—Robert E. Pulfrey
 Assistant Examiner—Stephen C. Pellegrino
 Attorney—Kevin C. McMahon

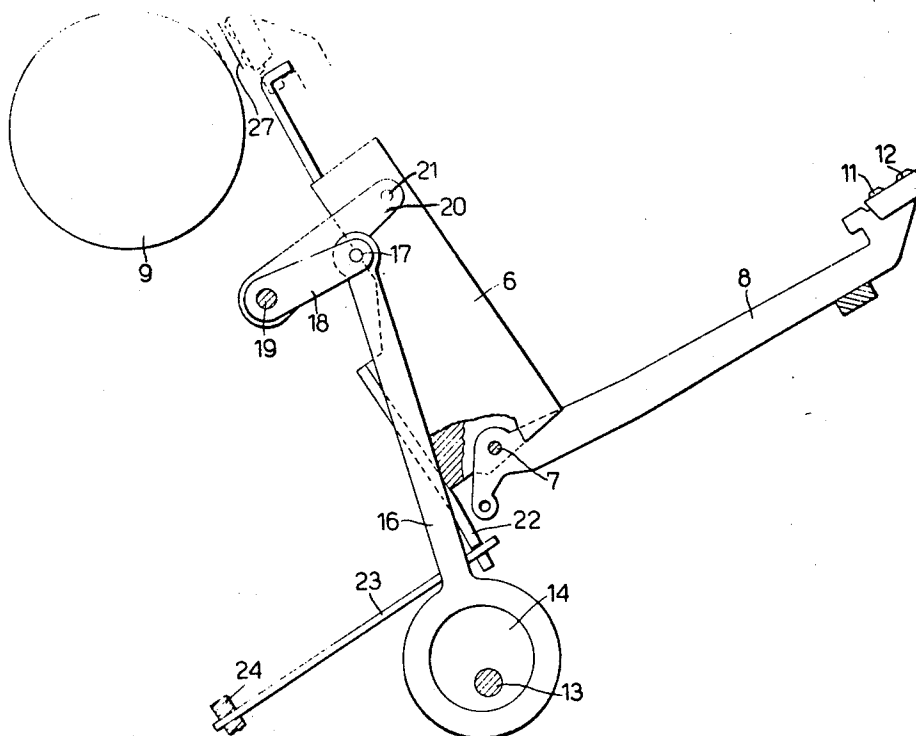
[54] **CARBON RIBBON VIBRATING DEVICE FOR A TYPE BAR TYPEWRITER**
 7 Claims, 8 Drawing Figs.

[52] U.S. Cl. 197/158,
 197/159, 197/17
 [51] Int. Cl. B41j 33/58,
 B41j 35/10
 [50] Field of Search 197/158,
 157, 117, 159

[56] **References Cited**
UNITED STATES PATENTS

1,018,062 2/1912 Kayle 197/159 X

ABSTRACT: A cyclic means executes a cyclic operation incidental to each operation of a typing mechanism and early in each such cyclic operation causes a ribbon vibrator first to be subjected to a resilient operating urge and then to be restored. Moreover, late in said operations of said cyclic means there is alternately set up one or another stopping condition for said vibrator, whereby said vibrator is operated resiliently to different extents at alternate typing operations. In connection with typing operations effected while the machine is in an upper case state, there becomes set up a substitute stopping condition for one of said two stopping conditions.



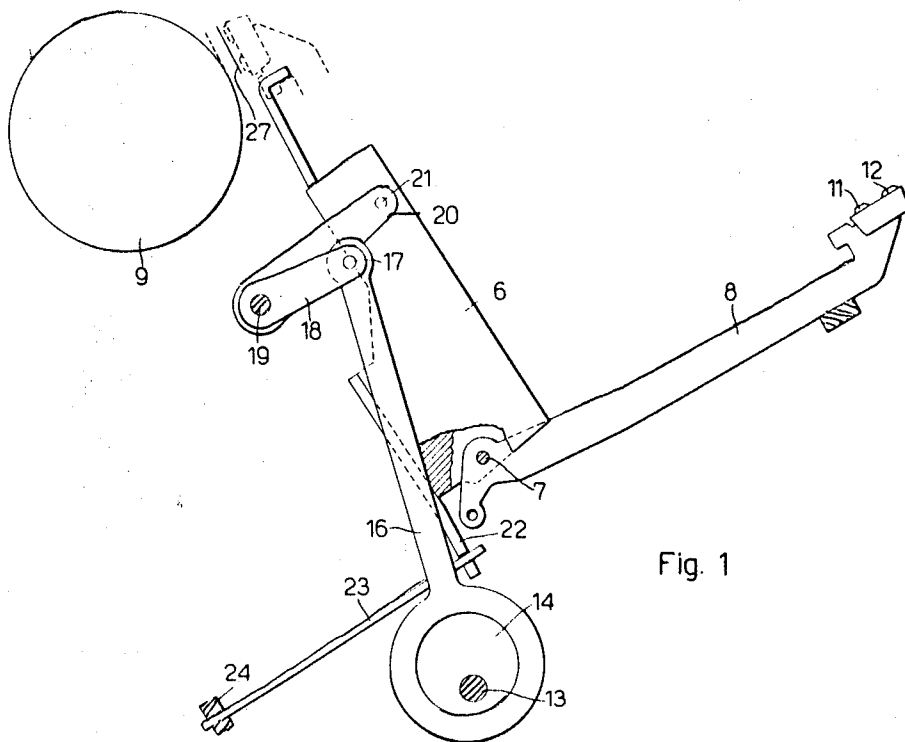


Fig. 1

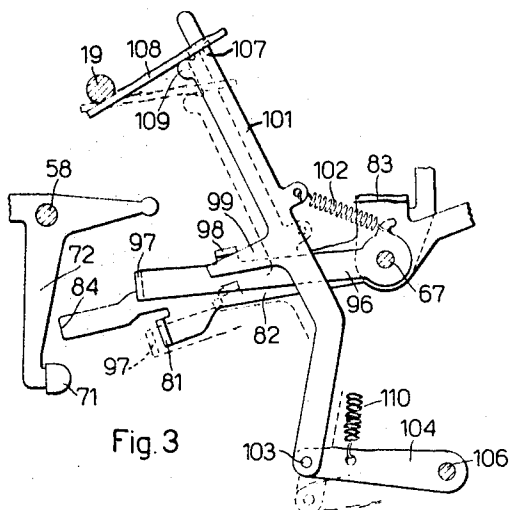


Fig. 3

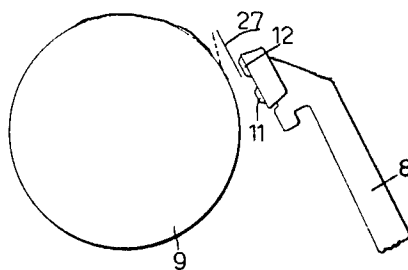


Fig. 6

INVENTOR.
WALTER ALBRILE

BY *Thomas N. Janant*

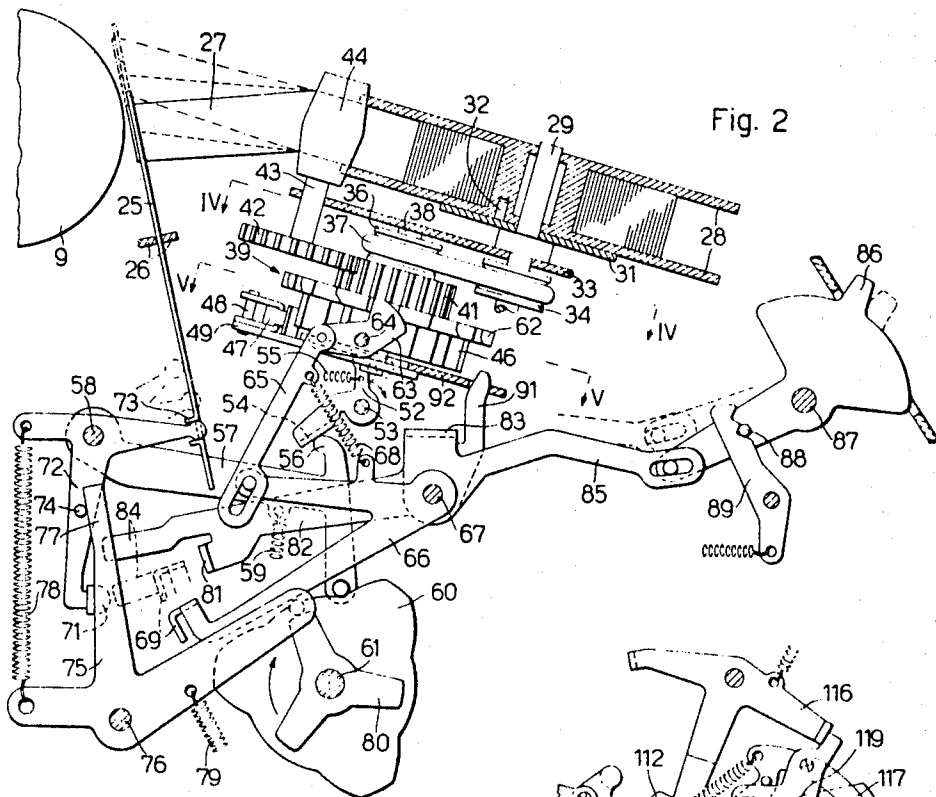


Fig. 2

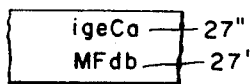


Fig. 8

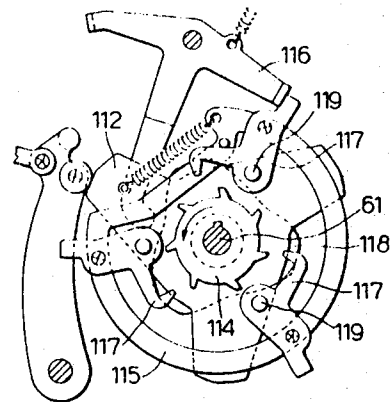


Fig. 7

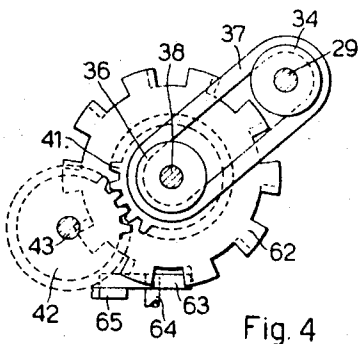


Fig. 4

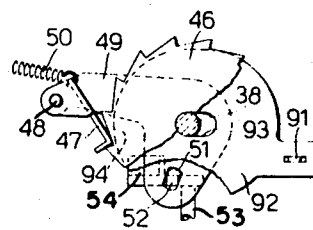


Fig. 5

INVENTOR.
WALTER ALBRILE

BY *Thomas N. Sarant*

CARBON RIBBON VIBRATING DEVICE FOR A TYPE BAR TYPEWRITER

This invention relates to ribbon-vibrating devices in general and more particularly to a kind wherein at successive typing operations a ribbon vibrator is lifted from a normal position alternately to a high lifted position and a low-lifted position to bring respectively a low-use track and a high-use track on the ribbon opposite to a printing point.

There are known several ribbon-vibrating devices of this species. In one such known device the different extents of ribbon vibrator lifts are effected under control of a toothed wheel unit which is stepwise turned at successive typing operations to present alternately a tooth and a tooth notch for regulating the vibrator for a low- and a high-ribbon throw. The said toothed wheel is on a part which moves with the vibrator and by reason of its mass and also the mass of the vibrator itself, the latter is subject to overthrow, particularly also in connection with the low throw of the ribbon vibrator.

According to the subject invention a ribbon vibrator means stands normally positively restored as an incident of the conclusion of the last preceding typing operation. Incident to the beginning of any typing operation the vibrator means is freed to be resiliently lifted and the lift thereof is controlled by either a positive high or a positive low lift stop condition, which stop conditions are alternately created incident to the last previous typing operation.

The ribbon on the vibrator takes a slightly raised position on the vibrator, whenever it is contacted by an uppercase type after the vibrator has received a high vibrating throw. This is due to the fact that the ribbon is contacted at its lower ribbon track and only by the uppercase type. In order to compensate for such error of effective ribbon lift under the stated condition and to make possible the use of a ribbon of minimum width, one feature of the invention provides for a modified ribbon vibrator lift stopping condition to come into effect for typing an uppercase type in the lower track of the ribbon as in the case the machine is in the lowercase typing state.

Furthermore, a stop member by a stencil-writing control is movable from an idle to another position wherein it will prevent operation of the vibrator by the stated resilient means.

The above and other characteristics of the invention will become apparent from the description of a preferred embodiment.

FIG. 1 is a left-hand, partial, sectional side view showing a type bar segment and portions of a power case shifting mechanism therefore;

FIG. 2 is a left-hand, partial, sectional side view of the machine showing a ribbon feeding and vibrating mechanism;

FIG. 3 is a left-hand, sectional side view of a provision to shorten the ribbon vibration slightly whenever an uppercase imprint is effected in a lower typing track of the ribbon;

FIG. 4 is a sectional plan view along line IV-IV of FIG. 2;

FIG. 5 is a sectional view along line V-V of FIG. 2;

FIG. 6 is a schematic view illustrating a tendency of the ribbon to lift when an uppercase type impression is made in the lower track of the ribbon;

FIG. 7 is a right-hand sectional side view of a cyclic clutch and certain related parts; and

FIG. 8 is an illustration of a piece of used carbon ribbon.

In FIG. 1 a conventional-type bar segment 6 is shown in a lowercase position. A usual curved rod 7 on the segment 6 pivotally supports the type bars 8 for individual swinging movement against a platen roll 9. Each type bar 8 has a lowercase type 11 and an uppercase type 12. In the shown lowercase position of the segment 6, the lowercase type 11 of any operated type bar 8 will strike against the printing line on the platen 9. If the segment 6 is case shifted down to uppercase position, the uppercase type 12 of any operated type bar 8 will strike said printing line. A power-operable case shift device, see FIG. 1, comprises a shaft 13 having an eccentric 14 thereon adapted to be rotated 180° in response to the opera-

tion of a conventional case shift key, not shown. In response to the release of the case shift key said shaft 13 rotates another 180° to its normal position. The eccentric 14 is in control of a connecting rod 16 which has a pivotal connection at 17 with an arm 18 carried fast on a shaft 19 that is rockably carried on the machine frame. Secured to the shaft 19 in opposite flanking relation to the segment 6 are two arms 20, only one being shown. The extending ends of these arms 20 have pivotal connections 21 with the segment 6. A downreaching member 22 on the segment 6 has a spring leaf 23 jointed thereto at a hole thereof and said spring leaf 23 extends from a frame portion 24. Obviously, the eccentric 14, if given a half turn from its FIG. 1 position, will case shift the segment 6 down to its upper case position, and if then given another half turn it will case shift the segment 6 up to its lowercase position.

Situated contiguous to the rear of the segment 6 is a ribbon vibrator 25, see FIG. 2, which has guidance to move tangential to the platen 9. Guidance means therefor includes a guide element 26 on the frame. The ribbon vibrator 25 has usual guiding eyes, not shown, through which a carbon ribbon 27 is adapted to travel, and is normally in a position so that the ribbon 27 is below the writing line on the platen 9. Carbon ribbon 27 is supplied to the vibrator 25 from a supply spool situated at the left of the segment 6, but not shown. From the vibrator 25, the ribbon 27, see FIG. 2, extends to a ribbon winding spool 28 situated to the right of the segment 6. The carbon ribbon 27 is wide enough to receive typing impressions on a lower writing track 27' (FIG. 8) and an upper writing track 27'', which tracks 27', 27'' are completely noninfringing upon each other to assure uniform quality typing impressions. The winding spool 28 (FIG. 2) is carried on a spindle 29 having unitarily turnable therewith a disc 31 which has a pin 32 in driving association with the spool 28 in a hole thereof. The spindle 29 is rotatively carried on a plate 33 removably secured to the machine frame.

Below the plate 33, the spindle 29 has fast thereon a pulley 34 which by an endless belt 37 is connected to a drive pulley 36. This drive pulley 36, together with a group of coaxial elements, collectively designated by the numeral 39 is rotatable on a stud 38 which is rigidly downreaching from the plate 33. Said group of elements 39 comprises a pinion 41, a toothed wheel 42, and a ratchet wheel 46, all preferably molded of plastic material. The pinion 41 is in constant mesh with a pinion 42 which is fast on a shaft 43 rotatably carried on the plate 33. Above such plate 33 the shaft 43 has fast thereon a ribbon feed roll 44 for drawing the ribbon 27 rightwardly from the vibrator 25, said feed roll 44 for such purpose having a usual pressure roll, not shown, cooperative therewith.

A pawl 47, see also FIG. 5, is swingably carried on a lever 49 by a stud 48, and by a spring 50 is constantly urged to engage the ratchet wheel 46. The lever 49 is rockable on the stud 38 and has a hole 51 whereinto one arm of a lever 52 extends. Such lever 52 is rockably provided on a stationary stud 53 and has on a downreaching arm a bent lug 54. A spring 55 is associated with the lever 52, to urge it counterclockwise in FIG. 2, so that said lug 54 normally is contacting upon a nose 56 of a lever 57. Such lever 57 has pivotal support on a stationary shaft 58 and is associated with a three-lobed cam 60 with respect to which it is a follower under the tension of a spring 59. The cam 60 and another cam 80 are rotatively unitary with an element 112 which by being power rotated in 120° cyclic steps, causes a power-typing operation to be carried out in accord with selective operations of type keys, not shown, as clearly disclosed in a patent to Salto, U.S. Pat. No. 3,151,722, dated Oct. 6, 1964. Said cams 60 and 80 and said element 112 are normally stationary on a constantly power-rotated shaft 61.

Cyclic rotative motions are imparted to said element 112, and thus said cams 60 and 80, through closure of a normally open clutch comprising a toothed clutch wheel 114 carried fast on said shaft 61, and three clutch pawls 117 carried pivotally at 119 on said element 112, said clutch pawls 117 being interconnected by a ring element 115 for conjoint open-

ing and closing action. A cycle conditioning member 116, by coaction with any one clutch pawl 117, holds normally all clutch pawls 117 in open clutch position. The cycle conditioning member 116 is tripped free of the clutch pawl 117 for instituting typing cycles, and at such time the three clutch pawls 117 become spring urged into engaged relation with the toothed clutch wheel 114 to drive the element 112. When each 120° turns nears completion, the clutch pawls 117 become conjointly divorced from the wheel 114 through the interception of one pawl 117 by the cycle conditioning member 116, the latter of which meanwhile has become restored by one of the lobes of a cam 118. The cam 60 in FIG. 2 is shown in one of three possible normal rest positions and when it receives a 120° turn incidental to a typing operation it will operate the lever 57 very late in such movement. It thus follows that the lever 52 and thus the feed pawl 48 for the ratchet wheel 46 is operated in each cycle very late, so that the type bar 8 strikes and recedes from the platen 9 before the ratchet wheel 46 is imparted a feed step and a ribbon feeding motion is transmitted to the roll 44.

The toothed wheel 62 of the group of elements 39, see FIG. 4, has substantially rectangular teeth. There are only half as many teeth on the wheel 62 as there are on the ratchet wheel 46. A lever 63, see FIG. 2, is fulcrumed on a stationary stud 64, and is under the constant counterclockwise urge of a spring 68 to enter the voids between the rectangular teeth of the toothed wheel 62. Alternate tooth advances of the ratchet wheel 46, cause respectively, a clockwise displacement of the lever 63 by a tooth of the wheel 62 against the tension of the spring 68 out of a void between two teeth, and an entrance of such lever 63 into the void between two teeth.

A link 65 pivotally connected to the lever 63 has a pin-and-slot connection with a lever 66 having pivotal support on a stationary rod 67. The before stated spring 68 extends between this upper portion of the link 65 and the lever 66 in a manner to urge the lever 63 counterclockwise and to urge the lever 66 clockwise. It will be seen that the lever 66 during alternate tooth advances of the ratchet wheel 46 is raised and lowered respectively to place a stop means or lug 69 alternately into and out of the operating path of a projection 71 of a lever 72 which lever 72 during each typing operation is allowed to become resiliently urged counterclockwise by a resilient means or spring 78 to lift the ribbon vibrator 25 by an arm which reaches into a socket 73 in the vibrator 25. When the lug 69 or stop means is in the operating path of the projection 71 it limits the operation of the lever 72 so that the upper track 27' (FIG. 8) of the ribbon 27 becomes presented at the printing point. Said lever 63 (FIG. 2) and said link 65 constitute thus a part of a means governed by successive tooth advances of said toothed wheel 62 to control a stop member 69 to become moved into and out of the operating path of vibrator means 25, 72.

Before each typing operation starts, one of three lobes on the cam 80 holds a lever 75 fulcrumed on a stationary pivot 76 against the tension of a strong spring 79, counterclockwise moved in the position seen in FIG. 2, so that by a pin 74 on the lever 72, it will hold normally the latter clockwise moved to block the ribbon vibrator 25 against upward movement from its idle, lowered position. Incidental to the commencement of any typing operation, after the cam 80 has turned only a little, the lever 75 under the tension of the spring 79 moves clockwise so that resultingly the lever 72 becomes actuated by the resilient means or spring 78 to the extent permitted by the lug 69 or either of two other lugs 81 and 97, later herein described. Obviously, each time the cam 80 in a typing operation moves through a last portion of its cycle rotation, it forcibly returns the lever 75 and thus the lever 72 and its associated ribbon vibrator 25.

The stated lug 81 is a full throw limiting stop for the vibrator 25. In FIG. 2, such lug is part of an arm 82, which except when the machine is conditioned for nonuse of the ribbon 27, as later explained, is in potentially effective position to limit the lever 72 for a full-throw ribbon vibration. Therefor, if a typing

operation is instituted with the positions of the parts as seen in FIG. 2, that is with the lever 66 in its lowered, out of the way position, then the lever 72 connected with the vibrator 25 will be lifted by the resilient means 78 to the extent permitted by the lug or full throw stop 81, thereby to bring the low-use track 27' (FIG. 8) of the ribbon 27 to the printing point.

In FIG. 2, a control lever 86 is shown which when moved to the dotted line position, conditions the machine for stencil writing, that is it incapacitates the ribbon feeding and the ribbon vibrating mechanism. Said control lever 86 is pivotally carried on a stationary shaft 87 and has a pin 88 thereon for cooperation with a notched, spring-urged, detent member 89 to be retained thereby in either of its two positions. The control lever 86 has a pin-and-slot connection with a forwardly reaching arm 85 of a bail 83 which is pivotally carried on a shaft 67. The before stated full throw stop or lug 81 is carried on a rearwardly reaching arm 82 of the bail 83 and in the full-line position of the control lever 86 stands in the operating path of the projection 71 on the lever 72. The arm 82 has an extending stop member 84 which while the control 86 is in the full-line position stands clear of the operating path of the projection 71 but which in the operated position of the control 86 blocks the projection 71 against operation so that no ribbon vibration can occur. As seen in FIG. 2, the bail 83 embodies an upreaching arm 91 reaching into a hole in a slide 92. Such slide 92 is also shown in FIG. 5 and is nested for fore-and-aft movement between the ratchet wheel 46 and the pawl-operating lever 49. A slot 93 in the slide 92 cooperative with a stud 38 assists in guiding the slide 92 for said fore-and-aft movement. When the control lever 86 is in its normal, full-line position, a rear edge 94 of the slide 92 stands clear of the feed pawl 47 and allows the latter to function effectively. Operation of the control lever 86 to the dotted, stencil position disposes the slide 92 in a rearwardly moved position so that its edge 94 holds the feed pawl 47 clear of the ratchet wheel 46 so that no ribbon feed can occur.

It is to be noted that the full-throw stop or lug 81 need not be on the movable lever 82 but may be frame supported. Of course, then the lever 82 would be required to be of a form so that its movement to its lower position would not be obstructed by the stationary full-throw lug 81.

When the type bar segment 6 is lowered to its upper case position or state and then the ribbon vibrator 25 incidental to an instituted typing operation becomes lifted to present the lower ribbon track 27' (FIG. 8) at the printing point, the uppercase type 12 only engages the ribbon 27 and specifically only at its lower printing track. See FIG. 6. The engaging uppercase type 11 in moving toward the platen 9 lifts the lower ribbon portion slightly from its true position on the vibrator 25 because the portion of the ribbon 27 above the striking type is not forced toward the platen 9. In order to compensate for the stated discrepancy in effective ribbon lift and thereby to avoid the necessity for a wider ribbon, an arm 96 with a stop lug 97 thereon, see FIG. 3, is pivotally provided on the rod 67. If the case shift segment 6 is in lowercase position or state, the arm 96 with its stop element or lug 97 stands in the full line position seen in FIG. 3, clear of the operating path of the projection 71 on the ribbon vibrator lift lever 72. Incidental to each effected movement of the case shift segment 6 from lower to uppercase position, the arm 96 becomes downward moved to the dotted line position and presents its lug 97 in back of the lug 81 to predetermine a slightly shorter lift of the ribbon vibrator 25. An arm 108 fast on the shaft 19 of the case shift bail 19, 20 is in control of the arm 96 through a projection 99 on a link 101 underlying an ear 98 on the arm 96, so that if the bail 19, 20 moves to its uppercase position, the arm 96 under the urge of a spring 102 connected thereto swings down to place its stop element 97 in its effective, dotted line position seen in FIG. 3. The lower end of the link 101 has pivotal support at 103 on a guiding arm 104 which is swingable on a pivot 106. At the upper end the link 101 extends into a hole 107 and has a shoulder 109 underlying the arm 108. A spring 110 is associated with the arm 104 to bias the link 101 constantly

toward the full line position, wherefor incidental to the movement of the segment 6 upwardly to lowercase position the link 101 by its projection 99 raises the arm 96 to place the stop element 97 in its idle position.

It is to be noted that the stops 69, 81, 97 are bendably adjustable so that the various throw conditions for the vibrator means 25, 72 can be individually adjustable.

The described device operates as follows:

Each type key operation causes a 120° cyclic rotation of the typing instrumentalities controlling element 112 and the cams 60 and 80. Late in each such cyclic rotation, the cam 60 operates its follower lever 57 and, through the parts 65, 63, 49 and 48, imparts each time a single tooth advance to the ratchet wheel 46. Depending on whether the said tooth advance brings a tooth or a void of the toothed wheel 62 to a position opposite the upper nose end of the lever 63, such lever 63 through the link 65 is caused to position the lever 66 to bring the lug 69 thereon respectively into or out of the operating path of the projection 71 on the lever 72. These opposite positioning movements of the lever 66 take place always after in each cyclic rotation of the element 112, the type 11, 12 after striking the platen 9 has moved away from the vibrator 25. Each time the lug 69 on the lever 66 is brought into the operating path of the projection 71 it is ready to restrict in the next typing operation the operation of the vibrator controlling lever 72 so as to bring the high-use track 27" (FIG. 8) of the ribbon 27 to the printing point. If the lug 69 (FIG. 2) conversely is brought out of the operating path, then the operation of the vibrator 25 in the next typing operation will be restricted either by the lug 81 or the lug 97, dependent on the prevalent case shift state of the machine.

Normally the follower lever 75 associated with the cam 80 rests on one of the lobes thereof and in such position, through the lever 72 holds the ribbon vibrator 25 retracted from the printing point. Immediately upon the start of any cyclic rotation of the cam 80, such cam 80 allows the follower lever 75 to become spring moved, clockwise in FIG. 2, to facilitate operation of the lever 72 by the resilient means 78 to lift the ribbon vibrator 25. However, the magnitude of the operation of the lever 72, and thus the magnitude of lift of the vibrator 25, depends on what stopping condition is afforded by the lugs 69 and 97 for the lever 72 when the cyclic rotation starts. Namely, if the cyclic rotation is effected while the case shift mechanism is in normal case state, then the resilient lift of the vibrator 25 may become stopped by the lug 69 or the lug 81, depending on whether in the last previous typing operation the lever 66 became operated from its full line to its dotted line position, or vice versa. On the other hand, if a cyclic rotation is effected while the case shift mechanism is in upper case state and thus the lug 97 is in the lowered position, then the lift of the vibrator 25 may become stopped by the lug 69 or the lug 97, depending on whether in the last typing operation the lever 66 became operated from the full line to the dotted line position, or vice versa.

To condition the machine for nonuse of the ribbon 27, the stated control 86 is moved to the dotted position. This swings the bail 83 to position the finger 84 to the dotted, vibrator blocking position and further incapacitates the ribbon-feeding mechanism.

What I claim is:

1. In a typewriter having typing instrumentalities power operable transitorily to effect individual typing impression at a printing point,

- a ribbon vibrator means operable from a retired to an operated position to present a ribbon at a printing point,
- resilient means for exerting an operating urge on said ribbon vibrator means toward said operated position,
- a cyclically rotatable cam,
- cyclic means effective incidental to each transitory operation of said typing instrumentalities to impart a cyclic rotation to said cam,
- a follower means controlled by said cam to hold said ribbon vibrator means normally in its retired position against the

urge of said resilient means, but early in each cyclic rotation of said cam being operative to cause an operation of said vibrator means by said resilient means,

a vibration stop for said ribbon vibrator means for limiting its vibration to a high throw for selection of a low-ribbon track, said vibration stop remaining standing during the machine operation,

a stop (means) member for said ribbon vibrator means for limiting its vibration to a low throw for selection of a high-ribbon track, said stop (means) member being movable into and out of the operating path of said ribbon vibrator means respectively to one or another position to become alternately effective with said vibration stop, and

means to effect incident to each cyclic rotation of said cam, late in such cyclic rotation, a positional alternation of said stop (means) member, whereby said ribbon vibrator means at alternate typing operation is given by said resilient means one time a high- and the other time a low-ribbon vibrating throw.

2. The invention set forth in claim 1, further including

a case shift mechanism movable from a lowercase to an uppercase state to condition the typing instrumentalities for typing by uppercase types,

a stop element normally out of the operating path of said vibrator means and controlled by said case shift mechanism when moved to said uppercase state, to become positioned for stopping said ribbon vibrator throw slightly short of the high-throw limit afforded by said high-throw ribbon vibration stop,

whereby in typing operations effected, while said stop means is out of the path of said ribbon vibrator means and while said case shift mechanism is in uppercase state, there will result a throw of the ribbon vibrator means slightly short of said high-throw limit afforded by said high-throw ribbon vibration stop.

3. In a typewriter having typing instrumentalities power-operable transitorily to effect individual typing impressions at a printing point,

a ribbon vibrator means operable from a retired to an operated position to present a ribbon at a printing point,

resilient means for exerting an operating urge on said ribbon vibrator means,

a first cyclically rotatable cam,

a second cyclically rotatable cam,

cyclic means effective incidental to each transitory operation of said typing instrumentalities to impart a cyclic rotation to said cams,

a follower means controlled by said first cam, to hold said ribbon vibrator means normally in its retired position, but early in each cyclic rotation of said cams being operative transitorily to cause an operation of said vibrator means by said resilient means,

a ratchet wheel having a given number of teeth,

ratchet wheel feeding means including a follower associated with said second cam, to impart a single tooth advance to said ratchet wheel late in each cyclic rotation of said second cam,

a toothed control wheel having half the number of the teeth said ratchet wheel has, being rotatively associated with said ratchet wheel and having voids intermediate its teeth,

a vibration stop for said ribbon vibrator means for limiting its vibration to a high throw for selection of a low-ribbon track,

a stop means for said ribbon vibrator means for limiting its vibration to a low throw for selection of a high-ribbon track, said stop means being movable into and out of the operating path of said ribbon vibrator means, and

means governed by successive tooth advances of said ratchet wheel late in the cyclic rotation of said second cam, to control said stop means by the teeth and intermediate voids of said control wheel to become moved into and out of the vibrating path of said ribbon vibrator means, whereby said ribbon vibrator means at alternative

typing operations is given alternatively a high- and low-ribbon vibrating throw by said resilient means.

4. The invention set forth in claim 3,

said governed means including a sensing element which incidental to successive single tooth advances of said ratchet wheel alternately is moved into a tooth void or is cammed out of it,

spring means urging said sensing element to enter said voids, and

means connecting said sensing element to control said stop means to move into and out of the path of said ribbon vibrator means at alternate tooth advances of said ratchet wheel.

5. The invention set forth in claim 3, further including

a ribbon feed roll rotatable by said ratchet wheel to draw a ribbon threaded through said vibrator means therepast each time a distance of about a half letterspace,

a stop member movable from an idle to an operated position to block movement of said ribbon vibrator means by said resilient means,

an element movable from an idle to an operated position to incapacitate said ratchet wheel feeding means, and

a control having operative connections with said stop member and said movable element to set them concomitantly in their idle or operated positions.

6. The invention set forth in claim 3,

said cyclically rotatable cams having a plurality of cam sectors, and

said cyclic means incidental to each transitory operation of said typing instrumentalities imparting a fractional rotation to said cams in accord with the number of cam sectors.

7. In a typewriter having typing instrumentalities each one associated with a type bar and operable to effect individual typing impression,

each type bar being provided with a lowercase type and an uppercase type,

a case shift mechanism movable from a lowercase to an uppercase state to condition the type bars for typing by uppercase types,

a ribbon vibrator means operable from a retired to an operated position to present a ribbon at a printing point, resilient means for exerting an operating urge on said ribbon vibrator means,

holding means to hold said ribbon vibrator means normally in its retired position, but early in each printing operation being operative to cause an operation of said vibrator means by said resilient means,

a vibration stop for said ribbon vibrator means for limiting its vibration to a high throw for selection of a low-ribbon track,

a stop means for said ribbon vibrator means for limiting its vibration to a low throw for selection of a high-ribbon track, said stop means being movable into and out of the operating path of said ribbon vibrator means,

means to effect incident to each printing operation, late in such operation, a positional alternation of said stop means, whereby said ribbon vibrator means at alternate typing operations is given by said resilient means one time a high- and the other time a low-ribbon vibrating track, and

a stop element normally out of the operating path of said vibrator means and controlled by said case shift mechanism when moved to said uppercase state, to become positioned for stopping said ribbon vibrator throw slightly short of the high throw limit afforded by said high-throw ribbon-vibrating stop,

whereby in typing operations effected, while said stop means is out of the path of said ribbon vibrator means and while said case shift mechanism is in uppercase state, there will result a throw of the ribbon vibrator means slightly short of said high-throw limit afforded by said high-ribbon vibration stop.

40

45

50

55

60

65

70

75