Dec. 18, 1956 K. D. YOST 2,774,816

PRINTING TELEGRAPH RECEIVER

Filed April 27, 1953 2 Sheets-Sheet 1

FIG. 1

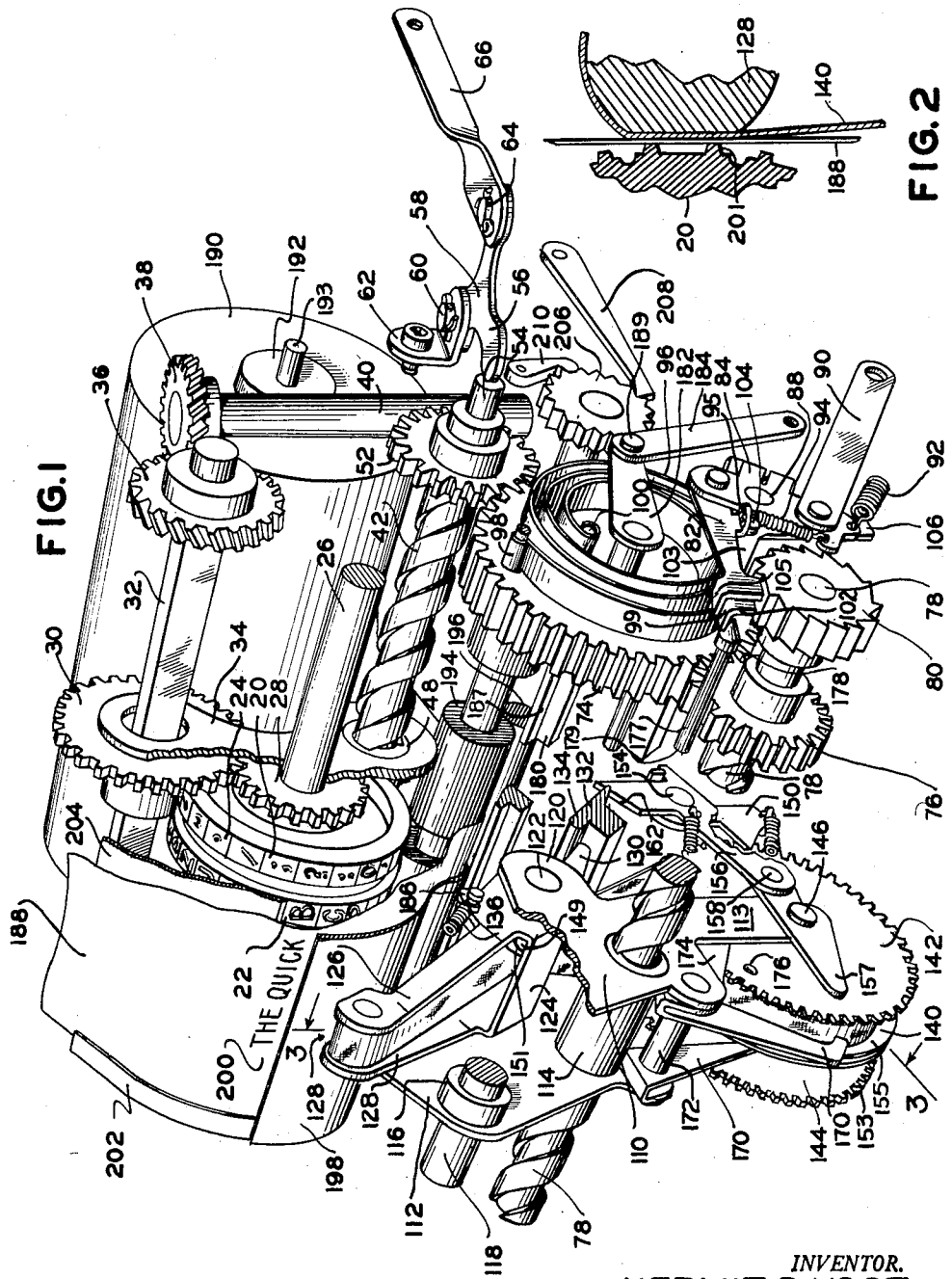


FIG. 2

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ATTORNEYS

Dec. 18, 1956 K. D. YOST 2,774,816

PRINTING TELEGRAPH RECEIVER

Filed April 27, 1953 2 Sheets-Sheet 2

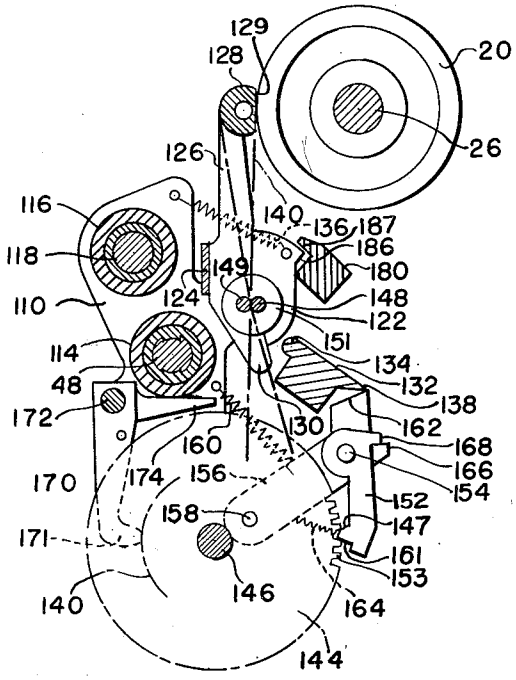


FIG. 3

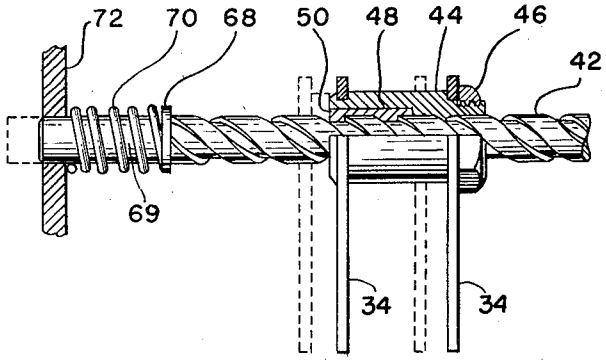


FIG. 4

INVENTOR

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BY Strauch, Nolan & Diggins

ATTORNEYS

United States Patent Office 2,774,816 Patented Dec. 18, 1956

2,774,816

PRINTING TELEGRAPH RECEIVER

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Application April 27, 1953, Serial No. 351,205

11 Claims. (Cl. 178—29)

The present invention relates to telegraph apparatus for receiving and recording coded signals and more particularly to printing telegraph apparatus known as typewheel page printers.

Apparatus for receiving conventional coded signals which automatically prints the coded signals into typographical characters for immediate reading have been heretofore known in the art, and have found wide commercial use. Such prior art devices have usually been composed of a typewheel; mechanism for moving the typewheel into printing position; an inking device for the typewheel, or a movable ribbon; and a carrier for the page upon which the message is to be printed. In the past, major portions of the aforementioned operating mechanism such as the typewheel, inking device or ribbon, and positioning mechanism of devices heretofore known in the art have been located for movement in front of the page upon which the transmitted message is to be printed with the consequent result, and disadvantage, that the copy cannot be read as it is printed. Additionally, printing telegraph devices heretofore known have been of a relatively complex nature, involving many complicated parts necesarily requiring repeated adjustments and servicing.

The present invention obviates the aforementioned difficulties encountered in prior art devices by providing a new and novel telegraph receiver of the page printing type wherein the major portion of the operating mechanism is located behind the page upon which the message is to be printed and wherein only a printing hammer and printing ribbon, or ink carrier, are located in front of the page which are so designed that their operation permits complete visibility of all the characters printed on the page in the course of the printing of the message.

The novel printing telegraph of the invention generally comprises a typewheel, bearing both letters and figures, which is letter spaced behind the printed page by a helical shaft. The helical shaft itself is longitudinally selectively shiftable to permit the printing of either letters or figures. A narrow printing hammer, over which an inking ribbon passes, is mounted in front of the page, and is designed for synchronous movement with the typewheel. When a selected character is to be printed the hammer which is positioned and normally held in a forwardly spaced relation away from the page is impelled toward the typewheel to compress the page therebetween and inscribe the positioned character on the front of the page. The various operating mechanisms for actuating and controlling the action of the print hammer and typewheel are mounted in such a manner as not to obstruct a view of the page upon which the message is to be printed. The print hammer, through located directly in front of the page is mounted in spaced relation to the page, and because of the design and rapidity of motion of the hammer, the eye will not be able to discern its position so that the entire line of printed matter will always be completely visible. Additionally the novel printing telegraph of this invention has been so designed as to employ the same mechanism for letter spacing the typewheel and for positioning the typewheel to selectively print either letters or figures, thereby reducing the number of parts and complexity heretofore encountered in prior art devices.

It is therefore a primary object of this invention to provide a novel printing telegraph which permits complete visibility of the printed portion of the message.

More specifically it is on object of the present invention to provide a printing mechanism in which the type carrier, platen and ink carrier are so positioned relative to a recording medium that a message being recorded may be read insofar as it has been recorded as soon as the recording of each character is completed.

In furtherance of the foregoing objects, it is an ancillary object of this invention to provide an improved inked ribbon feed device and cooperating platen in which the inked ribbon is fed in a path transverse to the direction of sequential character recordation so that the ribbon does not inhibit visibility of a line of characters being recorded;

An additional object of this invention is to provide a novel telegraphic page printer having a novel synchronously traversing type carrier and printing hammer, an inking ribbon mounted for traversing movement with the hammer and wherein a message is printed on a page disposed between the type carrier and hammer on the side of the page adjacent the hammer;

A still further object of this invention is to provide a novel telegraphic page printer comprising a type carrier and a print hammer mounting an inking ribbon means for imparting a synchronous traversing movement, after each printing operation, to the type carrier, print hammer and inking ribbon in one direction and automatic continuous return movement in an opposite direction for repositioning the type carrier and print hammer assembly to permit printing of successive lines of a message;

It is still another object of this invention to provide a novel telegraphic page printer having a major portion of its mechanism mounted in unobstructing relation to a page on which a message is to be printed and having a novel printing hammer and inking carrier as the only elements directly in front of the page upon which the message is to be printed adapted to permit complete visibility during printing of the message;

Yet another object of this invention is to provide a novel traversing printing hammer and type carrier for cooperative coaction and wherein an inking ribbon is mounted on the printing hammer for traversing movement therewith;

Another object of this invention is to provide improved mounting means on a traversing print hammer for an inking ribbon whereby the inking ribbon is equally stressed at all times;

A further object of this invention is to provide novel means for an intermittently movable inking ribbon mounted on a traversing printing hammer whereby the inking ribbon is immobile relative to the hammer during a printing function and is wound during a non-printing function;

Still another object of this invention is to provide a novel telegraphic page printer having a movable printing hammer, and means for blocking the printing hammer in response to a function signal being received; and

Still a further object of this invention is to provide novel means for winding and reverse winding of an intermittently movable inking ribbon mounted on a traversing printing hammer;

These and other objects will become apparent from the following description and appended claims when read in connection with the attached drawings, wherein:

Figure 1 is a perspective view partially broken away of

the novel printing telegraph showing the position of the typewheel, print hammer, and positioning mechanism;

Figure 2 is an enlarged fragmentary cross sectional view of the typewheel, and printing hammer and showing the relative position of the type ribbon and page;

Figure 3 is a cross sectional view of the print hammer carriage taken substantially along the line 3—3 of Figure 1; and

Figure 4 is an elevational view partially in section of the helical spacing shaft and typewheel carriage.

Referring now to Figure 1, cylindrical typewheel 20 consisting of a row of letters 22 and a row of figures 24 is slidably mounted on cylindrical shaft 26, supported in side frames, not shown. Rigidly affixed to the side of typewheel 20 is spur gear 28 which meshingly engages spur gear 30 slidably mounted on square shaft 32. A pair of spaced parallel side brackets 34, only one of which is visible in Figure 1, are disposed on opposite sides of typewheel 20 and spur gears 28 and 30 and mounted for movement longitudinally of shafts 26 and 32 to form a carriage for unitarily moving the typewheel and spur gears longitudinally back and forth relative to shafts 26 and 32. Helical gear 36 fixed on the right hand end of shaft 32, as viewed in Figure 1, meshingly engages helical gear 38 fixed upon the upper end of vertically disposed shaft 40. Shaft 40 is associated with a selecting mechanism which turns shaft 40 to selectively rotate or position typewheel 20 through the aforementioned gears in accordance with the incoming telegraphic signal. This selecting mechanism may take any suitable form, for example that disclosed in United States patent application Serial No. 190,359.

During the printing of a message the typewheel carriage moves from left to right, as viewed in Figure 1, in intermittant traversing movements and is then returned to the left hand starting position to print the next succeeding line upon the page. The mechanism for letter spacing the typewheel carriage from left to right and returning the carriage to its left hand starting position will now be described. Longitudinally helically grooved shaft 42 is journalled in the fixed parallel end frames (not shown) of the device, passes through the lower portions of typewheel carriage brackets 34, and is disposed in spaced parallel relation to shafts 26 and 32. In Figure 4 is shown the structure between brackets 34 which operatively engages shaft 42 and causes axial shifting of the typewheel assembly. Cylindrical housing 44 is rigidly mounted between brackets 34 and maintains the brackets in their spaced parallel relation. The left hand bracket member 34 is suitably secured in an annular groove in the periphery at the left hand end of cylindrical housing 44 while nut 46 maintains the right bracket securely against a shoulder at the right hand end of the cylindrical housing. A sleeve 48 having an internal helical spline 50 is mounted from the left hand end in a bore in cylindrical housing 44 and is rigidly held therein by suitable means, such as a pressed fit. Splines 50 of sleeve 48 are complementary to and engage the helical groove in shaft 48 so that, sleeve 48 being restrained against rotation, rotation of shaft 42 causes sleeve 48 to move longitudinally relative to shaft 42 and to move the typewheel carriage therewith.

Spur gear 52 is rigidly mounted on the right hand end of shaft 42, as viewed in Figure 1, on one side of a side frame (not shown) the shaft being rotatably and slidably journalled in the frame and terminating on the other side of the frame in projection 54. Projection 54 is in bearing contact with the end of arm 56 of a three armed bell crank lever 58 pivoted at 60 to bracket 62 which is rigidly secured to the side frame. Arm 64 of bell crank lever 58 is pivotally connected to connecting link 66 which is connected to the aforementioned selecting mechanism (not shown). Turning again to Figure 4 it will be clearly seen that the helical grooved portion of shaft 42 terminates short of the end of the shaft to form a shoulder against which washer 68, mounted on smooth cylindrical

portion 69 of shaft 42 abuts. Compression spring 70 is mounted on cylindrical portion 69 of shaft 42 intermediate and in abutting contact with washer 68 at one end and side frame 72 at the other end. Smooth cylindrical portion 69 of shaft 42 is rotatably and slidably journalled in side frame 72 to permit relative sliding of the shaft in the side frame for positioning the figure row 24 in printing position, as will be presently explained. When link 66 receives a forward thrust or is caused to move forwardly, as viewed in Figure 1, by the selecting mechanism, bell crank lever 58 will turn in a clockwise direction about pivot 60 and arm 56 will exert a force against the end of projection 54 of helical shaft 42 and cause the shaft 42 to shift axially to the left, compressing spring 70. The shifting of shaft 42 against the force of spring 70 will carry the typewheel carriage with it by virtue of the connection of shaft 42 and splines 50 and thus place the figure row in aligned position with the print hammer as will be hereinafter explained.

Carriage spacing and return

Spur gear 52, which is fixed on shaft 42 and therefore moves with the shaft 42 when it is shifted axially to the left to position figure row 24 in the printing position, is in mesh with and slides relative to large idler gear 74 which is sufficiently wide so that gear 52 never slides out of mesh during its axial movement. Idler gear 74 meshes with and is driven by spur gear 76 fixed on one end of helically grooved drive shaft 78 suitably journalled in the side frames of the device. Ratchet wheel 80 rigidly secured to drive shaft 78 substantially adjacent to gears 74 and 76 is rotatably stepped in a clockwise direction, as viewed in Figure 1, by reciprocable pawl 82 pivotally connected to crank 84, as at 86. Crank 84 pivotally mounted at 88 extends down therefrom and is pivotally connected at its lower end to an end of cam operated reciprocable link 90. Spring 92 is secured at one end in a suitable aperture in the lower end of crank 84 and at the other end to a spring stud (not shown) in the side frame of the device to exert a counterclockwise biasing force on the crank 84. Another spring 94 is also secured at one end in a suitable opening at the lower end of crank 84 and at the other end to tab 95 integrally formed on pawl 82 to exert a downward biasing force on pawl 82, as viewed in Figure 1, to hold the pawl in engagement with ratchet wheel 80. Each time link 90 moves to exert a clockwise rotary force on crank 84 about pivot 88, pawl 82 is moved rearwardly, as viewed in Figure 1, and turns ratchet wheel 80 in a clockwise direction an angular distance of one tooth. Clockwise rotation of ratchet wheel 80 produces rotation of shaft 78 and spur gear 76 which through the connection of gear train 76, 74, and 52, causes helically grooved shaft 42 to rotate a few degrees. The typewheel 20 will be moved axially of shaft 42 one character space position to align the type carriage for the printing of a succeeding character.

Carriage return mechanism

Spring 96, similar to a clock mainspring, is mounted adjacent an exposed face of gear 74 and is secured at one end to the gear as at 100 and at the other end to the side frame of the device as at 98. Clockwise rotation of spur gear 76 will rotate idler gear 74 in a counterclockwise direction and wind up spring 96 until a carriage return signal is received by the selecting mechanism (not shown). Reception of a carriage return signal will disengage pawl 82 from ratchet 80 and with pawl 82 released from ratchet wheel 80, spring 96 will unwind which unwinding will impart reverse rotation to gear 74 and consequently helically grooved shaft 42, which reverse rotation will rapidly move the typewheel carriage to the left, as viewed in Figure 1. The speed of return of the typewheel carriage is dependent upon the amount of tension in spring 96 which must be sufficient to rapidly return the typewheel carriage in the time cycle of one

incoming signal so that it will be in position for the next succeeding signal. In actual practice the carriage return signal is always followed by a line feed signal, which will become apparent as the description proceeds so two-signal cycles may be used for the return movement.

The unlatching of pawl 82 to permit return movement of the type carriage will now be described. Latching member 102 in the form of a bell crank 103 is pivotally mounted upon a fixed pivot at 104 to the left of an adjacent pawl 82, as viewed in Figure 1. Lower end 106 of bell crank 103 is operatively connected to the selecting mechanism (not shown) to respond to a carriage return signal. Pawl 82 is provided with bent tab 105 which overlies latch 102 so that clockwise rotation of bell crank 103 through a cam (not shown) acting on end 106 will lift latch 102 and consequently pawl 82 out of engagement with ratchet wheel 80 to permit spring 96 to reversely rotate gear 74 and shaft 42 to reposition the typewheel carriage to the start-of-line position. The cam operation of bell crank 103 is sufficiently long enough to assure complete return of the carriage to the left most position, as viewed in Figure 1.

It will also be noted from Figure 1 that latch 102 holds ratchet wheel 80 stationary while pawl 82 is moved forwardly to engage a tooth and rotate ratchet wheel 80 in a clockwise direction during normal letter spacing operation.

Printing hammer and ribbon feed

Side plates 110 and 112, which form a print hammer carriage, are mounted on helical shaft 78 to the left of spur gear 76, as viewed in Figure 1, and are held rigidly in spaced parallel relation by means of cylinder 114, exactly similar to feed cylinder 44, and a spacing guide sleeve 116 mounted for longitudinal sliding movement along a shaft 118 fixed between the side frames. Both shafts 42 and 78 are synchronized through gear train 76, 74 and 52 to turn at the same rate so that the print hammer carriage is progressively moved along shaft 78 in exact alignment and synchronism with the typewheel carriage. Print hammer carriage side plates 110 and 112 are provided with similar projections 120 having axially aligned openings forming journals for spaced axially aligned stub shafts 122 located on the parallel side portions 126 of hammer 124. Print hammer 124 is thus pivotally mounted in carriage side plates 110 and 112. Print hammer 124 comprises a pair of spaced integrally joined arms 126 mounting segmental cylindrical platen 128, having a flattened face 129, at their upper ends and having respective downwardly extending projections 130 at their lower ends operatively engaging the blade 134 of a longitudinally extending bail 132 pivotally mounted by the insertion of integral cylindrical end portions in aligned apertures of the side frames of the device. The cylindrical portion of the right end of bail 132, as viewed in Figure 1, forms the pivot member 88 to which crank 84 is fixed. Each time crank 84 is rotated in a counterclockwise direction to permit pawl 82 to grip the next tooth of ratchet wheel 80, bail 132 will also be rotated in a counterclockwise direction causing blade 134 to strike the downward projections 130 of print hammer 124. Bail 132 does not positively drive the hammer through its complete distance but merely imparts sufficient momentum to the hammer to cause it to travel to the printing position where flattened face 129 strikes an aligned character face on typewheel 20 as shown in Figure 3. Tension spring 136 secured at one end to frame 112 and at the other end to hammer 124 returns the print hammer to its retracted position illustrated in Figure 1. Suitable means may be provided to adjust the tension of spring 136 to regulate the force with which the print hammer strikes a paper sheet overlying print wheel 20.

Inking ribbon 140 is wound at opposite ends on spools 142 and 144 loosely mounted on common shaft 146 journalled in spaced parallel relation to the axis of shaft 78 on downwardly depending legs 113 of print hammer carriage members 110 and 112. Ribbon guide posts 148 and 149 (Figure 3) are fixed to the internal faces of opposite side portions 126 of the print hammer 124 in parallel relation to the axis of stub shafts 122 on opposite sides of the common axis of the stub shafts 122 and each extends substantially toward the opposite side of side portions 126 in overlapping relation to the other. Ribbon 140 is fed from spool 142 over guide post 148 upwardly over the flattened face of hammer head 128 and down the back of the hammer head over guide post 149 to spool 144, as is clearly illustrated in Figure 3. Washer 151 having a pair of openings is mounted on guide posts 148 and 149 between the adjacent edges of the ribbon and maintains the adjacent edges in non-interfering spaced relation. Ribbon 140 passes over both guide pin 148 and 149 at the common axis of shafts 122, as clearly seen in Figure 3. This permits the hammer 124 to move from the position illustrated in Figure 1 to that of Figure 3 without putting undue tension or strain upon one part of the ribbon and consequent slackening of the other part of the ribbon. The ribbon will remain taut on each side of hammer head 128 as the hammer operates because both sides of the ribbon are essentially fulcrumed on the hammer axis. It should be noted that in the present invention no ribbon vibrator is used to control the ribbon to permit visibility of the last printed line as is usually the case in devices where the inking ribbon runs across the entire face of the paper. In the present invention the novel mounting of ribbon 140 and the high rate of speed at which the print hammer operates permits complete visibility of the page and the matter printed thereon at all times.

Ribbon feeding and reversing

Ribbon 140 is intermittently fed over hammer head 128 from one spool to the other between each printing movement of hammer 124 to constantly present a good inking surface for legible printing. Referring now to Figures 1 and 3 the novel ribbon feeding and reversing mechanism will presently be described. Spaced pawls 150 and 152, each having a lug portion having sloping edge 147 and flat edge 161 for engagement with ratchet teeth 153 on spools 142 and 144, are pivotally connected as at 154 to arms 156 which are in turn each pivotally mounted at 158 on one end of members 157 attached to carriage side plates 110 and 112. Spools 142 and 144, with respective sides adjacent each other are axially slidable on shaft 146 so that only one pawl and a respective spool will be in engagement at any one time. For purposes of explanation the ribbon feeding operation will be described in connection with winding the ribbon on spool 144 as illustrated in Figure 3. Springs 160 connected between the arms 156 and the respective carriage side plates 110 and 112 hold upwardly extending shoulder 162 of each arm 156 against blade 138 of the lower edge of bail 132. Springs 164, which are connected respectively at one end to arms 156 and at the other ends to pawls 150 and 152, maintain the lug portions in engagement with ratchet teeth 153, depending on which spool and pawl are aligned. Extensions 166 on arms 156 coact with shoulders 168 on the respective pawls limiting the amount of toothed engagement between a pawl and its respective spool.

As bail 132 rotates in a counterclockwise direction to hit projections 130 and propel hammer 124 to a printing position, blade 138 is raised from shoulder 162 and arm 156 is permitted to rotate counterclockwise about pivot 158 under the biasing force of spring 160 to carry pawl 152 upwardly. By virtue of sloping edge 147 of the lug portion pawl 152 will ratchet or slide over teeth 153 of spool 144 without imparting movement thereto. When bail 132 returns to its normal position, as shown in Figure 3, blade 138 will press down on shoulder 162 moving arm 156 clockwise and pawl 152 downwardly. During the downward movement of pawl 152 flat edge 161 will

engage a tooth of spool 144 and rotate the spool a small angular distance to wind a small section of ribbon on the spool. The advance of the ribbon thus occurs immediately following each upward printing movement of the print hammer 124.

A pair of spaced sensing levers 170 are each loosely pivotally mounted on shaft 172 and have tongue portions 171 at one end in contact with the ribbon on spools 142 and 144, respectively. With continued reference to Figure 3, as ribbon 140 winds on spool 144 tongue 171 is moved outwardly rotating sensing lever 170 in a clockwise direction until integral angular lever arm 174 disposed adjacent the outer face of spool 144 is rotated sufficiently to contact knob 176 (shown on spool 142 in Figure 1). When lever arm 174 contacts knob 176, spool 144 is cammed axially to the right by the coaction of knob 176 with arm 174 to disengage pawl 152 and 153. Axial movement of spool 144 to the right exerts through mutually adjacent sides 155 of spools 142 and 144 and consequently spool 142, to shift spool 142 to the right to engage teeth 153 and pawl 150 and the ribbon is then fed to spool 142. This winding and rewinding feature is continuous and automatic and requires no attention by the operator other than periodic changing of the ribbon.

As a safety measure to prevent damage to the mechanism should a carriage return signal fail to be given, a rod 177 is axially slidable, mounted in the right side frame of the device and is provided with conical end 178 which slightly engages the under surface of bent tab 99 of latch 102. The opposite flat end 179 of rod 177 is disposed in the path of movement of the print hammer carriage for coacting abutment with side member 110. Should a return signal fail to be received, side member 110 will abut end 179 and force rod 177 to the right forcing cone 178 under tab 99 to lift the tab and disengage pawl 82 and permit spring 96 to start the return of the typewheel and print hammer carriages. However, as soon as the carriages are moved one space to the left, latch 102, under the biasing force of spring 94, will also move rod 177 to the left to permit pawl 82 to reengage ratchet wheel 80. As a result the carriages will oscillate back and forth in the right hand positions, a distance of one character space until a return signal is received to return the carriage completely to the left or until the machine is shut down. Thus no serious damage is possible to the machine.

It is necessary to provide means for preventing complete operation of the print hammer when a function signal is received. Bail 180 journalled on cylindrical end portions in the side frame (not shown) extends through the center of idler gear 74 and, at the right hand as viewed in Figure 1, has a lever arm 182, fixed thereto as by a pressed fit. A link 184 pivotally connected at one end to lever 182, as at 189, is connected at its other end to the function mechanism (not shown). Only when the function signals are received by the machine will the bail 180 be turned to its counterclockwise position (as viewed from the right side of the machine) to block complete operating movement of the print hammer. A projection 186 (Figure 3) of the print hammer will strike the projecting edge 187 of the bail 180 when the bail 180 is pivoted to its counterclockwise position so that the hammer head 128 will be prevented from striking the typewheel. When the bail is in its clockwise position, the print hammer projection 186 passes the projection 187 of bail 180 as shown in Figure 3 so that the hammer head 128 will strike the typewheel to print the selected character.

Means are also provided to prevent the effective longitudinal movement of the typewheel carriage and print hammer carriage when function operations are performed by the machine. Since the typewheel and print hammer carriages should not be advanced on the reception of signals for the following functions, namely: line feed, shift to letters position, and shift to figures position a cam mechanism (not shown) similar to the operation in response to a carriage return signal but of shorter duration momentarily operates arm 106. This operation of arm 106 raises latch 102 and consequently pawl 82 momentarily, to release ratchet 80 and permit it to rotate reversely and cancel out the one space it had been advanced during the earlier part of the operating cycle. Thus the carriages are actually advanced one space when these function signals are received but the carriage movement is cancelled out before the next signal is received.

Paper feed

Paper 188, upon which the message is to be printed, comprises a roll 190 mounted on spindle 192 rotatably supported on journals 193 in the side frames. The paper is fed from the bottom of roll 190 forwardly between rubber feed rolls 194 and rubber idler rollers 196, which are in peripheral contact, and upwardly between front guide plate 198 and typewheel 20. Guide plate 198 terminates in an upper edge positioned just below type line 200, as clearly seen in Figure 1, and a rear support plate for paper 188, is mounted to have a lower edge spaced just above type line 200 to define with plate 198 a type slot between the respective edges of plates 198 and 200 where the paper is exposed to both typewheel 20 and hammer head 128. Side guide members 202 overlie each edge of the paper and serve to guide the paper against rear support plate 204.

Ratchet wheel 206 rigidly secured to the right hand end of feed roll 194 is operatively engaged by a feed pawl 208, which is actuated by a function mechanism (not shown) to feed paper 188 upwardly one line. Detent 210, pivotally mounted to the side frame, engages the teeth of ratchet wheel 206 to prevent reverse rotation of feed roll 194 while pawl 208 is out of engagement with the ratchet wheel.

In operation a figure selecting signal is received which moves shaft 42 to the left in opposition to spring 70 (Figure 4) sufficiently to move the figure row of typewheel 20 into the printing position in alignment with platen 128. Shaft 42 and consequently typewheel 20 will remain in this position until a letter shaft signal is received to release the force on shaft 42 and allow spring 70 to move the shaft 42 and typewheel 20 to position the letter row in printing position. With the typewheel 20 selectively shifted to its desired position a character selecting signal is received to rotate shaft 40 and 32 and consequently typewheel 20 to position a selected character on the positioned letters or figures row into the printing position. After the type is positioned, as controlled by these signals, bail 132 is rotated counterclockwise by actuation of link 90 and crank 84 rigidly secured to the bail 132. Counterclockwise rotation of the bail causes blade 134 to strike projections 130 propelling print hammer 126 toward the positioned type. Ribbon 140 extending over head 128 strikes paper 188 compressing the paper against the raised surface 201 (Figure 2) of the selected character on typewheel 20, which will force a small quantity of ink from ribbon 140, in the shape of the type, onto the front face of the paper.

As bail 132 is rotated counterclockwise, blade 138 is moved away from shoulder 162 permitting arm 156 under the influence of spring 160 to also be rotated counterclockwise. Pawl 152 is also carried in a counterclockwise direction by virtue of its connection with arm 156 and the engagement of shoulders 162 and 168 and slides past teeth 153 by virtue of inclined face 147. At the end of the counterclockwise rotation of bail 132 shoulder 162 will again engage blade 138 and flat face 161 will engage a tooth 153 so that clockwise rotation of bail 132 will transmit force to engaged pawl 152 and cause rotation of spool 144, or 142 as the case may be, to feed ribbon 140 on to the actuated spool.

During counterclockwise rotation of bail 132 pawl 82 is also moved forwardly, as viewed in Figure 1, by virtue of its connection to crank 84 to engage the next forward tooth on wheel 80. Subsequent clockwise rotation of

crank 84 causes pawl 82 to move rearwardly rotating wheel 80 clockwise through an angular distance of one tooth to intermittently rotate helical shafts 42 and 78 and feed the typewheel and print hammer assemblies to the right as viewed in Figure 1 and to add further tension to spring 96. The typewheel and print hammer traverse from left to right with respect to paper 188 until a carriage return signal is received which causes a cam to rotate bell crank 103 clockwise releasing latch 102 and pawl 82 from wheel 80 and permitting spring 96 to reversely rotate the helical shafts and reposition the printing assemblies at the left of the page, for printing a new line. Pawl 208 is responsive to line feed signals to selectively rotate ratchet 206 clockwise to feed the paper 188 upwardly one line. As heretofore noted provision of safety member 177 prevents damage to the mechanism if there is a failure by the operator to send a carriage return signal. As also heretofore noted bail 180 is selectively rotated in a counterclockwise direction to permit abutting engagement of projections 186 and 187 to block print hammer 126 and effectively prevent hammer head 128 from contacting paper 188 when a function signal is being received.

The action of hammer 128 is so rapid in its movement towards and away from paper 188 that every letter is clearly visible practically at the very moment it is printed.

From the foregoing description it will be readily appreciated that I have invented a novel apparatus for printing characters of a message corresponding to or representing received coded signals and which incorporates a minimum number of parts requiring little or no adjustment, which in many instances perform dual functions resulting in an efficient, lightweight, simple and inexpensively manufactured device.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by United States Letters Patent is:

1. A telegraphic page printer comprising a guide for mounting a recording medium; a rotatable shaft; a type carrier operatively connected to said shaft and movable longitudinally thereof behind said guide upon rotation of said shaft; a second rotatable shaft; a printing hammer operatively connected to said second shaft for longitudinal movement relative thereto in front of said guide upon rotation of said second shaft and adapted to be moved toward and away from said type carrier; means for moving said printing hammer toward said type carrier to strike a recording medium mounted in said guide against said type carrier to print a character on the front of said recording medium; means responsive to predetermined type carrier positions for preventing the printing hammer from moving to strike a recording medium when no character is to be printed; and means to simultaneously rotate said shafts to move said type carrier and printing hammer longitudinally of their respective shafts to effect spacing between characters to be printed upon the recording medium.

2. A telegraphic page printer comprising, a guide for a recording medium; selectively positionable type means operatively mounted behind said guide; platen means operatively mounted in front of said guide and adapted to be propelled to a printing position against a recording medium mounted in said guide to compress the recording medium against said type means for printing a character on the front of the recording medium; and selectively operative means for blocking said platen means to prevent its movement to its printing position.

3. A telegraphic page printer comprising, a type carrier; a carriage mounted in front of said type carrier; a platen mounted on said carriage adapted to be propelled to a printing position against said type carrier to compress a recording medium disposed between said type carrier and platen against said typewheel to print a character on the front of the recording medium; a pair of spools mounted on said carriage; a ribbon operatively engaging said spools and extending over and engaged with said platen, that portion of said ribbon which extends over and is engaged with said platen being carried by said platen throughout the entire platen movement; feed means operative to wind said ribbon on said spools alternatively; and means operative to alternately engage said platen and said feed means to propel said platen to the printing position and operate said feed means.

4. A telegraphic page printer comprising, a guide; a type carrier operatively mounted behind said guide; a carriage mounted in front of said guide; a platen mounted on said carriage adapted to be propelled to a printing position against said type carrier to compress a recording medium mounted in said guide against said type carrier whereby a character is printed on the front of said recording medium; a pair of axially shiftable spools mounted on said carriage; a ribbon operatively engaging said spools with a portion of said ribbon extending over and propelled with said platen throughout its entire movement; feed means operable to wind the ribbon on said spools alternatively; means operative to alternately engage said platen and feed means to propel said platen to the printing position and to actuate said feed means; and sensing means for axially shifting said spools to effect such alternative engagement of said spools with said feed means to permit said ribbon to be wound from one spool to the other.

5. A printing mechanism including a plurality of type face elements; means for selectively moving each of said elements into a printing position; a platen in spaced alignment with the positioned type face element; a guide for receiving a recording medium mounted between said platen and type face elements; pivot means for said platen; means for moving said platen on said pivot means to strike a recording medium mounted in said guide against said positioned type face element, whereby a character is printed on said recording medium; an inking ribbon passing over said platen and movable therewith; and fulcruming means for said ribbon having an axis coincident with the axis of said pivot means whereby said ribbon fulcrums about the same axis as said platen to avoid unequal stressing of the ribbon.

6. A printing mechanism comprising, a plurality of type face elements; means for selectively moving each of said elements into a printing position; a movable platen in spaced alignment with the positioned type face elements; a guide for receiving a recording medium disposed between said platen and positioned type face element; an inking ribbon passing over said platen; fulcruming means for said platen; means for moving said platen on said fulcruming means to strike a recording medium mounted in said guide against said positioned type face element whereby a character is printed on said recording medium; and a pair of guide pins for said inking ribbon centered on said platen fulcruming means to maintain said ribbon taut and immovable on said platen to eliminate unequal stressing of said ribbon during operation of said platen.

7. A telegraphic page printer comprising, a type carrier, a carriage mounted in front of said type carrier; a platen mounted on said carriage adapted to be propelled to a printing position against said type carrier; a pair of spools mounted on said carriage; an inking ribbon operatively connected to said spools with a portion of said ribbon extending over and carried by said platen throughout its entire movement; feed means operable to wind said ribbon on said spools alternatively; and means operative to

actuate said feed means when the platen is in a non-printing position whereby said ribbon is immobile relative to said platen during a printing function.

8. In a printing device, a selectively positionable type carrier mounted in said device for longitudinal character space movement, carriage means longitudinally movable in said device with said type carrier; a platen mounted on said carriage means for movement therewith and adapted for independent printing movements relative to said type carrier; and an ink carrier mounted on said carriage means and platen for longitudinal movement therewith and feed movement of said ink carrier in a path transverse to said longitudinal movement.

9. In a device for printing telegraphic messages, a rotatable shaft; carriage means longitudinally movable relative to said shaft upon rotation of the shaft; a type carrier selectively positionable to place a selected character in printing position and operatively associated with said carriage means to move longitudinally relative to said shaft for spacing successively positioned characters; drive means responsive to character selecting signals; and gear means operatively connecting said drive means and type carrier and movable with said carriage means for selectively positioning said type carrier.

10. In a device for printing telegraphic messages, a rotatable and selectively axially shiftable shaft; carriage means operatively connected to said shaft for longitudinal relative movement thereto upon rotation of said shaft and adapted for unitary movement therewith upon axial shifting of said shaft; a rotatable typewheel movable with said carriage; and having adjacent rows of characters selectively positionable in printing position upon shifting of said carriage; shift means for axially moving said shaft and carriage to selectively move said rows of characters to a printing position; drive means responsive to character selecting signals; and gear means movable with said carriage and operatively connecting said drive means and typewheel for selectively positioning characters on one of said rows in printing position.

11. A telegraphic page printer comprising: means to receive two groups of signals; a guide for mounting a sheet upon which a message is to be printed; a type carrier selectively movable to position characters thereon in printing position and mounted for traversing movement behind said guide and the sheet in said guide; platen means located in front of said guide and the sheet in said guide, responsive to signals from either of said groups to coact with said type carrier by moving to press the sheet between said platen means and said type carrier to print a message on the front of a sheet in said guide, including means mounting said platen for synchronous traversing movement with said type carrier; spacing means responsive to predetermined ones of said signals operatively connected with said type carrier and said platen means for synchronously traversing said type carrier and said platen means; return means connected to return said type carrier and said platen means upon receiving a specific return signal from one of said two groups of signals; means responsive to predetermined ones of said signals, including a device for engaging and moving said sheet to position said sheet for successive lines of print; and selectively operative means responsive to signals in only one of said groups of signals to prevent said platen means from moving to engage and press the sheet between said platen means and said type carrier.

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