June 3, 1941. K. J. BOTHAM ET AL 2,244,095

TYPEWRITING MACHINE

Filed Oct. 11, 1938 2 Sheets-Sheet 1

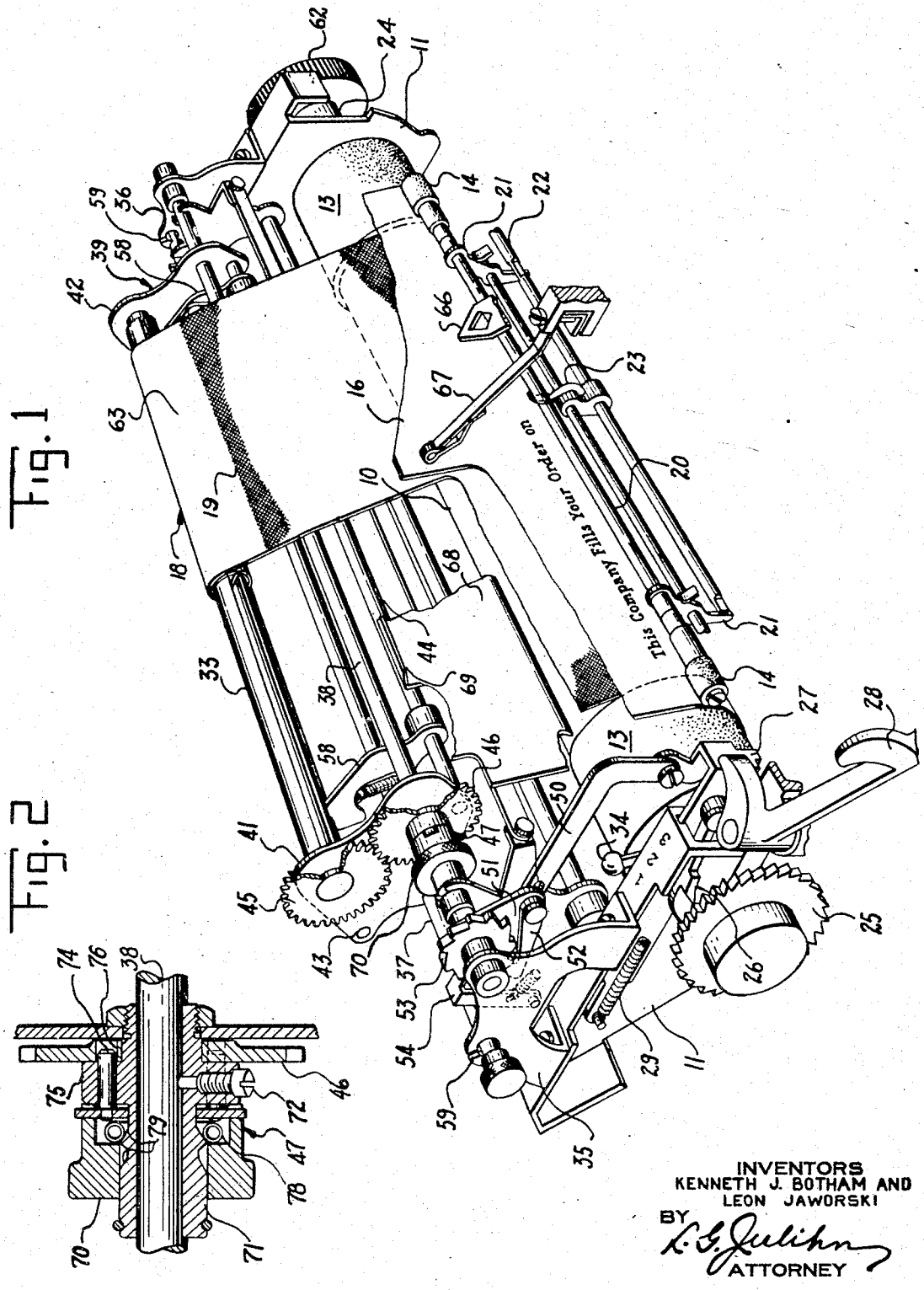


Fig. 1

Fig. 2

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Fig. 3

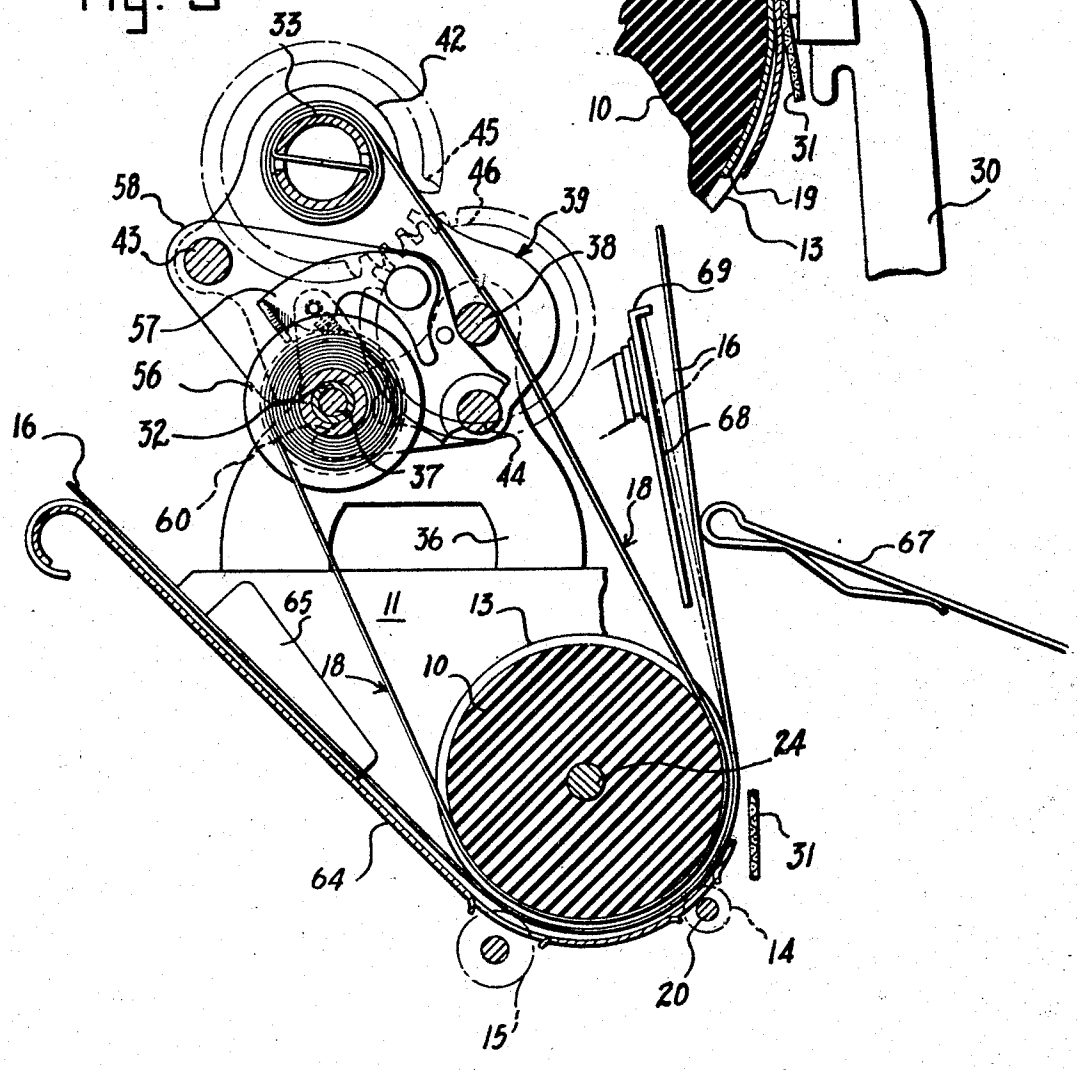


Fig. 4

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TYPEWRITING MACHINE

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Application October 11, 1938, Serial No. 234,413

4 Claims. (Cl. 197—1)

This invention relates to typewriting machines and more particularly to work-sheet and transfer-sheet holding and feeding means.

The charged side of a transfer-sheet contacts the paper when positioned in a typewriter of ordinary construction. Smudging of the transfer-substance onto the contacting work-sheet cannot be avoided if the particular kind of work requires the use of a transfer sheet charged with a very soft substance as the transfer medium. Master sheets used, for example, in spirit duplicators are required to be typed with a very soft smudgy "hectograph" ink.

Direct transfer duplicators, although relatively low in cost, have not become popular because the preparation of the master sheet for use in such machines requires the use of a special typewriter having negative impressing types and a reverse letter-feeding carriage. Such typewriter cannot be used for typing ordinary correspondence and the cost of producing and keeping such special typewriter in stock is high.

Master sheets typed with a carbon coated transfer paper have been found most satisfactory in producing perfect duplicated copies. The carbon paper is usually in the form of a paper ribbon supplied from a spool and fed over the printing point. Sometimes master sheets are typed with impregnated fabric ribbons. In order to obtain perfect imprints, it is necessary to feed these ribbons to a new unused carbon field at each type stroke. The weight and size of the carbon spool has to be small in order not to affect the ease of operation of the machine. The carbon supply, therefore, is necessarily small and becomes exhausted in a very short time and the operator is required to frequently exchange the carbon ribbon. It is impossible for the operator to avoid soiling her fingers while handling and threading the smudgy ribbon.

It is one of the objects of the invention to avoid frequent handling of a transfer-substance-charged sheet or ribbon and especially to avoid the tedious and hand soiling work connected with the threading of a ribbon through a ribbon guide of a typewriter.

It is another object of the invention to provide means in a typewriter for holding a transfer-substance-charged sheet and a work sheet out of contact with each other to avoid smudging, but very closely together at the printing region so that whenever a type is moved to printing position there will be established between the two sheets a temporary transfer-contact at the printing point.

It is a further object of the invention to prevent smudging from a soft transfer-substance-charged sheet on to the back side of a work sheet when preparing a negatively printed sheet with positive impressing types.

It is a further object of the invention to provide means capable of feeding a work sheet relative to the carbon sheet and to avoid contact between the two sheets.

It is a further object of the invention to feed a carbon sheet automatically a small distance whenever the work-sheet is line spaced to thereby move a closely adjacent fresh portion of carbon to the printing line, the carbon being fed a uniformly small distance irrespective of the distance of line feed given to the work sheet.

Another object of the invention resides in the provision of simple and efficient holding and feeding means for both the work sheet and the carbon sheet to feed both sheets in non-contacting relation.

Other features and advantages will hereinafter appear.

In the drawings,

Figure 1 is a perspective view of a platen carriage embodying the novel work-sheet and carbon-sheet holding and feeding mechanisms.

Figure 2 is an enlarged detail of a releasable clutch used in transmitting motion to a carbon paper winding spool.

Figure 3 is a side view illustrating a work sheet supported upon enlarged platen ends and illustrates a continuous carbon sheet supported in non-contacting relation to the work sheet.

Figure 4 illustrates on an enlarged scale a type pressing a work sheet rearwardly into back-printing contact with a carbon sheet at a printing point along the typing line.

Referring now more in detail to the drawings, a platen roll 10 is pivotally mounted in carriage end-plates 11. The platen roll includes increased diameter end-portions 13 which in cooperation with front and rear feed-rolls 14 and 15 are adapted to grip and feed a work sheet 16 by its margins. The work sheet is suspended over the platen between the enlarged platen-ends. A continuous carbon sheet 18 of lesser width than the work sheet 16 is held upon the platen surface between the two enlarged platen-end-portions 13 so that its carbon coated side 19 facing the work sheet does not contact the back side of the work sheet. The diameter of each platen end is large enough to prevent smudging contact between the work sheet and the carbon. The feed rolls 14 and 15 cooperate with the en-

larged platen ends to grip and contact the work-sheet only along the margin. The feed rolls at no time contact any written portion of the sheet.

The feed-roll mechanism is substantially conventional and corresponds generally to the usual "Underwood" construction except that no feed-rolls are provided intermediate the platen ends. The "Underwood" standard construction includes front and rear feed-roll supporting shafts indicated in the drawings at 20 as carried upon arms 21. These arms are normally spring pressed toward the platen so that the rolls grip the work sheet 16. The usual feed-roll release mechanism including the cam-shaft 22 is also employed. Fingers 23 mounted upon a tie-rod of the carriage-frame are provided to prevent undue flexing of the shafts 20 toward the work sheet, between the shaft supporting front and rear arms. The platen roll 10 is provided with the usual center shaft 24 which serves to pivot the platen in the carriage frame ends 11 and to which at one end the usual line-space ratchet wheel 25 is fastened. A line-space pawl 26 is provided upon a slide 27 which is guided in one of the carriage ends 11 and is operative to feed the wheel 25. The platen and its enlarged work-sheet feeding ends 13 are line fed through the said parts 26 and 27 whenever a line-space lever 28 is operated. Operation of the lever 28 may feed the work sheet one, two or three line-spaces depending on the setting of the usual "Underwood" line-space feed-regulator shown at 34. A spring 29 returns the line spacing mechanism 26, 27 and 28 to normal position after its actuation. Type bars 30 having positive-impression type-faces are arranged to strike rearwardly and force the work-sheet into contact with the normally non-contacting carbon sheet 18. (See Figure 4.) Clear cut negative character imprints are thereby deposited from the carbon-coated surface 19 onto the back side of the work sheet. The machine may, if desired, be equipped with a regular typewriter ribbon 31 to imprint the work sheet additionally at the front side thereof to enable the operator to observe the typed characters in positive aspect.

The carbon sheet is taken from a supply spool 32 and fed around the bottom side of the platen between the two enlarged platen ends 13 on to a winding spool 33. The general design of the carbon supply and winding mechanism may be substantially as disclosed in the patent to Mann No. 2,101,747. Brackets 35 and 36 carry a rod 37 and a shaft 38 and are screwed to the platen frame ends 11. Upon the rod 37 and the shaft 38 an auxiliary frame 39 is mounted, the frame comprising end plates 41 and 42 connected and held together in spaced relation by tie rods 43 and 44. The carbon winding spool 33 is journalled in the end plates 41 and 42 of the auxiliary frame and carries at one side thereof a gear 45. A sidewise retained gear 46 is rotatably mounted upon the shaft 38. Motion may be transmitted over the shaft 38 and gears 45 and 46 to wind the spool 33 at every line-space operation of the lever 28. A clutch 47 establishes a driving connection between the shaft 38 and the gear 46 thereon. The line-space slide 27 is connected to one end of a link 50, of which another end is connected to an arm 51 that is loosely pivoted upon the shaft 38. The arm 51 carries a pivotally mounted spring pressed pawl 52 which engages a ratchet wheel 53 that is fixed on the shaft 38. The ratchet wheel 53 is advanced a single tooth during each line-feed operation of the work sheet by the lever 28, whether this line feed be a single, double or triple space. A spring pressed pawl 54 prevents backward rotation of the ratchet wheel 53 and winding spool 33. The supply spool is rotatably mounted upon the rod 37 and includes end-flanges 56 upon each of its ends. A spring pressed friction shoe 57 bearing against each end-flange serves in cooperation with said back-lash check 54 to hold the carbon sheet taut around the platen and free of the work sheet 16. The friction shoes 57 may be pivotally secured upon supply-spool locating members 58 which form part of the auxiliary frame structure 39.

The auxiliary frame 39 is supported upon the brackets 35 and 36 in a manner to allow quick replacement of the supply spool 32. It is merely necessary to turn the rod 37 to unlock it from the brackets 35 and 36 to facilitate its rearward removal through the slots 59 in the brackets 35 and 36. The auxiliary frame-ends 41 and 42 include forked portions 60 fitting over the rod 37 and allowing removal of the rod rearwardly without interference. An exhausted spool can be quickly slipped off the rod 37 and a new one placed thereupon.

Only enough carbon paper is unwound from the spool 32 at a line space operation to present a fresh unused field of carbon to the printing line. A spool having a diameter of 1¾ inches is only exhausted after writing about ten thousand lines. The machine is provided upon each end of the platen shaft 24 with a knob 62 which may be used to feed the work sheet greater distances without feeding and wasting carbon paper. The leading end 63 of the carbon-sheet is not coated with carbon (see Figure 1), so that the operator can attach the continuous carbon-sheet upon the winding spool without soiling her fingers.

The carriage includes a rear-feed paper table 64. Left and right side edge paper guides 65 may be provided to assist the operator in rear-feeding the work sheet over the table 64 in its proper relation to the paper-feeding platen ends 13. The paper table 64 extends around the bottom of the platen to guide the work-sheet upwardly at the front. One or more fingers 66 are arranged at the front of the platen to guide the work-sheet in a curvature corresponding to the periphery of the platen ends 13, upwardly and slightly rearwardly past the printing line. Another guide finger 67 is arranged at a higher level to prevent the work sheet from flexing forward.

The work-sheet is prevented from contacting the carbon-sheet above the printing line by a paper table 68 arranged therebetween. The paper table may have a ledge 69 against the underside of which the leading edge of the work-sheet may be squared. The work-sheet feeds normally clear and forward of the ledge 69.

Ordinary correspondence may be typed upon the machine if desired. A back-print preventing shielding sheet, not shown, of a width corresponding to the carbon-sheet may be positioned over the carbon sheet. This shielding sheet may extend downward in back of the carbon-winding spool, and in back of the supply-spool, around the platen and upward in front of the winding spool. Both ends of the sheet may be clipped together so that the work sheet cannot possibly contact any carbon-coated surface. It is desired to avoid unnecessary consumption of carbon paper when typing ordinary correspondence. The aforesaid clutch 47 for this purpose may be

opened to prevent transmission of carbon-winding motion at the line spacing operations. The clutch includes a driving member **70** revolving with the shaft **38** and a driven member constituting the gear **46**. The gear **46** is loosely mounted upon a sleeve **71** that is fastened by a screw **72** upon the shaft **38**. The driving member **70** is slidably mounted upon the sleeve and includes diagrammatically opposed pins **74** loosely positioned in a flange **75** of the sleeve. The ends of the pins **74** in order to drive the gear **46** normally project from the flange into holes **76** provided in the gear **46**. The driving member **70** may be shifted along the sleeve to withdraw the pins **74** from the gear **46** so that no carbon paper is fed from the supply-spool during line spacing operations. The clutch member **70** is resiliently held upon the sleeve in either an open or closed clutch-position by a detent spring **78** in cooperation with two sleeve grooves **79**.

Having described our invention, we claim:

1. In a typewriter, in combination, a carriage, a platen roll rotatably supported upon the carriage, typing elements movable against the front of the platen, means to guide a work-sheet past the front of the platen, means cooperating with the platen near the end portions thereof to feed the work-sheet at its margins, said platen having a wide annular groove between the platen end-portions of a depth slightly in excess of the thickness of a transfer-web to provide a passage for the transfer-web, a transfer-web supply-spool, means to feed the transfer-web from said supply-spool around the bottom and front of the platen in said groove with its transfer-medium-coated side facing outwardly toward the work-sheet, means to maintain the transfer-web in taut condition, whereby the work-sheet is maintained with clearance from the transfer-medium of the transfer-web, except when forced into transfer-contact therewith by the movement of the types against the platen, and means for operating said transfer-web feeding means.

2. In a typewriter, in combination, a carriage, a platen roll rotatably supported upon the carriage, typing elements movable against the front of the platen, means to guide a work-sheet past the front of the platen, means cooperating with the platen near the end portions thereof to feed the work-sheet at its margins upon rotating the platen, said platen having a wide annular groove between the platen end-portions of a depth slightly in excess of the thickness of the transfer-web to provide passage for a transfer-web, a transfer-web supply-spool, means including a winding-spool to feed said transfer-web around the bottom and front of the platen in said groove with its transfer-medium-coated side facing outwardly toward the work-sheet, means associated with said spools to maintain the transfer-web in taut condition, whereby the work-sheet is always maintained out of contact with the transfer-medium of the transfer-web, except when forced into transfer-contact therewith by the movement of the types against the platen, and means for line-spacing said platen and step-feeding said transfer-web winding-spool.

3. A typewriter having a carriage with a platen roll having a wide annular groove between the platen end-portions, typing elements movable against said platen, a transfer-medium web in said groove having a transfer coating facing outwardly, means for feeding said transfer-web around the bottom and front of the platen in said groove, means to maintain said transfer-web in taut condition at all times, said groove being of a depth slightly in excess of the thickness of the transfer-web, means for feeding a work-sheet near the end-portion of the platen past the platen with clearance from the transfer coating of said web, said work-sheet being adapted to be forced into contact with said transfer coating by the movement of said typing elements toward the platen, and means for preventing smudging contact of the work-sheet and transfer-web as both are fed beyond the platen.

4. A typewriter having a carriage with a platen roll having a wide annular groove between the platen end-portions, typing elements movable against said platen, a transfer-medium web in said groove having a transfer coating facing outwardly, means for feeding said transfer-web around the bottom and front of the platen in said groove, means to maintain said transfer-web in taut condition at all times, said groove being of a depth slightly in excess of the thickness of the transfer-web, means cooperating with the end-portions of the platen for feeding a work-sheet past the platen with clearance from the transfer coating of said web, said work-sheet being adapted to be forced into contact with said transfer coating by the movement of said typing elements toward the platen, means for preventing smudging contact of the work-sheet and transfer-web as both are fed beyond the platen, and means for conjointly operating the work-sheet feeding means and the transfer-web feeding means.

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