June 13, 1939. R. C. COXHEAD 2,161,856

RIBBON MECHANISM

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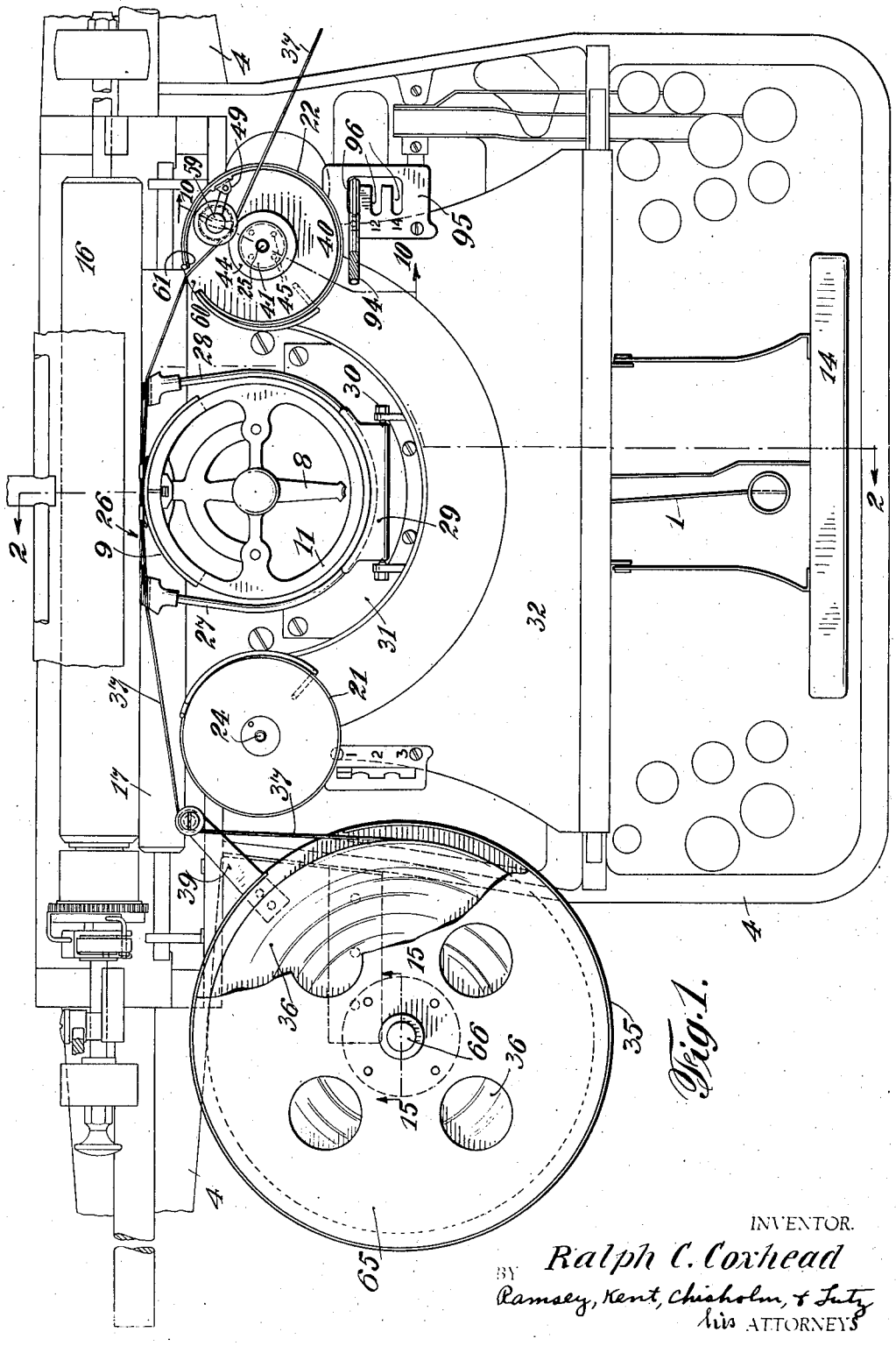


Fig. 1.

INVENTOR.
Ralph C. Coxhead
BY
Ramsey, Kent, Chisholm, & Luty
his ATTORNEYS

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RIBBON MECHANISM

Filed April 28, 1937 5 Sheets-Sheet 2

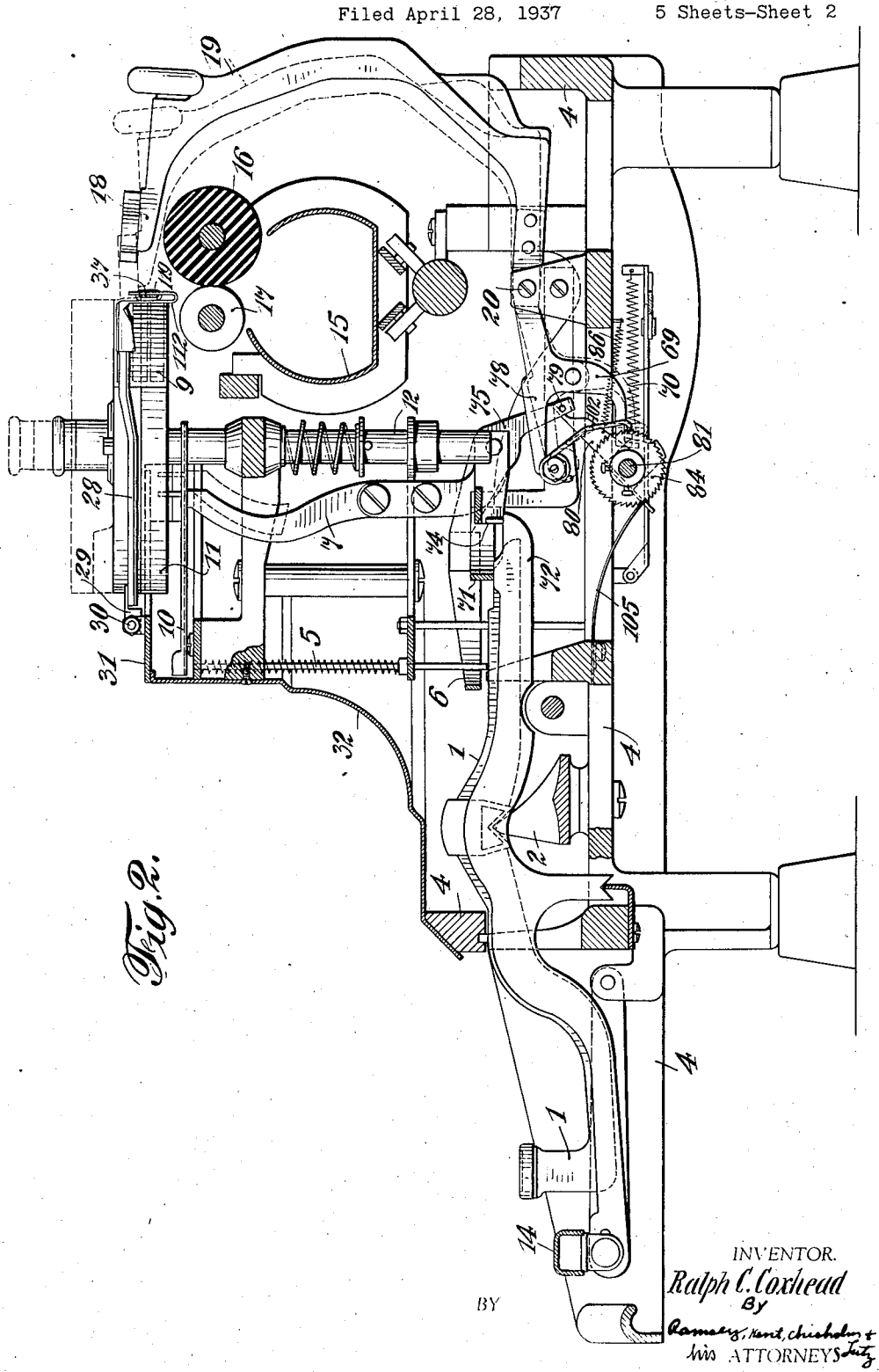


Fig. 2.

INVENTOR.
Ralph C. Coxhead
By
Ramsey, Kent, Chisholm & Lutz
his ATTORNEYS

BY

June 13, 1939. R. C. COXHEAD 2,161,856

RIBBON MECHANISM

Filed April 28, 1937 5 Sheets-Sheet 3

Fig. 3.

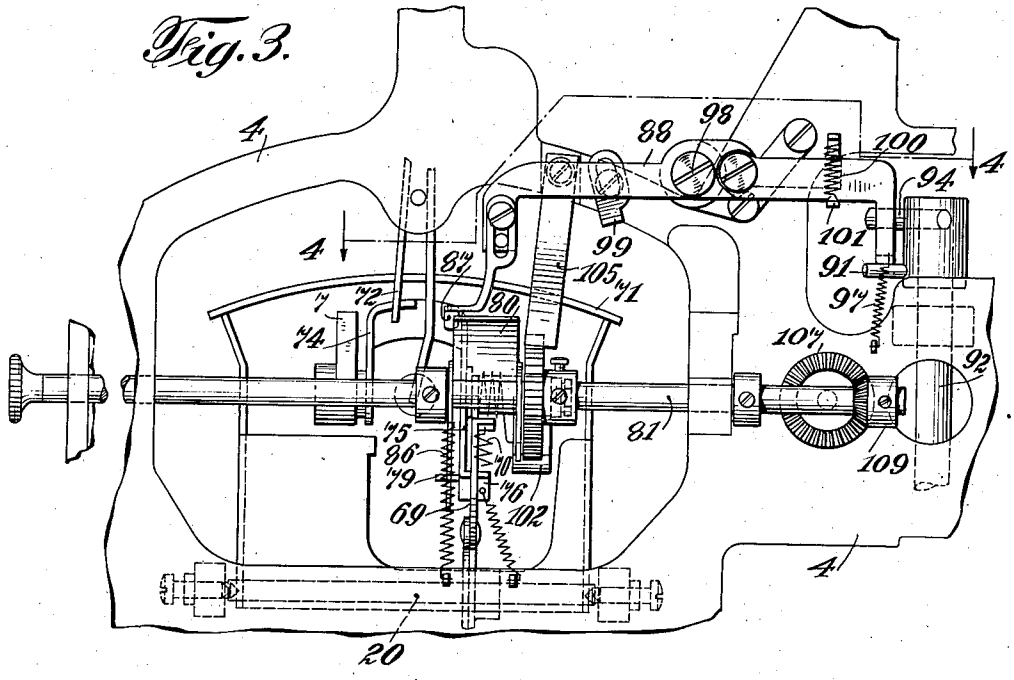


Fig. 4.

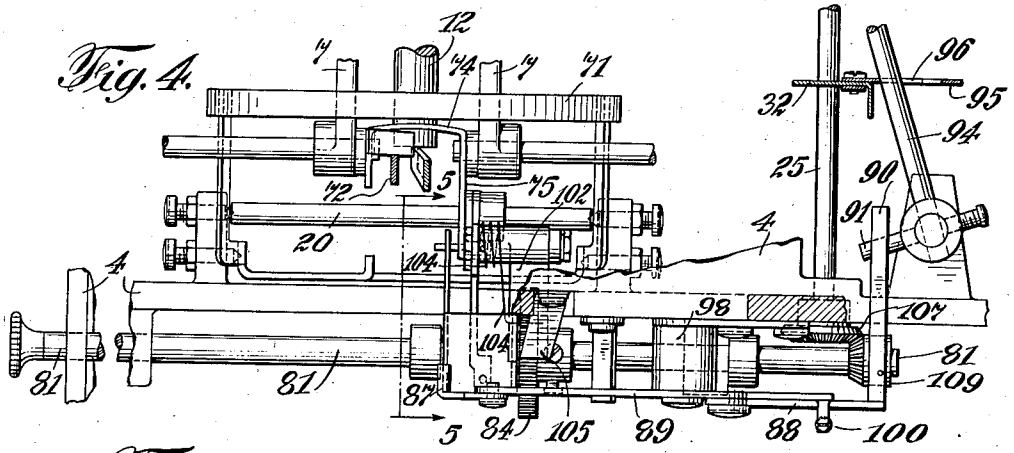


Fig. 18.

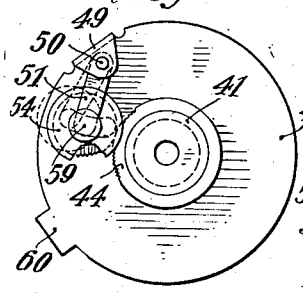


Fig. 19.

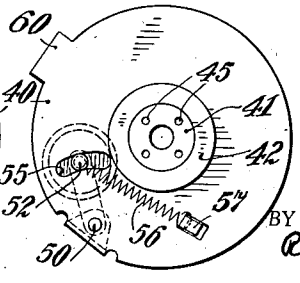
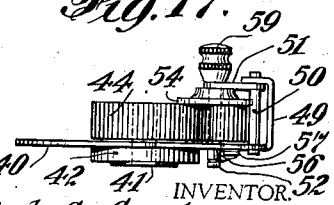


Fig. 17.



INVENTOR.
Ralph C. Coxhead
BY
Ramsey, Kent, Chisholm, & Lutz
his ATTORNEYS

June 13, 1939. R. C. COXHEAD 2,161,856

RIBBON MECHANISM

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Fig. 6.

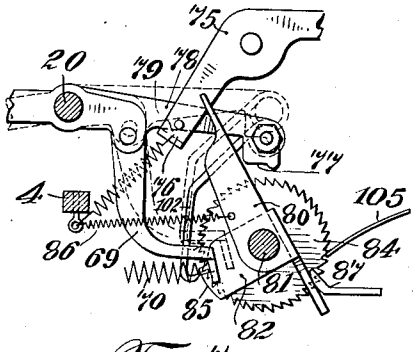


Fig. 5.

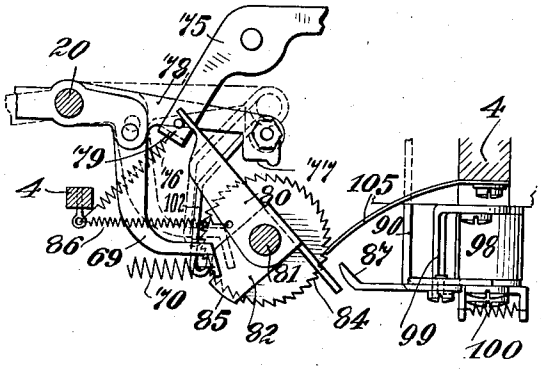
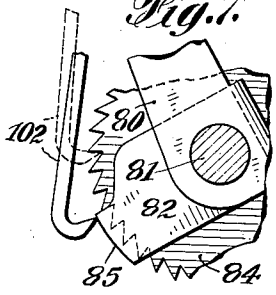


Fig. 7.



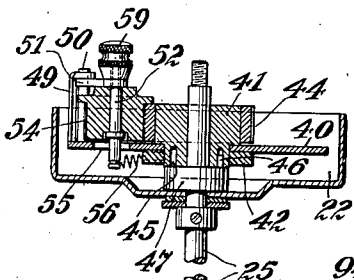
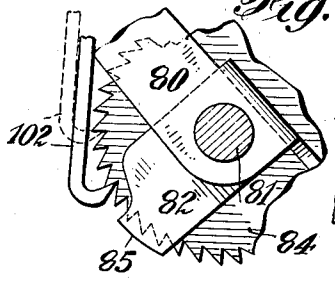


Fig. 8.



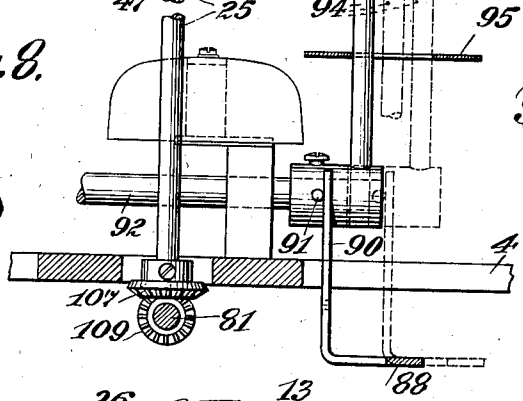


Fig. 10.

Fig. 13.

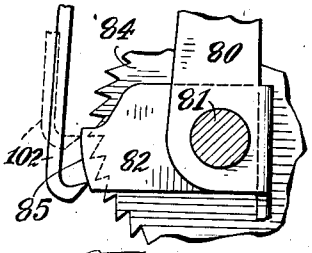


Fig. 9.

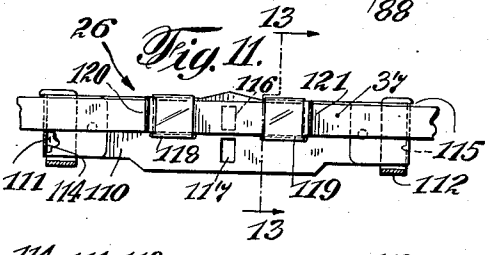
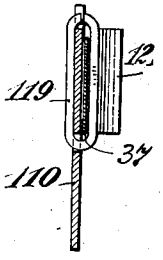


Fig. 11.



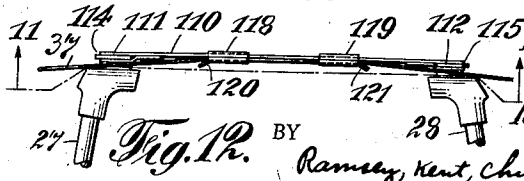


Fig. 12.

INVENTOR.
Ralph C. Coxhead
BY
Ramsey, Kent, Chisholm & Lutz
his ATTORNEYS

June 13, 1939. R. C. COXHEAD 2,161,856

RIBBON MECHANISM

Filed April 28, 1937 5 Sheets-Sheet 5

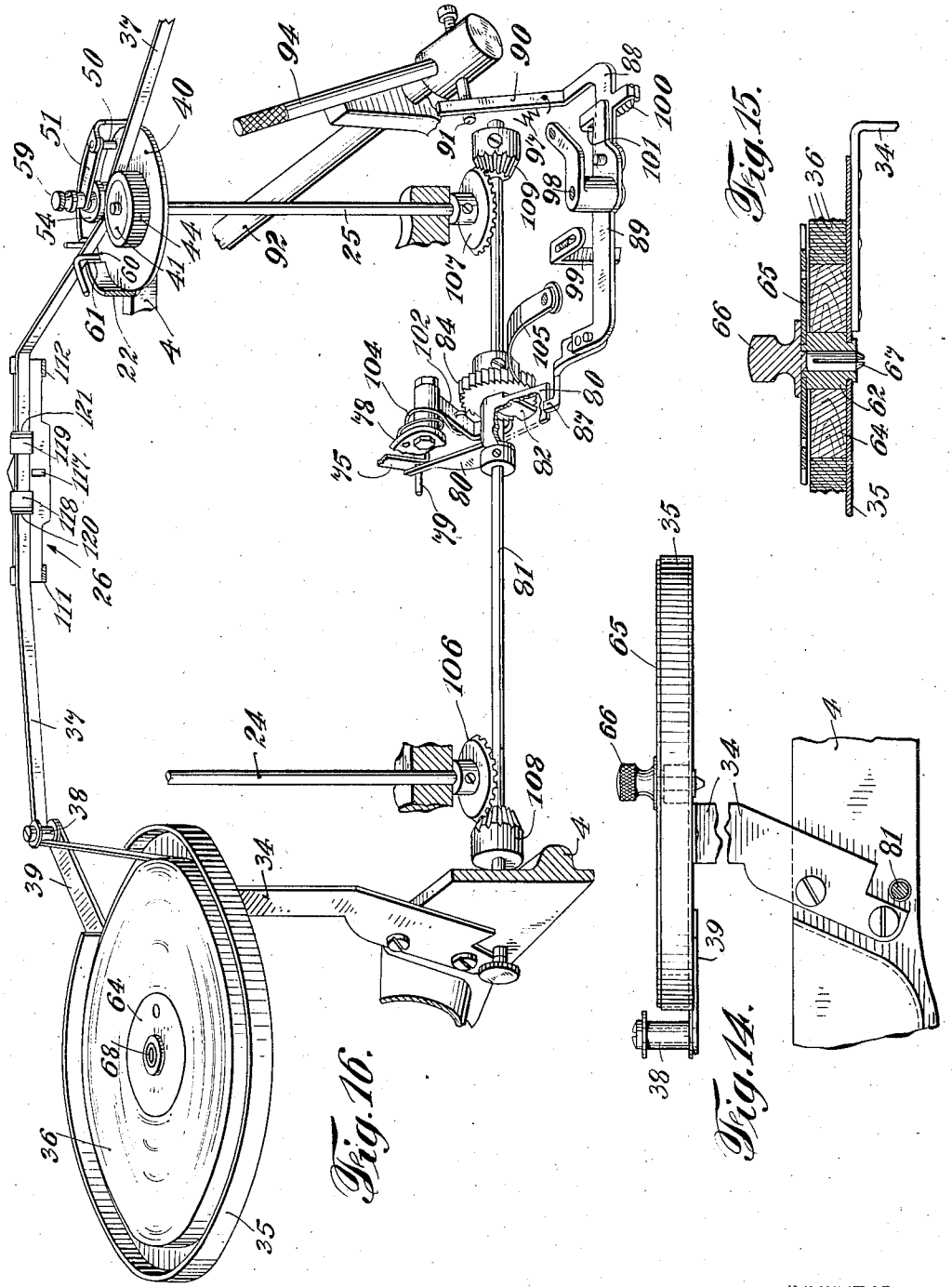


Fig. 16.

Fig. 15.

Fig. 14.

INVENTOR.
Ralph C. Coxhead
BY
Ramsey, Kent, Chisholm, & Lutz
his ATTORNEYS

Patented June 13, 1939

2,161,856

UNITED STATES PATENT OFFICE

2,161,856

RIBBON MECHANISM

Ralph C. Coxhead, New York, N. Y., assignor to Ralph C. Coxhead Corporation, New York, N. Y., a corporation of Delaware

Application April 28, 1937, Serial No. 139,425

9 Claims. (Cl. 197—151)

The present invention relates broadly to typewriters and more especially to a ribbon mechanism which is adaptable not only for typewriters but for other printing devices which use ribbons such as calculating machines, check printers, etc.

The present invention is disclosed more especially with reference to a typewriting machine known in the art as the "Vari-Typer" but it is useful in connection with other types of machines.

The particular embodiment disclosed is a construction in the form of an attachment to a normal ribbon mechanism whereby a special ribbon may be utilized for special kinds of work.

One of the principal features of the present invention is a narrow width paper ribbon carrying a pigment, and which is operated under control of mechanisms in such manner that the printing occurs in substantially the mid portion only of the ribbon that is fed through the mechanism once and then discarded.

A further feature of the invention relates to the feed mechanism of the ribbon which is so controlled as to advance the ribbon one type character space after each printing operation so that an entire unused spot in the ribbon is available at the printing point whereby each imprint from a type character comprises an unused part of the ribbon.

A further feature of the invention, in its more specific embodiment, comprises a ribbon feed constructed to feed the ribbon variable amounts depending upon the width of the type faces of the type characters. The "Vari-Typer" typewriter is provided with changeable fonts of type which may vary in size as well as in design and the ribbon feed mechanism is adjustable to properly feed the ribbon with relation to the particular font of type in use.

A still further feature of the present invention comprises constructions whereby the ribbon feed is controlled with reference to the printing instrumentalities so that the operation of a space bar which feeds the carriage without printing does not result in a ribbon feed operation.

A further feature of the present invention resides in constructions which are detachable and which cooperate with normal ribbon feed mechanism usually employed with textile ribbons so that by simple manipulation and changes of removable parts, the machine may be quickly changed from a textile type ribbon of normal use to the special narrow width paper ribbon for special use.

The present invention while adapted for various purposes is particularly useful in connection with the production of master sheets of printing adapted for reproduction by lithographic processes for publication. In this type of work, it is particularly desirable that the typewritten or printed master sheet shall be composed of printed characters of uniform density and without the ribbon pattern appearing on the characters as is the situation where textile ribbons are used for printing the characters on the master sheet. In order to obtain the desired results, it has been found that carbon paper or other pigmentized smooth material may be used as a ribbon strip.

The ordinary typewriter ribbon mechanism feeds the ribbon slight distances for each printing operation so that type imprints on the ribbon may overlap and, furthermore, the ordinary textile ribbon is of double width so that there are two zones on the ribbon adjacent each edge thereof for printing operations. It has been found that where wide paper ribbons have been used, the pounding of the type against the paper strip tends to stretch the portion under impact so that double width paper ribbon is unsatisfactory because one side becomes longer than the other and hence tends to wrinkle and thus interferes with its proper functioning of the ribbon. The use of a narrow paper ribbon on which the impressions are made in the center of the ribbon obviates the difficulty and since the ribbon is used but once and discarded, the danger of uneven printing due to a prior use of the ribbon is entirely avoided.

Another important feature of the present invention is that the narrow ribbon is fed positively and definitely for each operation of the ribbon feed. The ordinary ribbon mechanism operates by unwinding the ribbon from a supply spool and winding it upon a receiving spool. As the receiving spool increases in diameter, during the ribbon feed operation, the amount of ribbon feed varies, since ordinarily the receiving spool receives uniform angular movements for each ribbon feed operation. According to the present invention, the ribbon is fed between a pair of positive feed rolls and is discarded after leaving the feed rolls. Since the feed rolls are of constant diameter, there is no variation in the ribbon feed due to winding up the ribbon on the receiving spool.

Other features of the invention will in part be obvious and will in part be pointed out in the specification hereinafter wherein like parts in the several figures of the drawings are indicated by like characters.

It is realized that the present invention may be embodied in structures other than those specifically disclosed herewith, and, therefore, this dis-

closure is to be understood as illustrative and not in the limiting sense.

Fig. 1 is a plan view of the preferred embodiment of the present ribbon mechanism invention, as applied to a "Vari-Typer" typewriter.

Fig. 2 is a sectional view on line 2—2 of Fig. 1.

Fig. 3 is a bottom plan view, looking upwardly from beneath the machine, of certain of the driving mechanism for the ribbon feed.

Fig. 4 is an upright sectional detail view taken on line 4—4 of Fig. 3.

Fig. 5 is a detailed sectional view taken on line 5—5 of Fig. 4 and illustrating a portion of the ribbon feed mechanism by which the feed may be varied.

Fig. 6 is a view similar to Fig. 5 and in which the ribbon feed mechanism is shown as being adapted to be adjusted to vary the amount of ribbon feed.

Fig. 7 is a detail view illustrating the effective operation of the ribbon feed driving mechanism to advance the ribbon for a small amount of ribbon feed.

Fig. 8 is a view similar to Fig. 7 illustrating the parts arranged for a larger amount of ribbon feed.

Fig. 9 is a view similar to Figs. 7 and 8 in which the parts have been controlled by the space bar to prevent feeding of the ribbon when the space bar is operated to cause the advance of the typewriter carriage.

Fig. 10 is a detail view, shown partly in section, of the control lever for adjusting the ribbon feed and also illustrates in section the rollers which provide the positive feed for the ribbon.

Fig. 11 is a detail view of a ribbon carrier shield which positions the ribbon at the printing point.

Fig. 12 is a plan view of the ribbon shield illustrated in Fig. 11.

Fig. 13 is a view showing a section on line 13—13 of Fig. 11.

Fig. 14 is an elevational view of the supply cup for the paper ribbon.

Fig. 15 is a detail sectional view through the hub and top plate of the supply reel of paper ribbon.

Fig. 16 is a perspective view illustrating details of the ribbon feed mechanism and showing portions thereof in section.

Fig. 17 is an elevational view of the removable feed disc carrying the ribbon feed rolls.

Fig. 18 is a top plan view of the removable feed disc and feed roll.

Fig. 19 is a bottom plan view of the feed disc and feed roll.

Referring more especially to Figs. 1 and 2, the the key levers 1 are pivoted upon a pivot bar 2 which is mounted in the machine frame 4. These key levers extend rearwardly and the stop rods 5 are positioned over each character key lever. Actuator bars 6 (one of which is shown in Fig. 2) operate actuators 7 which swing shuttle carrier 8 for the type segment 9 and also the stop arm 10 which strikes the upper end of the lifted stop rod 5 to position a type on the type shuttle 9 at the printing point, which type corresponds to the character key lever which was depressed. The type shuttle is mounted to oscillate upon the anvil wheel 11 which sustains the printing blow when the printing operation occurs. This anvil wheel 11 is mounted upon a supporting shaft 12 which is solidly set in the machine frame 4. The anvil wheel 11 is adapted to be raised for case shift and also for changing type shuttles so that a selected type shuttle may be set in effective position at the printing point. It is a characteristic of a typewriting machine of the kind illustrated that the type segments may be changed to provide various sizes and kinds of type at the printing point.

A type carriage is mounted for reciprocation past the printing point and is adapted to be moved one letter space for each actuation of a character key. The machine is provided with the usual space bar 14 which, when actuated, causes the carriage to move idly for one space for each actuation of the space bar. The carriage is provided with a basket 15 in which paper sheets are received when fed between the paper feed rolls 16 and 17. Suitable mechanism (not shown) is provided for the carriage feed. In the type of machine disclosed, the imprint on the paper is made by striking the paper and an interposed ribbon against the character positioned at the printing point. This striking operation is performed by a hammer 18 and comprises a part of a hammer arm 19 which is mounted on a pivot 20 carried by the machine frame. All of the foregoing mechanism is well known in the typewriter art, and, therefore, has not been described in specific detail. Reference may be made to patent to Trego No. 1,967,273, July 24, 1934, for further information regarding the details above outlined.

Referring now more especially to Figs. 1, 2, and 16, the machine is provided with the usual ribbon feed mechanism comprising a pair of ribbon cups 21 and 22 through which extend shafts 24 and 25 that are adapted to be selectively driven by suitable mechanism to feed the ribbon across the printing point. A ribbon shield 26 is mounted upon arms 27 and 28 which extend from a frame 29 that is pivoted at 30 to the top plate 31 in order that the ribbon shield 26 may be raised and lowered during each machine operation for the purpose of making the writing line visible and also may be raised for the purpose of placing a new ribbon in the machine or as may otherwise be desired.

The forward portion of the key levers 1 and associated mechanisms are protected by a front plate 32 which is mounted upon the machine frame and encloses the forward portion of the machine.

Referring now more especially to Figs. 1 and 16, a bracket 34 is attached to the left side of the machine frame 4 and carries a large stationary cup 35 which receives the supply roll 36 of narrow paper ribbon 37. This paper ribbon extends over a guide roll 38 mounted on an arm 39 carried by the stationary cup 35. The narrow ribbon 37 extends through the ribbon shield 26 and to the ribbon feed mechanism which is removably mounted in the ordinary ribbon cup 22. This narrow ribbon feed mechanism (see Figs. 10, 17, 18, and 19) comprises a disc 40 in which is journalled a stub shaft 41 which is provided with a shoulder on the upper portion bearing against the disc 40 and an extension passing through the disc 40 with a retaining collar 42 mounted on the extension in order to mount the stub shaft 41 in the disc 40 for rotation. The stub shaft carries on its upper end a knurled metal feed roller 44. The lower end of the stub shaft is provided with four circular pockets 45 each of which is adapted to receive the driving pin 46 on collar 47 carried by the ribbon drive shaft 25. A bracket 49 is struck from the metal comprising the disc 40 and is bent over at the top to provide a bearing for the shaft 50 of a swinging arm 51. This swing-

ing arm carries a shaft 52 on which is mounted a knurled idler feed roll 54. The shaft 52 extends downwardly through a slot 55 in the disc 40 and the lower end of the shaft is attached to a spring 56, the other end of which is secured to an anchor post 57 so that this spring normally urges the knurled feed roll 54 against the driven feed roll 44. The upper end of the idler feed roll 54 is provided with a flange which lies over the driven knurled feed roll 44 so as to comprise a guide for the narrow ribbon 37 which passes between these feed rolls 44 and 54. The shaft 52 is provided on its upper end with a thumb piece 59 by means of which the operator may swing the arm 51 to move the idler feed roll 54 away from the driven feed roll 44 for the insertion or removal of the narrow paper ribbon. As the paper ribbon leaves the feed rolls 44 and 54, it passes from the machine and may be destroyed as the ribbon is no longer useful for typewriting purposes in accordance with the present invention. The disc 40 is provided with a lug 60 which fits a slot 61 in the normal feed cup 22 to prevent the disc 40 from rotating. The disc 40 and the parts carried thereby are removable by lifting the same vertically from the feed cup 22 and then the ribbon mechanism is adapted to receive the usual textile wide ribbon spools in the cups 21 and 22.

The stationary cup 35 is provided with a hollow stud 62 upon which a wooden core 64 of the supply roll 36 is adapted to rotate, and a cover plate 65 carries a thumb piece 66 which is provided with a split plug 67 that is adapted to be inserted in the opening 68 in the hollow stud 62 to retain the cover plate in position on the end of the hollow stud 62 to retain the supply roll 36 in position within the stationary cup 35. The hollow stud 62 is slightly longer than the thickness of the supply roll 36 so as to avoid friction between the cover plate 65 and the supply roll 35 which rotates freely around the stud 62 when the ribbon is being fed.

Referring more especially to Figs. 2, 3, 4, and 16, the drive mechanism for the ribbon feed will now be described. The hammer arm 19 is bifurcated at its inner end to provide a lower arm 69 to which the hammer spring 70 is attached so that when the hammer is set in cocked position, the spring 70 is tensioned sufficiently to drive the hammer forwardly for printing operation as has been described when the hammer is released for printing. A universal bar 71 (Figs. 2, 3, and 4) extends over the rear end of the key levers 1 and also over the space bar arm 72 so that each time a character key or the space bar is actuated, the universal bar 71 is raised. This universal bar connects with the carriage mechanism which is not shown for the reason it is well known in the art. However, attention is directed to patent to Trego No. 1,933,570, November 7, 1933. A small universal bar 74 extends over the space bar arm 72 so that only the space bar operates the small universal bar 74, the reason for this being that it is important the hammer should not operate when the space bar is used and to this end the arm 75 (Figs. 2, 5, and 6) connected with the small universal bar 74 swings each time the small universal bar 74 operates. This arm 75 is provided on its lower end with an extension 76 (Figs. 3, 5, and 6) which moves beneath the shoulder 77 on the upper arm 78 of the bifurcated end of the hammer arm 19, so that this extension 76 prevents movement of the hammer arm when the space bar is actuated.

The effective operation of the extension 76 beneath the shoulder 77 on the upper hammer arm takes place before the hammer is released and thus the hammer is restrained from movement.

The above mechanism comprising the small universal bar 74 and the arm 75 is a part of the ribbon feed control in that a pin 79 carried on the side of the arm 75 is constructed to contact a swinging arm 80 loosely mounted upon a ribbon driving shaft 81 so as to rotate around this driving shaft (Figs. 4, 5, 6, and 16). This arm arm carries a lift arm 82 which extends outwardly beyond the operative face of a ratchet wheel 84 which is fixedly mounted on the ribbon driving shaft 81 and is adapted when actuated to rotate the said driving shaft. An extension 85 is also provided on the swinging arm 80. A spring 86 normally urges the arm 80, lift cam 82 and extension 85 in a counter-clockwise direction as shown in Figs. 5 to 9 inclusive. The movement of these parts under the operation of the spring 86 is checked either by the arm 80 contacting with the pin 79 as shown in Fig. 5 or with the lower end of the arm 80 contacting with a stop dog 87 on a control lever 88, as shown in Fig. 6. This control lever 88 (Figs. 3, 4, and 16) comprises a main lever 89 which carries a relief arm 90 that extends upwardly to be engaged by a pin 91 on a setting handle shaft 92 which is under control of a setting handle 94 which extends through a dial plate 95 (Fig. 1) that is provided with notches 96. This setting handle 94 and setting lever shaft are adapted to regulate the carriage feed with reference to the width of character space movements of the carriage, and the dial plate 95 is marked with numerals "10", "12" and "14". These numerals mean that when the setting lever 94 has been moved and positioned in a notch 96 that the carriage movement for each character space operation will be respectively one-tenth, one-twelfth, or one-fourteenth of an inch dependent upon the particular notch in which the setting handle is positioned. (See patent to Trego No. 1,918,299, July 18, 1933).

As has previously been explained, it is desirable for the ribbon feed to bear a definite relation to the carriage feed, and, therefore, the setting handle 94 which controls the setting of the carriage feed also controls the ribbon feed as will now be explained. When the setting handle 94 is operated to shift the handle shaft 92 longitudinally to change the carriage feed, the pin 91 acts upon the relief arm end of the control lever 88. This relief arm 90 is held against the pin 91 by a spring 97 (Fig. 16). The operation of the pin 91 on the relief arm 90 is to swing the control lever 88 on the pivot 98 which is mounted on the underneath portion of the machine frame. The swinging of the control lever 88 changes the position of the stop dog 87 relative to the extension 85 and this controls the position of the lift cam 82 relatively to the ratchet wheel 84. As shown in Fig. 5, the setting handle 94 is set in the "10" notch 96 of the dial plate 95. This permits the control lever 88 to swing on its axis sufficiently to remove the stop dog 87 from contacting with the extension 85 on the arm 80 so that the spring 86 operates to swing the arm 80 until it contacts with the pin 91. Fig. 6 shows the relation of the parts when the setting handle 94 is in either the notches "12" or "14" of the dial plate 95. When the setting handle 94 is moved into notch "12", the control lever 88 has been swung until the main lever 89 has contacted with a lever stop 99 (Fig. 16). This has advanced

the stop dog 87 as shown in Fig. 6 to swing the swinging arm 80 clockwise and to advance the lift cam 82 relative to the ratchet wheel 84. Since there is little difference between the carriage feed when the setting handle is moved from notch "12" to notch "14" in the present instance, it has been deemed desirable to make no further change in the ribbon feed and therefore since the main lever 89 is in engagement with the lever stop 99, when the setting handle 94 is in the notch "12", the relief arm 90 has been pivoted to the main lever 89 and a spring 100 (Figs. 3 and 16) is provided to retain the relief arm 90 in contact with the stop 101 on the main lever 89. As the setting handle 94 is moved from the notch "12" to the notch "14" of the dial plate 95, the relief arm 90 swings upon its pivot and stresses the spring 100 but since the main lever 89 is in engagement with the lever stop 99, the stop dog 87 has not changed its position.

A driving pawl 102 is pivoted on the upper arm 78 (Figs. 5 to 8 and 16) and is urged in the direction of the ratchet wheel 84 by a helical spring 104. When the lift cam 82 is positioned as shown in Figs. 5 and 8, when the setting lever is in the notch "10", the driving pawl 102 is in engagement with the teeth of the ratchet wheel 84. When the hammer arm 18 is operated to cock the hammer, the driving pawl 102 is raised, as is indicated in dotted lines in Figs. 5 to 9 inclusive. It, therefore, will be noted that when the parts are set as illustrated in Figs. 5 and 8, the driving pawl 102 will rotate the ratchet wheel 84 three teeth when the driving pawl is lifted and consequently will rotate the ribbon driving shaft 81 a corresponding amount. When the parts are in the position illustrated in Figs. 6 and 7, the lift cam 82 has raised the end of the driving pawl 102 from the teeth of the ratchet wheel, when the parts are in stationary normal position. Therefore, when the driving pawl 102 is lifted, it is effective to move the ratchet wheel two teeth and this, therefore, correspondingly shortens the angular rotation of the ribbon driving shaft and thereby shortens the ribbon feed. When the space bar 14 is operated, the forward end 72 of the space bar arm raises the small universal space bar 74 and this causes the pin 79 on the arm 75 to engage the S-shaped cam face 83 on the swinging arm 80 so that when the parts come to rest, the swinging arm 80 has reached a substantially vertical position as illustrated in Fig. 9. This positions the lift cam 82 beneath the driving pawl 102 so that as soon as a slight pressure is relieved from the space bar sufficient to permit the hammer to be cocked and the pawl 102 to be actuated, it will be observed that the complete stroke of the pawl 102 is on the face 85 of the lift cam 82, and, therefore, is ineffective to rotate the ribbon shaft 81 so that no ribbon feed occurs when the space bar is operated. A holding dog 105 (Figs. 5, 6, and 16) comprises a flat spring secured to the machine frame and with its free end bearing against the teeth of the ratchet wheel 84. This prevents retrograde movement of the ratchet wheel and holds the parts in position to which they have been moved by the last operation of the driving pawl 102.

The shafts 24 and 25 (Figs. 1 and 16) which extend vertically into the ribbon cups 21 and 22 are provided on their lower ends with gears 106 and 107. These are adapted to engage pinions 108 and 109 on the ribbon drive shaft 81, which is slidably mounted in the machine frame to cause engagement of one gear with one pinion at a time and to shift the engagement from one pair of gears and tension to the other pair of gears and tension to reverse the ribbon when wide textile ribbon is used in the normal operation of the machine as is well known in the patent to Trego No. 1,930,068, October 10, 1933. This reversing operation is not effective while the narrow ribbon attachment is being used. From the foregoing, it will be observed that angular rotative movements imparted to the ribbon driving shaft 81 will be communicated to the shaft 25 and hence to the knurled metal feed roller 44, carried by the disc 40, to impart movement thereto to feed the narrow ribbon.

The ribbon shield 26 previously referred to comprises a thin flexible sheet of metal 110 which as previously explained is mounted upon arms 27 and 28. The forward ends of these arms 27 and 28 are each provided with uprights 111 and 112. Each end of the shield 26 is folded backwardly upon itself to provide pockets 114 and 115 to receive the uprights 111 and 112 when the ribbon shield is in position for operation. This ribbon shield is provided with two printing openings 116 and 117 through which printing characters on the type shuttle 8 are exposed for printing operation. The lower opening 117 in the present shield is intended to be uncovered, that is, there is no ribbon which extends over this opening, and consequently, the opening 117 may be used for making stencils. The ribbon shield is provided with a pair of flat tubular guides 118 and 119 through which is provided a very thin opening having a width and height substantially corresponding to the thickness and width of the paper ribbon. The ends 120 and 121 of the flat tubular guides 118 and 119 are bent outwardly to comprise guide wings to guide the ribbon through these flat tubular guides without interfering with or scraping the pigmentation carried thereon. These narrow flat tubular guides are of substantial importance in the operation of the device. The ribbon shield being extremely flexible and very thin, does not in any way interfere with the printing operations but securely holds the narrow flat ribbon in position for operation when the thin paper ribbon is being utilized as has been explained.

When the narrow thin paper ribbon passes through the knurled rollers 44 and 54, the ribbon is corrugated by these rollers and therefore is destroyed in such manner that it cannot be re-used, thereby insuring a fresh ribbon each time the ribbon supply is exhausted. This narrow ribbon is of a maximum width which is substantially the width of the maximum size of printing characters adapted for use in the machine so that the entire ribbon face is available for printing operations. The ribbon shield 26 being provided with the two openings 116 and 117 makes this shield particularly useful with a machine of this character in that the narrow ribbon covers only that portion of the shield in which is located the printing opening 116 thereby leaving the opening 117 at all times available for cutting stencils without any manipulation of the ribbon mechanism other than the raising of the ribbon shield sufficiently to make the opening 117 available. This makes the machine quickly convertible from use as a printing machine to a stencil cutting machine.

Another advantage of the flat tubular guides 118 and 119 is that these guides being very narrow and smooth and fo med of flexible metal do not have any tendency to flake the pigmented

coating and feed the ribbon in an efficient, accurate, and satisfactory manner.

The narrow paper ribbon comprising a part of this invention is preferably a strip of material known in the art as "carbon paper". This strip is preferably coated on one side only. Thus there is no danger of the pigment material collecting on the type, and, therefore, each type impression is clear and sharp. Since the pigment coating is uniform and the strip is used but once, each printing character is of uniform density and the typewritten sheet is admirably adapted for reproduction by lithography. The machine is constructed to use rolls of this narrow ribbon comprising substantially twelve hundred feet of ribbon strip which is approximately one-quarter of an inch in width.

Since the paper strip is used but once, it should be conserved in use, and, therefore, the feed of the strip is arranged to correspond to the width of the type face being used or in other words to correspond to carriage feed movements. This is conveniently provided for by constructions which change the ribbon strip feed when the carriage feed is changed. Since no ribbon strip feed is necessary when the carriage moves under control of the space control, the ribbon strip feed is not effective when the space bar is operated.

While the present invention is preferably an attachment which is auxiliary to the normal ribbon feed, it may be constructed as a main ribbon feed structure.

What we claim is:

1. In a machine of the class described, the combination of printing type, means to present selected printed type at a printing point, means to guide a narrow ribbon paper strip having pigmentation thereon to present the same in effective position relative to said printing type, means to impress printing type through said ribbon upon an impression sheet, means to feed said narrow ribbon strip definite predetermined intervals for each operation of the machine, carriage feed means, and means to change both said carriage feed and said ribbon feed from one definite predetermined feed to another definite predetermined feed.

2. In a machine of the character described, the combination of printing type adapted to be presented at a printing point, a narrow ribbon strip carrying pigmentation, ribbon guide means adapted to guide a narrow paper ribbon and to present a portion of said ribbon strip in effective position relative to said printing type, said ribbon guide means comprising a shield of thin flexible metal having tubular guide tubes on each side of said printing point, wing guides on the outer edges of said tubular guides to guide the paper ribbon through the flat tubular guides without interfering with the pigmentation thereon, means to cause an impression to be made on an impression sheet through said narrow strip ribbon, and means to feed said ribbon out of said machine for each operation of said impression means only, whereby said ribbon may have but a single use in said machine.

3. In a machine of the class described, a narrow paper ribbon having one side coated with pigmentation and the other side non-pigmentized, printing type, said paper ribbon being substantially as wide as the largest printing type is high, means to feed said ribbon past said printing type with the non-pigmentized side of the ribbon toward said printing type, and a flexible metal ribbon shield adjacent the printing point for said type, a pair of tubular ribbon guides carried by said shield on each side of said printing point, guide wings on the outer edges of said tubular ribbon guides, said ribbon shield being adapted to withhold said ribbon from contacting with an impression sheet during a printing operation except that portion of the ribbon over the type which is effective at the printing point, said shield being constructed to present the mid portion of said paper ribbon to said printing type.

4. In a machine of the class described, printing means operative at a printing point, means to support a roll of narrow paper ribbon adapted for a single use in said machine, means to feed said ribbon step by step past said printing point, a carriage to support impression material, carriage feed means to feed said carriage step by step past said printing point, control means to set the step by step movement of the carriage according to the width of printing characters in use, and means operated by said control means to set the step by step feed of the ribbon according to the step by step setting of said carriage feed.

5. In a machine of the class described, printing means operative at a printing point, means to support a roll of narrow paper ribbon, means to feed said ribbon past said printing point after each printing operation, a carriage to move impression material past said printing point, carriage feed means to feed the carriage step by step past the printing point, control means to set the step by step movement of the carriage according to the width of printing characters in use, and means to set the ribbon feed movement according to the carriage feed.

6. In a machine of the class described, printing means operative at a printing point, means to support a roll of narrow ribbon, means to feed said ribbon one printing character space for each printing operation only of the machine, a carriage to support a sheet of impression material, carriage feeding means to move said carriage one printing character space for each printing operation, and means to disable said ribbon feed when said carriage is moved for spacing between printing characters.

7. In a machine of the class described, a removable type shuttle carrying printing characters, key means to operate said shuttle to position a predetermined printing character in effective position at a printing point, a printing hammer adapted to strike an impression sheet against said character at the printing point, means to support a portion of a narrow paper ribbon at the printing point, means to feed said narrow paper ribbon when said printing hammer is rendered effective to strike a printing blow, a carriage to support said impression sheet, means to feed said carriage step by step past the printing point, a space bar and connections to cause said carriage to move for word spacing, and means to disable said ribbon feed when said space bar is operated.

8. In a machine of the class described, a ribbon, means to guide said ribbon past a printing point, a readily removable type font having printing type characters for use at the printing point, said font being adapted to be removed so as to be replaced by another font, the printing characters of which are of a different width from the corresponding characters of the first mentioned font, means to make printing impressions at the printing point from the printing

type of the font in use at the printing point, and adjustable feeding means for said ribbon to feed the ribbon step by step past said printing point by amounts according to the printing type of the font in use at the printing point, and means having a portion thereof exterior of the machine for adjusting the amount of the feed of said adjustable feeding means.

9. An attachment to replace one of the normal ribbon spools of a typewriter, said attachment being adapted to feed a ribbon and comprising a unit having a base plate, a feed roller mounted for rotation on said base plate, a pivoted arm mounted on said base plate, said arm carrying an idler roller, a spring adapted to urge the free end of said arm toward said feed roller to cause said idler roller to be spring pressed toward said feed roller, means to operatively couple said feed roller with the ribbon spool drive shaft of said typewriter, and means on said base plate adapted to cooperate with a fixed portion of said typewriter to prevent the rotation of said base plate.

RALPH C. COXHEAD.