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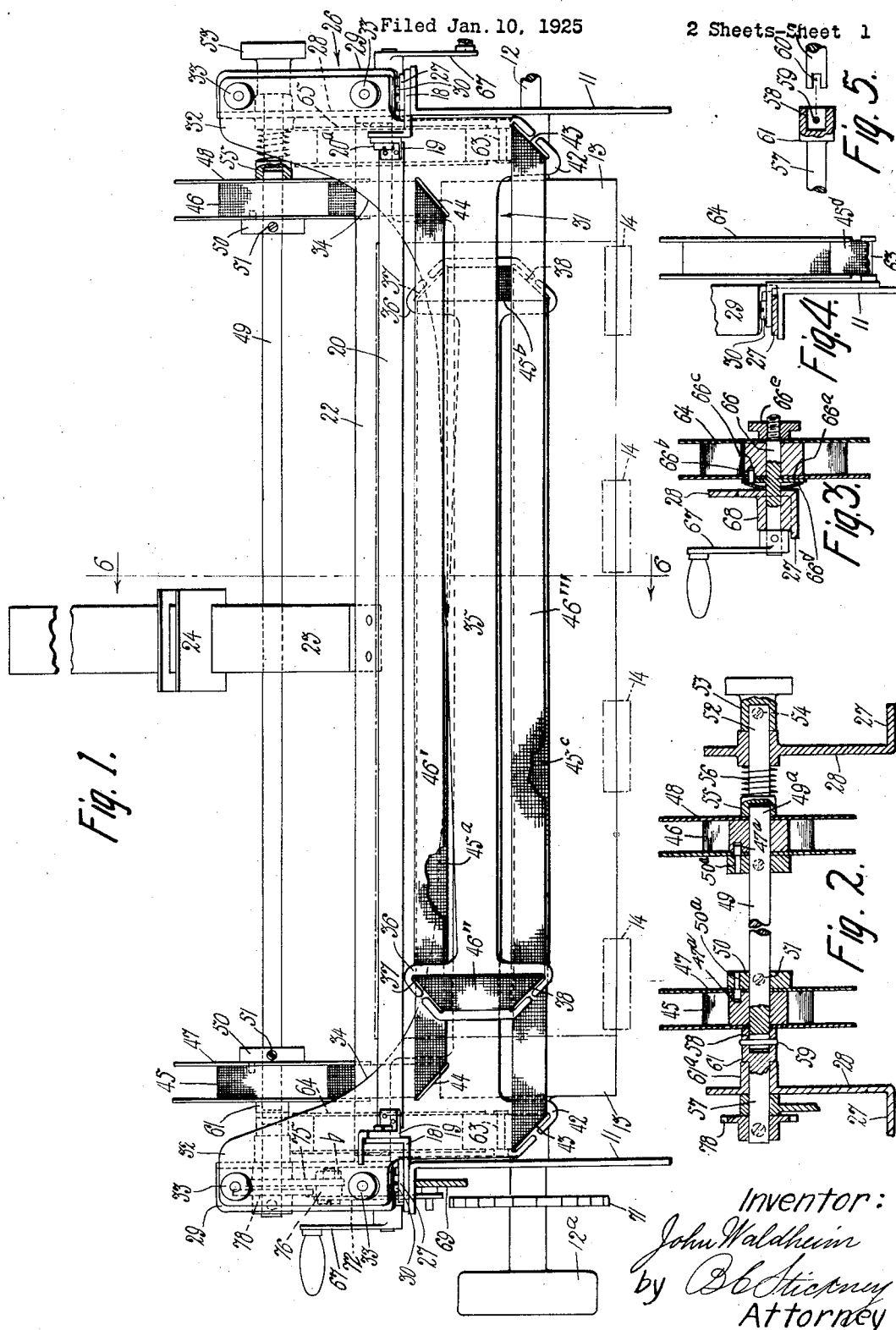
1,654,906

J. WALDHEIM

TYPEWRITING MACHINE

Filed Jan. 10, 1925

2 Sheets Sheet 1



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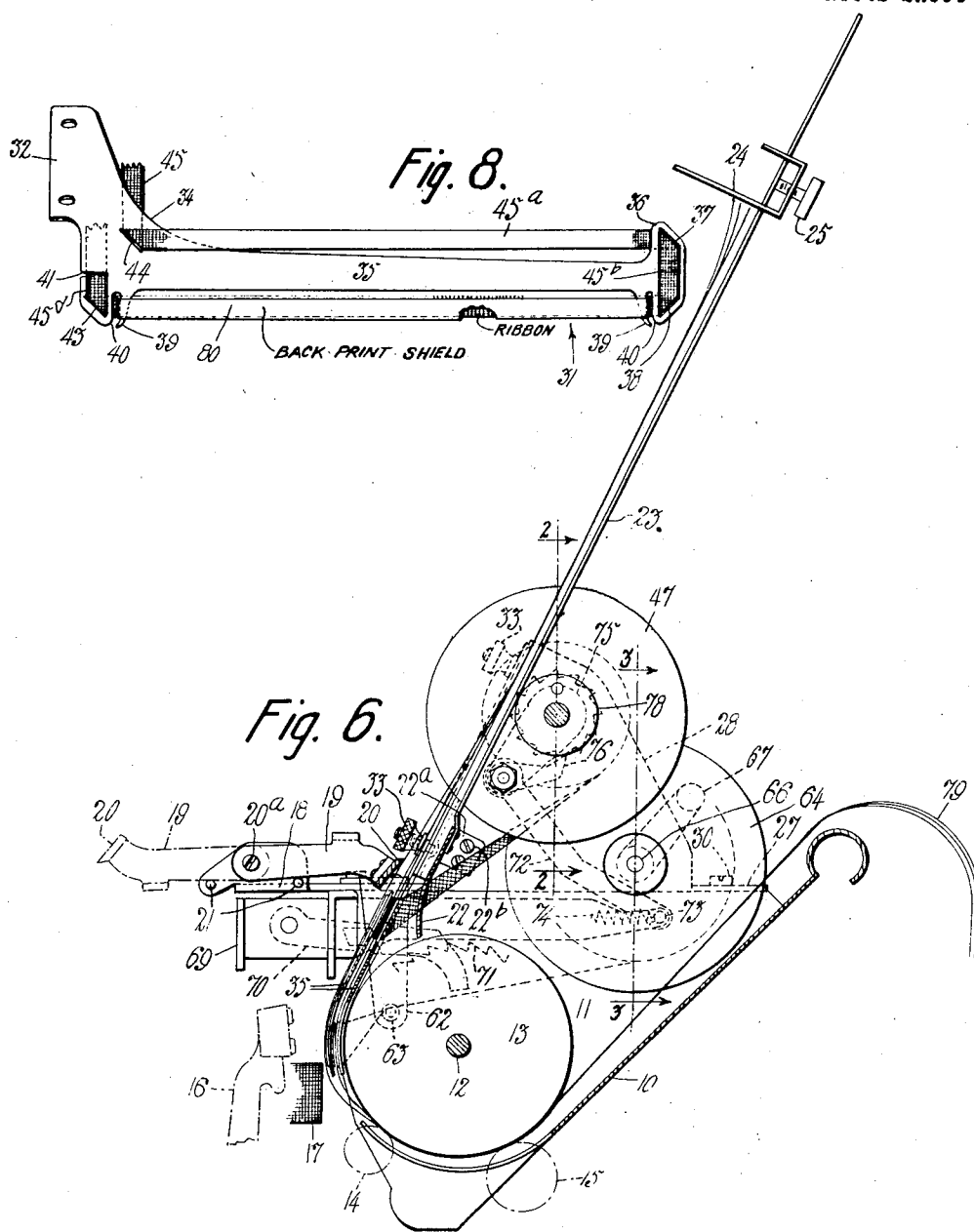
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UNITED STATES PATENT OFFICE.

JOHN WALDHEIM, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO UNDERWOOD TYPE-WRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

TYPEWRITING MACHINE.

Application filed January 10, 1925. Serial No. 1,524.

This invention relates to ribbon mechanism for typewriting machines, and more particularly to those used for manifolding on a fan-folded work-web in which the successive superposed plies of the web are joined at their opposite edges. The usual main ribbon is supported on the main frame of the machine and is used to type on the outer ply of the web. The manifolding or auxiliary ribbons are supported by brackets or plates on the carriage in a manner similar to that disclosed in my co-pending application, Serial No. 725,129, filed July 10, 1924 (now Patent No. 1,619,045, dated March 1, 1927), said brackets extending into the folds of the work-web from opposite sides of the carriage.

A feature of the invention relates to means to guide each auxiliary ribbon, so that it may readily be fed to present more highly-linked portions to the printing line of the platen.

Another feature of the invention relates to the manner of conducting each auxiliary ribbon in front of the platen, so as to present only a single ply to the printing line to thus keep the total thickness of the ribbons at a minimum, and consequently produce better copies than in the past. To this end the ribbon is caused to follow a U-shaped path, the stretch of ribbon forming one arm of the U-shaped path registering with the printing line of the platen, and the stretch of ribbon which forms the other arm of the U-shaped path extending along the platen and above the printing line.

Each auxiliary ribbon has a pair of ribbon spools associated therewith, one to deliver the ribbon, and the other to receive and thus feed the ribbon. The ribbon spools are arranged one pair on each side of the carriage. The ribbon-receiving spools of the various pairs are mounted on a common shaft, which is connected to the platen line-spacing mechanism to rotate said spools, and thus feed said auxiliary ribbons, while the platen is being rotated. To enable this common driving connection, which comprises a shaft between the ribbon spools, the ribbon deliv-

ery spools are separately supported on the carriage.

A further feature of the invention relates to means to prevent printing by the auxiliary ribbons on the back of the plies of the work-webs. To this end there is associated with each auxiliary ribbon a back-print prevention shield. These shields may be detachably supported on the ribbon-carrying arms, and are located in front of the active stretches of the auxiliary ribbons.

Still another feature of the invention relates to means for removing the ribbon-feeding spools in order to replace the worn-out ribbons.

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a front elevation of an Underwood typewriter carriage with the invention applied thereto.

Figure 2 is a cross-sectional view taken on line 2—2 of Figure 6, showing the mounting of the ribbon-feeding spools.

Figure 3 is a cross-sectional view taken on line 3—3 of Figure 6, showing one of the ribbon-delivering spools.

Figure 4 is a detail of a feed-and-rewinding spool and means for guiding the ribbon from the spool.

Figure 5 is a fragmentary view, showing a make-and-break shaft-joint between the shaft which supports the ribbon spools and the driving means connected to the line-spacing mechanism.

Figure 6 is a vertical end section taken on the line 6—6 of Figure 1.

Figure 7 is a diagrammatic top plan view of a fan-folded web, showing the blades extending from opposite ends into the folds thereof.

Figure 8 is a front elevation of one of the guide-plates showing a back-print shield attached thereto.

The invention is shown as applied to an Underwood typewriting machine, in which 10 designates a paper-shelf suitably supported upon end plates 11 of a platen-frame. The platen 13 is mounted on the plate-shaft

12, which is rotated by the finger-knob 12^a. 14 and 15 designate the front and rear feed-rolls associated with the platen 13. 16 designates the type-bars, which strike upon the main ink-ribbon 17 which vibrates in the printing zone. 18 designates brackets secured respectively upon the end plates, and having pivoted thereon the levers 19 which support a severing knife 20 extending longitudinally of the machine, and this knife can be swung about pivot-pins 20^a so as to engage either of the two stop pins 21 secured upon the brackets to locate the knife in either its operative or inoperative position. 15 A shield 22 has lugs 22^a secured by fasteners 22^b upon the side walls 28 of supports 26, about to be described. The usual gage-bar 23 is secured to the shield 22 and carries an adjustable gage 24 secured in position upon the gage-bar 23 by the thumb-screw 25.

20 Guide-plates 31 upon which the multiple ribbons are mounted are constructed as follows: Supports 26 have base flanges 27 secured upon the end plates 11; each support 25 also has a side wall 28 formed with a shelf 29, the fasteners 30 securing the flanges 27 in position. The guide-plates 31 are formed with integral side lugs 32 which are removably secured by fasteners 33 upon the shelves 30 of the supports 26. Each guide-plate or blade is also formed with a web 34 having an arm 35 terminating in the head 36 formed with the oppositely-inclined or diagonal slots 37 and 38. Each guide-plate 35 may also be provided with hooks 39 at its opposite ends, as shown in Figure 8, and with recesses 40 alongside the hooks. Where the hooks 39 are in use the web 34 of the plate will have a slot 41, also shown in Figure 40 8. Each plate is provided upon the web 34 with an ear 42 having an inclined slot 43 which is parallel with another inclined slot 44 also formed in the web.

The multiple ribbons are designated, respectively, 45 and 46 (Figure 1). The ribbon 45 is threaded first into the slot 44 of one blade 31 providing a stretch 45^a extending longitudinally of the arm 35, and the stretch 45^a is threaded through the slot 37 in the head 36 and provides another stretch 15^b which is threaded into the slot 38 by which another stretch 45^c is provided also extending longitudinally of the arm parallel with the stretch 45^a, and this stretch 45^c is threaded into the slot 43. Similarly the ribbon 46 is initially threaded through the slot or eye 44 of the other blade 31 providing a longitudinal stretch 46', which passes through the slot 37 providing a stretch 46'', thence passing through the slot 38 providing the stretch 46''', being ultimately threaded through the slot 43.

Means are provided for feeding the ribbons 45 and 46. Each ribbon has separate 65 spools at one side of the machine upon

which its respective ends may be attached for winding and unwinding purposes. The spools 47 and 48 are secured upon a removable shaft 49 by collars 50 on the spools secured by fasteners 51 to this shaft. Each of the collars 50 carries a pin 50^a arranged to be received in a recess 47^a of each of the spools 47 and 48. By reason of this arrangement the spools are readily detachable from the shaft 49. Two stub-shafts are provided; the stub-shaft 52 has an operating handle 53 secured to it by fasteners 54 (see Figure 2) and also has a socket-member 55, this stub-shaft being journaled in the side wall 28 of one of the supports 26. One end 80 49^a of the shaft 49 is detachably received into the socket-member 55, and a coil spring 56 surrounds the stub-shaft 52. The other stub-shaft 57 is journaled in the other side wall 28 of another support 26, and has a 85 shoulder 61 abutting the boss 61^a of the side wall 28. Said shoulder is formed in a plane with a socket-member 58 receiving the forked end 60 of the shaft 49, this fork straddling a pin 59 fixed in the socket-member 58, so that, by rotating the stub-shaft 57, the pin 59, rotating therewith, will rotate the fork 60 and the shaft 49 and therefore the two spools 47 and 48 on shaft 49. The coil-spring 56 holds the fork 60 of the shaft 49 against the pin 59, and applies tension to said shaft as it rotates with the socket-member 58 of the stub-shaft 57. In this way the two stub-shafts 52 and 57 and the intermediate shaft 49 are arranged in 100 axial alignment.

Means are provided for winding each of the multiple ribbons 45 and 46 upon the feed-spools. Brackets 62 are secured upon the base flanges 27 of the supports 26 at 105 either side of the machine, and these brackets carry idlers 63 upon which the ribbons 45 and 46 pass before they are wound upon the respective spools 64 and 65 located one on each side of the machine, which spools 64 110 and 65 are loosely mounted upon stub-shafts 66 supported in bosses 68 secured to the side walls 28 (see Figure 3), in which the ends of the shafts 66 are journaled. Each shaft is provided with a flange 66^a having a stud 115 66^b to enter a hole 66^c in the ribbon spool to connect the spool with the shaft 66. Each shaft 66 is further provided with a crank handle 67 by which the shaft 66 may be rotated to rewind the ribbon on the spool 64. 120 It will be understood that both crank handles 67 are rotated at the same time, one by the right hand and the other by the left hand. To keep the ribbon taut in front of the platen while it is being fed from the spools 64 and 65 there are provided cup 125 springs 66^d between the flanges 66^a and the walls 28. The spools 64 and 65 may be held on the stub-shafts 66 by thumb-nuts 66^e.

Means are provided for rotating the feed 130

spools by means of the usual line-spacing mechanism. The usual line-spacer slide 69 carries a feed-pawl 70 for rotating the usual ratchet-wheel 71, which is mounted upon the platen spindle or shaft 12 and secured to the platen 13. A link 72 is connected to the slide 69 at one end and to a lever 75 at its other end, this lever being journaled upon the stub-shaft 57. The lever 75 carries a feed-pawl 76 which is urged by a suitable spring (not shown) to engage a ratchet-wheel 78 fixed upon the stub-shaft 57. The work 79 may consist of separate sheets or the usual fan-folded web. A back-print prevention shield 80 is provided which extends longitudinally in-front of the stretch or ply 46'', having its opposite ends removably secured upon the hooks 39.

In operation, when the typing occurs, spacer slide 69 actuates the feed-pawl 70 to turn the ratchet-wheel 71, which movement actuates the link 72 against the tension of the usual slide spring 74 secured to a pin 73. The link in turn feeds the pawl 76 against the ratchet-wheel 78, and turns the stub-shaft 57, which, through the connections 58, 59, and 60, turns the shaft 49 and the spools 47 and 48, thereby winding up one end of each of the ribbons 45 and 46, and unwinding the ribbons from the feed-spools 64 and 65. As often as the spacer slide is actuated in the usual manner the spools 47 and 48 and 64 and 65 will be rotated intermittently, and by this action the stretches of each ribbon 45 and 46 are caused to move in their guide-plates 31, one stretch 45^c or 46''' being fed along the printing line in one direction while the other stretch 45^a or 46' moves in an opposite direction above the printing line which it has just left.

Where a fan-folded web is used one plate 31 is introduced from one side of the web between its sides 79^a and 79' (see Figure 7), and the other plate 31 is introduced at the other side of the same web between the sides 79' and 79'', so that the longitudinal stretch 45^a of the ribbon 45, and the stretch 46' of the ribbon 46 will project in longitudinal alignment in the several folds of the fan-folded web and will be located above the printing line of the platen, while the stretch 45^c of the ribbon 45, and the stretch 46''' of the ribbon 46 will extend in longitudinal alignment at the printing line, where the type-bars engage the platen for printing purposes.

When the ribbons have been wound completely upon the spools 47 and 48, they may be rewound as follows: By turning the crank handles 67 simultaneously the spools 64 and 65 may be rotated the proper direction to unwind the ribbons from the spools 47 and 48. If these ribbons are worn or have become impaired then the handle 53 of the stub-shaft 52 is drawn outwardly against

the tension of the spring 56, so that the shaft 49 may be bodily pushed against the tension of the spring 56 to disengage its forked end 60 from the socket-member 58 and the pin 59 in the latter. This permits the shaft 49 with the spools 47 and 48 thereof to be removed from the machine whence new ribbon spools with fresh ribbons may be mounted upon this shaft.

It will be understood that the spools 64 and 65 may readily be replaced by spools having fresh ribbons instead of the spools 47 and 48, above described.

It will be understood that after the fan-folded web has received typed impressions upon each successive form printed thereon, the form is gaged by drawing the web forward against the gage 24, and then cut off along the edge of the severing knife 20.

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. In a typewriting machine, the combination with a carriage, a platen on said carriage around which a fan-fold work-web may be fed, said web comprising superposed plies joined successively at their opposite ends, a main ribbon, and a plurality of auxiliary ribbons, each auxiliary ribbon being carried by said carriage to serve only a single ply of said work web, of devices on said carriage to guide said auxiliary ribbons in superposed relation to each other from opposite sides of the carriage into the folds of the work-web and back out again, each device having means to guide its associated ribbon in non-superposed plies, with only a single ply of ribbon between any adjacent work-plies at the printing line, and means to feed said auxiliary ribbons.

2. In a typewriting machine, the combination with a carriage, a platen around which a fan-fold work-web may be fed, a main ribbon, and a plurality of auxiliary ribbons on said carriage, of means to guide each of said auxiliary ribbons in between the plies of the work-web and then out therefrom, at the same side, one of the stretches of each ribbon extending along the printing line, while the other stretch thereof lies to one side of the printing line, the ribbon-guiding means including brackets supported at opposite sides of the carriage and extending into the folds of the fan-fold work-web, each bracket terminating at a point closely adjacent the joined sides of the plies and having a pair of oppositely-disposed diagonal slots through which a ribbon is threaded, and means for feeding the ribbons.

3. In a typewriting machine, the combination with a carriage, a platen around which a fan-fold work-web may be fed, and

a ribbon on said carriage, of a device to guide said ribbon into, and then out of, adjacent folds of said work-web, said device including a substantially L-shaped support

5 secured to the carriage and having a T-shaped free end, extending between said folds, said L-shaped support having ribbon-guiding slots adjacent its secured end, the T-shaped end having diagonal slots adjacent
10 the opposite sides of the T, all of said slots being positioned to direct one of the stretches of said ribbon along the printing line and the other stretch to one side of said line, and means to feed said ribbon.

15 4. In a typewriting machine, the combination with a carriage, a platen on said carriage, and a ribbon on said carriage, of a device to guide said ribbon along said platen, between the plies of a fan-fold work-
20 web, said device being L-shaped at one end for the purpose of securing it to the carriage, and T-shaped at the other end, the opposite sides of the T having diagonal edges for directing the ribbon in a U-shaped
25 path, with one stretch of the ribbon registering with the printing line, and the other stretch of said ribbon extending along the platen at one side of the printing line, and means to feed said ribbon.

30 5. In a typewriting machine, the combination with a carriage, a platen on said carriage, and a ribbon on said carriage, of means on said carriage to guide said ribbon from one end of the carriage along the
35 printing line in a single ply and back to said end of the carriage to one side of the printing line, said guiding means comprising an arm supported at one side of the carriage and extending to the other side be-
40 tween the ribbon plies.

6. In a typewriting machine, the combination with a carriage, a platen on said carriage around which a fan-fold work-web may be fed, and a ribbon on said carriage,
45 of means on said carriage to guide said ribbon from one end of the carriage along the printing line in a single ply and back to said end of the carriage to one side of the printing line, said guiding means including an arm supported at one side of
50 the carriage and extending to the other side, between two adjacent plies of the work-web, the free end of said arm having diagonal edges around which the ribbon is conducted from the printing line to one side thereof,
55 and means for feeding said ribbon.

7. In a typewriting machine, the combination with a carriage, a platen on said carriage around which a fan-fold work-web may be fed, and a ribbon on said carriage,
60 of a supporting arm attached to the carriage and extending between adjacent plies of the work-web to guide said ribbon in a U-shaped path from one end of the carriage in non-superposed plies in front of said platen,
65

only one of the stretches of the U-shaped ribbon registering with the printing line of the platen, and means for feeding said ribbon.

8. In a typewriting machine, the combination with a carriage, a platen on said carriage around which a fan-fold work-web may be fed, a main ribbon, and an auxiliary ribbon, of means on said carriage for supporting and guiding said auxiliary ribbon
75 from one side of the carriage, between adjacent plies of the work-web and back again, with only a single ply of ribbon between said adjacent plies, at the printing line, and means to feed said auxiliary ribbon. 80

9. In a typewriting machine, the combination with a carriage, a platen around which a fan-fold work-web may be fed, a main ribbon, and an auxiliary ribbon, of means on said carriage to guide said auxiliary ribbon between two adjacent plies of said work-web in a U-shaped path extending from one end of the carriage, a ribbon-delivery spool, a ribbon-receiving spool, both of said spools supported by the carriage,
90 the stretch of ribbon forming one arm of the U-shaped path extending from one of said spools and registering with the printing line of the platen, the stretch of ribbon forming the other arm of the U-shaped path extending along the platen above the printing line to the other one of said spools, means to drive the receiving spool to feed said auxiliary ribbon, and means to rotate the delivery spool to rewind said auxiliary ribbon thereon. 100

10. In a typewriting machine, the combination with a carriage, a platen on said carriage around which a fan-fold work-web may be fed, and a ribbon, of a single supporting arm mounted on the carriage and extending between adjacent plies of the work-web, said arm including means to guide said ribbon from one end of the carriage along the printing line in a single
105 ply, and back to said end of the carriage to one side of the printing line, means for feeding the ribbon, and a back-printing prevention shield carried by said arm and disposed in front of that portion of ribbon at the printing line. 115

11. In a typewriting machine, the combination with a carriage, a platen on said carriage around which a fan-fold work-web may be fed, and a ribbon, of a single supporting arm mounted on the carriage and extending between adjacent plies of the work-web, said arm including guides adjacent both sides of the carriage to direct said ribbon from one end of the carriage along the printing line in a single ply, and back to said end of the carriage to one side of the printing line, means for feeding the ribbon, a back-print prevention shield for that portion of the ribbon at the printing line, 130

and supports on said arm and extending across the printing line to carry said shield.

12. In a typewriting machine, the combination with a carriage, a platen on said carriage around which a fan-fold work-web may be fed, and a ribbon on said carriage, of a single supporting arm mounted on the carriage and extending between adjacent plies of the work-web, said arm including diagonal slots adjacent each end thereof for guiding the ribbon, into said plies, along the printing line and then out of said plies, at one side of the printing line, the arm being interjacent the two stretches of the ribbon, means to feed said ribbon, a back-print prevention shield, and a pair of fingers carried by said arm and extending across said printing line, the back-print prevention shield being mounted upon the fingers.

13. In a typewriting machine, the combination with a carriage, a platen on said carriage around which a fan-fold work-web may be fed, said web comprising superposed plies joined successively at their opposite ends, a main ribbon, and a plurality of auxiliary ribbons, each auxiliary ribbon being carried by said carriage, of devices on said carriage to guide said auxiliary ribbons from opposite sides of the carriage into the folds of the work-web and back out again, each device being effective to guide its associated ribbon in non-superposed plies, means to feed said auxiliary ribbons, each device being L-shaped at one end for the purpose of securing it to the carriage, and T-shaped at the other end and having means for guiding the ribbon from the printing line to one side thereof, and means to feed said ribbons.

14. In a typewriting machine, the combination with a carriage, a platen on said carriage, a main ribbon, and a plurality of auxiliary ribbons on said carriage, the latter being supported on said carriage, of ribbon-delivery spools, ribbon-feeding spools, all of said spools on said carriage, a shaft to support all of the ribbon-feeding spools, and means to rotate said shaft to feed all of the auxiliary ribbons.

15. In a typewriting machine, the combination with a carriage, a platen on said carriage, a main ribbon, and a plurality of auxiliary ribbons on said carriage, the latter being supported on said carriage, of ribbon-delivery spools, ribbon-feeding spools, all of said spools on said carriage, a shaft to support all of the ribbon-feeding spools, and means to rotate said shaft to feed all of the auxiliary ribbons, said ribbon-feeding spools being detachably supported on said shaft.

16. In a typewriting machine, the combination with a carriage, a platen on said carriage, a main ribbon, and a plurality of auxiliary ribbons on said carriage, the latter being supported on said carriage, of ribbon-

delivery spools, ribbon-feeding spools, all of said spools on said carriage, a shaft to support all of the ribbon-feeding spools, and means to rotate said shaft to feed all of the auxiliary ribbons, said shaft being detachably supported on said carriage, and said spools being detachably supported on said shaft to enable replacement of the auxiliary ribbons.

17. In a typewriting machine, the combination with a carriage, a platen on said carriage, and a plurality of ribbons on said carriage, of means to guide said ribbons in front of the platen, ribbon-delivery spools, ribbon-feeding spools, platen line-spacing mechanism, a rotatable device operable by said line-spacing mechanism, a shaft to support said ribbon-feeding spools, said shaft being connected to and supported at one end by the rotatable device, and means to support the shaft at its other end, said last-named means being effective to facilitate the detachability of said shaft for the purpose of replacing the ribbon spools.

18. In a typewriting machine, the combination of a revoluble platen around which a fan-fold work-web may be fed, a platen-frame, a plate secured upon said frame and extending along the front of said platen, said plate having guiding slots adjacent each end of the platen, for directing a ribbon along said platen, in two non-superposed stretches, between adjacent folds of the work-web, one of the stretches extending along the printing line of said platen and the other stretch disposed at one side of the printing line, and means for feeding the ribbon.

19. In a typewriting machine, the combination of a platen, a pair of guide-plates located in front of the platen, each plate having a ribbon traveling longitudinally in alignment with the printing line, the ribbons being parallel to said plates and supported thereon, automatic means for simultaneously feeding said ribbons, and manual means for rewinding said ribbons.

20. In a typewriting machine, the combination of a revoluble platen, a pair of plates fixed in position at the ends of said platen, arms carried by said plates projecting in opposite directions, the outer ends of said arms having separate ribbons looped respectively into them, and providing longitudinally aligning stretches, said stretches disposed above and below said arms, each plate having diagonal slots through which said stretches project, a pair of ribbon-feed spools at the opposite ends of said platen for winding up one stretch of each ribbon, and a pair of ribbon-rewinding spools for unwinding the ribbons from the ribbon-feeding spools.

21. In a typewriting machine, in combina-

tion, a revoluble platen, means for supporting an inking ribbon between adjacent plies of a longitudinally-folded web, including a blade supported at one end only and extending along the platen and between adjacent plies of the fan-fold web, said blade including means for directing said ribbon between the folds from one end of the platen and along the full length of the printing line and then return-directing the ribbon away from said printing line and out of said folds to the same end of the platen, and mechanism for feeding said ribbon. 10

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