April 2, 1940. E. LOEWENSTEIN 2,195,464

TYPEWRITER

Filed March 8, 1939 3 Sheets-Sheet 1

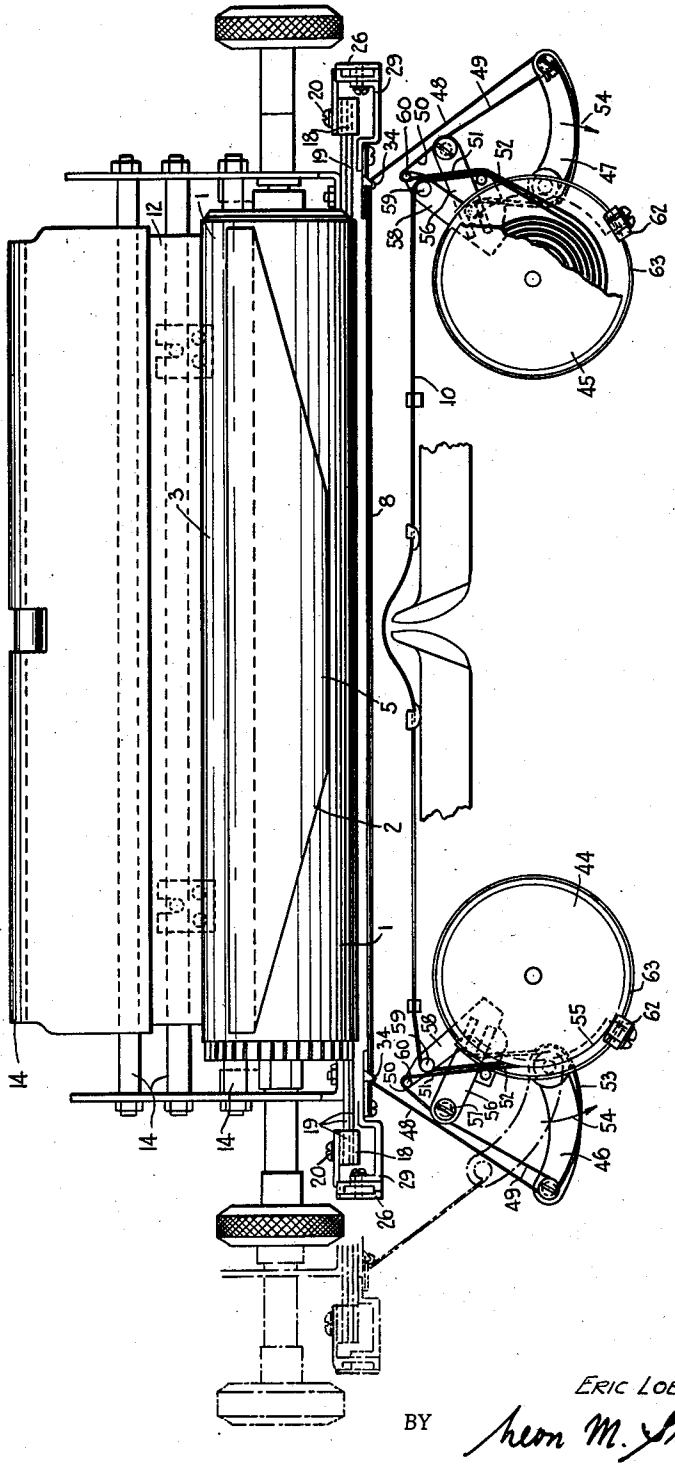


Fig. 1.

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TYPEWRITER

Filed March 8, 1939 3 Sheets-Sheet 2

Fig. 2.

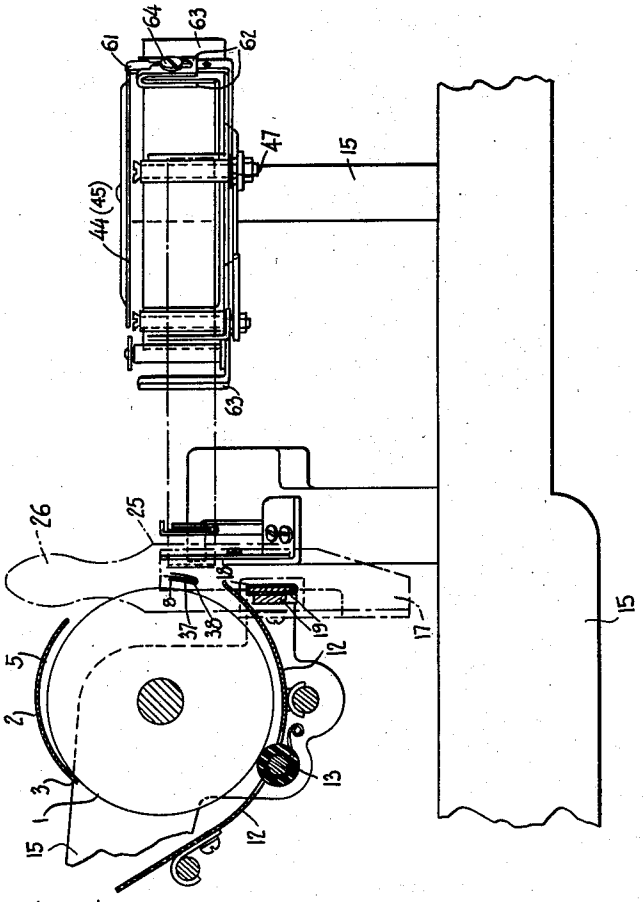


Fig. 10.

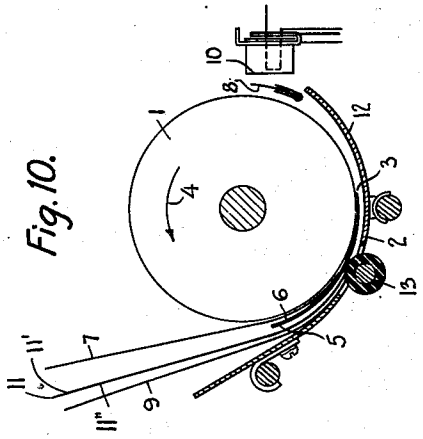
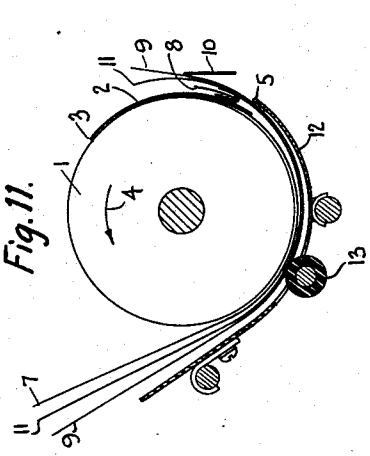


Fig. 11.



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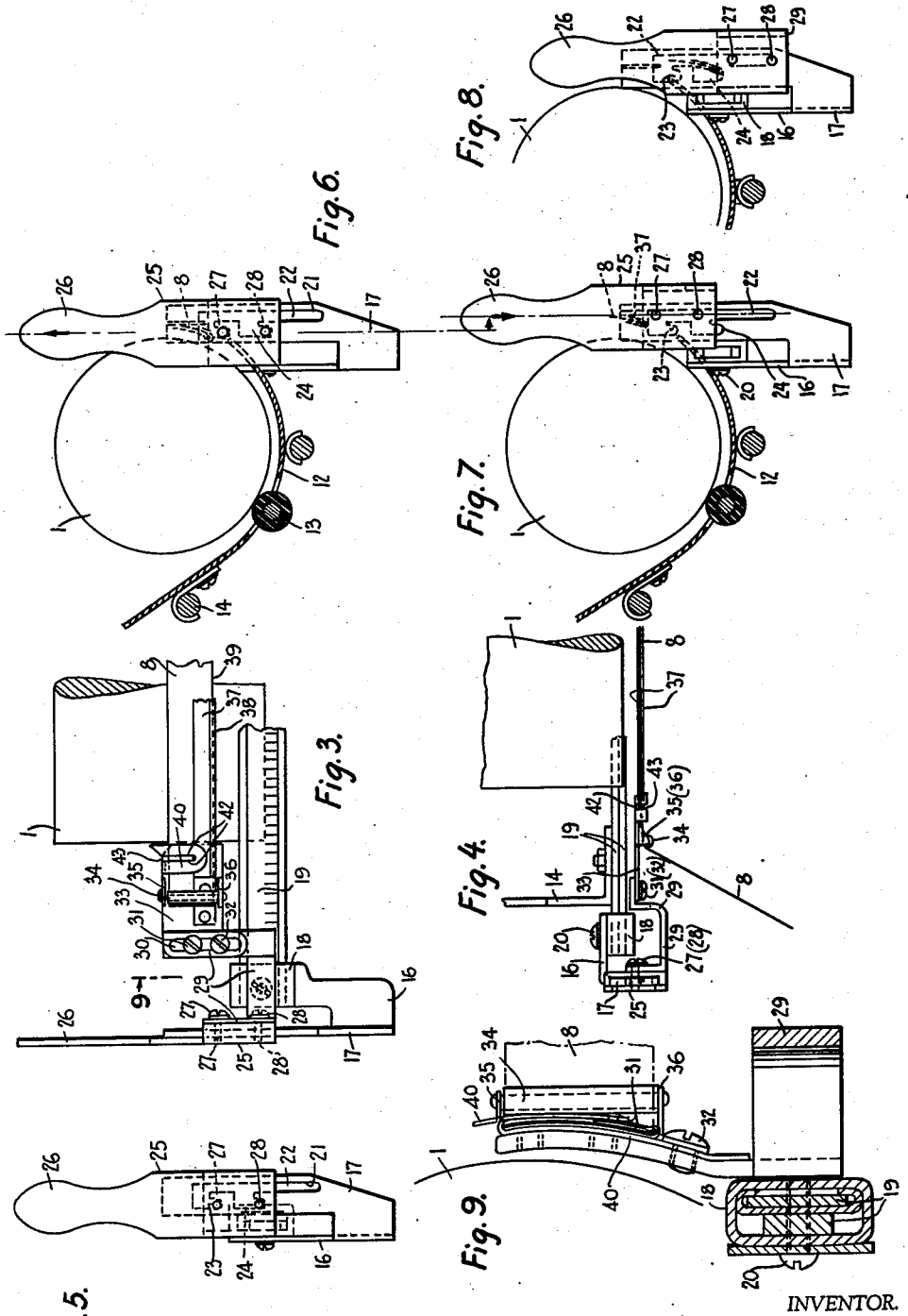


Fig. 8.

Fig. 6.

Fig. 7.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 9.

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UNITED STATES PATENT OFFICE

2,195,464

TYPEWRITER

Eric Loewenstein, New York, N. Y.

Application March 8, 1939, Serial No. 260,613
In Germany July 27, 1938

7 Claims. (Cl. 197—153)

The present invention relates to improvements in typewriters, and particularly to a device to be fixed on typewriters for the print of copies by means of typewriter ribbons which run alongside the cylindrical platen inside and between the copies in addition to the ribbon printing the original.

These additional ribbons are spooled on ribbon spools fixed on the machine-frame. These ribbons are directed by means of said spools and between mechanism maintaining them alongside the platen and the ribbon spools; they are fixed in a way enabling the sliding carriage to move on its guides.

With constructions of this kind the problem presents itself of separating the various copies when being inserted between platen and feed-roller or paper guide, in such a way that between the additional ribbons and platen those copies are put which are to be printed by the additional ribbons.

There must be provided means to render these additional ribbons ineffective. Special attention must be given to the guidance of the additional ribbons because it has been proved that they follow the line spacing and are moved out of the printing position. In accordance with the possibility to make use of the printing effects of both sides of the additional ribbons, heretofore there have been provided transparent copysheets, the print appearing as a negative being thus made legible. In those cases, in which this is not to be done, it has been proposed to cover or protect the additional ribbon. In such a case however complicated devices were needed to fix the covering ribbon. Therefore it is further necessary to construct this device so that the covering ribbon can be fixed with a simple manipulation.

Heretofore difficulties could not be overcome with respect to the guidance of the ribbon alongside the platen. For, while the ribbon should be taut, on the other hand it must be possible to switch the ribbon over independently of the movement of the ribbon spool.

Attempts to solve this technical problem have been made, for instance by guiding the ribbon through a rail pressing against the ribbon with a certain tension which was strong enough to keep the ribbon alongside the platen taut; but this did not prevent the movement of the spools having its effect on the movement of the ribbon. To obtain this exact tension, considerable difficulties were encountered.

Apart from this, one had to satisfied, that the movement of the ribbon was effected on both ends of the sliding carriage stroke; however, it is more expedient or desirable to get said movement in the usual manner, namely, with each touch of the keys.

Furthermore, besides overcoming the disadvantages regarding the guidance of the additional ribbons alongside the platen, another problem to be dealt with was the guidance of the additional ribbons between the guiding devices, which work alongside the sliding carriage and the spools, because the loose loops or folds of the ribbon entangle themselves and thus disturb the movement.

Specially when spooling the ribbon it may become entangled and there might be the danger that the ribbon will enter the guiding device. Since it cannot pass in this state, the movement of the carriage and spool are suspended. The movements of the sliding carriage are also hindered by loose ribbon folds and these folds may be damaged to such an extent that the ribbon becomes useless. There is also a possibility of soiling the operator's hands and the paper when touching the loops. Therefore the loops also need to be guided to exclude the above-mentioned drawbacks.

It is, therefore, a main object of the present invention to provide copying mechanism in a typewriter which mechanism is capable of efficiently producing copies of the original simultaneously therewith.

It is a further object of the present invention to provide in such machanism cooperative means for separating the paper sheets on which the type and the ribbons work, guiding thereby said sheets and ribbons properly and precisely to overcome certain prominent disadvantages heretofore known in the art of such devices.

It is still a further object of the present invention to provide means for temporarily eliminating or making inactive the additional ribbons when so desired for a different use.

These and other objects and advantages of the invention will appear from the following disclosure thereof together with the attached drawings which illustrate certain forms of embodiments thereof. These forms are shown for the purpose of illustrating the invention since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized and that the invention is not limited to the precise arrangement and organization of

the instrumentalities as herein shown and described.

In the drawings:

Fig. 1 is a plan view of the sliding carriage arrangement for a typewriter and of the spools fixed in the frame of the typewriter made in accordance with the invention.

Fig. 2 is a fragmentary side elevation of Fig. 1 partly in section.

Fig. 3 shows the front view of Fig. 1 with one end of the sliding carriage.

Fig. 4 shows a plan view of Fig. 3.

Fig. 5 shows a side elevation of a detail of Fig. 3.

Fig. 6 shows the same part and the adjacent parts of the sliding carriage in a working position of the additional ribbons.

Fig. 7 shows the same arrangement as Fig. 6, the additional ribbon however being in a position to be made inactive.

Fig. 8 is a view showing the end or lowermost position of the arrangement illustrated in Figs. 6 and 7.

Fig. 9 shows an enlarged sectional view in elevation along line 9—9 of Fig. 3.

Fig. 10 shows a vertical sectional view taken across the axis of the platen of certain parts at the beginning of the turning of said platen necessary for the insertion of several sheets of papers to be typewritten.

Fig. 11 is a view similar to Fig. 10 after the insertion is accomplished.

It has already been mentioned that the different paper sheets when inserted into the space between platen and feed roller, forming a kind of paper guide, have to be separated in a manner, such that there are, between additional ribbons and platen, those sheets which have to be printed by the additional ribbons. This does not, of course, apply to those copy sheets which, as they are transparent, become legible, when their back surface is printed in negative. For these copy sheets, seen in the direction of the ribbon printing the original are placed before the additional ribbons, so that the insertion of these sheets does not offer any difficulties. Heretofore, the necessary separation of the various paper sheets has been effected by arranging paper guides in addition to the usual one, or by allowing said sheets to be spaced for the sliding ribbons.

The arrangement of additional paper guides, however, offered difficulties, because these guides like the usual paper guides have to allow the feed rollers to work. As, however, the paper sheets when being inserted try to move in the direction of the tangent to the platen and besides this, have the tendency to curve, it became inevitable that the edges of the thin sheets of copy paper hit the edges of the paper guides so that these paper sheets were caused to rumple and to be spoiled.

The sliding ribbon, on the other hand, hindered (resting in an immovable position between the moved paper sheets) the transmitting movement of the platen on the paper, so that the various paper sheets do not move simultaneously together. This disadvantage was also manifest when additional paper guides were used, which necessitated an adjustment for each of the great number of makes of machines to which they would have to be fitted.

All these difficulties have been overcome by the present invention in view of the fact that on cylinder platen 1, as shown in Figs. 1, 9 and 10, there is provided a tongue 2 whose fixing point 3 on said cylinder is situated in front of the free tongue-end 5, so that the edge 6 of the copy-paper sheet 7 can be put underneath the tongue-end 5, which sheet has to be transported to and inserted between the additional ribbon 8 and cylinder platen 1. Figs. 1, 9 and 10 show only one additional ribbon 8 and only one copy-paper sheet 7, which has to be printed by said ribbon in the usual manner. Paper sheet 9, however, will be printed as an original by ribbon 10. Finally, there is used a paper sheet 11 which is transparent. The additional ribbon 8 being usable for print on both surfaces thereof will cause a positive print on sheet 11 seen from the side facing the typist.

Thus, it is necessary to insert the paper sheets 9 and 11 into the space between ribbons 8 and 10 and the sheet 7 in the space between ribbon 8 and platen 1, so that at the insertion through the space between platen 1 and the usual paper guide 12 with feed-roller 13 no difficulties will be encountered.

This purpose is served by guiding tongue or flap 2 as mentioned above. This tongue 2 made of any flexible and relatively thin material and capable of substantially conforming to the arcuate surface of the roller platen 1 is secured to the latter at one end thereof and longitudinally therewith. Said secured end and the adjacent portion of said platen serve as a stop for paper sheet 7. It is only necessary that the free back-edge 6 of said copy-sheet 7 be inserted between free tongue-end 5 and platen 1, while the remaining paper sheets 9 and 11 are inserted between the top surface of the tongue 5 and paper guide 12. If now the platen 1 is turned in the direction indicated by the arrow 4 (Figs. 10 and 11) for the purpose of the insertion-movement, the paper sheets 7, 9 and 11 come simultaneously under the influence of the feed-roller or rollers 13 so that all sheets are moved forward simultaneously. By tongue 2 being connected with platen 1 along line 3 (for instance by glueing), and because tongue 2 possesses a certain stiffness, the tendency of copy-sheet 7 to spread in a tangential direction to the inserted sheet has been entirely overcome. Thus, sheet 7 is compulsorily moved between ribbon 8 and platen 1, as illustrated in Fig. 11. Tongue 2 has, as shown in Fig. 1, a somewhat trapezoid form. To lessen its weight and bulkiness, it may consist of paper, which can be stiffened according to circumstances. In case of newly manufactured typewriters, the platen 1 can be grooved or adjusted to the installation of tongue 2, so that the round form of the roller in no way is impaired.

In order to make the additional ribbon temporarily inactive, for instance in those cases in which said additional ribbon 8 is not required, the following is provided:

On any suitable part of the sliding carriage 14 in which the platen 1 is mounted for horizontal movement with respect to the fixed frame 15 of the typewriter, support 16 is installed, which carries a small knife-like sideshield 17. In the present instance, sleeve 18 serves as fixing means for support 16 with the sliding carriage, on which the support is set up free of the adjusting-scale 19 of the sliding carriage 14. By means of a screw 20 the position of the sleeve 18 is secured relatively to scale 19.

Fastening of the support in the aforesaid manner does not offer the slightest difficulties and does not require any remodeling of the typewriter itself since suitable parts are provided on any make of typewriters so that the supplemen-

tary fastening of the support 16 never offers any difficulties. The side-shields 17 have a slotted cut-out 21 which is made in form of a double bayonet slot. Thus, apart from the longer bayonet slot 22 two shorter slots 23 and 24 are provided which are in connection with said slot 22.

On the fixed side-shields 17 which together with supports 16 and the fastening arrangement 18 and 20 are installed on both sides of the sliding carriage, sliders 25 are provided which terminate in regulating handles 26. The sliders 25 with relation to the shields 17 are secured in position by two screws 27, 28, said screws being so installed that their shafts may rest in the recesses 23, 24 or 22. The screws 27, 28 connect sliders 25 with U-pieces 29. The arm of U-piece 29 facing the slider 25 is provided with a slotted ear 30.

Screws 31, 32 connect to U-piece 29 carrier 33 receiving parts of the auxiliary ribbon, for guiding said ribbon alongside the platen. Rollers 34 are held in the upper and lower parts 35 and 36 of the carrier 33. Fixed to carrier 33 is the U-form rail 37 in which the auxiliary ribbon 8 slides. The channel provided in the rail 37 embraces the lower edge 38 of said ribbon 8, which lower edge 38 is made somewhat larger or beaded, as clearly shown in Fig. 9, thus providing a thickening of the ribbon 8 thereat. This thickening or enlarged edge maintains ribbon 8 against change in its position relative to the rail 37 except for movement in a horizontal direction.

Keepers 40 made of metal are vertically arranged with respect to the additional ribbons and have relatively sharp edges. They are slotted and formed similar in shape to a tuning fork and can be made unitary with the carrier 33. Thus, it is only necessary to introduce the covering ribbon (not shown) into the slot 43 of the keeper 40, so that the sharp edges 42 of the keepers press firmly against the covering ribbon (not shown) and keep it unmovably in position, so that printing in negative on the original sheet which is located in front of the additional ribbon will be thereby avoided. The covering material may consist of a tissue-strip preferably unaffected by any coloring matter.

Fig. 6 shows that when the sliders 25 are in a position indicated in Figs. 3 and 5, the additional ribbon 8 is in its working position resting between platen 1 and paper guide 12. If the sliders 25 are moved downwards on the shields 17, the ribbon 8 together with the carrying rail 37 will then enter deeper into the space between platen 1 and paper guide 12; but the additional ribbon would still remain within the printing area of the keys.

To eliminate the effect of the additional ribbons it is necessary to move the sliders 25 and 26 upwards in the direction as shown in Fig. 6. By this operation and when the sliders in their upper position 25, 26 are moved parallel to themselves, so that the screw shafts 27, 28 disengage from the shorter bayonet slots 23, 24 and enter into the longer bayonet slot 22, the ribbon 8 takes the position as shown in Fig. 7. If, however, this control movement of the sliders 25, 26 (Fig. 7) comes to an end (until the position of the parts as in Fig. 8 is reached), the ribbon 8 is completely inactive, as illustrated in Fig. 8. This position is, for instance, desirable if more than two copies have to be made by carbon sheets with a typewriter provided with only one additional ribbon. In such event, the installation of an additional ribbon and its guiding rail 37, 38 would be a hindrance. In such case, the elimination of the auxiliary ribbon according to Figs. 3–8 has to be made. Fig. 9 shows the coordination of parts for the switch off arrangement in enlarged form. From this figure it is evident that the side of the U-piece 29 provided with the slot 30 is adjusted to the bow form of the platen, thus enabling by means of the arrangements 30, 31 and 32 to adjust the working position of knee or support 16, which is dependent on those parts of the paper slider 14 which may fasten the knee 16 to the particular make of typewriter concerned.

The arrangement provided in accordance with this invention has the advantage that the additional ribbons do not necessarily move during the movements of the sliding carriage, so that the additional ribbons are always in the right position opposite the sliding carriage. However, the revolving of the spools together with each touch of the keys, simultaneously causes the longitudinal movement of the additional ribbons. During this latter movement, the additional ribbons are kept in unwrinkled condition and stretched alongside the platen, because the moving of the original ribbon and the corresponding movement of the auxiliary ribbon produce a natural strain thus keeping the same tight. The rail 37, 38 serves, thus, only to hinder movements of the auxiliary ribbons in transverse direction or perpendicular to the direction of the horizontal forward movement thereof.

The additional or auxiliary ribbon 8, however, does not only have to be led alongside the platen, but provision must also be made for guiding the additional ribbon between the rollers 34 and the spools 44 and 45. Wound on said spools in superposed relation are both the original ribbon 10 and the additional ribbon 8 as clearly seen in Fig. 1. Both ribbons are fed in a manner identical with the feeding of the conventional original ribbon in a typewriter and their horizontal movement are not impeded by the guide means hereinafter described. To guide also the parts of the ribbon between guide 34 and spools 44, 45 resilient levers 46, 47 are provided. These levers, the springs of which tend to turn them in a direction indicated by arrow 54, are fixed on segments 55. Fastened to these segments are carriers 56 upon which are mounted rollers 57. The carriers 58 supporting rollers 59 for guiding the original ribbon 10 are provided on each typewriter so that only the additional rollers 60 have to be installed. These, however, can also be provided on special carriers constructed similar to carrier 56 and adjustably fixed on segment 55. The segment 55 has a hinged dog hook arm 61 running parallel to the axis of the spool (Fig. 2). This arm is adjustably guided in a fork 62 suspended inside the spools. Thus it is possible to install the segment 55 with all necessary parts in any conventional spool-box.

As can now be understood all devices shown are independent of the particular make of typewriter to which they are to be applied; therefore, there is no difficulty encountered in providing any typewriter with additional ribbons. However, typewriters may be built incorporating these devices.

By the various means heretofore described, a wide range of variation or modification of characteristics may be had.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features or advantages before enumerated as desirable, but

which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a single embodiment, it will be understood that various admissions and substitutions and changes in the form and details of the device illustrated and its operation may be made by those skilled in the art without departing from the spirit of the invention.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent, is:

1. In a typewriter having a frame, a carriage longitudinally movable on said frame, a cylindrical platen on said carriage, friction rollers cooperating with said platen to transport superposed paper sheets between said platen and said rollers, a pair of spools ratatably mounted on said frame in spaced apart relation, at least two ribbons wound in superposed relation on one of said spools; the combination of means to guide said ribbons in spaced apart relation from said one spool to the other of said spools providing a front ribbon and a rear ribbon, and separating means secured at one side to said platen, said separating means aiding in transporting one paper sheet between said rear ribbon and said platen, when said one paper sheet is inserted between said separating means and said platen while the friction rollers transport another paper sheet of said superposed sheets between said ribbons upon rotation of said platen.

2. In a typewriter having a frame, a carriage longitudinally movable on said frame, a cylindrical platen on said carriage, friction rollers cooperating with said platen to transport superposed paper sheets between said platen and said rollers, a pair of spools rotatably mounted on said frame in spaced apart relation, at least two ribbons wound in superposed relation on one of said spools; the combination of means to guide at least one of said ribbons in horizontal direction from said one to the other of said spools, and separating means fixed at one side on said platen, said guiding means including a part to maintain said one ribbon in position during its longitudinal travel, said separating means aiding in transporting one paper sheet, when said one paper sheet is inserted between said separating means and said platen, between said one ribbon and said platen while the friction rollers transport another paper sheet of said superposed sheets between said ribbons upon rotation of said platen.

3. In a typewriter having a frame, a carriage longitudinally movable on said frame, a cylindrical platen on said carriage, friction rollers cooperating with said platen to transport superposed paper sheets between said platen and said rollers, a pair of spools rotatably mounted on said frame in spaced apart relation, at least two ribbons wound in superposed relation on one of said spools; the combination of means to guide said ribbons in spaced apart relation to the other of said spools, and means fixed at one side on said platen, said guiding means being positioned on said carriage and embracingly holding one of said ribbons at one edge thereof to permit its movement in horizontal direction, said means fixed on said platen aiding in transporting one paper sheet, when inserted between said fixed means and said platen, between said one ribbon and said platen, upon rotation of the latter while the friction rollers transport another paper sheet of said superposed sheets between said ribbons.

4. In a typewriter having a frame, a carriage longitudinally movable on said frame, a cylindrical platen on said carriage, friction rollers cooperating with said platen to transport superposed paper sheets between said platen and said rollers, a pair of spools rotatably mounted on said frame in spaced apart relation, at least two ribbons wound in superposed relation on one of said spools; the combination of means to guide said ribbons in spaced apart relation from said one to the other of said spools, and separating means secured at one side to said platen, said first means including a part positioned adjacent and along said platen to maintain one of said ribbons in position, and to separate said one ribbon from the other of said ribbons, when said ribbons are advanced along said platen, said second means aiding in transporting one paper sheet between said one ribbon and said platen, when inserted between said second means and said platen, upon rotation of the latter while the friction rollers transport another paper sheet of said superposed sheets between said ribbons.

5. In a typewriter having a frame, a carriage longitudinally movable on said frame, a cylindrical platen on said carriage, friction rollers cooperating with said platen to transport superposed paper sheets between said platen and said rollers, a pair of spools rotatably mounted on said frame in spaced apart relation, at least two ribbons wound in superposed relation on one of said spools; channel means adjacent said platen for longitudinally carrying one of said ribbons at the bottom edge thereof, when said ribbons are moved from said one to the other of said spools, and means fixed on said platen aiding in transporting one paper sheet, when inserted between said latter means and said platen, between said channel means and said platen upon rotation of said platen while the friction rollers transport another paper sheet of said superposed sheets between said ribbons.

6. In a typewriter having a frame, a carriage longitudinally movable on said frame, a cylindrical platen on said carriage, friction rollers cooperating with said platen to transport superposed paper sheets between said platen and said rollers, a pair of spools rotatably mounted on said frame in spaced apart relation, at least two ribbons wound in superposed relation on one of said spools; in combination means to guide said ribbons in spaced apart relation from said one to the other of said spools, said means including a displaceable channeled member adjacent said platen longitudinally carrying one of said ribbons at the bottom edge thereof, and separating means on said platen adapted to move one paper sheet, when inserted between said separating means and said platen, between said platen and said channeled member upon rotation of said platen while the friction rollers transport another paper sheet of said superposed sheets between said ribbons, said channeled member being adapted to be moved out of printing position.

7. In combination with a typewriter having a frame, a carriage longitudinally movable on said frame, a cylindrical platen mounted on said carriage, friction rollers cooperating with said platen to transport superposed paper sheets between said platen and said rollers, a pair of spools rotatably mounted on said frame in spaced apart relation, a plurality of inking ribbons wound in superposed

relation on one of said spools; displaceable means to guide at least one of said inking ribbons along the entire length of the platen, and flexible means secured at one side to the platen, said first means being positioned on the carriage adjacent said platen, said second means aiding in transporting one paper sheet, when inserted between said second means and said platen, between said one ribbon and said platen upon rotation of said platen while the friction rollers transport another paper sheet of said superposed sheets between said ribbons.

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