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AUTOMATIC CARRIAGE RETURN AND LINE FEED MECHANISM

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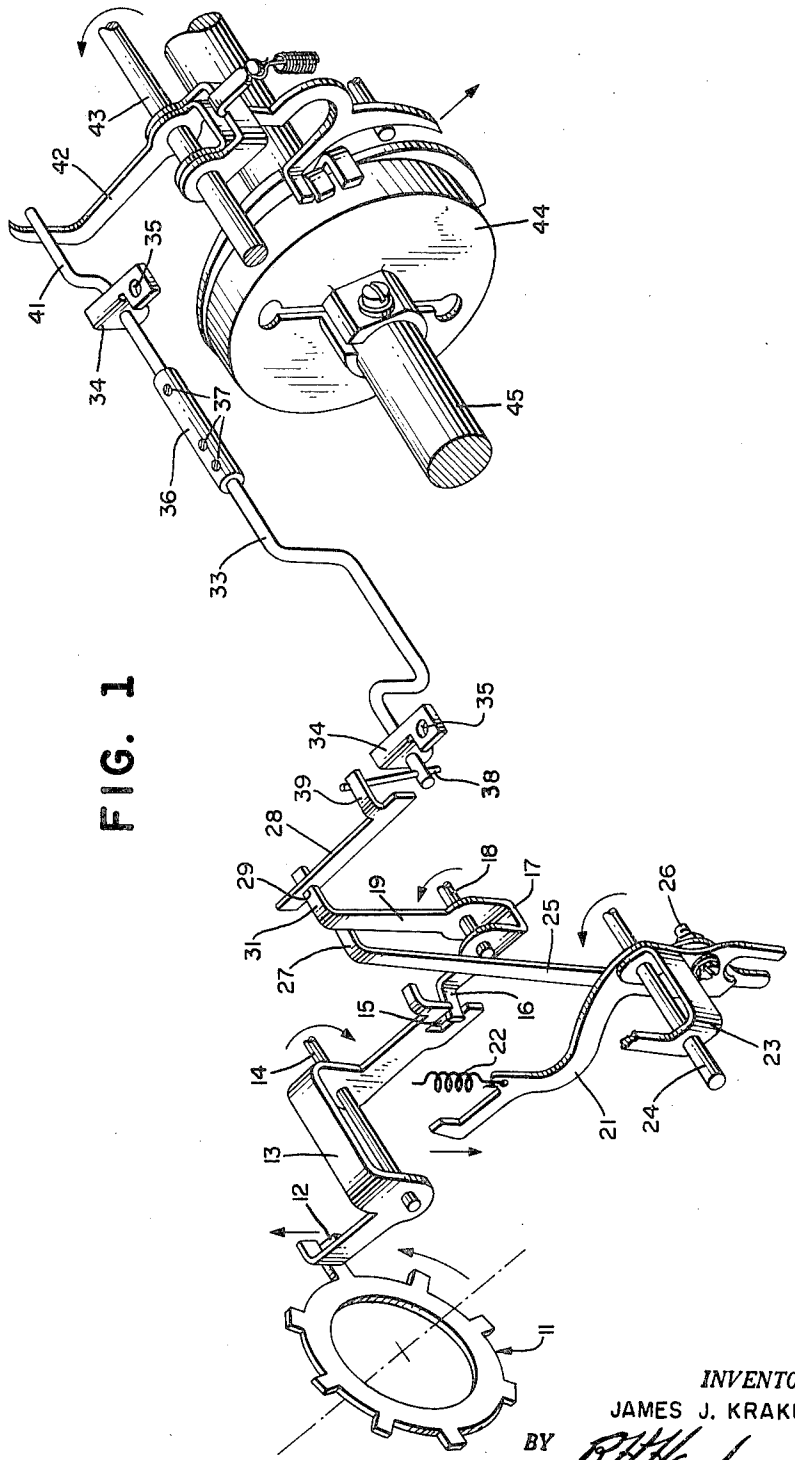


FIG. 1

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AUTOMATIC CARRIAGE RETURN AND LINE FEED MECHANISM

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This invention relates to the printing telegraph art generally, and more particularly to a novel carriage return and line feed mechanism for the page printer.

Printers of the usual type provide carriage return and line feed operation from appropriate function signals transmitted to them by a keyboard printer. When they receive transmissions from a tape transmitter or other non-keyboard device, however, and even occasionally in receiving transmissions from a keyboard transmitter, the appropriate function signals for carriage return and line feed may be absent from the transmission.

In this event, and after the receipt and printing of the last full line of characters, the spacing mechanism of the printer is automatically disabled so that all further characters are overprinted on the last character of the last line received, until the later receipt of some subsequent carriage return and line feed function signal.

An entire line of received characters can thus be lost by failure to receive a single function signal. Automatic carriage return and line feed have been developed to overcome this difficulty, and to provide line feed in the absence of function signal, but the known mechanism for this purpose requires the use of "function box" accessory.

In cases where the printer is used in applications providing for selective station calling, it is found that the capabilities of the function box are exhausted by the provision of this feature, and automatic carriage return and line feed can not be obtained with known types of such equipment for this reason.

I have found that these deficiencies can be overcome by the use of a relatively simple and inexpensive mechanical arrangement which does not require the modification of any of the existing parts of the printer, but is easy to install on the existing machine and requires little or no maintenance. The result achieved is to effect a carriage return and line feed operation automatically upon receipt of the 59th signal on any 58 character line, so that the next following characters will be printed on the next lower line. It will be seen that while the described action depends for its complete effectiveness upon providing a carriage return and line feed action rapid enough to place the type box of the printer in position for operation on a succeeding line before the next letter is struck, it is nevertheless an action which is controlled entirely from the receiving end and does not depend in any way on the receipt of a function signal subject to the vagaries of transmission.

In providing the automatic function performance of the present invention, which is entirely mechanical in its operation, advantage is taken of the fact that the spacing ratchet wheel of the conventional printer is provided with a spacing suppression mechanism operative upon receipt of the 58th character of any line to prevent further spacing from occurring until after a carriage return has been accomplished. Motion of the spacing cut-out bail acquired from the spacing cut-out transfer bail and in turn acquired from the space suppression ring on the spacing ratchet wheel of the printer, all of which last mentioned members are existing parts of the printer, is applied to a structure to be described, which is effective to transfer such motion to the existing line feed clutch trip lever and carriage return lever in the manner later

explained. By this means, the line feed clutch trip lever and carriage rturn lever are actuated automatically, in the same manner as if the appropriate keybord keys had been depressed manually to actuate them, and carriage return and line feed thereby accomplished.

It is therefore an object of this invention to provide in a printing telegraph, simple carriage return and line feed means operable from a remote signal.

It is another object of the invention to provide such a device which is operable without loss of characters.

It is a further object to provide such a device which is adapted to installation on a printer without modification thereof.

There objects I achieve in a manner which will become apparent by reference to the detailed description of a specific illustrative example of the invention taken together with the drawings wherein:

FIG.1 is an isometric view of an assembly comprising the elements of the present invention.

Referring now to the drawings, there is seen in FIG. 1 at the left a space suppression ring 11 which actuates by means of its elongated and bent-over projection 12, a transfer bail 13 journalled on a fixed bearing stud 14. A notch 15 in this bail engages the bent-over tail 16 of the spacing cut-out bail 17, which bail is journalled on a stud 18 on the (fixed) spacing mechanism bracket not shown. Motion of the space suppression ring beyond a predetermined point, as caused by its attachment to the spacing drum not shown, is thus communicated to the arm 19 of the spacing cut-out bail 17.

A carriage return lever 21 having a return spring 22 and a carriage return bail 23 are journalled on a fixed shaft 24 and interconnected so that motion of lever 21 retracts certain feed pawls from a spacing drum to cause resilient carriage return. The above described mechanism is conventional and comprises a relevant portion of one of the specific types of page printer with which the instant embodiment is adapted to be used.

A lever 25 is affixed by means of bolt 26 to the carriage return lever 21 and has at its end a bent-over portion 27 for engagement with the arm 19 of spacing cut-out bail 17. Any motion of the bail 17 is thereby communicated promptly to the carriage return lever 21.

A link 28 is provided with a hole 29 into which the tail 31 of the arm 19 of the spacing cut-out bail 17 is inserted. Link 28 is slidable longitudinally in fixed guides not shown, and so slides upon any motion of the spacing cut-out bail.

A line feed transfer rod 33 is supported on a pair of bearing brackets 34 bolted through the holes 35 to the existing guide bar of the machine (not shown). Coupling sleeve 36 retains in alignment the two separate sections of transfer rod 33 and provides means for adjusting the orientation of its ends by means of the set screws 37. The entire mechanism is so designed that it can be installed on the printer without need for alteration or disassembly of the printer, a procedure made possible in part by the separation of transfer rod 33 into two parts joined by the coupling sleeve 36.

A pin 38 transfixing rod 33 engages tail 39 of link 28 to convert any sliding motion of said link into rotation of said rod. The terminal portion 41 of said rod is bent into crank shape and provides a translating motion of the crank upon rotation of the rod.

Such motion of crank 41 rotates the existing clutch trip lever 42 on its shaft 43 to actuate the line feed clutch 44 on the main shaft 45 of the printer.

It is to be noted that in the operation of the mechanism here described, the carriage return and line feed operations are intended to occur, and are required to be completed within the short period of time which elapses between the receipt of of the last character signal on

a line and the typing of the next successive character signal in an unbroken sequence. Within this severe time limitation, it has nevertheless been found that carriage return and line feed can be accomplished so that the first character of the succeeding line will be correctly located on the paper, even at speeds as high as sixty words per minute, by the use of the present invention. It is imperative, however, that the carriage return be initiated at the earliest possible instant after movement of the space suppression ring on the spacing drum indicates the completion of a line by movement of the spacing transfer bail.

A direct connection between this member and the carriage return lever is therefore utilized by attaching the carriage return sensing lever immediately to the carriage return lever without any intermediate linkage, and with no pivots or bearings to introduce lost motion and consequent time delay in the operation.

Such extreme rapidity fortunately is not required of the line feed trip mechanism since the line feed function can be performed in a much shorter period of time than is required for the return of the carriage, and it therefore is not harmful to the correct operation of the device to introduce the several convenient and separate linkages described in order to actuate the line feed clutch trip lever.

It should not be inferred from this, however, that the carriage return and line feed functions are separate and independent, since they are not. Both are normally commanded by receipt of a single function signal, and both must occur rapidly and practically simultaneously in order to effect the autonomous lineation of the instant invention. The occurrence of either separately without the other obviously would be entirely destructive of the purposes of the invention, and it is only by making the instant provision for the autonomous occurrence of both functions practically simultaneously that the present invention can be operative.

Although this invention has been described in terms of a specific illustrative example thereof, it will be apparent that various elaborations and modifications thereof will occur to those skilled in the art, and it is therefore intended that the invention shall be limited only by the appended claims.

What is claimed is:

1. In a telegraph printer mechanism comprising a spacing cut-out bail, a carriage return lever and a line feed clutch trip lever, automatic carriage return and line feed means comprising as carriage return means a swingable arm engaging the spacing cut-out bail and located for carriage return lever impingment and movement upon spacing cut-out bail motion, and comprising as line feed means a slidable member having an aperture engaging a movable portion of the spacing cut-out bail and having an engagement tail at one end thereof, a cross shaft for line feed function transmission by shaft rotation, a cross-pin at one extremity of said cross shaft located for engagement with said slidable member and operable to rotate said cross shaft upon slidable member motion, and an offset portion comprising a crank at the other end of said cross shaft located for engagement with the line feed clutch trip lever, for actuation thereof upon motion of said slidable member.

2. In a machine for producing a visible record of characters according to electrical impulses, which employs a record sheet and linearly returnable character recording means for the sheet having a relative forward linear motion therewith for character spacing in a line on the record sheet, and having a spacing cut-out bail on a spacing mechanism bracket having a stud for end of line operation and having a return bail movable to cause reverse linear relative motion between the character recording means and the record sheet, and having a line feed lever to cause line feed operation and a fixed guide bar; automatic line feed means and retracting means for the character recording means which comprises: lever means on and affixed to the return bail and having a sidewardly extending tail for engagement with the spacing cut-out bail to actuate the return bail upon motion of the spacing cut-out bail, a link having an aperture for engagement with the spacing cut-out bail and slidably mounted for sliding motion upon motion of the cut-out bail and having a sidewardly extending rear portion, line feed transfer rod means extending transversely of the machine, mounting brackets therefor on the fixed guide bar, crank means terminating said transfer rod means and engaging at one end thereof said link and at the other end thereof the line feed lever, whereby end of line motion of the spacing cut-out bail causes line feeding motion of the line feed lever and return motion of the character recording means.

3. Line feed and carriage return mechanism for a telegraph printer having a spacing cut-out bail, a carriage return bail, a guide bar, a spacing mechanism bracket and a line feed clutch trip lever which comprises:

(a) tailed and perforated slide means located for engagement of the perforation by the spacing cut-out bail and movable thereby;

(b) a line feed transfer rod, mounting brackets on an aligning said transfer rod with the guide bar, fastened to the guide bar for rotational motion of the transfer rod in respect thereto;

(c) said transfer rod having a transverse perforation at an end adjacent said slide, and having a crank portion at the opposite end thereof;

(d) a lever in the perforation of said transfer rod and engaging the tail of said slide means for rotation of said rod by motion of said lever;

(e) said transfer rod engaging by the crank end thereof the line feed clutch trip lever for tripping thereof upon rod rotation; and

(f) a lever having a transverse tail portion affixed to the carriage return lever and engaging by means of the transverse tail the spacing cut-out bail;

whereby spacing cut-out bail motion causes immediate carriage return bail tripping by direct motion of unlinkaged parts while line feed clutch trip lever tripping is accomplished by simultaneous operation of a separate linkage.

4. In a telegraph printer having carriage return means and a line feed mechanism and a spacing cut-out device, mechanical means on the printer responsive to the spacing cut-out device for actuating the line feed mechanism, and separate mechanical means for actuating the carriage return means on the carriage return means responsive to the spacing cut-out device whereby carriage return is initiated simultaneously with line feed by an independent linkage as a result of spacing cut-out.

5. Telegraph page printer lineation means comprising sliding means to operate a crank pin, said means being mounted for actuation by a spacing cut-out motion of the printer, transfer rod means and transverse pin means therethrough for engagement of said pin means by said sliding means, crank means on said transfer rod means for line feed triggering, and separate lever means located adjacent to said sliding means and comprising a carriage return trigger for applying spacing cut-out motion of the printer directly to unlocking a carriage return motion of the printer whereby carriage return and line feed are accomplished automatically at end-of-line, the carriage return being initiated independently of the line feed linkage so as to operate rapidly enough to print an initial character of a subsequent line in its proper position at relatively rapid printing rates.

6. Autolineation means for the printing telegraph of the kind having a carriage return lever, a spacing cut-out bail, and a line feed clutch trip lever which comprises:

movable arm means fixed to the carriage return lever and having a sidewardly projecting tail for engagement with the spacing cut-out bail for carriage re-

turn lever energization by the spacing cut-out bail, and further comprises

line feed clutch trip lever actuating means consisting of rotatably mounted transverse shaft means having an offset crank portion at one end thereof located for depressing the line feed clutch trip lever upon shaft means rotation, and having a transverse hole at the other end thereof for cross pin retention; said transverse shaft means having two abutting portions joinable by a coupling, and a coupling joining the two abutting portions,

a cross pin in the hole of said shaft means

and perforated link means having a transverse tail for cross pin deflection slidably mounted for perforation engagement with the spacing cut-out bail for transverse shaft means rotation through cross pin deflection upon link means sliding induced by motion of the spacing cut-out bail.

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