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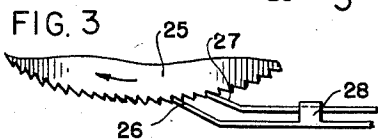
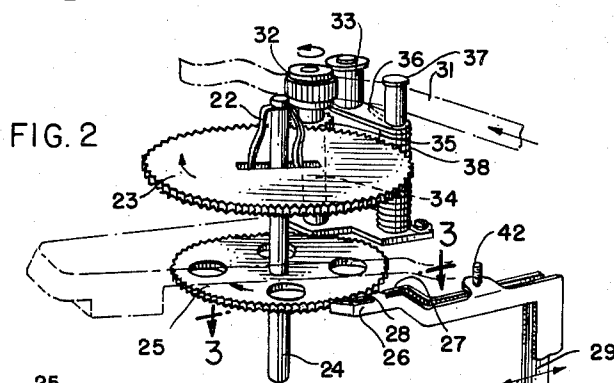
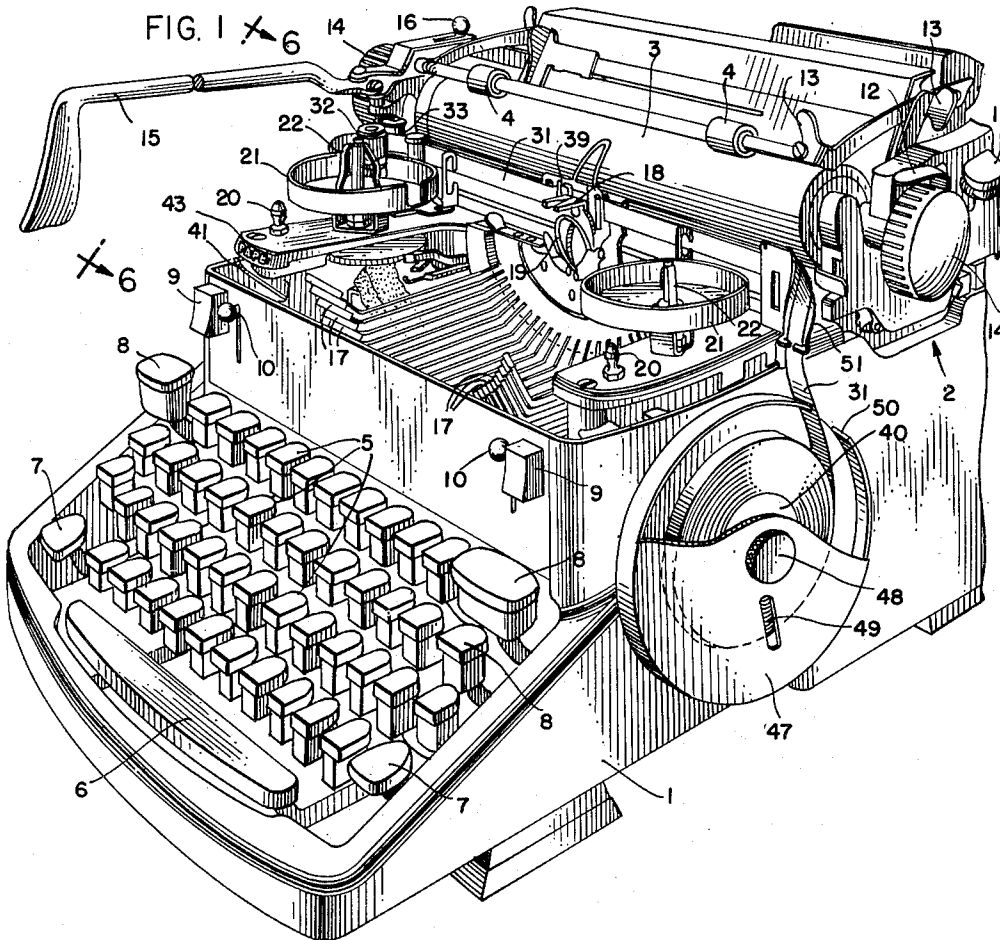
J. T. CARLSON

2,815,110

RIBBON FEED MECHANISM

Filed Nov. 15, 1955

2 Sheets-Sheet 1



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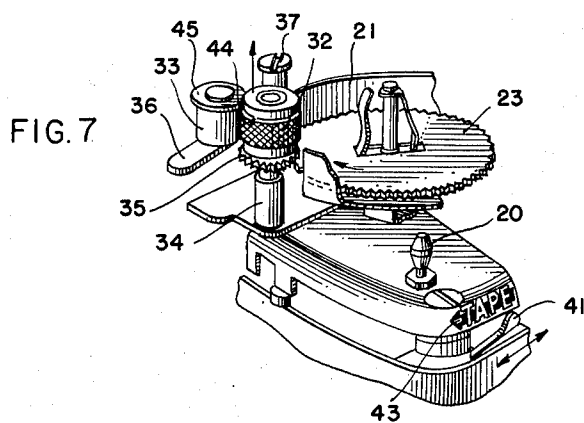
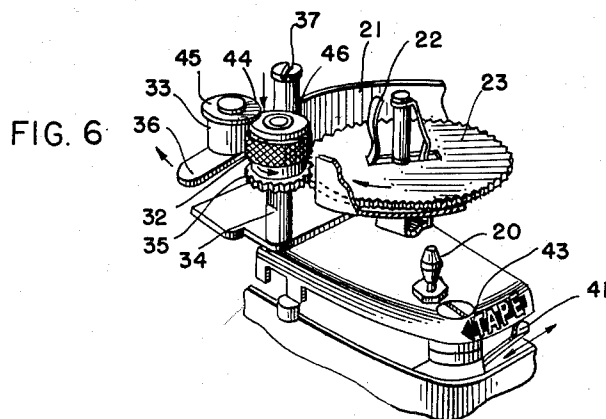
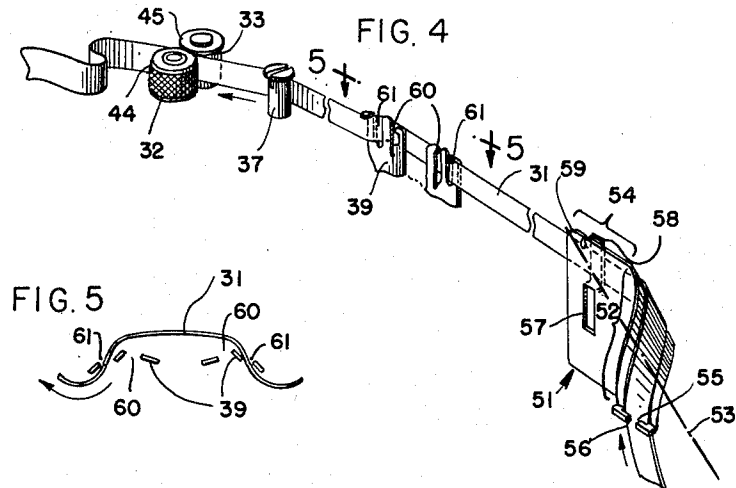
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RIBBON FEED MECHANISM

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2 Sheets-Sheet 2



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RIBBON FEED MECHANISM

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7 Claims. (Cl. 197—151)

This invention relates to ribbon feed mechanisms for typewriters and the like, and more particularly to such mechanisms for feeding auxiliary ribbons in typewriters or other machines having conventional ribbon feed arrangement

An object of this invention is to provide an improved auxiliary ribbon feed mechanism in a typewriter for feeding a disposable carbon paper ribbon past the printing point.

A further object of this invention is to provide an auxiliary ribbon feed mechanism for a typewriter including a pair of rolls between which the auxiliary ribbon may be frictionally engaged and which may be driven from one of the conventional ribbon spools of the machine.

Another object is to provide an improved arrangement to feed an auxiliary carbon paper ribbon in a typewriter; the ribbon originating on a supply reel mounted at one side of the typewriter; thence passing around a curved guide and thence through special slots provided in a ribbon vibrator at the printing point; and finally passing between a pair of rolls which hold it in frictional engagement and pull it from the supply reel at a rate corresponding to the frequency with which type bars strike the printing point.

A further object is to provide a guide for passing the auxiliary carbon ribbon from the supply reel mounted at a side of the typewriter and directing it in alignment toward the vibrator supporting means at printing point; the guide being curved about a spiral path for the ribbon, the spiral being a portion of a cylindrical surface about an axis, which makes an angle of substantially forty-five degrees with the vertical and which lies in a vertical plane substantially parallel to the movement of the typewriter carriage.

A further object of this invention is to provide a vibrator means for supporting the ribbon as it is conducted past the printing point; the vibrator having two pairs of slots of different dimensions—a first pair for supporting a conventional cloth ribbon, and a second pair adapted to support a carbon paper ribbon.

A more complete understanding of the present invention, its mode of operation and its advantages may be gathered from further reading of this specification, together with an inspection of the accompanying drawing in which:

Fig. 1 is a perspective view of a typewriter embodying a carbon ribbon feed arrangement of this invention, said typewriter being shown with the front hood removed exposing the underlying mechanism;

Fig. 2 is a perspective view of the driving arrangement for the ribbon feed, certain other parts being removed to expose a ratchet and pawl drive;

Fig. 3 is an enlarged detail taken along the line 3—3 of Fig. 2 showing a portion of the ratchet wheel and a pair of pawls for driving and holding the ratchet;

Fig. 4 is a schematic perspective view showing the arrangement of the ribbon guide, the ribbon vibrator, and a frictional roll;

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Fig. 5 is an enlarged schematic view looking along the plane 5—5 of Fig. 4, showing the ribbon vibrator and illustrating the method for threading carbon ribbon through the vibrator;

Fig. 6 is a perspective view along the line 6—6 in Fig. 1, showing the frictional rolls and the left-hand ribbon spool, the frictional rolls being drivingly engaged with gear teeth on the ribbon spool; and

Fig. 7 is a view similar to Fig. 6, but the frictional rolls have been moved to a position of disengagement with the teeth of the ribbon spool.

The typewriter embodying this invention is shown generally in Fig. 1 and comprises a supporting frame 1, upon which is mounted a movable carriage 2 having a platen 3 and paper holders 4 for securing a sheet of paper. A keyboard includes a number of type bar actuating keys 5, a space bar 6, a pair of shift keys 7, as well as auxiliary keys 8 for back spacing, tabulator operation and marginal controls. Other keys 9 and levers 10 may control the tabulation of the typewriter, the touch resistance of the type keys and the conventional ribbon. Further controls of the typewriter include margin set keys 11, a carriage release lever 12, and paper release levers 13. The platen 3 may be turned by either of a pair of knobs 14 or by the line spacing lever 15, which operates the platen in accordance with the space control 16.

As a type key 5 is depressed, a corresponding type bar 17 is actuated to move and strike the platen at a printing point 18. A ring of spring steel 19 is depressed as the type bar strikes the platen and thence operates to throw the type bar from the platen to avoid smearing a typed character on the sheet of paper or causing a double letter.

A front cover (not shown) may be supported by a pair of upstanding studs 20. When the cover is removed from the typewriter, as is illustrated in Fig. 1, the mechanism thereby exposed to view includes a pair of ribbon spool cups 21 into which conventional typewriter ribbon reels may be inserted. Centrally located in each cup 21 is a prong 22 to which the ribbon reels are secured.

In the left-hand cup 21, the center hub prongs 22 are secured to a flat base gear 23 positioned in the bottom of the cup and mounted to rotate with the prong 22. As is shown in Fig. 2, the gear 23 and the reel holding prongs 22 are mounted on a vertical shaft 24, to which is also mounted a ratchet wheel 25. A pair of spring pawls 26 and 27 are pressed against and engage the ratchet wheel 25. The pawl 26 remains stationary and prevents the ratchet wheel 25 from rotating in a counter-clockwise direction (Figs. 2 and 3). A keeper or guideway 28 is positioned on the stem of the fixed pawl 26, and the pawl 27 may slide longitudinally within the guideway 28. As a type bar key 5 is depressed, the pawl 27 is moved longitudinally by a linkage part 29, which oscillates as shown by the arrows 30 in Fig. 2. The ratchet wheel 25 may turn only in a clockwise direction because the stationary pawl 26 engaging the ratchet wheel will prevent counter-clockwise motion. As the pawl 27 moves to the right (Fig. 3), the ratchet is held stationary by the pawl 26 and, thence, as the pawl 27 moves to the left, the ratchet 25 is engaged and turned in a clockwise direction. Thus, with each movement of a type bar actuating key 5, the ratchet wheel 25 is given an incremental movement in a clockwise direction, which movement is transferred to the prongs 22 and the gear 23 of the left-hand ribbon cup.

The carbon ribbon 31 is pulled between a pair of rolls 32 and 33. The roll 32, constituting a drive member for the ribbon, is rotatably mounted upon a vertical shaft 34, upon which is secured a gear 35 engageable with the gear 23 positioned in the left-hand ribbon cup 21. The roll 33 is rotatably mounted on a lever 36 which pivots upon a fixed stud 37 and is urged into frictional engagement against the roll 32 by a spring 38

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positioned about the stud 37. The carbon ribbon 31 passes behind the stud 37, which thereby acts as a ribbon guide and thence the ribbon passes between the friction rolls 32 and 33. As the keys 5 are operated and the ratchet 25 and gear 23 are thereby rotated in incremental movements, such incremental rotation is conveyed through the gear 35 to the drive roll 32, and thus the ribbon 31 is pulled through a vibrator support 39 at the printing point 18 and from a supply reel 40.

The typewriter is equipped with a lever 41 for manually controlling the direction of travel of the conventional ribbon. This lever 41 is mechanically coupled to pivot the ratchets 26 and 27 through a slight arc about a pivot point 42 (Fig. 2). When the lever 41 is moved to the right, the pawls 26 and 27 pivot away from the ratchet wheel 25 and simultaneously similar pawl and ratchet mechanisms (not shown) for operating the right-hand ribbon reel engaging prongs 22 are engaged, such that the conventional ribbon, if used, would travel to the right. On the other hand, when the lever 41 is moved to the left, the ribbon feed mechanism operating the prongs 22 at the right side of the machine, are disengaged, and the pawls 26 and 27 (Fig. 2) are pivoted into engagement with the ratchet wheel 25. To operate the auxiliary carbon ribbon feed mechanism, it is necessary that the lever 41 be moved to the right and, therefore, an arrow indicator 43 designates the proper position of the lever 41 when tape or carbon ribbon is used in the typewriter (Figs. 1, 6 and 7).

The operation of the ribbon feed friction rolls 32 and 33 is accomplished by linkage connecting the type bar keys 5, which thereby impresses a slight resistance or drag upon these keys as they are operating. Therefore, if the typewriter is to be used with a conventional ribbon rather than with the carbon ribbon 31, it is desirable that the carbon ribbon feed mechanism or rolls 32 and 33 be disengaged. This is accomplished by permitting the drive roll 32 to be raised upon the shaft 34, such that the gear 35 is disengaged from the gear 23, as is shown in Fig. 7. The friction roller 32 and gear 35 may be of a unitary construction and may have a circumferential slot of reduced diameter 44. The spring urged roll 33 may have a part of increased diameter 45, which may be a simple washer not integral with the roll 33. When the roll 33 is lowered into the engaged position, as is shown in Fig. 6, the washer 45 is spring urged upon the lever 36 to override a top or shoulder part 46, and thereby holds the drive roll 32 in the depressed position such that the gear 35 engages the gear 23. When it is desired to use a conventional typewriter ribbon, the lever 36 is moved outwardly from the drive roll 32, the drive roll 32 is then raised, and the lever 36 is permitted to return, such that the washer 45 seats within the circumferential slot 44 on the drive roll, thus holding the drive roll in a raised position and out of engagement with the gear 23.

A supply reel 40 is rotatably mounted about a horizontal axis such that the reel is generally disposed in a vertical position on the right side of the typewriter. A cover plate 47 is mounted to cover and hold the supply reel 40 in position with the aid of a knurled screw 48 to permit convenient removal thereof. A slotted opening 49 in the cover plate provides a visual indication of the quantity of tape or carbon ribbon remaining on the supply reel.

The tape 31 from the reel 40 passes upwardly through a slotted opening 50 to a curved ribbon guide 51. The ribbon guide 51 functions to receive the carbon ribbon 31 from the supply reel 40 and redirect it in alignment with the vibrator support 39 at the printing point. The principal surface 52 for guiding the ribbon is curved in a spiral about an axis 53 and is a portion of a circular cylinder. The axis 53 (Fig. 4) of this cylindrical surface extends substantially at a forty-five degree angle with the vertical and lies in a plane parallel with the axis of the platen of the typewriter and the direction of move-

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ment of the typewriter carriage. A further portion of the ribbon guide 51 constitutes a flat or plane surface 54, which is so aligned to permit the ribbon 31 to lie closely thereupon, and to pass directly to the vibrator support 39. The leading portion of the guide 51, which receives the ribbon upwardly from the supply reel 40, is turned at a right angle to the surface generally and has a part cut therefrom to form a ribbon receiving slot 55 which has a front opening 56. Thus the ribbon may be inserted by pressing it through the front opening 56 to lie in its ultimate position in the slot 55. A further guide part is provided by cutting an opening 57 on three sides thereof and folding a tab 58 backwardly therefrom and upwardly in a position to cradle the ribbon. A further tab 59 is bent backwardly from the top of the guide 51 and prevents the ribbon from shifting upwardly from its normal position in the guide. Neither the tab 58 nor the tab 59 presses tightly against the ribbon or actually engages the ribbon in normal use of the typewriter, but merely secures the ribbon from becoming displaced upon the guide as a result of manipulating thereby by the typist or operator.

A principal feature of the guide 51 lies in the fact that the ribbon is contacted on its rear side only, which side is clean and not coated with the carbon material. Therefore, there is no tendency for the carbon from the ribbon to smear off upon the guide.

The vibrator support 39 is provided with two pairs of slots 60 and 61 (Figs. 4 and 5). The first pair of slots 60 are dimensioned to accommodate a conventional cloth typewriter ribbon. When a carbon ribbon is used on the typewriter, it is threaded to the vibrator, as shown schematically in Fig. 5, passing through the pair of slots 61.

A typewriter using a carbon paper ribbon is advantageous over a conventional typewriter ribbon in that the printed characters thus typed are of uniform degree of blackness. Because the ribbon is inexpensive and because the typewriter machine feeds only when a type bar key is depressed, the ribbon is used but one time and is disposable thereafter. A further advantage of a carbon ribbon typewriter lies in the fact that the carbon or character imprinting ink is placed on one side only of the ribbon. The type keys which strike the carbon ribbon, therefore, do not come in contact with typewriter ink and, therefore, the type keys remain clean as the machine is used. The typed characters are therefore clear and distinct, regardless of the amount of use to which the typewriter has been put.

Changes may be made in the form, construction and arrangement of the parts without departing from the spirit of the invention or sacrificing any of its advantages, and the right is hereby reserved to make all such changes as fall fairly within the scope of the following claims.

The invention is claimed as follows:

1. In a typewriter having a take-up spindle adapted to receive a ribbon spool for a first ribbon feed mechanism, apparatus for feeding an auxiliary carbon paper ribbon, said apparatus comprising a pair of friction rolls adapted to frictionally engage and feed the auxiliary ribbon, a shaft fixed to said typewriter, a first of said rolls being rotatably mounted and slidable on said shaft, said take-up spindle having a drive gear rotatable therewith, said first friction roll having a gear fixed thereto, said first friction roll being adapted to slide on said shaft into an operative position with the gear on said roll being intermeshed with the gear on the take-up spindle, said first friction roll being further adapted to slide on said shaft into an inoperative position with the gear on said roll being disengaged from the gear on the take-up spindle.

2. In a typewriter having a take-up spindle for holding and turning a ribbon spool for feeding a first ribbon past a printing point, apparatus for alternately feeding an auxiliary carbon paper ribbon past the printing point,

said apparatus comprising a pair of friction rolls for frictionally engaging and feeding the auxiliary ribbon, a shaft fixed to said typewriter, a first of said rolls being rotatably mounted on and slidable along said fixed shaft, a pivot arm upon which the second of said rolls is rotatably mounted, said pivot arm having a spring for urging the arm to pivot toward the first roll, and a gear mounted to rotate with the take-up spindle of the typewriter, said first roll having a gear fixed thereto, said first roll being slidable along said shaft to an operative position wherein the gear on the first roll is drivingly engaged with the gear on the take-up spindle, said first roll being further slidable along the shaft to an inoperative position wherein the gear on the first roll is disengaged from the gear on the take-up spindle, the second roll being spring urged into frictional engagement with the first roll when said first roll is in the operative position on the shaft, and cooperating parts on the two rolls whereby the first roll may be retained in the inoperative position by the spring urged second roll.

3. In a typewriter having a take-up spindle for holding and turning a ribbon spool for feeding a first ribbon past a printing point, apparatus for alternatively feeding an auxiliary carbon paper ribbon past the printing point, said apparatus comprising a pair of friction rolls for frictionally engaging and feeding the auxiliary ribbon, a shaft fixed to said typewriter, a first of said rolls being rotatably mounted on said shaft, said first roll being slidable on the shaft into an operative position and into an inoperative position, a pivotal arm upon which the second of said rolls is mounted, cooperating means on said first roll and said second roll for retaining the first roll in the inoperative position, and a spring means urging the pivotal arm toward the first roll for frictionally engaging the rolls when the first roll is in the operative position and for engaging the cooperating retaining means when the first roll is in the inoperative position.

4. The apparatus according to claim 3 wherein the cooperating retaining means comprises a circumferential groove around the first roll and a member of increased diameter associated with the second roll, said member being adapted to engage the groove and thereby prevent the first roll from sliding on the shaft.

5. In a typewriter having a first ribbon feed mechanism including a vibrator support at a printing point and a take-up spindle to hold a ribbon spool in spaced relation with the vibrator support, apparatus for alternatively feeding an auxiliary carbon paper ribbon past the printing point, said apparatus comprising an auxiliary ribbon supply reel rotatably mounted on one side of the typewriter, a ribbon guide having a curved surface and a plane surface extending tangentially from the curved surface and toward the vibrator support, said ribbon guide being operative to conduct the auxiliary ribbon from the supply reel and to the vibrator support, said vibrator support having an auxiliary pair of slots adapted to hold the auxiliary carbon paper ribbon, a pair of rolls for frictionally engaging and pulling the auxiliary ribbon from the supply reel, past the ribbon guide and through the vibrator support, a shaft fixed to said typewriter, a first of said rolls being rotatably mounted on said shaft, drive means associated with the take-up spindle and coupled to drive the first roll, pivotal supporting means for rotatably supporting the second roll, and means for urging the second roll against the first roll, whereby the auxiliary carbon ribbon may be frictionally engaged between the rolls.

6. In a typewriter having a first ribbon feed mechanism including a vibrator support at a printing point and a take-up spindle to hold a ribbon spool in spaced relation with the vibrator support, apparatus for alternatively

feeding an auxiliary carbon paper ribbon past the printing point, said apparatus comprising an auxiliary ribbon supply reel rotatably mounted on one side of the typewriter, a ribbon guide having a curved surface and a plane surface extending tangentially from the curved surface and toward the vibrator support, said ribbon guide being operative to conduct the auxiliary ribbon from the supply reel and to the vibrator support, said vibrator support having an auxiliary pair of slots adapted to hold the auxiliary carbon paper ribbon, a pair of rolls for frictionally engaging and pulling the auxiliary ribbon from the supply reel, past the ribbon guide and through the vibrator support, a vertical shaft fixed to said typewriter, a first of said rolls being rotatably mounted on said vertical shaft, said first roll having a gear fixed to rotate therewith, said take-up spindle having a gear rotatably mounted and fixed thereto, said first roll being slidable along the vertical shaft and having thereon an operative position wherein said gears are drivingly engaged and an inoperative position wherein said gears are disengaged, a pivotal supporting arm for rotatably supporting the second roll, and means for urging the second roll against the first roll for frictionally engaging the auxiliary ribbon when the first roll is in the operative position, and cooperating means on both rolls for retaining the first roll in the inoperative position.

7. In a typewriter having a first ribbon feed mechanism including a vibrator support at a printing point and a take-up spindle to hold a ribbon spool in spaced relation with the vibrator support, apparatus for alternatively feeding an auxiliary carbon paper ribbon past the printing point, said apparatus comprising an auxiliary ribbon supply reel rotatably mounted on one side of the typewriter, a ribbon guide having a curved surface and a plane surface extending tangentially from the curved surface and toward the vibrator support, said ribbon guide being operative to conduct the auxiliary ribbon from the supply reel and to the vibrator support, said vibrator support having an auxiliary pair of slots adapted to hold the auxiliary carbon paper ribbon, a pair of rolls for frictionally engaging and pulling the auxiliary ribbon from the supply reel, past the ribbon guide and through the vibrator support, a vertical shaft fixed to said typewriter, a first of said rolls being rotatably mounted on said vertical shaft, said first roll having a gear fixed to rotate therewith, said take-up spindle having a gear rotatably mounted and fixed thereto, said first roll being slidable along the vertical shaft and having thereon an operative position wherein said gears are drivingly engaged and an inoperative position wherein said gears are disengaged, a pivotal supporting arm for rotatably supporting the second roll, said first roll having a circumferential groove and said second roll having a projecting washer adapted to engage the groove and to retain the first roll in the inoperative position on the vertical shaft, and a spring associated with the pivotal supporting arm for urging the second roll toward the first roll for frictionally engaging the auxiliary ribbon when the first roll is in the operative position and for engaging and holding the washer in the groove when the first roll is in the inoperative position.

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