

Sept. 10, 1940.

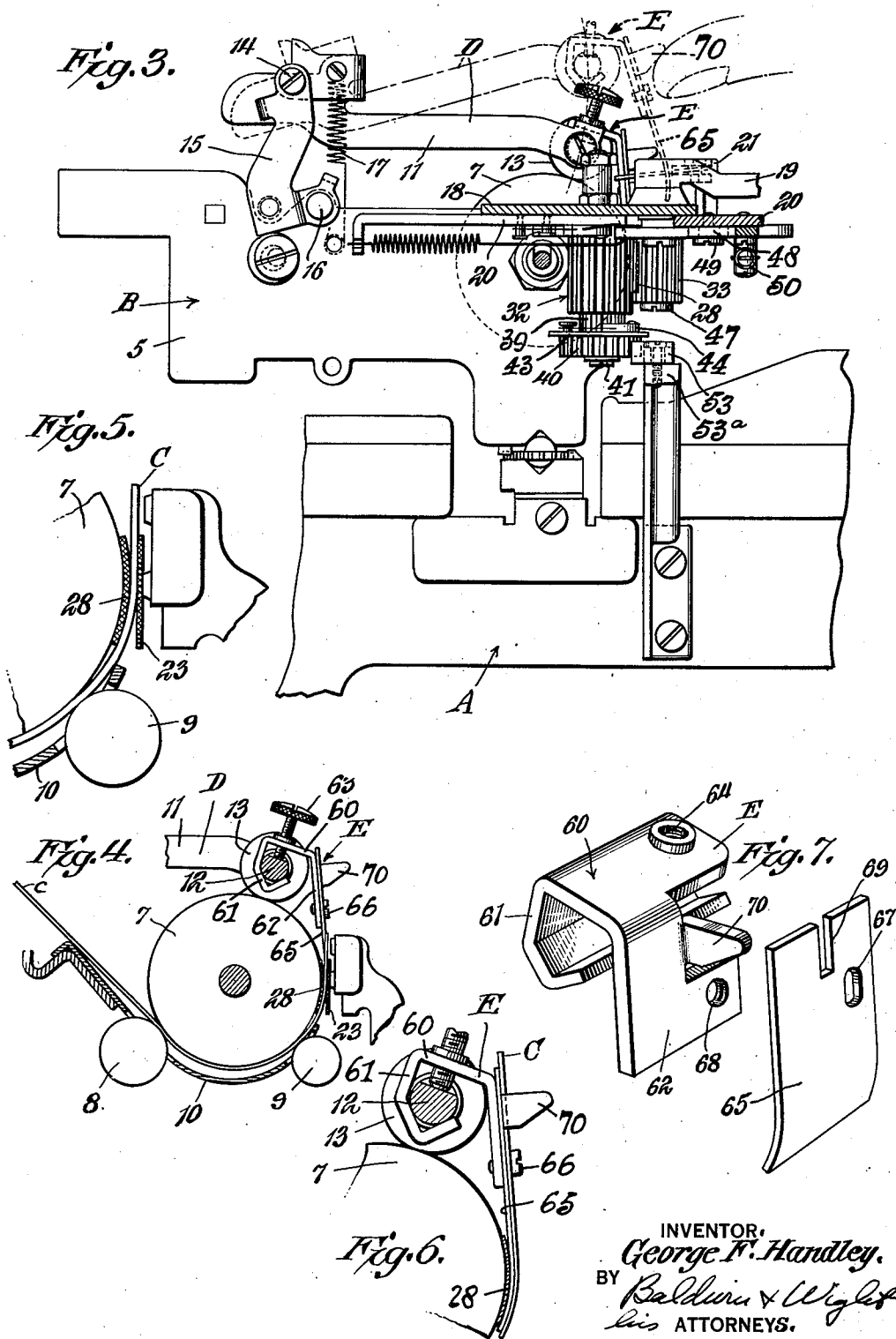
G. F. HANDLEY

2,214,413

TYPEWRITING MACHINE

Filed Oct. 22, 1937

3 Sheets-Sheet 2



INVENTOR,
George F. Handley.
BY *Baldwin & Wright*
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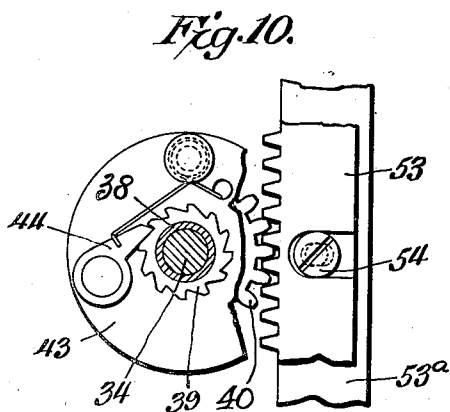
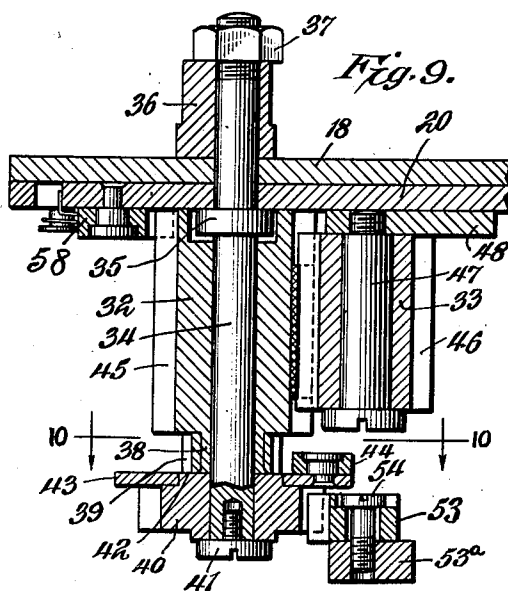
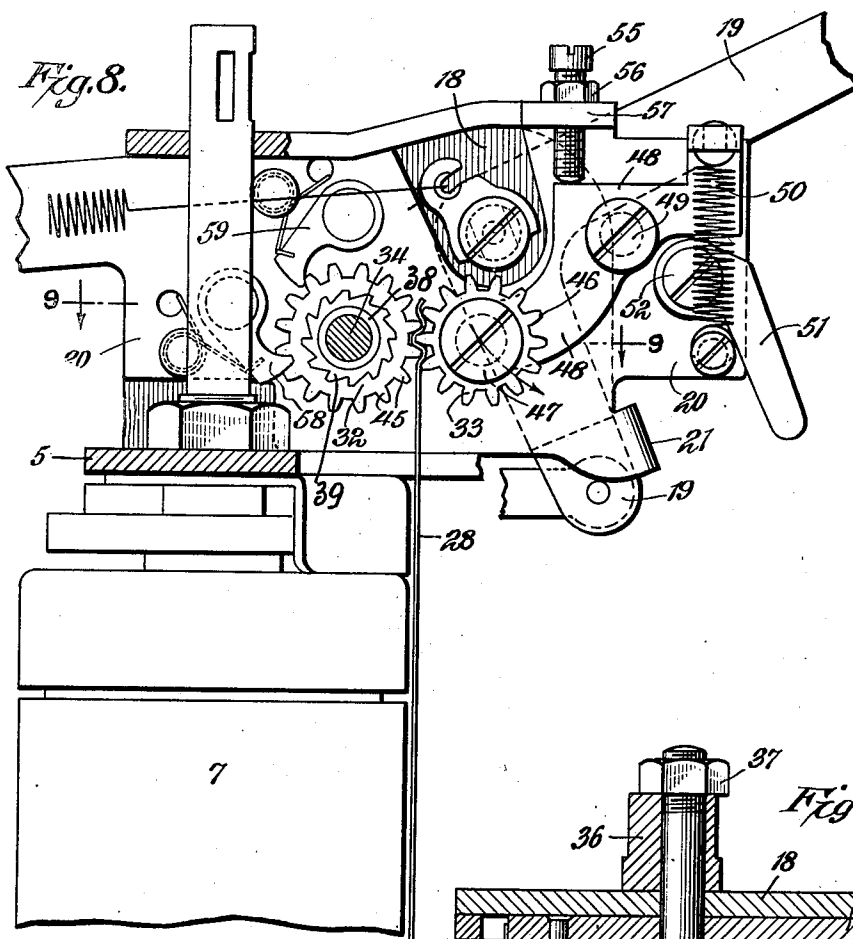
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G. F. HANDLEY
TYPEWRITING MACHINE

2,214,413

Filed Oct. 22, 1937

3 Sheets-Sheet 3



INVENTOR,
George F. Handley,
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UNITED STATES PATENT OFFICE

2,214,413

TYPEWRITING MACHINE

George F. Handley, Glendale, N. Y., assignor to
Royal Typewriter Company, Inc., New York,
N. Y., a corporation of New York

Application October 22, 1937, Serial No. 170,451

4 Claims. (Cl. 197-143)

This invention relates to new and useful improvements in typewriting machines generally, although more particularly to means for forming negative imprints on a master sheet which is subsequently used for reproducing numerous duplicates.

Heretofore, the master sheets have been printed on a typewriting machine with the aid of "hectograph" carbon sheets. This process of forming the master sheets has been found to be very expensive because one sheet of carbon paper can be used but once regardless of the length of the typed matter.

One of the principal objects of this invention is to reduce the cost of printing these master sheets by employing a typewriting machine having a narrow carbon strip of indeterminate length and of a width sufficient for a single printed line only, the free end portion of the strip being fed automatically lengthwise of the platen upon movement of the carriage in one direction.

Another object of the invention is to provide in such a machine a feeding means for the carbon strip which will feed a length of said strip from the supply equal to the previously typed line on the master sheet.

Another object of the invention is to provide in such a machine means for so mounting the carbon strip as to permit edgewise shifting of the strip so as to adapt the machine for two color work.

With these and other objects in view which will more fully appear, the nature of the invention will be more clearly understood by following the description, the appended claims, and the several views illustrated in the accompanying drawings.

In the drawings—

Figure 1 is a top plan view showing my invention applied to a typewriting machine,

Figure 2 is a front elevation thereof,

Figure 3 is an enlarged end view thereof,

Figure 4 is an end view, partly in section, showing the relation of the platen, the feed rolls, the paper sheet, the ribbons disposed in front of and in rear of the paper, one of the guides for the rear ribbon, and a type bar,

Figure 5 is an enlarged fragmentary view of the same,

Figure 6 is an enlarged fragmentary view of Fig. 4, but showing the master sheet in operative position,

Figure 7 is a view showing in separated perspectives the parts which form one of the guides for the rear ribbon,

Figure 8 is an enlarged bottom plan showing the feeding means for the rear ribbon,

Figure 9 is a vertical section taken on the line 9-9 of Fig. 8,

Figure 10 is a horizontal section taken on the line 10-10 of Fig. 9, and

Figure 11 is a fragmentary detail front elevation illustrating the use of a two color carbon strip and mounting means enabling edgewise shifting of the strip for presenting one or the other of the colored portions thereof in effective position.

Like reference numerals designate corresponding parts throughout the several figures of the drawings.

Referring to the accompanying drawings, I have shown my invention as applied to a Royal standard typewriting machine but it is to be understood, however, that the invention may be applied to other typewriting machines if desired.

In the present instance the typewriting machine includes a stationary main frame A and a carriage B. The carriage B is mounted on the main frame for the usual reciprocatory movements, viz., an intermittent or step-by-step movement from right to left which is effected in the usual manner by a motor and an escapement mechanism which is actuated by the key levers, or the space bar, and a return movement from left to right, such an escapement mechanism being illustrated in the patent to G. F. Handley, #1,212,939, January 16, 1917.

The carriage includes the usual end plates 5, 6 in which is journaled a platen 7, and also mounted on the carriage for cooperation with the platen for feeding a primary or master sheet C are the usual feed rollers 8, 9. An apron 10 is also mounted on the carriage for directing the lead-in end of the master sheet C forwardly under the platen and thence upwardly in front thereof. Mounted on the carriage end plates is a bail D for directing usual work sheets (when such are used) rearwardly over the platen. This bail D includes spaced supporting arms 11, 11 and a connecting bar 12 having journaled thereon pressure rollers 13, 13. The arms 11, 11 extend rearwardly over the platen and are pivotally connected as at 14, 14 to the upper ends of arms 15, 15 which are pivotally mounted as at 16, 16 on the end plates 5, 6 of the carriage. Springs 17 50 connect the arms 11 with the end plates of the carriage and function to yieldably retain the pressure rollers 13 against the platen. The end plate 5 is provided with a laterally extending integral shelf 18 on which is journaled a com- 55

bined line spacing and carriage return lever 19, said lever having the usual connections with the adjacent end of the platen 7 for rotating the same for line spacing purposes. A supplemental plate 20 is attached to the under face of the shelf 18 and is provided with an upwardly extending stop 21 for limiting the return movement of the lever 19. Supported on the main frame are two ribbon spools 22, 22 and the usual inking ribbon 23 is unwound from one spool and wound onto the other.

The typewriting machine as above described is of the usual construction and it is believed that a sufficient description thereof has been given for a clear understanding thereof to any one skilled in the art.

Mounted on the end plate 6 of the carriage is a longitudinally extending bracket 24 which terminates at its right hand end in a forwardly extending supporting arm 25 having a vertically disposed shaft 26 on which is journaled a spool 27 containing a roll formed by a transfer ribbon such as a carbon paper strip or ribbon 28 of indeterminate length. A tension plate 29 is mounted on the spool 27 above the carbon paper roll and a nut 30 is threadably mounted on the shaft 26 for tensioning said roll or supply. The free end of the strip 28 is led horizontally toward the left so as to extend longitudinally of and in front of the platen and along the writing line thereof, said strip passing in rear of a guide roller 31 journaled on the bracket 24 between the spool 27 and the end plate 6 of the carriage. The free end of the carbon strip after it passes beyond the left end of the platen is directed between a pair of strip feeding rollers 32, 33. The strip 28 is carbonized on its front face only. The roller 32 is disposed below the shelf 18 of the carriage and is journaled on said shelf through the medium of a vertical shaft 34 which projects upwardly through the supplemental plate 20 and the shelf. The shaft is provided with a shoulder 35 which bears against the supplemental plate 20, and a spacing sleeve 36 and nut 37 cooperate with the upper end of the shaft and with the shelf 18 to clamp the shaft to the shelf and plate.

The lower end of the roller 32 is provided with a reduced extension 38 on which is fixedly secured a ratchet wheel 39. A gear 40 is journaled on the lower end of the shaft 34 directly below the ratchet wheel 39 and a screw 41 which is threaded into the lower end of the shaft 34 functions to retain the roller 32, the ratchet 39, and the gear 40 on said shaft. The upper face of the gear 40 is provided with a reduced extension 42 on which is tightly fitted a plate 43. Pivotaly mounted on the upper face of the plate 43 is a spring pawl 44 which engages the teeth of the ratchet wheel 39 whereby the rotation of the gear 40 in one direction will effect the rotation of the roller 32 in the same direction, but which in the opposite rotation of the gear 40 will slide over the teeth of the ratchet wheel 39 without imparting rotation in either direction to the roller 32. The rollers 32 and 33 are preferably formed of metal and are respectively provided on their peripheries with corrugations or intermeshing teeth 45, 46. The roller 33 is journaled on a vertical shaft 47 which is fixedly secured to and depends from one arm of a bell crank lever 48 which is pivoted at its angle as at 49 to the supplemental plate 20. A coil spring 50 is connected at one end to the other arm of the bell crank lever 48 and to the supplemental plate 20 and functions to yieldably retain the roller 33 in mesh with the

roller 32. A cam lever 51 is fulcrumed as at 52 on the supplemental plate 20 for cooperation with the other arm of the bell crank lever 48 for swinging said lever to retract the roller 33 from the roller 32 whenever it is desired to position the free end of the carbon strip 28 between the rollers or to remove said strip therefrom. This cam lever 51 is so shaped that when it is swung to its operative position, the bell crank lever 48 will be effectively retained against closing movement, and consequently the rollers will be held in open relation until said cam lever is returned to its normal position.

In order to rotate the gear 40 when the carriage is moved in opposite directions, I have provided a horizontally disposed rack 53 which extends longitudinally of the carriage and is stationarily supported on the main frame A through the medium of a bracket 53a which is attached to the left wall of said main frame. The rack 53 is in constant mesh with the gear 40 and is mounted on the bracket 53a by screw and slot connection 54 whereby the rack may be adjusted toward and from said gear.

An adjustable screw 55 having a lock nut 56 is threaded into a depending lug 57 of the supplemental plate 20 for cooperation with the bell crank lever 48 to limit the inward or closing movement of said lever to thereby regulate the distance between the teeth or corrugations of the rollers 32 and 33.

In order to hold the strip 28 in a locked position and to prevent backward rotation of the driving feed roller 32 and its cooperating driven roller 33, I have provided two spring pressed check pawls 58, 59 which are pivotaly mounted on the supplemental plate 20. These pawls engage the teeth 45 of the roller 32 and function to check the backward rotation of the roller within a peripheral space of one-half tooth, thus insuring a tight condition of the ribbon at all times.

In order to protect the master sheet C from being marred by the carbon strip 28 when the latter is in its normal position or when it is being fed to present a fresh portion thereof to said sheet, I have provided spaced guards E, E which separate the master sheet C from said carbon strip 28. These guards are independently mounted on the connecting bar 12 of the bail D at points adjacent the ends of the platen 7. Each guard includes a supporting plate 60 which is bent to form a sleeve 61 which surrounds the connecting bar 12 of the bail D, the plate extending forwardly and downwardly from said bar, as at 62. The plate 60 is adjustably secured to the connecting bar 12 of the bail D by means of a thumb screw 63 which has threaded engagement in an opening 64 formed in the plate 60 and has clamping engagement against said connecting bar 12. A guard plate 65 is secured to the inclined supporting plate 62 by means of a screw 66 which passes through a vertical slot 67 in the plate 62 and engages in a threaded opening 68 formed in the supporting plate 62. The upper edge of the guard 65 is provided with a downwardly extending slot 69 for receiving a thumb piece and master sheet guide 70 which projects forwardly from the plate 62. It will, therefore, be seen that the guards E, E constitute combined work sheet protectors and guards and are independently adjustable along the connecting bar 12 of the bail D. By means of the thumb piece 70 of either guard, the operator may readily raise the bail D together with both guards whenever it

is desired to insert a carbon ribbon in the machine.

The platen 7 is provided with an axle extension 71 which is disposed in rear of the bracket 24 and is provided with a hand-wheel 72 at its outer end, the length of the shaft extension 71 being such that the carriage may be moved in either direction for the full distance without the hand contacting the ribbon spool 27. This position of the hand-wheel is also important in that it permits the operator to manually rotate the platen without interfering with the ribbon spool 27 or the ribbon 28.

In operation, the bail D is first elevated. A carbon ribbon 28 is positioned in the rear of the guide roll 31 and along the front face of the platen. The driven feed roller 33 is then swung forwardly by means of the cam lever 51, the free end of the carbon strip 28 is then positioned between the feed rollers 32, 33, the front or driven feed roller 33 is then returned to its normal position whereby the free end of the strip will be clamped between the two rollers 32, 33, and finally the bail is returned to its normal position with the guard plates 65, 65 disposed in front of the carbon strip 28. A master sheet is then positioned around the platen, the leading edge passing in front of the carbon ribbon 28 and in front of the guide plates 65, 65. The operator then types the original story on the front face of the master sheet C by means of the usual ribbon 23, and by reason of the carbon strip 28 being in rear of said sheet C, a reverse printed copy of the original will be printed on the rear face of said sheet. During the printing of each line of the original, the carriage will be moved by the usual escapement mechanism in letter space direction, that is, from right to left, and during this movement the ribbon 28 will not be fed owing to the fact that the pawl 44 will slide over the teeth of the ratchet 39. Consequently the strip 28 will be moved in unison with the carriage during said movement of the latter. When, however, the carriage is returned by the operator to its right hand position, the gear 40 will be rotated by the movement of the rack 53 and will positively rotate the roller 32 through the medium of the pawl 44 and ratchet wheel 39, and the rotation of the roller 32 will rotate the roller 33 and thereby effect a feeding of the ribbon strip 28. The ratio between the rack 53 and the gear 40 is such that a length of ribbon 28 will be fed which is equal to the length of the carriage return movement, or, in other words, the length of the fed ribbon is equal to the length of the previously typed line on the master sheet C. Furthermore, the rate of speed of the strip feed is equal to the speed of the carriage during its return movement, and consequently the strip remains stationary with respect to the main frame A during said return movement of the carriage. Thus it will be seen that the carbon strip feeding means is inactive during the entire movement of the carriage in letter space direction, and is active throughout the entire return movement of the carriage. As a result of this ribbon feeding mechanism, an entire fresh section of the carbon strip will be presented to the master sheet immediately prior to the printing of each line thereon. The extreme free end of the carbon strip 28 after it leaves the feed rollers 32, 33 is torn off from time to time by the operator.

It is desirable at times to type in credits or other matter in red or contrasting colors, similar to bichrome or two color ribbon work, and for that

purpose there is shown in Figure 11 of the drawings an arrangement whereby the carbon strip 28 can be shifted edgewise to effectively position selective upper and lower longitudinal half portions thereof. The pin on which the guide roller 31 is mounted is vertically extended as at 75 so as to enable up and down shifting of said roller, and the strip 28 is equipped with upper and lower half portions 76 and 77 of different color and selective by shifting of the position of the roller 31. The guide roller pin is provided with a pair of grooves 78 each centered on one strip portion 76 or 77 and adapted to receive a spring pressed ball 79 carried by the roller for yieldably holding the roller in one or the other of its shifted positions. At the position of the frame plate 5 the strip 28 passes through a guide fork 80 which may be shifted like the roller 31 to position the strip vertically in its selected positions.

It is of course to be understood that the details of structure and arrangement of parts may be variously changed and modified without departing from the spirit and scope of my invention.

I claim:

1. In a typewriting machine, a platen; means for positioning a transfer ribbon along the printing line of the platen; means for positioning a work sheet to extend past the printing line of the platen and in proximity to said ribbon; and a combined work sheet protector and guide comprising a guard part adapted to engage the face of the work sheet adjacent said transfer ribbon for resisting relative pressing of the work sheet against the transfer ribbon, and a part projecting forwardly beyond said guard part and being engageable by an edge of the work sheet for guiding the latter.

2. In a typewriting machine, a platen; means for positioning a transfer ribbon along the printing line of the platen; means for positioning a work sheet to extend past the printing line of the platen and in proximity to said ribbon; a combined work sheet protector and guide comprising a guard part adapted to engage the face of the work sheet adjacent said transfer ribbon for resisting relative pressing of the work sheet against the transfer ribbon, and a part projecting forwardly beyond said guard part and being engageable by an edge of the work sheet for guiding the latter; and means mounting said combined protector and guide for adjustment longitudinally of the platen.

3. In a typewriting machine, a platen; a bail; means for positioning a transfer ribbon along the printing line of the platen; means for positioning a work sheet to extend past the printing line of the platen and in proximity to said ribbon; and a combined work sheet protector and guide mounted on said bail and comprising a guard part adapted to engage the face of the work sheet adjacent said transfer ribbon for resisting relative pressing of the work sheet against the transfer ribbon, and a part projecting forwardly beyond said guard part and being engageable by an edge of the work sheet for guiding the latter.

4. In a typewriting machine, a platen; means for positioning and maintaining a transfer ribbon along the printing line of the platen; means for positioning a work sheet to extend past the printing line of the platen and in proximity to the ribbon; a bail mounted to swing about an axis at the rear of the platen and having a bar extending above and parallel to the platen printing line; and a combined work sheet protector and guide carried by said bail bar and comprising

a supporting plate embracing said bar and having a forwardly projecting part, a guard plate formed with a slot extending downwardly from its upper edge and receiving said forwardly projecting part, the latter extending through said slot for locating said guard plate with respect to said supporting

plate and projecting forwardly beyond said guard plate to serve as a thumb piece for lifting the bail and the protector and to serve as a guide for the edge of the work sheet.

GEORGE F. HANDLEY.