This invention concerns the platen carriages of typewriting machines and is particularly but not exclusively concerned with the kind of carriage wherein the platen is displaceable between operative and inoperative positions.

It is known in typewriting machines, particularly continuous stationery machines employed for manuscripting, to provide the carriage with a tear-off knife against which a typed length of paper may be torn from the stationery supply. In general, the knife should be located close above the typing station, and since the act of tearing off the paper imposes a considerable bending strain on it, it has to be of substantial cross section. It has been found that a comparatively flat oblong section located in the main tangential to the periphery of the platen with one thin edge adjacent to the platen surface is suitable. The difficulty arises, however, that the knife obscures at least some of the typewriter, and in billing and lets operations it is often necessary for the operator to refer to the material just typed for the purpose of transferring data to a calculating machine. Therefore, according to the present invention, a typewriting machine carriage is provided with a tear-off knife at the front of the platen which knife is movable between an operative position in which it is located close to the typing station so that the paper passes between it and the platen, and an inoperative position in which it is displaced from the platen and exposes the typing to view.

In certain continuous stationery machines embodying a carriage of the kind referred to above it is the practice to displace the platen to the inoperative position after the requisite length of typing has been completed so that the carbons or other transfer sheets may be retracted between the sheets of paper with which they are interleaved, and then to restore the platen to the operative position and to tear off the typed paper against a knife. According to a further feature of the present invention a typewriting machine carriage of the kind referred to has a tear-off knife normally located in the operative position close to the platen but movable between said operative position and an inoperative position in which it is spaced from the platen, and automatic means for causing the knife to assume its operative position when, subsequent to displacement of the platen, the latter is returned to operative position. Preferably, the knife assumes its normal relation to the platen prior to the latter reaching its operative position. Thus typing may proceed with the knife in the inoperative position in which the last few lines of typing are visible, the operator then moves the platen to inoperative position, retracts the carbons and upon or prior to the restoration of the platen to the operative position the knife automatically assumes its operative position in relation to the platen so that the typed paper may be torn off against it. This obviates separate movements by the operator for repositioning the knife to its operative position, and for restoring the platen to the operative position, and is a considerable advantage in the operation of the machine.

Since, as has been explained, the pull of the paper on the knife during tearing-off is considerable it is desirable that releasable latching mechanism shall be provided for holding the knife in the operative position. Furthermore, since it is necessary for the knife to remain in the inoperative position for a substantial period while typing proceeds it is further desirable that means shall be provided for retaining it in that position.

These and other features of the invention set out in the appended claims are incorporated in the construction which will now be described, as an example, with reference to the accompanying drawings, in which:

Figure 1 is an end view of a typewriter carriage incorporating the present invention;
Figure 2 is a plan showing the relevant parts thereof;
Figures 3 and 4 are sections on the line 3--4 in Fig. 2, looking in the direction of the arrows, and showing the knife in the "open" and closed positions respectively;
Figures 5 and 6 are like sections on the line 5--6 in Fig. 2;
Figure 7 is a plan of the relevant parts at the right hand end of the carriage shown in Fig. 2 and illustrating the manual release of the knife lock;
Figures 8 and 9 are respectively, sections on the lines 8--8 and 9--9 in Fig. 2; while
Figure 10 is a view, similar to Figs. 5 and 6, but illustrating the action when the platen is swung to the inoperative position.

In Figure 1 the invention is shown as applied to the typewriter carriage described in British Patent Specification 548,198. For details of reference may be made to said specification, but a brief description will be given herein and accorded the same reference numerals. The typewriter carriage 10 is pivoted at the front thereof to between the carriage ends 23, a sub-frame consisting of platen end plates 26 connected by a paper table 29 in which sub-frame the platen 11
is mounted by the platen spindle 19. The said sub-frame is displaceable about its pivot 22 (the axis of displacement being parallel to but in advance of that of the platen) by means of the paper support arm 30 to swing the platen 11 upwards and forwards away from the co-operating feed rollers 25, 26 and the paper tray 24 so that the feeding grip on the web of paper is relaxed. This displacement is effected by hand, the operator gripping the margin of the paper against the paper support arm 30 and pulling the support arm forward. At each end of the sub-frame there is a lever 35 pivoted at 35 and said levers being connected by a tubular member 21 to which the support arm 30 is attached. Thus when the support arm 30 is pulled forward said levers 36 are rocked around pivots 35 against the action of springs 38, the extent of movement being restricted by screws 42 passing through slots 41. At least one lever 36 carries a projecting stud or roller 33 which is thus brought into contact with a platen clamping lever 40 associated with a platen clamp 32, said clamp and lever being pivoted to the carriage end 23 at 33 and being driven by a spring 34 so that the clamp 32 normally overlies a roller 45 on the platen spindle 19. The lever 40 and clamp 32 are thereby moved to the left in Fig. 1, the extent of movement being determined by a screw 44 extending through a slot 40 into the carriage end. The pull on support arm 30 therefore unlocks the platen clamping mechanism and swings the platen upwards and forwards. In the return movement of the platen to its operative position the roller 45 on the spindle 19 makes contact with the arm 40 and displaces the clamp 32 so that an extent of the platen spindle 19 can pass freely into the cradles 46 provided for its reception in the carriage ends 23.

The knife 21 is of flat cross section, as will be appreciated from Figs. 3 to 6 and normally has its tearing edge (which may be serrated as shown in Fig. 2) located at the front of the visible platen 11 in close proximity thereto and just above the typng station at which the type characters strike and which, as is well known for the type of carriage illustrated, is approximately on the horizontal diameter of the platen, so that the typed paper passes upwards between the platen and knife 21. In this attitude of the knife 21 obscures a few rows of typing and it is therefore desirable that it shall be movable to what may be termed an open position in which it is spaced further away from the platen 11, and is preferably positioned edge-on to the platen so that all or nearly all the typing is visible to the operator. For this purpose the knife 21 is mounted by means of short side arms 60 on the pivot pins 22 by which the platen sub-frame is pivotally supported in the carriage 10 for movement of the platen 11 between operative and inoperative positions. The left-hand side arm 60 is attached to a cam member 61 (best shown in Figs. 5, 6 and 8) formed as a cam with two flanks or flats 61a and 61b thereon located at an angle to one another and co-operating with a leaf spring 62 secured at 63 to the left-hand platen end plate 20. In the closed position of the knife 21 the free end of the spring 62 bears on the flat 61a as shown in Fig. 5 and positions the knife 21 with a lug 64 (Fig. 3) bearing against a stop pin 71 projecting from the right-hand carriage end plate 23. Since in the closed or tearing off position of the knife 21 the pull on the paper being torn against its edge would tend to swing it to the open position, releasable locking mechanism is provided for locking the knife in the closed position. This locking mechanism comprises a latch member 65 pivoted at 69 to a part 20 on the right-hand platen end plate 20 and biased by a leaf spring 70 in the anti-clockwise direction, the extent of its movement being limited by a screw 72 extending through a slot 73. Figs. 2 and 7 show that a nose 66a on the latch overlies a surface on the right-hand side arm 60 of the knife 21.

The knife 21 is movable to the open position by a release lever 68 operation of which also serves to release the said latch 65. The said release lever 68 is pivoted on the right-hand pivot pin 22 and is connected to the right-hand side arm 60 by a lost motion connection. In the illustrated embodiment this lost motion connection comprises a pin 66 projecting from the inner face of the release lever 65 into an overize hole 71 in the aforesaid right-hand side arm 60. In movement of the release lever 65 in the clockwise direction (Figs. 3 and 4) the lost motion between it and the knife serves to release the latch 65 after which (connection having been established) a further movement of the release lever serves to swing the knife 21 about its pivots 22. In order to release the catch, at the outer face of the release lever 65 there is a conical projection or stud 71 adapted to engage with the up-turned end 68a of a finger on the latch arm 66 so that the release lever 65 rises, a slope of the projection 71 moves the latch 65 to the right in Fig. 7, and so removes the retaining nose 66a from above the side arm 60. During the subsequent movement of the knife to the open position the free end of the spring 62 moves over the lobe or crest 61c between the two flats 61a, 61b and so causes the knife to rotate about its pivots 22 until it reaches a position shown in Figs. 4 and 6 in which a stop lug 68a on the right-hand side arm 60 makes contact with the aforesaid stop pin 71 and the free end of the spring 62 bears on the flat 61b.

The knife 21 may be restored to the closed position by manual operation of the release lever 68. In the return movement the spring 62 rides off the flat 61b and over the crest 61c so that during the final stages of the closing movement the knife springs home. The engagement of the latching mechanism is automatic. The right-hand side arm 60 engages the inner front edge of the knife 21 and the platen are moved to the right (Figs. 2 and 7) and the projection 71 then engages the upturned end 68a and holds the knife in the release position until the knife is fully home whereupon the latch springs across to the latching position.

According to the present invention, however, if the platen 11 is raised to its inoperative position with the knife 21 already in its open position, the said knife is automatically coupled in the closed position for return with the platen. Considering Figs. 6 and 10, if the platen is swung in an anti-clockwise direction about its pivotal axis 22 it will be seen that the free end of the spring 62 is lifted by the flat 61b and rides over the lobe 61c. This therefore causes the knife to spring in a clockwise direction until it reaches the closed position with relation to the raised platen. In this spring influenced movement of the knife, the latch 65 is temporarily moved to the release position and then engages as before described so that when the platen is subsequently swung back to the operative position it carries the knife with it in the closed position. A single movement therefore serves to move the platen and the knife to operative position.
Details of the pivoted mounting of the platen and knife are shown in Figs. 8 and 9. The pivot pins 22 extend through the platen end plates 20 into bushes 74 which are therefore clamped against said ends, and these bushes are rotatably mounted in the carriage end plates 23, desirably by roller bearings 75. The cam member 61, to which the left hand side arm 68 is attached, rotates on the plain end of the left hand pin 22, but the right hand side arm 69 is attached to a bush 181 rotatable on the plain end of the right hand pin 22. Therefore the knife 21 is positioned endwise between bushes 74. The release lever 65 is attached to a sleeve 75 which encircles bush 181 and rotates in relation thereto within the limits of the lost motion connection.

1 claim:

1. A typewriting machine carriage of the kind having a platen displaceable between operative and inoperative positions; having a tear-off knife normally located in operative position close to the platen but movable between said operative position and an inoperative position in which it is spaced from the platen, and means for causing the knife to assume its operative position when subsequent to the displacement of the platen, the latter is returned to operative position.

2. A carriage according to claim 1, having means for causing the knife to assume its normal relation to the platen prior to the displaced platen reaching its operative position.

3. A carriage according to claim 1, having releasable latching mechanism for holding the knife in its operative position.

4. A carriage according to claim 1, having releasable latching mechanism for holding the knife in its operative position and for connecting the knife in its normal relation to the platen when the platen is displaced to inoperative position subsequent to movement of the knife to inoperative position.

5. A typewriting machine carriage of the kind comprising a platen, and a sub-frame displaceable on the carriage to move the platen between operative and inoperative positions; having a tear-off knife, means mounting said knife in the sub-frame for movement in relation to the platen between a closed position in which it is located close to the platen and an open position in which it is spaced from the platen, a manual control for moving the knife between its two positions when the platen is in operative position, and releasable self-engaging latching mechanism for latching the knife in its operative position and for latching the displaced knife in its normal relation to the platen in the sub-frame, when the latter is displaced to inoperative position, for return with said sub-frame.

6. A carriage according to claim 5, having a manual control for releasing the latching mechanism and for displacing the knife.

7. A carriage according to claim 5, having a manual control for releasing the latching mechanism and for displacing the knife, a lost-motion connection between said control and latching mechanism, and means whereby initial movement of the control, within the limits of said connection, releases the locking mechanism and subsequent movement displaces the knife.

8. A carriage according to claim 5, having spring means for biasing the knife, upon movement towards either of its two positions, into that position.

9. A typewriting machine carriage, comprising a platen, a sub-frame carrying the platen and pivotally mounted on the carriage for movement, about an axis which extends at the front of the platen parallel to the platen axis, between operative and inoperative positions, a tear-off knife at the front of the platen and movable with the sub-frame, in movement of the latter between said two positions, to retain its normal location with respect to the platen but also movable independently of the sub-frame between a closed position in which it is close to the platen and an open position in which it is spaced from the platen, manual means for moving said knife between open and closed positions, and automatic means for causing the knife to move to the closed position when, the knife being in the open position, the sub-frame is moved out of and then into operative position.

10. A typewriting machine carriage of the kind referred to, having a platen-carrying sub-frame pivotally movable on the carriage between operative and inoperative positions, a tear-off knife movable separately from the platen about the same pivot between an operative position in which it is located near to the platen and an inoperative position in which it is spaced from the platen, a stop for the inoperative position of the knife, spring means for biasing the knife towards that position, self-engaging releasable latching mechanism for holding the knife in the operative position and for automatically latching the inoperatively-positioned knife to the platen sub-frame, for return therewith to the operative position, when the sub-frame is moved to the inoperative position, and a manual control for releasing the latching mechanism and for moving the knife between operative and inoperative positions.

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