

[54] **RIBBON MECHANISM FOR
CARTRIDGE SUPPORTED RIBBONS**

[72] Inventors: **Carl P. Anderson, Homer; Charles H. Kennedy, Ithaca; Donald S. Perry, Fayetteville, all of N.Y.**

[73] Assignee: **SCM Corporation, New York, N.Y.**

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[58] Field of Search 197/151, 168, 153, 170, 175, 197/160, 162, 159; 242/197, 198, 200

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Primary Examiner—Robert E. Pulfrey

Assistant Examiner—Stephen C. Pellegrino

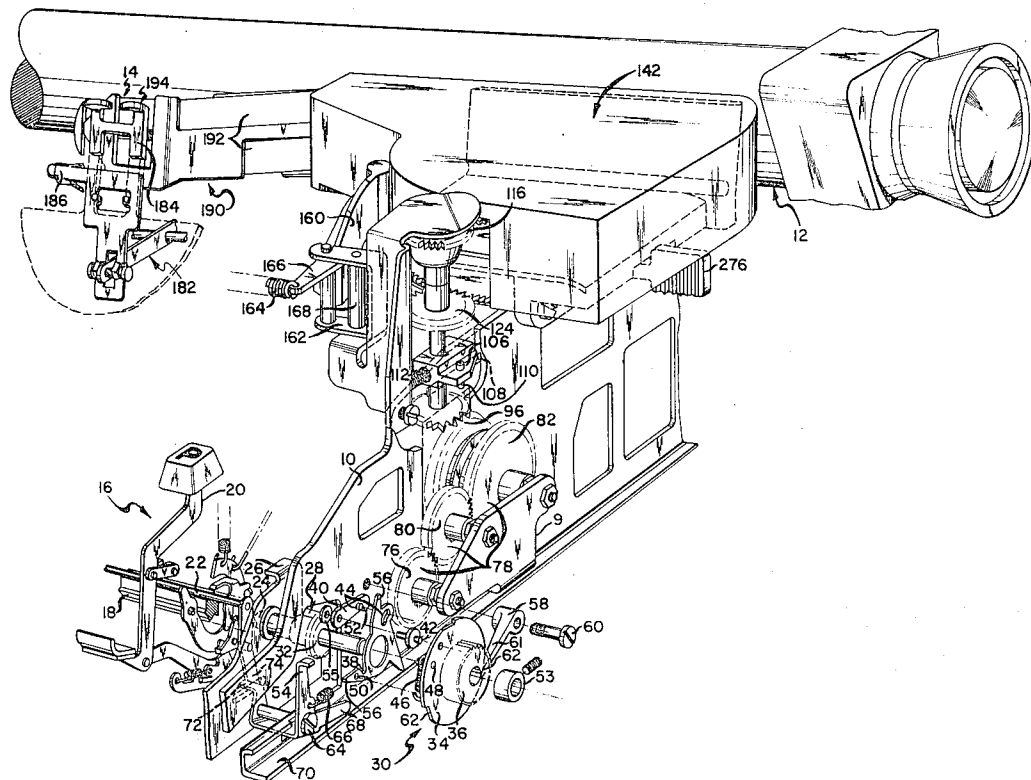
Attorney—Carlos Nieves, Milton Wolson and Harvey Zeller

[57]

ABSTRACT

A ribbon mechanism for cartridge supported ribbons includes a gear train which is clutch operated in response to typing actuations and which provides incremental rotation to two independent cartridge-type ribbon driving means for feeding a ribbon past the machine print point. The two independent driving means are coaxially mounted and are driven in opposite directions thus accomplishing both a feed means and a takeup means for either a cartridge having an endless ribbon system supported therein or a cartridge having a two spool ribbon system support therein.

24 Claims, 9 Drawing Figures



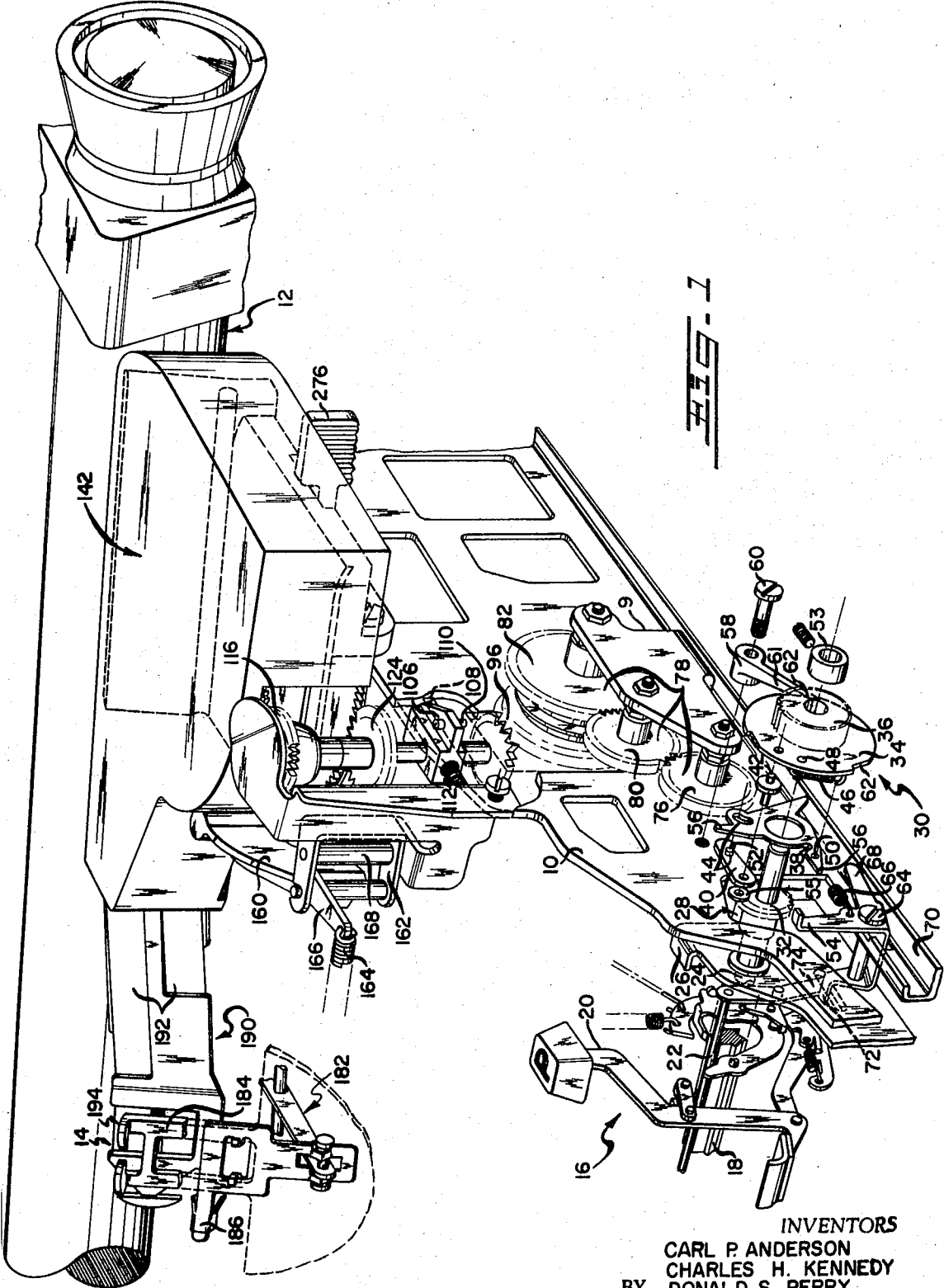
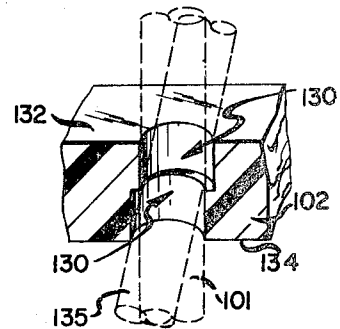
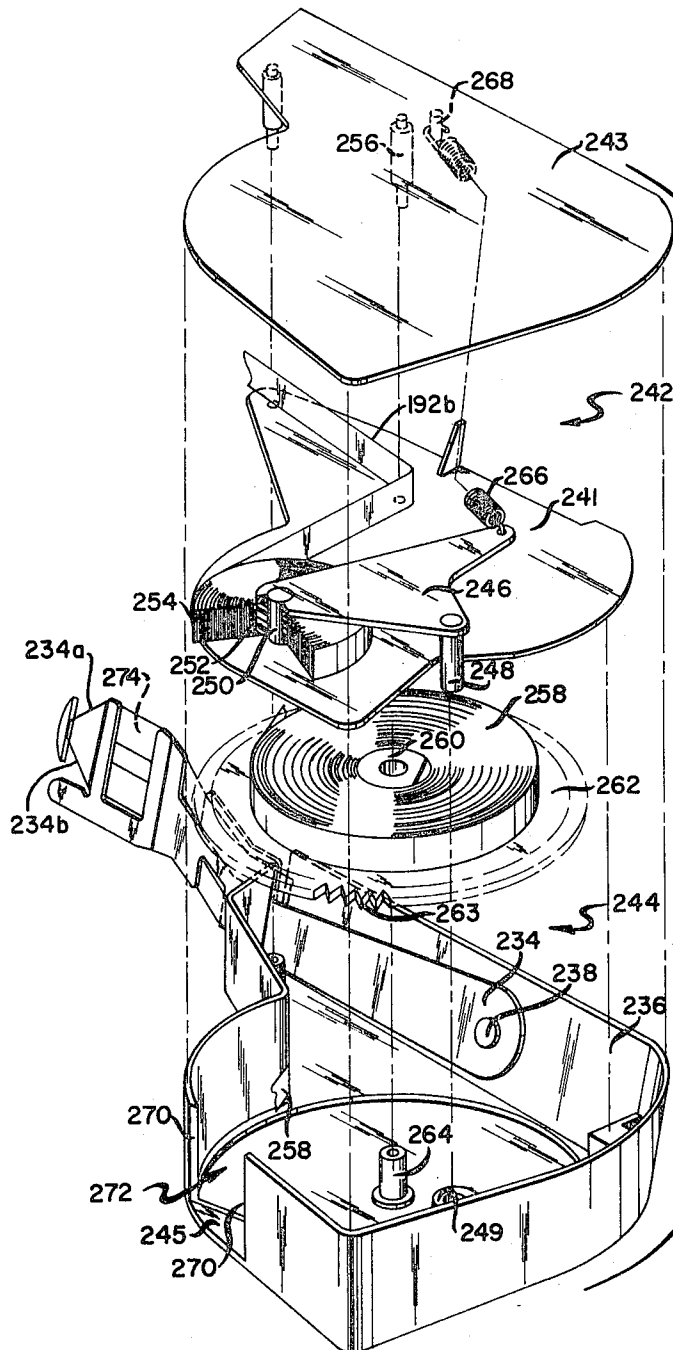


FIG. 1

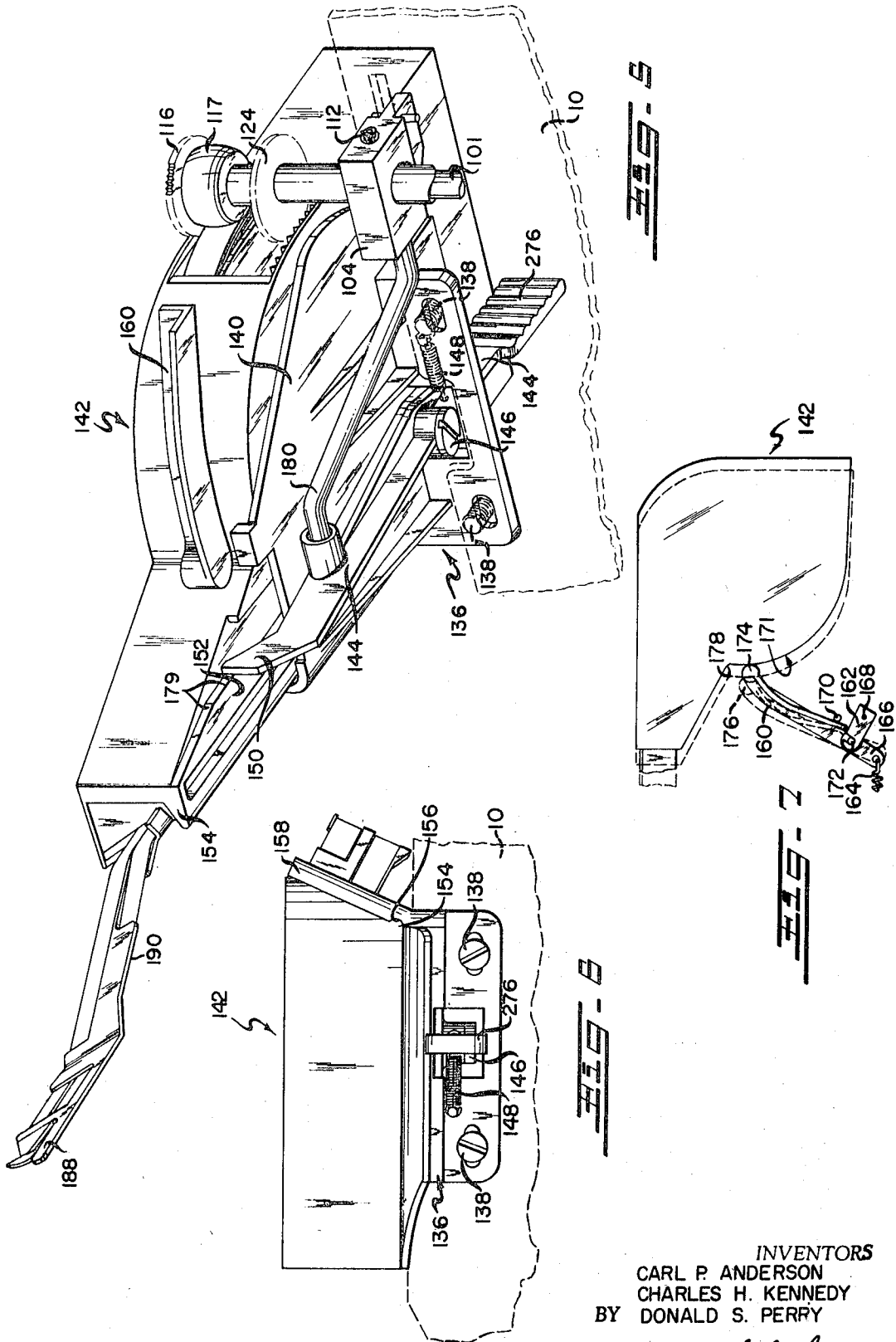
INVENTORS
CARL P. ANDERSON
CHARLES H. KENNEDY
BY DONALD S. PERRY
Kenneth W. Sub
AGENT

36 INVENTORS
CARL P. ANDERSON
CHARLES H. KENNEDY
BY DONALD S. PERRY



INVENTORS
CARL P. ANDERSON
CHARLES H. KENNEDY
BY DONALD S. PERRY

Kenneth H. Sub
AGENT



INVENTORS
CARL P. ANDERSON
CHARLES H. KENNEDY
BY DONALD S. PERRY

Kenneth H. Sub
AGENT

RIBBON MECHANISM FOR CARTRIDGE SUPPORTED RIBBONS

This is a continuation of application Ser. No. 732,343, filed 5/27/68, now abandoned.

BACKGROUND OF THE INVENTION

This invention relates to ribbon feeding mechanisms for typewriters or like machines and more particularly to those types which employ the single unit, nonseparable removable-type ribbon cartridge.

The art for typewriter ribbon feed mechanisms over the years has been determined by the types of ribbon and their degree of usability. For example, the reusable fabric ribbon dictates use of a ribbon feed mechanism capable of having a reversible drive means in order to realize the full advantage of the degree of ribbon usability. On the other hand, the carbon nonreusable-type ribbon dictates use of a feed mechanism which is capable of metering the ribbon feed so as to use as much of the ribbon area as is possible during its single pass past the printing point.

Well-known advances have been made in recent years with respect to packaging these types of ribbons into cartridges for neater and quicker installation purposes. However, these cartridges aided only in installing the ribbon into the machine vibrator and did not require any change in the feed mechanism employed.

More recently, the ribbon cartridge art has experienced an advance wherein the cartridge carries its own vibrator arm and provides a housing from which the ribbon is both supplied and taken up. This newer type of ribbon cartridge need only be installed into an appropriate support on the typewriter to be ready for operation, thus virtually eliminating ribbon handling in typewriters and like business machines. This new type of cartridge may be equipped with either an endless-type ribbon or a two spool, supply and takeup-type, ribbon. The fabric-type ribbon is provided in an endless-type cartridge and the carbon ribbon is provided in a two spool-type cartridge as will be seen shortly. The ribbon feed mechanism need not necessarily provide a reversing mechanism but it must be applicable to feed either type of cartridge equipped ribbon.

SUMMARY OF THE INVENTION

It is the main object of this invention to provide a ribbon feed mechanism capable of feeding either a two spool carbon ribbon supported in a cartridge or a single spool endless fabric ribbon supported in a cartridge. This object is accomplished by providing two separate coaxially mounted drive means, which drive in opposite directions and are arranged to automatically cooperate with the appropriate mechanism of either type of cartridge when the cartridge is installed in the machine.

The above mentioned and other objects of this invention will become apparent by reference to the following description in conjunction with the accompanying drawings in which:

DESCRIPTION OF THE DRAWING

FIG. 1 is a right front perspective view of the invention assembled to the right side frame of a ribbon cartridge equipped typewriter, one of the clutches of the novel mechanism shown exploded;

FIG. 2 is a left front perspective view of the two coaxially mounted feeding means and the means by which their opposite rotative direction is achieved, a clutch of which is shown exploded;

FIG. 3 is a sectional view of the feeding means taken along line 3—3 of FIG. 2;

FIG. 4 is a sectional view of one of the supporting blocks for the feeding means;

FIG. 5 is a bottom left perspective view of the typewriter ribbon cartridge support shown with a cartridge installed therein;

FIG. 6 is a right side elevational view of the cartridge and support;

FIG. 7 is a top plan view of the cartridge ejecting finger;

FIG. 8 is a right front exploded perspective view of an endless fabric ribbon supported in a cartridge; and

FIG. 9 is a right front exploded perspective view of a two spool carbon ribbon system supported in a cartridge.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The novel mechanism in general is comprised of a vertically mounted shaft having two sets of pivotally mounted gear driving means which are incrementally driven in opposite directions thru a clutch actuated gear train in response to typing actions. One set of gear driving means on the shaft is driven frictionally while the other set is driven positively. The frictionally driven set provides the driving means for ribbon takeup whereas the positively driven set provides the driving means for the ribbon feed. The frictionally driven gear set is designed to be freely driven through a greater angle of rotation than is the positively driven gear set to provide a means for taking up all the ribbon which has been fed thus insuring tautness of the ribbon at all times.

More specifically and with reference to FIGS. 1 and 2, the novel mechanism is shown assembled to the right side frame 10 of a power operated typewriter having a movable platen carriage 12, a print point 14 and a plurality of key-actuating mechanisms 16 which, when selectively engaged with a motor driven power roll 18, effect acceleration of one of a plurality of conventional typebars (not shown) to the print point 14 to thereby effect a printing operation.

Each key actuator 20 effects a clockwise pivoting motion of a pivotally mounted bail 22 during its operative stroke. The power roll shaft 24 is pivotally mounted at its ends in a pair of intermediate side frames 26 (one of which is shown) and is conventionally motor driven at its left end for continuous clockwise rotation while its right end projects through a large opening 28 in the right side frame 10. A clutch 30 is pivotally mounted near the right end of the shaft 24 near a rigidly mounted gear 32 and comprises three main parts: a clutch plate 34 which has rigidly mounted gear 36 on its right face, a latch plate 38 which is pivotally mounted on a hub of the clutch plate 34, and a pawl 40 which is pivotally mounted on a rigid clutch plate pin 42 and is operatively engaged with the latch plate 38 by a pin and slot arrangement 44. The latch plate 38 is biased clockwise by a tension spring 46 interconnected between a clutch plate pin 48 and a latch plate hole 50. The pawl 40 is retained on the clutch plate pin 42 by means of a washer 55 which is placed onto the pin 42 before the left end of the pin 42 is headed over.

The pin and slot arrangement 44 between the pawl 40 and the latch plate 38 is such that when the clutch 30 is assembled and retained on the shaft 24 by a rigidly mounted collar 53, and when the latch plate 38 is pivoted clockwise with respect to the clutch plate 34, the pawl 40 is pivoted clockwise about pin 42 whereupon a pawl tooth engaging nose 52 is moved substantially in a radial direction into engagement with the teeth of the constantly rotating gear 32. On the other hand, if the latch plate 38 is moved counterclockwise with respect to the clutch plate 34, the pawl 40 will pivot counterclockwise about the pin 42 and out of engagement from the shaft gear 32.

The latch plate 38 is normally held from any clockwise rotation by a finger 54 which contacts any one of three latch plate projections 56 while the clutch plate 34 is constantly urged in a clockwise direction by the clockwise motion of the shaft 24 as the clutch plate 34 pivotally bears on the shaft 24. The clutch plate 34 is insured against counterclockwise movement by a plastic member 58 which is rigidly mounted on the side frame 10 by a screw 60 and has a finger 61 which cooperates with one of three notches 62 in the clutch plate periphery. The plastic member 58 is of a resilient material whereby the finger 61 may be deflected by the clutch periphery during rotation of the clutch plate 34 and will snap into the next approaching notch 62. The latch plate holding finger 54 is constructed to arrest one of the latch plate projections 56 just prior to when the plastic finger 61 snaps into one of the clutch plate notches

62. This provides yielding of the pawl spring 46 and causes the pawl 40 to be limited radially outward by the camming action of the pin and slot arrangement 44 to insure the normal disengagement of the clutch 30.

The latch plate holding finger 54 is pivotally mounted on a frame rigid screw 64 and is normally biased clockwise by a tension spring 66 in a holding position. The latching finger 54 has a lower extension 68 which abuts the side frame lower lip 70 for limiting its holding position as shown while a formed finger 72 on the left end of the latch finger 54 lies in the path of the lower extension 74 of the key actuated bail 22. Each time the bail 22 is oscillated by a key action 16, the clutch 30 is engaged with the power roll shaft 24 by releasing of latch plate 38 and the engagement of the pawl 40 with the gear 32 for one-third a revolution whereupon the latch finger 54 arrests the next latch plate projection 56 and effects disengagement of the pawl 40 from the gear 32. Thus clutch 30 provides incremental driving movements from a continuously rotating power roll 18.

The clutch plate gear 36 meshes with the first gear 76 of a gear train 78 and transmits the incremental rotative motion in response to each key actuation, through an idler gear 80 to a large gear 82. The large gear 82 (FIG. 2) is rigidly mounted on a shaft 84 by a set screw 85 and has a rigid pin 86 on its inner surface upon which a pair of friction pad retaining members 88 are pivotally mounted. Members 88 are biased radially inward about their pivot by a spring 90 interconnected between their free ends which in turn applies a like force to a pair of friction pads 92 each of which is disposed between the inner surfaces of the members 88 and a large hub 94 of a bevel gear 96. The large bevel gear 96 is pivotally mounted on the shaft 84 while a small bevel gear 98 is rigidly mounted near the left end of the shaft 84.

The incremental clockwise motion delivered by clutch 30 to the large gear 82 is therefore transmitted positively to the small bevel gear 98 and frictionally to the large bevel gear 96.

The cartridge ribbon feeding means 100 (FIGS. 2 and 3) is comprised of a shaft 101 which is vertically mounted within a pair of supports 102 and 104. The lower support 102 is rigidly mounted to the side frame 10 while the upper support 104 is slideably mounted on the frame 10 for limited horizontal movement by means of a support extension 106 which extends through a side frame slot 108 and has a pin 110 (FIG. 1) secured therethrough on the outside of the frame 10. A horizontally supported compression spring 112 is supported at its forward end by a frame rigid pin (not shown) and extends into a blind hole 127 in the upper support 104 for normally limiting the shaft 101 in the position shown with the upper support 104 limited against the rear wall of the side frame slot 108.

At each end of the shaft 101 is a rigidly mounted gear 114 and 116. The lower gear 114 is a bevel gear and is mounted on the shaft 101 by means of a set screw 118 while the upper gear 116 is a spur gear and is mounted on the shaft 101 by means of a press fit. In addition, a rubber friction roll 117 is press fit onto the hub 116a of the shaft rigid gear 116. Intermediate these two rigidly mounted gears 114 and 116 is a pivotally mounted metal bushing 120 which also has near its ends a pair of rigidly mounted gears 122 and 124. The lower gear 122 is a bevel gear and is mounted on the bushing 120 by means of a set screw 126 while the upper gear 124 is a spur gear and is mounted on the bushing 120 by means of a press fit. The lower bushing supported gear 122 has a long downward extending hub 128 which rests upon the lower support 102 for supporting the bushing mounted gears 122 and 124. The main shaft 101 is in turn supported against gravity by virtue of the upper gear 116 resting on the hub extension 130 on the bushing mounted upper gear 124.

Support 102 is equipped with a pair of slightly elongated holes 130 (FIG. 4) which extend inwardly from opposite top and bottom faces 132 and 134 respectively of the appropriate support 102 (FIG. 4) and are slightly offset with respect to one another. The arrangement provides a normal vertical support

for the shaft 101 and also allows clearance for forward tilting 135 of the shaft 101 within the support against the action of the compression of spring 112 (FIG. 2) during a cartridge 142 installation.

Support 104 is also equipped with a pair of holes 104a (FIG. 3) which are slightly offset with respect to one another. The arrangement provides a vertical support for bushing 120 and allows clearance for forward tilting of the bushing 120, which is on shaft 101, during cartridge 142 installation.

Referring again to FIG. 2, the left end of the horizontal shaft 84 extends beyond its rigidly mounted small bevel gear 98 so as to pivotally bear within a suitable hole in the right face of the lower support 102. The horizontal shaft small rigid bevel gear 98 is therefore brought into mesh with the vertical main shaft lower bevel gear 114 while the large frictionally driven bevel gear 96 is brought into mesh with the bushing rigid lower gear 122.

As the pair of horizontally supported gears 96 and 98 are incrementally rotated clockwise (FIG. 2), the vertically supported gears 122 and 114 are therefore driven in opposite directions wherein gear 122 is moved clockwise and gear 114 is moved counterclockwise. The gears 122 and 114 in turn transmit their motion to their cooperating spur gears 124 and 116 respectively.

Referring to FIG. 5, a cartridge guide support 136 is rigidly mounted on the side frame 10 by a pair of screws 138 and has a large horizontal platform 140 upon which the cartridge 142 is supported when installed in the machine. A lever 144 is pivotally mounted on the under side of the platform 140 by means of a shoulder screw 146 and is normally biased counterclockwise by a spring 148. The lever 144 has at its left end, an upward extending finger 150 for abutting the sidewall 179 of a projection 152 molded on the under side of the cartridge 142 for providing a rest position limit for the cartridge 142 and retaining the cartridge 142 in the installed position. A lip 154 which runs along the bottom rear edge of the cartridge is provided for mating with a like groove 156 (FIG. 6) molded in an upstanding rear wall 158 of the support 136. This insures proper guidance of the cartridge 142 during installation.

An arm 160 (FIGS. 1 and 7) is pivotally mounted in a U-shaped bracket 162 and is heavily biased clockwise by a tension spring 164 interconnected between a forward extending finger 166 of arm 160 and a frame member (not shown). The bracket 162 is pivotally mounted on a frame rigid post 168 while another frame rigid post 170 acts to limit the arm 160 in its normal inoperative position as shown in FIG. 7.

When the cartridge 142 is installed in the support 136 from right to left, the housing wall 171 contacts the arm 160 as shown and pivots the arm counterclockwise about its pivot 172 against the action of spring 164. When the forward end 174 of the arm 160 has moved to the position shown in hidden lines 176, it comes into contact with an interfering portion 178 of the housing wall. Further movement of the cartridge 142 now effects a counterclockwise pivoting of the bracket 162 about post 168 to provide a rearward biasing effect on the cartridge 142 thus insuring contact between the cartridge rear lid 154 and its cooperating guide support groove 156 (FIG. 6) during the remainder of the installation.

As the cartridge 142 nears its installed position, the lever finger 150 (FIG. 5) is cammed along the sidewall 179 of the cartridge molded projection 152 and snaps into its cartridge latching position as shown. During the installation, when the lever 144 is cammed clockwise from a first position to a second position, a solid link 180, which is rigidly connected to the lever 144 and loosely guided into an opening 181 (FIG. 3) in the upper support 104, effects the aforementioned forward tilting of the feeding means 100 against the action of the compression on spring 112. This action displaces the feeding means 100 from an effective position to an ineffective position and thereby insures against engagement of the feeding gears 116 and 124 with the cooperating gears 210 and 224 of the modified cartridges 142a and 142b, herein after described, until a cartridge has fully reached its installed position.

A vibrator mechanism 182 (FIG. 1), which oscillates up and down in response to typing actuations by conventional means, is guided by a type guide 184 and has a U-shaped guide 186 into which a mating finger 188 (FIG. 5) of a cartridge arm 190 is located during the cartridge 142 installation. The arm 190 which carries the ribbon 192 from within the cartridge to a location adjacent the print point 14, is pivotally mounted on the cartridge 142 so that an exposed portion 194 of the ribbon is lifted to the print point by the vibrator mechanism 182 in response to a key action 16 thereby effecting a printing operation.

Referring now to FIG. 8, a fabric endless loop type ribbon 192 supported in the cartridge 142a is shown. A cartridge arm 196 is pivotally mounted on the cartridge rear wall 198 by a rivet 200. The cartridge 142a has a separator plate 204 for providing the cartridge 142a with an upper chamber 206 created by a cover 207 and plate 204 and a lower chamber 208 created by plate 204 and the base 209. Each chamber has similar gears 210 and 211 pivotally mounted on a common post 213 which mate with the two feed spur gears 116 and 124 respectfully of the previously described feeding means 100.

The endless spool 212 of fabric inked ribbon 192 is wound on a partially cone-shaped hub 214 having a flange 215 extending from one end thereof. The hub 214 is pivotally mounted on a rigid upstanding post 217 in the lower chamber 208. A loop of the ribbon extends from the spool 212 inner convolution up through an opening 216 in the separator plate 204 into upper chamber 206, around an upper gear stripper finger 218 and a guide post 220, out of the upper chamber 206 and to the end of the arm 196, back into the lower chamber 208, around a lower gear stripping finger 222, around a guide plate 223 and onto the periphery of the ribbon spool 212. A second guide plate 221 integrally extends from the housing to provide a ribbon storage area between guide plate 221 and guide plate 223 for any excess ribbon 192 that may accrue from an unbalance of the amount of ribbon 192 pulled from the inner convolution and the amount of ribbon 192 taken up on the outer convolution. Each gear 210 and 211 has a washer shaped hub portion 224 and 225 respectfully rigid relative thereto which extends through appropriate slots 218a and 222a and mating stripping fingers 218 and 222 respectively. Each gear 210 and 211 also has a cooperating tension finger 226 and 227 which is pivotally mounted on a post 228 and 229 and is biased clockwise by a torsion spring 230 and 231 for insuring proper friction between the ribbon as it comes into contact with the gear hubs 224 and 225. When this type of ribbon equipped cartridge 142a is installed into the machine, the upper positively driven feeding gear 116 (FIG. 3) will cooperate with the cartridge upper chamber gear 210 while the lower frictionally driven feeding gear 124 will cooperate with the cartridge lower chamber gear 211. Being that the upper chamber gear 210 will be incrementally fed in a clockwise direction by its feeding gear 116 and being the lower chamber 211 will be fed counterclockwise by its feeding gear 124, when the cartridge 142a is installed in the typewriter, it will be seen that the portion of exposed ribbon 232 near the end of the arm 196, will always be fed in response to typing actions past the print point and onto the ribbon spool periphery.

Referring now to FIG. 9, two spool-type carbon ribbon equipped cartridge 142b is shown. A cartridge arm 234 is pivotally mounted on the cartridge rear wall 236 by a rivet 238 while the cartridge 142b has a separator plate 241 for providing the cartridge 142b with an upper chamber 242 created by plate 241 and a cover 243 and a lower chamber 244 created by plate 241 and a base 245. The upper chamber 242 is equipped with an arm 246 which is rigidly mounted on a post 248 and which has a rigid downward extending post 250. Post 248 is pivotally mounted in an apertured support 249 integral with the cartridge. A core 252 which has a single pass inked ribbon such as carbon ribbon 192b, for example, wrapped around and secured thereto by suitable means such as adhesive material, is pivotally mounted on the post 250. The post

250 and the core 252 cooperate to form a supply spool for the carbon ribbon 192b.

The ribbon 192b extends around a guide post 256 and out of the upper chamber 242 along the arm 234. Arm 234 has two notches near its left end through which ribbon 192b passes. The ribbon 192b extends along the arm 234 into the lower chamber 244 onto the periphery of a takeup spool of ribbon 258. The ribbon 192b has its other end secured to the hub 260 of the takeup spool by suitable means such as adhesive material.

The takeup hub 260 is rigid with a bottom flange gear 262 having teeth 263 on the periphery thereof which is pivotally mounted on a cartridge rigid upstanding post 264. The supply spool arm 246 is biased about its pivot post 248 by a tension spring 266 interconnected between the arm 246 and a cartridge rigid post 268 whereby the outer convolution of the supply spool 254 is tensioned against the defining edges 270 of a cartridge aperture 272. When the cartridge 240 is installed in the machine, the supply spool periphery will cooperate with the feeding means rubber friction feed roll 117 (FIG. 3) while the takeup spool flange gear 263 will cooperate with the feeding means gear 124. When the feeding means 100 returns to its normal position after being tilted forward when the cartridge is installed, the diameter of its rubber feed roll 117 is such that it displaces the supply spool arm 246 slightly clockwise against the tension of the spring 266 so that the periphery of the supply spool of ribbon 254 is free from contacting the cartridge aperture walls 270. Being that the upper chamber supply spool of ribbon 254 will be fed in a clockwise direction by its rubber feeding roll 117 and the lower chamber takeup flange gear 262 will be fed counterclockwise by its feeding gear 124 in response to typing actions, it will be seen that the portion of exposed ribbon 274 near the end of the arm 234 will always be fed past the print point and onto the takeup spool 258 periphery. Being the rubber feeding roll 117 is incrementally rotated by equal amounts from the clutch 30 and being the outer convolution of the supply ribbon 254 is biased against the roll 117, equal incremental lengths of the ribbon 192b is fed from the supply spool regardless of the diameter of the ribbon outer convolution.

The ability of the present ribbon feed mechanism to automatically accept either of two different types of ribbon equipped cartridges 142a and 142b upon installation thereof provides both an improved method of ribbon installation which overcomes the problems heretofore encountered with other cartridge ribbon systems and an improved method of changing the type of ribbon used.

An installed cartridge may be removed simply by pushing the lever button end 276 (FIG. 5) to the rear whereupon the biasing arm 160 will effect partial ejection of the cartridge from the guide support plate 140 for convenient complete removal therefrom while another cartridge of a different ribbon type or color may be installed by a simple sliding installation.

In addition to these advantages, the ability of the present feeding means to be completely disengaged from the approaching path of the cartridge appropriate cooperating feed means until the installation of the cartridge is complete, provides insurance against damage of either the cartridge feed parts of the machine feed parts and also insures against undue tensioning of the ribbon within the cartridge.

What is claimed and desired to be secured by Letters Patent

is:

What is claimed is:

1. A cartridge ribbon feed mechanism for a typewriter comprising:
 - a frame;
 - an incrementally operable driving means supported on the frame;
 - a tiltable first drive member incrementally rotatable by the driving means;
 - a tiltable second drive member coaxial with said first drive member incrementally rotatable by the driving means,

means for supporting the tiltable first and second drive members coupled to the frame;
 a bracket mounted on the frame;
 a ribbon cartridge removably supported on the bracket;
 a ribbon;

a supply spool supported in the cartridge having a supply of the ribbon, spirally wound thereon, engageable with the first drive member for feeding ribbon from the supply spool in response to incremental operations of the driving means when the cartridge is positioned on the bracket;

and
 a takeup spool supported in the cartridge having means engageable with the second drive member for feeding ribbon on to the takeup spool in response to the incremental operations of the driving means to take up the ribbon fed from the spool.

2. A cartridge ribbon feed mechanism as defined in claim 1 wherein the spirally wound ribbon on the supply spool is engageable with the first drive member.

3. A cartridge ribbon feed mechanism as defined in claim 2 wherein the supply spool is supported in the cartridge by a movably mounted arm for carrying the outer convolution of the spirally wound ribbon into engagement with the first drive member for feeding equal incremental lengths of ribbon regardless of the diameter of the ribbon outer convolution.

4. A cartridge ribbon feed mechanism as defined in claim 3 further comprising spring means for biasing the outer convolution of the spirally wound ribbon into engagement with the first drive member.

5. A cartridge ribbon feed mechanism as defined in claim 1 wherein the supply spool is supported by an arm pivotally mounted in the cartridge, a post carried by the arm and spring means connected to the arm for biasing the outer convolutions of the spirally wound ribbon into engagement with the first drive member.

6. A cartridge ribbon feed mechanism as defined in claim 1 wherein the driving means includes a power source; and, a friction clutch coupled to the power source and to the second drive member for taking up the amount of ribbon feed by the first drive member.

7. A cartridge ribbon feed mechanism as defined in claim 1 wherein the driving means includes a power source; and, a friction clutch coupled to the power source and to the second drive member for incrementally rotating the second drive member relative to the first drive member for maintaining a predetermined amount of tension on the ribbon.

8. A cartridge ribbon feed mechanism as defined in claim 1 wherein the driving means includes connecting means for incrementally rotating the second drive member in a direction opposite the first drive member.

9. A cartridge ribbon feed mechanism as defined in claim 1 wherein the driving means includes positive drive means for incrementally rotating the first drive member and friction drive means for incrementally rotating the second drive member.

10. A cartridge ribbon feed mechanism as defined in claim 1 wherein the driving means includes connecting means for incrementally rotating the second drive member simultaneously with the first drive member.

11. A cartridge ribbon feed mechanism for a typewriter comprising:
 a frame;
 a power source;
 an incremental driving means supported on the frame and operable by the power source;
 feed means incrementally operable by the driving means;
 means for supporting said feed means, coupled to the frame, wherein the feed means are tiltable from an effective position to an ineffective position;
 a lever operatively connected to the feed means and operable from a first position to a second position for displacing the feed means from the effective position to the ineffective position;

a ribbon; a cartridge having a ribbon supply means supporting the ribbon therein; and

abutment means carried by the cartridge for engaging and moving the lever from the first position to the second position to displace the feed means from the effective position to the ineffective position during installation of the cartridge into the typewriter; and, spring means for returning the lever to the first position and the feed means to the effective position for engagement with the ribbon supply means for feeding the ribbon therefrom.

12. A cartridge ribbon feed mechanism as defined in claim 11 wherein the feed means includes a shaft coupled to the driving means.

13. A cartridge ribbon feed mechanism as defined in claim 12 wherein the means for supporting said feed means includes a first support rigidly mounted on the frame and a second support slideably mounted on the frame.

14. A cartridge ribbon feed mechanism as defined in claim 11 wherein the cartridge further includes a ribbon takeup means and wherein the feed means includes a first driven means for feeding the ribbon from the ribbon supply means and a second driven means for feeding the ribbon on to the ribbon takeup means.

15. A cartridge ribbon feed mechanism as defined in claim 14 wherein the driving means includes connecting means for incrementally rotating the second driven means in a direction opposite the first driven means.

16. A cartridge ribbon feed mechanism as defined in claim 14 wherein the first driven means and the second driven means have a common axis of rotation.

17. A cartridge ribbon feed mechanism as defined in claim 14 wherein the driving means includes a friction clutch for incrementally rotating one of the driven means for maintaining a predetermined amount of tension on the ribbon.

18. A cartridge ribbon feed mechanism as defined in claim 11 wherein the ribbon supply means includes a support member movably mounted in the cartridge for carrying the ribbon supply means into engagement with the feed means for feeding equal incremental lengths of ribbon in response to each incremental operation of the driving means.

19. A cartridge ribbon feed mechanism as defined in claim 18 further comprising spring means for biasing the ribbon supply means into engagement with the feed means.

20. A cartridge ribbon feed mechanism as defined in claim 11 wherein the ribbon supply means includes a spool rotatably supported in the cartridge having an endless ribbon mounted thereon, a first feed roller rotatably supported in the cartridge and incrementally rotatable by the feed means for drawing the ribbon from the inner convolutions of the endless ribbon, and a second feed roller rotatably supported in the cartridge and incrementally rotatable by the feed means for winding the ribbon on to the outer convolution of the endless ribbon.

21. A cartridge ribbon feed mechanism as defined in claim 11 wherein the lever and the cartridge abutment means form a rest position for retaining the cartridge in the installed position.

22. A typewriter ribbon cartridge comprising:
 a housing having upper and lower walls and a sidewall;
 an aperture in said sidewall;
 a support member, pivotally mounted in said housing about a first axis of rotation;
 a supply spool mounted on said support member and having a second axis of rotation,
 a ribbon supported on the supply spool;
 means for biasing the support member in a predetermined direction whereby the outer convolution of said ribbon on said supply spool is maintained in a position adjacent said aperture for cooperation with an external drive means for incrementally driving said ribbon past a print point in a typewriter.

23. A ribbon cartridge as defined in claim 22 wherein the means for biasing include a coil spring coupled to the housing.

24. A ribbon cartridge comprising:
 a housing;

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a spool rotatably supported in the housing;
an endless ribbon spirally wound on the spool having an
inner and outer convolution;
a first rotatable member supported in the housing and
operable to pull the ribbon from the inner convolution for 5
feeding ribbon therefrom and for rotating the spool;
means for guiding the ribbon from the first rotatable
member to the outside of the housing and return to the in-
side thereof;
a second rotatable member supported in the housing coaxial 10

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with said first rotatable member and being rotatable inde-
pendently thereof to pull the ribbon fed from the first
rotatable member to maintain a predetermined ribbon
tautness therebetween; and
means supported in the housing for storing ribbon between
the second rotatable member and the outer convolution
of the ribbon, thereby enabling the spool rotation caused
by the first rotatable member to take up the ribbon on the
outer convolution of the ribbon.

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