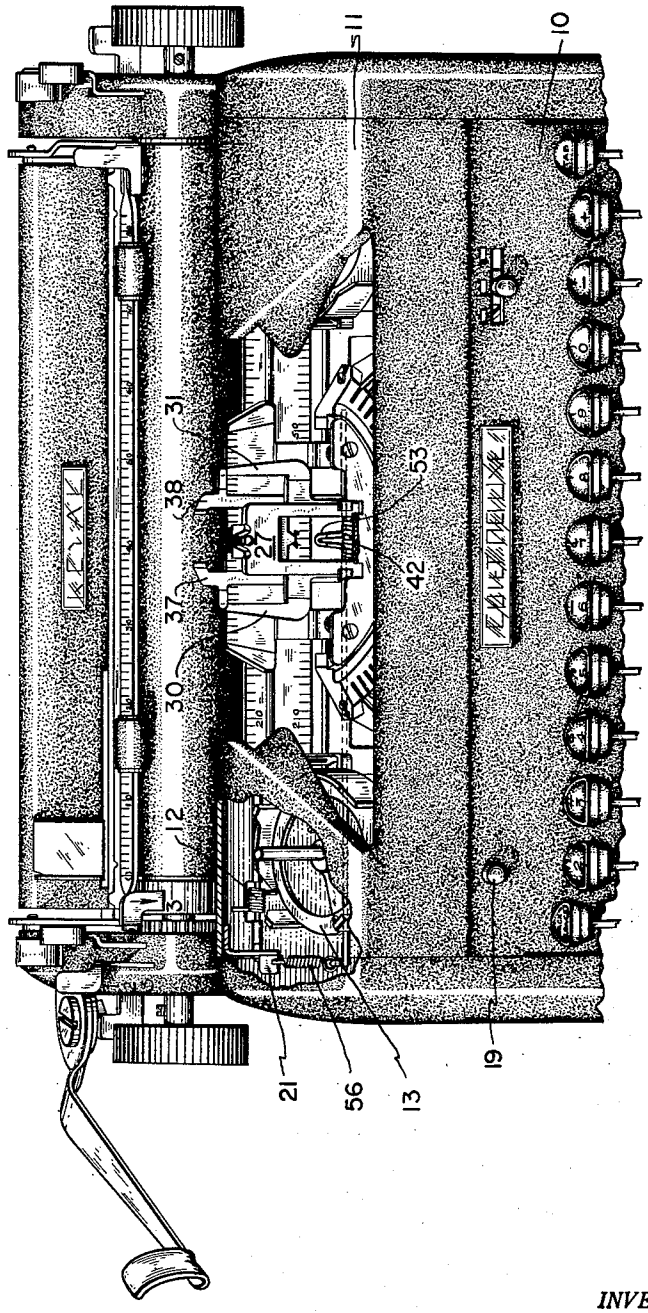
Feb. 11, 1958 E. A. ROY 2,822,909

APPARATUS FOR AUTOMATICALLY OPENING AND CLOSING THE EYES OF A RIBBON CARRIER FOR TYPEWRITERS AND LIKE PRINTING MACHINES

Filed Oct. 30, 1956 3 Sheets-Sheet 1

FIG. 1



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FIG. 4

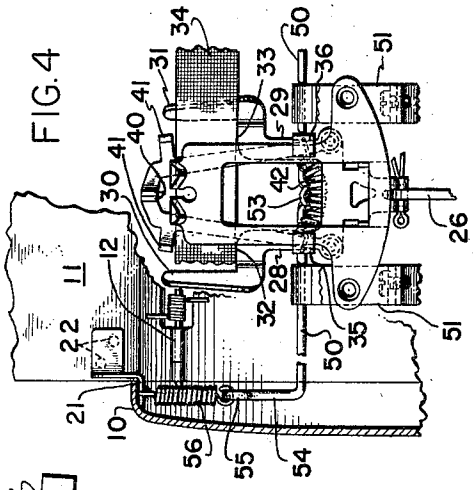


FIG. 3

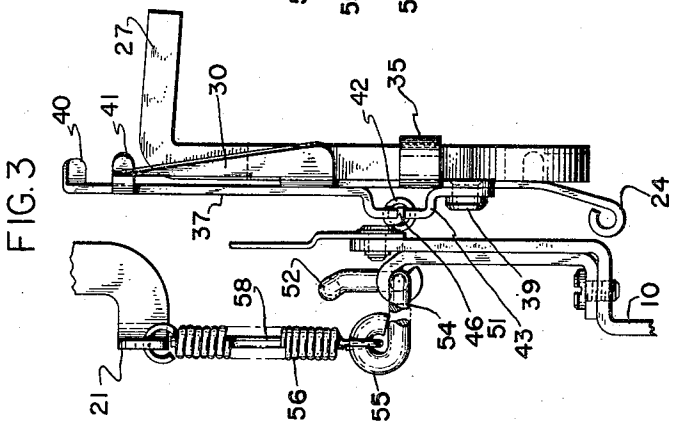


FIG. 2

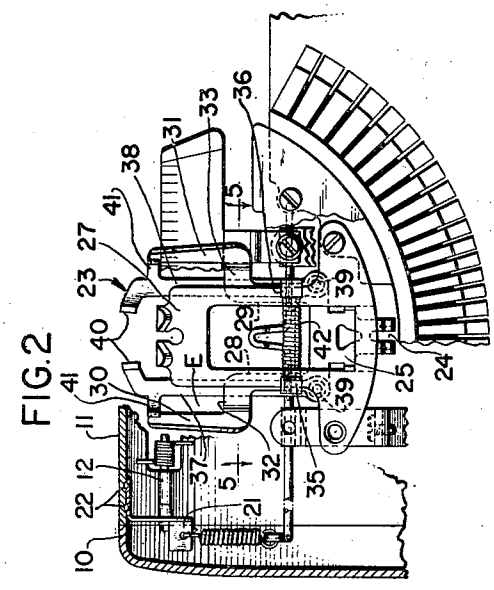
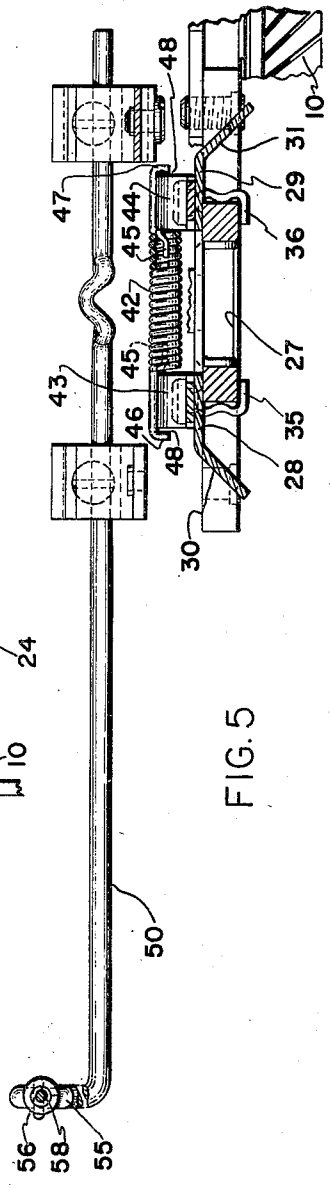


FIG. 5



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FIG. 6

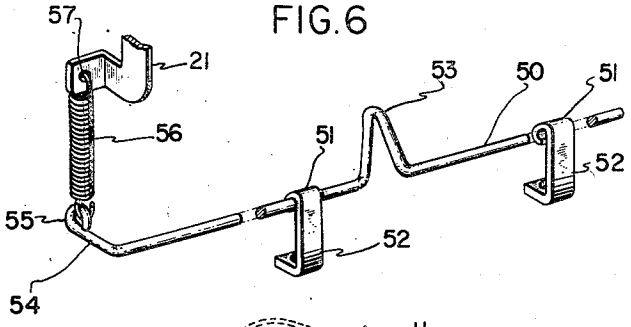
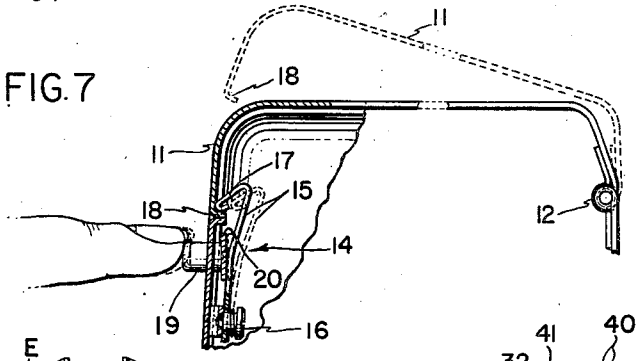


FIG. 7



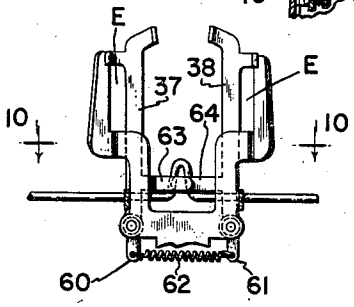


FIG. 8

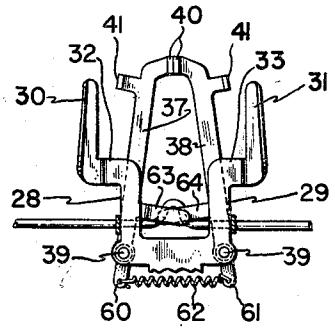


FIG. 9

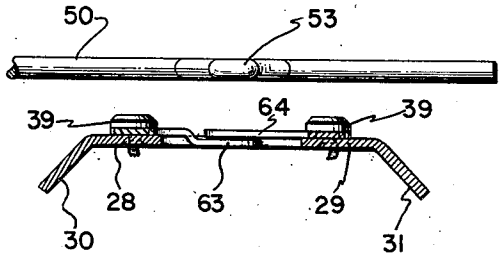


FIG. 10

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APPARATUS FOR AUTOMATICALLY OPENING AND CLOSING THE EYES OF A RIBBON CARRIER FOR TYPEWRITERS AND LIKE PRINTING MACHINES

Earl A. Roy, Unionville, Conn., assignor to Royal McBee Corporation, New York, N. Y., a corporation of New York

Application October 30, 1956, Serial No. 619,262

10 Claims. (Cl. 197—170)

This invention relates generally to printing machines, such as typewriters, adding machines and the like, having an inked printing ribbon supported adjacent the printing zone of the machine by a ribbon-carrier.

More specifically, the present invention contemplates the provision of new and novel apparatus for automatically opening and closing the eyes of such ribbon-carrier in order to facilitate quick and convenient insertion of the inked printing ribbon into said eyes or its removal therefrom.

Changing inked ribbons on printing machines, of the kind above referred to, has, for many years, been considered an undesirable and time consuming task, particularly by persons changing the ribbons, since this operation usually results in soiled fingers through contact with the ink in the ribbon.

Recent improvements have been made with a view toward eliminating the possibility of soiled fingers for the person changing inked printing ribbons. For example, one such improvement is disclosed in U. S. Patent #2,509,862, issued March 30, 1950, to E. H. Dreher wherein the eyes of the ribbon-carrier are formed by a pair of rigid arms and a pair of movable arms, the movable arms being pivoted with respect to the rigid arms. As shown in the Dreher patent, the movable arms of the ribbon-carrier are designed to be manually moved toward one another to an open ribbon-insertion or removal position, and held in such open position by spring detent means, until they are subsequently returned to closed ribbon-retaining position upon depression of any printing key of the typewriter. It is an object of the present invention to provide new and improved means for automatically opening and closing the movable arms of a ribbon-carrier, of the kind above referred to, without requiring the operator to touch the ribbon-carrier when opening the eyes or to strike a printing key to effect closure of such eyes.

Another object of the invention is to provide new and improved means, for automatically opening and closing the eyes of a ribbon-carrier, which can be operated by merely pushing a button or like control element conveniently located preferably at the front of the machine.

Further objects of the invention are to provide apparatus of the kind above referred to, which is of simple construction and which may easily be applied to, or combined with, existing typewriters or like printing machines of various constructions.

Still further objects of the invention are to provide an improved ribbon-carrier and operating means therefor which is durable and reliable in use and economical to manufacture.

These and other objects will be readily apparent to those skilled in the art of typewriters and like printing machines.

The invention consists in the construction, arrangement and combination of the various parts of the device whereby the objects contemplated are obtained, as hereinafter more fully set forth, pointed out in the claims, and illustrated in the accompanying drawings in which:

Fig. 1 is a fragmentary front elevational view of a typewriter embodying one form of the present invention.

Fig. 2 is a front elevational view illustrating a ribbon-carrier constructed according to the present invention, associated parts of a typewriter, and new and novel apparatus for automatically opening and closing the eyes of such ribbon-carrier.

Fig. 3 is an enlarged side elevational view of Fig. 2 but omitting certain parts of the typewriter appearing in Fig. 2.

Fig. 4 is a fragmentary view showing the top cover of a typewriter in open position and the ribbon-carrier eyes moved to open ribbon-insertion or removal position, such movement being effected through movement of said cover.

Fig. 5 is an enlarged horizontal sectional view taken on a plane corresponding to line 5—5 of Fig. 2 with a portion of the spring located between the movable arms broken away.

Fig. 6 is a perspective view of a portion of the apparatus for automatically opening and closing the eyes of the ribbon-carrier.

Fig. 7 is a vertical sectional detail of the top cover latch mechanism taken on a plane corresponding to line 7—7 of Fig. 1.

Fig. 8 is a front elevational view illustrating a modified ribbon-carrier construction and showing the movable arms of the carrier in closed or ribbon-retaining position.

Fig. 9 is a view similar to Fig. 8, but showing the movable arms of the ribbon-carrier in open ribbon-insertion or removal position, and

Fig. 10 is an enlarged horizontal section of the modified ribbon-carrier of Fig. 8 the section being taken along line 10—10 of Fig. 8.

The present invention will be described and shown in the accompanying drawings as embodied in a Royal typewriter, but it is to be clearly understood that the invention may be used with any make of typewriter or like printing machine with equal success.

Referring now to the drawings, wherein are shown specific embodiments of the invention and wherein like reference characters designate like or corresponding parts in the several views, there is shown in Figs. 1 and 7 a typewriter casing 10 which includes the usual or conventional top cover 11 pivotally supported by a pair of spring hinges 12, only one of which appears in the drawings. The spring hinges 12 permit the cover to swing from a closed position, illustrated in Figs. 1, 2 and 7, to an open position, illustrated in Figs. 4 and 7, in order to provide for convenient access to ribbon spools adapted to be mounted on holders 13 and various other parts of the machine located beneath the top cover. The top cover 11 is normally held in its closed position against the tension of spring hinges 12 by any suitable latch or holding means indicated generally by reference numeral 14 (Fig. 7).

In the illustrative embodiment shown in Fig. 7, latch means 14 comprises a spring member 15 secured in any suitable manner to the typewriter casing 10 as by bolts 16 or the like. The spring member 15 is adapted to extend within top cover 11 and is provided with a hooked end 17. The front portion of the top cover 11, which abuts the casing 10 in the closed position, has formed thereon an inwardly extending lip 18 adapted to cooperate with the hooked end 17 of the spring member 15 whereby the top cover 11 is held latched and closed against the tension of spring hinges 12. A release button 19 is preferably located so that one end projects out of casing 10, while the other end 20 is adjacent the spring member 15.

It will now be obvious that in order to release the top cover 11, when this is desired, release button 19 may be pushed inwardly, and in so doing, push the spring mem-

ber 15 so that its hooked end 17 is moved out of latching engagement with lip 18. Thereafter spring hinges 12 may act to swing top cover 11 upwardly to the open position, illustrated in dotted lines in Fig. 7, where its movement is arrested by an upstop 21 in cooperation with casing 10 (Figs. 2, 3 and 4). Upstop 21 may be spot welded, as indicated by reference characters 22, or otherwise suitably attached to the underside of top cover 11.

Referring now to Figs. 2 through 5 there is shown a ribbon-carrier generally designated by reference numeral 23 having a coupling adapter 24 on its lower stem end 25 arranged for pivotal connection to a vibrating lever 26 (Fig. 4). As is understood in the art the ribbon-carrier 23 is shifted vertically in sliding relationship along a type guide or anvil 27 to cover and uncover the printing zone. As seen from the drawings the ribbon-carrier 23 comprises a pair of spaced stationary arms 28 and 29 extending vertically from stem end 25. Stationary arms 28 and 29 are formed integral with upper vertically extending laterally displaced wings 30 and 31, the wings 30 and 31 being angularly disposed with respect to each other and to arms 28 and 29. The lateral displacements form horizontal portions 32 and 33 which serve to support the lower edge of ribbon 34 (Fig. 4). As seen in the figures stationary arms 28 and 29 are provided with ears 35 and 36 which embrace the type guide or anvil 27 to prevent lateral movement of the ribbon carrier 23. The ribbon-carrier further comprises, as is understood in the art, a pair of movable arms 37 and 38 within stationary arms 28 and 29, spaced apart from each other a sufficient distance to permit the type to pass therebetween. Spaced movable arms 37 and 38 are pivotally secured to the stationary arms below the horizontal portions 32 and 33, as at fulcrums 39. The free ends of the movable arms are provided with forwardly and outwardly bent pieces 40 and angularly disposed bars 41, the latter of which normally cooperatively engage the tips of angularly disposed wings 30 and 31, thus serving to prevent the ribbon 34 from riding up and out of eyes E defined by stationary wings 30 and 31 and movable arms 37 and 38.

In accordance with the invention movable arms 37 and 38 are biased in the closed position shown in Figs. 1 and 2 by a flexible member preferably a coil spring 42, interposed and mounted between them. As seen more clearly in Figs. 3 and 5 the movable arms 37 and 38 are formed with horizontal channels 43 and 44 therein, each channel having secured thereto an offset inwardly directed finger 45. Fingers 45 extend into the spring 42 and in cooperation with the extended ends 46 and 47 of spring 42, which bend around and loosely embrace the channel portions 43 and 44 of movable arms 37 and 38, maintains the spring 42 between said arms.

It will be noted from Figs. 3 and 5 that the coil ends of the unbiased spring 42 substantially squarely abut the facing edges of the channels 43 and 44, thereby maintaining movable arms 37 and 38 relatively rigid in a vertical position, and bars 41 in engagement with the tips of stationary wings 30 and 31. This feature further eliminates the possibility of the ribbon jumping out of the eyes while typing. As further seen in Fig. 5, clearances 48, between the outer channel edges and the extended embracing ends 46 and 47 of the coil spring 42, enables smooth performance of operation when the spring 42 is deflected, in that, the initial force of deflection takes up the clearances and the arms thereafter are drawn together more steadily about their fulcrums 39. Hence the mode of attachment described serves a dual purpose.

Referring now to Fig. 6 there is shown a rod 50 adapted to flex the spring 42 upon actuation of the release button 19, whereby the eyes E are automatically opened. Rod 50 is supported for rotation by eyes 51 formed in two spaced brackets 52, bolted or otherwise suitably secured to the typewriter frame. The rod has formed therein an actuator 53 comprising a substantially triangular kink or sharp crook. The actuator is substantially intermediate the spaced brackets 52 whereby it occupies a position immediately behind the spring 42 (Fig. 5). A portion of the rod at one end is bent rearwardly to form an arm 54 which, as shown in Fig. 6, terminates in an eye 55. A lever, or preferably a relatively stiff coil spring 56, joins the eye 55 to the top cover 11 through a bore 57 formed in the upstop 21. The spring 56 is preferable in that it acts as an impact absorbing element when the top cover is rapidly raised. A stiffening member 58 (Fig. 3) is also provided and maintained within the coils of spring 56 for reasons which will be apparent infra.

In operation then, in order to remove or insert a ribbon, the release button 19 is depressed and the hooked end 17 of leaf spring 15 disengages the lip 18 on the top cover 11. The top cover 11 is thereafter raised, through the force applied thereon by spring hinges 12, until stop 21, which moves with the top cover, contacts the typewriter casing 10. The movement of the upstop 21 urges spring 56 upwardly thereby raising arm 54 of rod 50. This movement causes the rod to rotate and in turn forces the actuator 53 against the central portion of coil spring 42, deflecting it downwardly (Fig. 4). As the spring is bowed it urges movable arms 37 and 38 toward each other until pieces 40 thereon substantially contact each other thereby opening the eyes E of the ribbon-carrier.

As is apparent a ribbon may then be removed and another inserted with ease. After insertion of the ribbon, top cover 11 is then moved downwardly to a closed position until it latches as hereinbefore described. In so doing the upstop 21 travels downward and, through the lever action of stiffening member 58 in coil spring 56, rotates rod 50 and actuator 53 therein out of engagement with the coil spring 42. Spring 42 then flexes back to its normal position, and urges the movable arms 37 and 38 apart to the closed or eye forming position.

Referring to Figs. 8, 9 and 10 there is shown a preferred embodiment which provides a more positive and reliable structure for actuating movable arms 37 and 38 to their open and closed positions. As seen in Figs. 8 and 9 the lower ends 60 and 61 of the movable arms extend beyond their fulcrum points 39 and are held in a horizontally spaced vertical eye closed position (Fig. 8) by an unbiased elastic member, preferably a coil spring 62, operatively connecting the two ends.

The movable arms 37 and 38 above their fulcrums 39 are each provided in a specific embodiment with integral horizontal arms 63 and 64 extending toward and overlapping each other. It is to be understood however that other suitable means such as a taut spring steel wire connecting said arms may also be employed. One of the arms 63 is offset from the other so that they may move relative to one another. In this embodiment the actuator 53 of rod 50 is placed immediately behind the arms 63 and 64 and as hereinbefore described, movement of the rod 50 causes the actuator 53 to apply a downwardly deflecting force upon arms 63 and 64 thereby urging movable arms 37 and 38 toward one another against the tension of spring 62. After a ribbon has been removed or inserted, and the top cover 11 is closed, arms 63 and 64 and integral arms 37 and 38 assume their normal positions through the action of spring 62 returning to its normal state.

It may be seen therefore that applicant has provided an automatically controlled ribbon vibrator mechanism which eliminates manually pinching the movable arms of the vibrator and which also eliminates the necessity for utilizing a type bar to spread the movable arms of the vibrator after a new ribbon has been inserted. This latter feature further enables a ribbon to be changed even when the machine is set for stenciling, a feature not possible in the prior art arrangements.

Obviously some changes may be made in the construction and arrangement of the automatic opening and

closure means for the movable arms of the improved ribbon-carrier without departing from the real spirit and purpose of the invention and it is the intention, therefore, to cover by the claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

The invention claimed is:

1. In a typewriting machine having a casing and a top cover, a ribbon-carrier comprising a pair of stationary arms, a pair of movable arms cooperating with said stationary arms to form guiding eyes for a ribbon, and means operatively connected with said top cover through which the movable arms can be automatically displaced upon opening of said top cover, whereby a ribbon may be inserted or removed, and thereafter automatically returned to ribbon retaining position upon closure of said top cover.

2. In a typewriting machine having a casing and a top cover, a ribbon-carrier comprising a pair of stationary arms, a pair of movable arms cooperating with said stationary arms to form guiding eyes for a ribbon, biasing means for normally maintaining said movable arms in contacting relationship with said stationary means, and means operatively connected with said top cover for altering said biasing means when said top cover is moved to an open position, whereby said movable arms are displaced from said stationary arms to facilitate a ribbon removal or insertion, and for returning said biasing means to normal upon closure of said top cover.

3. In a typewriting machine having a movable top cover, a ribbon-carrier comprising a pair of stationary arms having integral therewith laterally off-set vertically extending wings, a pair of movable arms pivotally connected to said stationary arms and cooperating with said wings to form guiding eyes for a ribbon, normally unflexed elastic means mounted between said movable arms for maintaining said eyes closed, and means connected and responsive to opening and closing of said top cover for effecting the flexing and unflexing of said elastic means whereby said eyes open and close in response to movement of said movable arms.

4. A typewriting machine as recited in claim 3 wherein said elastic means is a spring secured between said movable arms below their pivots, and further comprising means mounted on and between said movable arms above said pivots, said means connected and responsive to movement of said top cover being adapted to deflect said means, thereby urging said movable arms into an eye open position and stretching said elastic means, said elastic means upon closure of said top cover being adapted to return said movable arms to an eye closed position.

5. A machine as recited in claim 4 wherein said last named means comprises a pair of offset overlapping arms connected respectively to said movable arms.

6. In a typewriting machine having a top cover and a ribbon vibrator with stationary and movable arms forming ribbon guide eyes therein, means automatically responsive to opening and closing of said top cover for opening and closing said ribbon guide eyes, said means comprising an elastic member secured between said movable arms, and means mounted adjacent said elastic member for applying a stress thereto in response to the opening of said top cover, whereby said movable arms are displaced to an open eye position, and for relieving said stress when said cover is closed, whereby said movable arms return to a closed eye position.

7. In a typewriting machine having a top cover and a ribbon vibrator with stationary and movable arms forming ribbon guide eyes therein, means automatically responsive to opening and closing of said top cover for opening and closing said ribbon guide eyes, said means comprising a pair of offset overlapping arms connected respectively to said movable arms, means for normally maintaining said movable arms in ribbon guide eye closed positions, and means mounted adjacent said offset overlapping arms and cooperating therewith to impart angular movement to said movable arms in response to opening of said top cover whereby said arms are moved to ribbon guide eye opened positions.

8. A typewriting machine as recited in claim 3 wherein said elastic means comprises a spring secured between said movable arms above their pivots.

9. In a typewriting machine, a ribbon vibrator comprising a pair of stationary arms, a pair of movable arms pivotally connected to said stationary arms and cooperating therewith to form guiding eyes for a ribbon, biasing means mounted between said movable arms for normally maintaining said eyes closed, means for altering said biasing means whereby said movable arms are moved to ribbon guide eye open positions, and manually operable means for actuating said last named means.

10. In a typewriting machine as recited in claim 9 wherein said manually operable means comprises a control button on said typewriting machine, and means responsive to actuation of said button for actuating said means for altering said biasing means.

No references cited.