

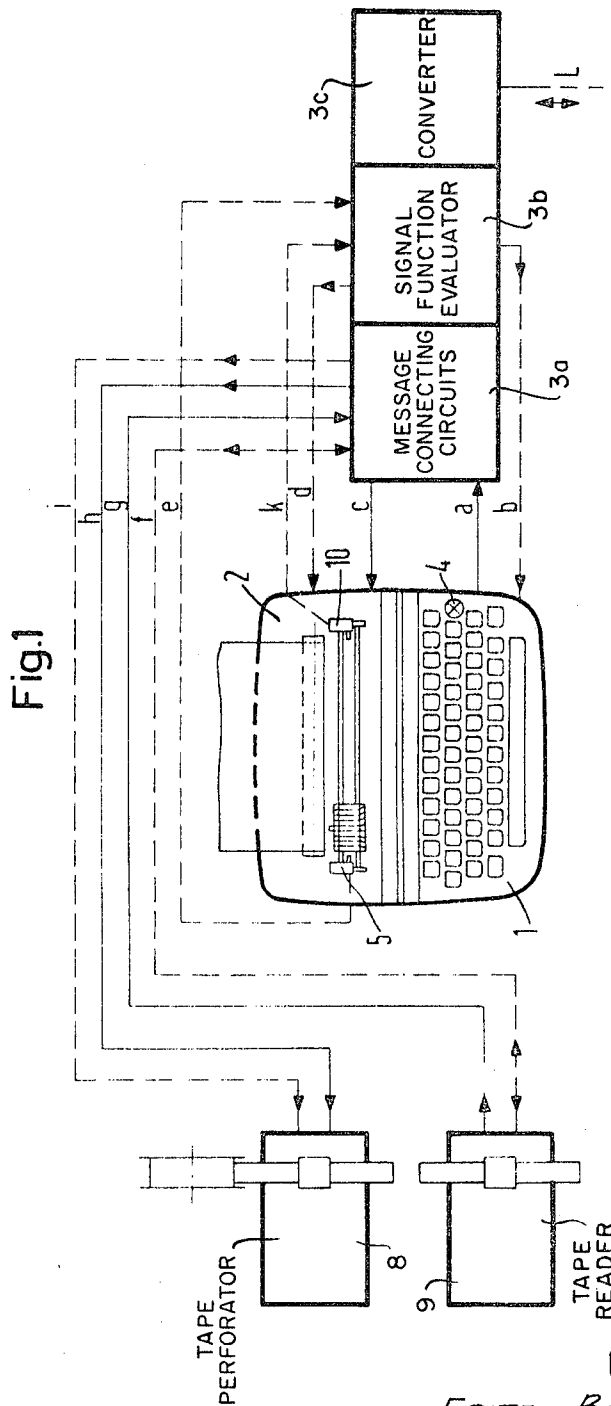
June 10, 1969

F. BUTZKE ET AL
TELEPRINTER APPARATUS EMPLOYING TECHNIQUES
FOR INTERRUPTING MESSAGE FLOW
DURING CARRIAGE RETURN

3,449,515

Filed Oct. 13, 1965

Sheet 1 of 2



INVENTORS

FRITZ BUTZKE

SVEN VOELCKER

BRUNO, NITSCHKE

BRUNO NITSCHKE
BY *Shie & Shie* ATTORNEYS

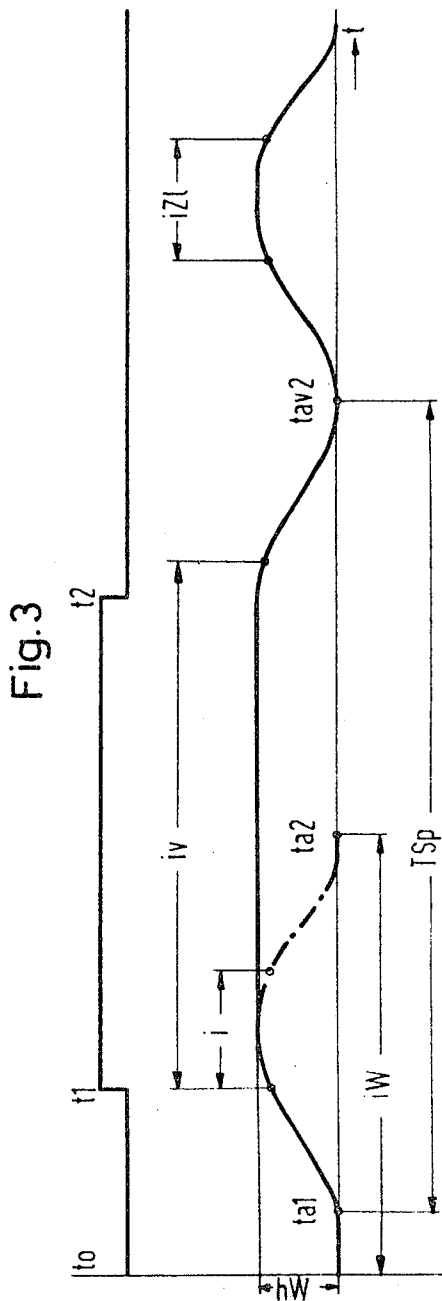
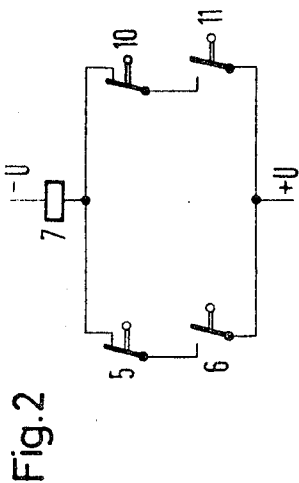
June 10, 1969

F. BUTZKE ET AL
TELEPRINTER APPARATUS EMPLOYING TECHNIQUES
FOR INTERRUPTING MESSAGE FLOW
DURING CARRIAGE RETURN

3,449,515

Filed Oct. 13, 1965

Sheet 2 of 2



INVENTORS

FRITZ BUTZKE

SVEN VOELCKER

BRUND NITSCHKE

BY *W. H. H. H.* ATTORNEYS

1

3,449,515

TELEPRINTER APPARATUS EMPLOYING TECHNIQUES FOR INTERRUPTING MESSAGE FLOW DURING CARRIAGE RETURN

Fritz Butzke, Baierbrunn, Buchenhain, and Sven Voelcker and Bruno Nitschke, Munich, Germany, assignors to Siemens Aktiengesellschaft, a corporation of Germany
Filed Oct. 13, 1965, Ser. No. 495,445

Claims priority, application Germany, Oct. 14, 1964, S 93,726

Int. Cl. H04L 15/18, 15/12, 15/24

U.S. Cl. 178-17.5

5 Claims

ABSTRACT OF THE DISCLOSURE

A teleprinter utilizes a plurality of signals of the character of carriage return signals to interrupt message flow during the carriage return operation. Switching apparatus, operated by the carriage as it reaches its line beginning position, releases the message flow to continue printing and transmission.

In teleprinter installations for speeds of 75 Bd it is a known practice in the operation of sheet teleprinter machines having a carriage which is automatically returnable, as required, to the beginning of the line, to assure a faultless type character impression at the beginning of such a line following carriage return and line feed, by an arrangement whereby two carriage return signals are transmitted before the line feed signal.

At still higher telegraphing speeds or in the case of an especially wide sheet as the recording carrier, there exists the danger that such safety measures will not suffice.

In order, with simple design of the whole apparatus, to be able to carry out the carriage return as rapidly as possible, and because a sufficiently great auxiliary force is available anyway for the stepwise carriage movement during the typing process, it is usual in the case of teleprinter machines, in contrast to typewriters and certain proposals during the initial period of development of the teleprinter machine, to have the carriage returned by means of energy stored in a spring, which is subsequently reenergized during the typing process.

In order to avoid the initially mentioned drawbacks in a teleprinter installation with at least one sheet teleprinter of the type referred to, which is either to be operated at a relatively high telegraphing speed or an especially wide sheet is to be typed, or in which both requirements have to be fulfilled, according to the invention, means are provided to initiate the continuation of the transmission of the information portion of a message, following carriage return and line feed, in each case in dependence upon the completion of the carriage return special function up to the start of the next line.

According to a further development of the invention, in certain operating conditions, there are provided, in a manner known per se, means for blocking the transmission during the carriage return in conjunction with the automatic resumption of the transmission upon completion of the carriage return. This can take place, for example, in the form of a deenergization of the releasing magnets for a perforated tape transmitter in connection with the delivery of continuous current over the line.

According to another further development of the invention, means are provided for the insertion of filler signals following carriage return signals, which are in sufficient number that the duration of the carriage return at least is filled out. These filler signals preferably likewise are carriage return signals.

2

Further details of the invention will be apparent from the following description.

An example of the invention is described in the following and illustrated in the drawing in which:

FIG. 1 illustrates a schematic diagram of a teleprinter installation;

FIG. 2 is a circuit diagram of an additional control device for an electromagnet for the temporary locking of selector members which are scannable a number of times during the locking period; and

FIG. 3 is a time-path diagram for the arrangement of FIG. 2.

FIG. 1 illustrates only one of two teleprinters connected with one another over a line L. This machine contains a keyboard 1 with parallel output for the code signals and a printer 2 with parallel inputs for the code signals. The line L is connected with the teleprinter over a connecting device which contains an electronic converter 3c which includes a series-parallel converter for the conversion of parallel signals into series signals for the transmission of the signals, as well as for the conversion of series signals into parallel signals in the receiving of signals over the line L. The connecting device further contains a signal function evaluator 3b, in which are evaluated those signals that are available which, instead of printing, initiate the execution of certain functions, such as carriage return, line feed, bell and call-back devices, release, horizontal and vertical tabulating, perforator circuits, and possibly other functions. Such an evaluator replaces the usual mechanical evaluating devices for special function signals in the printer of the teleprinter and enables an especially high flexibility with respect to the number and kind of signals to be evaluated and their representation in the particular code used. Finally, message connecting circuits 3a forms a further part of the connecting device.

In order to make possible, without difficulties, the utilization of the teleprinter installation for operation at a high telegraphing speed, and in order to be able to use teleprinters with especially wide carriages, provision is made in the following system for the lengthening of the time span available for the carriage return during keyboard transmission. On termination of the line there are depressed, in a usual manner, the keys "carriage return" and "line feed" (or a combined key for these two functions). The coded signals run as parallel pulses over line a to the connecting circuits 3a, which, for the most part, contains electrically operating structural parts, and from there to the signal function evaluator 3b. The carriage return signal is there recognized and, as a result thereof, a blocking signal is conducted over a signal line b to the keyboard and there effects a locking action which prevents typing operation and, possibly, provides an optical indication by the lamp 4. The coded signals are extended over the part 3a of the connecting apparatus, along with an additional releasing signal, over line c to the printer 2 and there cause the printing of the control text. The special function signals ascertained in the signal evaluator pass over the line d to the printer 2, in order to there bring about a corresponding electromagnetic release, which is subsequently explained in greater detail.

The carriage return signal brings about the return of the type carrier or paper carriage, and the following line feed signal effects the line advance. As long as the process of the carriage return continues, there is present in the signal function evaluator 3b the code combination "carriage return" and the parallel-series converter of converter 3c, if need be, delivers this combination several times to the line. This process is terminated by a completion signal for the carriage return derived from a line-

beginning switch 5 of the printer and conducted over a corresponding signal line. In the process, a carriage return series signal is terminated and, if need be, another such signal or several is automatically added in order to assure that the printer, possibly driven with fluctuations in rate of revolution of a receiving sheet teleprinter machine, general installed at a remote location, is capable of following the control commands. In general, however, the Z1-signal always following upon the WR signal or signals suffices to give adequate time for the possibly uncompleted WR-function.

For a better understanding of the operation of prior teleprinting apparatus, reference may be taken to United States Patent 2,907,823 of Wüsteney et al., granted Oct. 6, 1959 and assigned to the same assignee as the present invention.

Assuming that the transmitting apparatus is equipped with a signal storer, for example, a machine in which the transmitting selector members are driven over a continuously running auxiliary drive and, in case of need, are lockable in the displaced position and repeatedly scannable, contrary to the practice in teleprinting machines, according to FIG. 2, in this case, following setting of the selector members on the code combination "carriage return" by means of the corresponding key, a closeable contact 6 can be inserted in series with the carriage controlled contact 5, which is only open in the "line beginning" position, and with a controllable electromagnet 7, operative to lock the selector members for "carriage return," facilitating the insertion of a succeeding code combination, such as "line feed." In this case the code combination "carriage return" is transmitted several times, in contrast to the normal or usual devices for theoretical prevention of double transmission of "set-up" impulse combinations. The code combination "line feed" thus remains stored in the keyboard and is emitted when the signal is given to the keyboard over the signal line *e* by the printer 2, evaluator 3b and the line *b*. The lamp 4 in the keyboard is then extinguished and it is possible to resume transmission of the message text.

In the receiving teleprinter machine, signals arriving from the line L over the converter 3c, which also includes a series-parallel converter for converting series signals into parallel signals, is fed to the signal function evaluator 3b and, over the lines *c*, to the printer 2, with the special function signals ascertained in the evaluator 3b being conducted over the line *d*. This manner of operation corresponds to that described for the control text in the transmitting operation. The keyboard is locked as long as signals are arriving. A function usual in telegraphic communication, "Stop through duplex-writing" is releasable by a special key independently of the keyboard, which acts on the electronic circuit of the converter 3c. For example, in the case of radio operation, combinations which were dropped on the transmission line of "carriage return" (abbreviated to WR in the following) and "line feed" (abbreviated to Z1 in the following), can be automatically inserted in such a manner that at the end of the line a switch is actuatable, which, without interrupting the receiving process in progress, brings about the addition of the combinations mentioned over a signal line *k*.

The time course of the insertion of additional WR signals and of the variable delay of the combination Z1 up to the completion of carriage return is shown in FIG. 3. It is here assumed that the first release of the symbol WR occurs at time *t₀* and the keying-in of symbols for Z1 (with interstorage) at time *ta1*. At this time there also begins the locking time TSp of the keyboard. On release of any arbitrary signal there also begins at time *ta1*, for example, the stroke *hW* of the selector comb involved, which makes possible, during the time interval *i*, the transmission of allocated pulse combinations of normal message signals. After the time *iW* of for example 50 ms. (at time *ta2*) the selector comb normally is back in its rest position. If, however, in dependence on the pulse combination WR the magnet 7 is energized at time *t1* to time *t2*, there

then results, for the delivery of impulse combinations WR, a lengthened pulse time *iv*. The release of the key lock and simultaneously of the interstorer for the setting of the selector comb in correspondence to the combination Z1 in this case occurs at the time *tav2*. The pulse time *iZ1* for the delivery of the pulse combination Z1 follows with a corresponding delay.

In the event an additional perforated tape receiver is provided, by the pressing of an allocated key for "punched tape reception" the code signal input of an automatic tape perforator 8 may be connected over line *h* with that of the printer. In this manner there can be concurrently punched a message transmitted over the keyboard as well as a message received over the line L. If the distant subscriber transmits a signal "punch over" over the line, then there automatically takes place the switching on of the perforator 8 over the signal function evaluator 3b. Likewise the switching off of the perforator is controllable from a distance. In all cases, however, on termination of a telegraphic teleconnection the switching off of the perforator should be locally releasable by the usual remote switching device.

The electrical connection of the tape perforator 8 with the teleprinter machine also allows a selective use thereof as manual perforator or controlled printer. In this case the keyboard 1 and the perforator 8 are connected with one another and locally operate together, while the printer 2, over the series-parallel converter portion of converter 3c, receives the incoming signals from the line L.

Through operation of a switch (not illustrated) constructed, for example, as an illuminated key on the message connecting circuits 3a or possibly in the key field and the arrangement of an additional perforated strip reader 9, if desired or necessary, there can also be initiated transmission from a perforated strip. The perforated strip reader 9 there receives a start signal over a signal line *f*. The signals are made available to the message connecting circuits 3a on call in the timing of the parallel-series portion of converter 3c, over a cable *g*. The converter 3c transforms the parallel signals into series signals for transmission over the line L. If a control key in the message connecting circuits 3a is actuated, they also pass from the connecting circuits in the form of parallel signals, over the line *c* to the printer.

The arrangement according to FIG. 1 makes it possible without difficulties, with the aid of the electrical coupling of the structural group consisting of a machine with keyboard and printer, a perforated tape reader and a perforator, to carry out other types of operation. Thus, the reader may contain a program strip, which establishes the course for the preparation of blank forms, etc., thus assuring correct entries according to columns and lines, and automatic insertion of standard or repetitive texts.

In the arrangement initially mentioned, of a teleprinter installation with a blocking of the signal transmission during the carriage return, it is possible to provide a time member for the delay of the resumption of the message transmission after completion of the carriage return. In principle, with the aid of the line-beginning switch 5 the blocking of the signal transmission can be suspended. The same process of blocking the keyboard and arresting the operation of the perforated tape reader is utilizable in column tabulating, which can be initiated by a special signal "new column." Here the contact of a slider-controlled tabulator bar gives the completion signal on reaching the new column. At the same time, according to FIG. 2, advantageously a switch 10, connected in series with a key switch 11 for initiating the signal repetitions may be provided at the end of the line for effecting a termination of such repetitions.

We claim:

1. In a teleprinter installation connected to a communication line, printing means operable to print messages upon receipt of message signals, said printing means including a carriage movably mounted for movement between a line

5

beginning position and a line ending position and returnable to said beginning position upon receipt of a carriage return signal, means operable to generate message signals and control signals, means for applying said message and control signals to said line and to said printing means, and means connected to said generating means and operable upon receipt of a carriage return control signal to interrupt the operation of said signal applying means for the duration of the return of said carriage to said line beginning position.

2. Apparatus for printing telegraphic signals according to claim 1 comprising keyboard transmission means in said generating means, and means for storing at least one signal before transmission wherein the signal following a carriage return signal is storable until completion of the carriage return operation.

3. Apparatus for printing telegraphic signals in accordance with claim 2 comprising selector members and means for locking said selector members in set positions as code combinations and means for repeatedly scanning said members for reproducing the allocated code combinations.

4. Apparatus for printing telegraphic signals in accordance with claim 3 comprising a selector comb, a control member operable to lock said comb in a set position, and

6

first switching means operable by said carriage to release said comb upon completion of the carriage return.

5. Apparatus for printing telegraphic signals in accordance with claim 4, wherein said selector members are adjustable for a period of time and comprising auxiliary drive means for driving said selector members continuously, second switching means operable in response to the setting of said selector members on a carriage return code combination, said first switching means serially connected with the second switching means and operable to be open only in the line beginning position and third switching means operable to lock the selector member setting for a carriage return code to provide the insertion of a subsequent code combination.

References Cited

UNITED STATES PATENTS

2,189,541	2/1940	Burcky	178—25
2,669,602	2/1954	Salmon et al.	178—42
2,907,823	10/1959	Wusteny et al.	178—17.5
2,912,485	11/1959	Kaufman et al.	178—4.1

THOMAS A. ROBINSON, *Primary Examiner.*

U.S. Cl. X.R.

178—25