Dec. 8, 1942. R. E. ZENNER 2,304,295

PRINTING TELEGRAPH SYSTEM AND APPARATUS

Original Filed May 23, 1938

FIG. 1

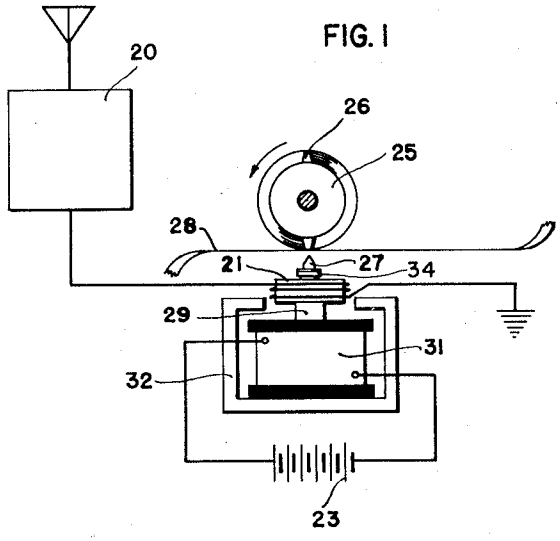


FIG. 2

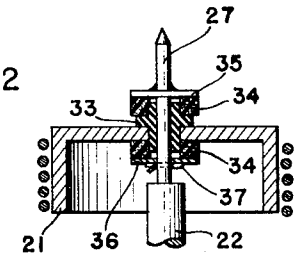
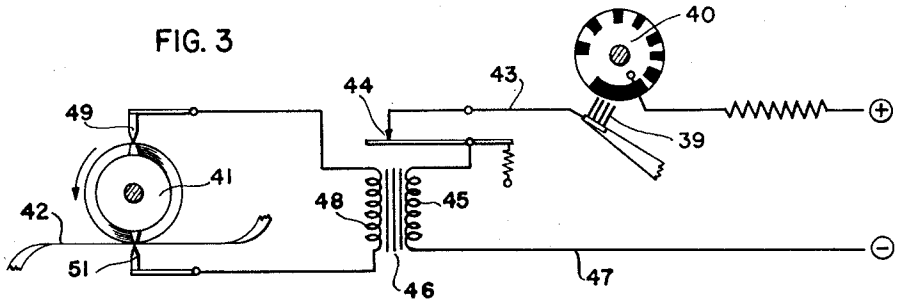


FIG. 3



INVENTOR.
RAYMOND E. ZENNER

BY H. B. Whitfield.
ATTORNEY.

Patented Dec. 8, 1942

2,304,295

UNITED STATES PATENT OFFICE

2,304,295

PRINTING TELEGRAPH SYSTEM AND APPARATUS

Raymond E. Zenner, Brookfield, Ill., assignor to Teletype Corporation, Chicago, Ill., a corporation of Delaware

Original application May 23, 1938, Serial No. 209,523. Divided and this application December 23, 1940, Serial No. 371,359

6 Claims. (Cl. 178—11)

This invention relates to automatic telegraph systems in which a record is made in response to a succession of signal impulses, and more specifically to telegraph apparatus operable by facsimile methods of operation.

The present application is a division of application Serial No. 209,523, filed May 23, 1938.

In telegraph systems involving apparatus for recording characters by a series of elemental areas of positive and negative surfaces, transmitting apparatus has been employed wherein each letter, symbol, or character is analyzed into a succession of constituent areas and a code set of corresponding character embodiments are constructed, which embodiments then are selected under control of a message record tape. In accordance with such scanned or analyzed embodiments, electrical impulses are generated which cause corresponding operation of recording apparatus of the form disclosed in United States Patent No. 2,131,741 to form characters in a line.

The primary object of this invention is to provide means to assure the distinct printing of characters.

Another object of the invention is to provide for printing on waxed paper by arcing between a scanning wheel and a knife-edge platen.

A better understanding of the invention may be had from the following description, taken in conjunction with the accompanying drawing, wherein,

Fig. 1 is a schematic view of a receiving apparatus embodying the print hammer rebound prevention means according to the present invention;

Fig. 2 is an enlarged cross-sectional view of the line coil and platen shown in Fig. 1; and

Fig. 3 is a schematic view of a receiving circuit for printing on chemically prepared paper by means of arcing.

Referring now to the drawing, the receiving printer, represented diagrammatically in Fig. 1 (with which the transmitting apparatus, exemplified by Figs. 1 and 2 of the parent application, co-operates) is normally operative, with its printing or recording wheel constantly rotating. The signals transmitted from a radio frequency transmitter (not shown) are received by the radio frequency receiver 28, where they are demodulated and amplified and are directed through a line coil 21 of a radio printing apparatus of the type shown in the aforementioned Patent No. 2,131,741, and thence to ground.

The radio printer disclosed schematically in Fig. 1 comprises the printing or recording wheel 25 which is normally rotating constantly. As disclosed in said copending parent application, the printing wheel 25 is provided on its cylindrical surface with symmetrical spiral knife edges 26 which co-operate with an operating member or platen 27, having a knife edge arranged transversely of the tape 28. Platen 27 moves with the line coil member 21, and reciprocates vertically with said line coil in response to the received signals. Thus, in response to a marking signal the line coil 21 will be actuated upwardly, bringing the platen 27 against the printing wheel 25. Then, upon receipt of a spacing signal the coil 21 moves downwardly under the action of gravity or by means of a return spring, bringing the platen against a down stop 22 (Fig. 2).

The line coil 21 is arranged over the core 29 of the local field magnet 31 and operates between the poles 32. The winding of the coil 31 is connected in an obvious circuit including battery 23, such as is diagrammatically shown in Fig. 1. As fully described in the aforementioned Patent No. 2,131,741, the line coil 21 responds to marking signals to raise the platen 27 against the tape 28, thus pressing the tape 28 and a contiguous strip of carbon paper (not shown) against the spiral knife edges 26 of the rotating printing wheel 25, whereby the tape 28 is marked in accordance with the received marking signals to record characters. It is understood, of course, that an ink roller may be substituted for carbon paper. As set forth in the parent application, the tape 28 moves only during signal reception and for a predetermined interval thereafter, and control means is provided to stop the tape after said predetermined cessation of message reception.

To prevent bouncing of the platen 27 which occurs when the platen is rigidly secured to the line coil spool 21 thus causing undesirable marks on the tape, especially when an inking roller is used, the construction shown in Fig. 2 is employed. With this arrangement, the platen 27 is fitted into a bushing 33 supported by the line coil or spool 21. The spool 21 is interposed between a pair of rubber washers 34, preferably of sponge rubber, which are clamped between a flange 35 on the platen 27, and a metal washer 36, by a cotter pin 37. The rubber washers 34 act to eliminate rebound because of the ability of rubber to absorb mechanical energy without releasing the same, due to its high internal friction. Thus, when the assembled platen and line coil are actuated upwardly toward the printing

wheel in response to a marking signal, the platen 27 strikes the printing wheel 25 and tends to rebound, but due to the continued upward force of the line coil spool 21, the rebound of the platen is resisted, the rubber washers 34 serving to absorb the mechanical energy expended by both the platen and the line coil. The same result is achieved upon the return or downward movement of the assembled platen and line coil when the platen 27 impinges against the down stop 22. With this arrangement distinct printing is assured. Obviously, any material having high internal friction might be used in place of rubber.

The present invention also provides, as shown in Fig. 3, a means for printing or marking on a sensitized or chemically prepared tape, such as a wax coated tape, by means of sparking or arcing from a free running spiral member 41 near the tape 42 but out of contact. Briefly, the brushes 39, in response to permutation code signals, are selectively brought into contact with code discs or image records 40 to complete the circuit from positive battery, through primary winding 45, to negative battery. With this arrangement, facsimile signals are transmitted from the transmitter, exemplified by code discs 40 and brushes 39, over the conductor 43, through the vibrator contact 44, through the primary winding 45 of transformer 46, over conductor 47, to negative battery. Transformer 46, in the present embodiment, is shown as a step-up transformer with an interrupter or vibrator in the primary. The vibrations caused in the vibrator of the transformer 46 generate higher voltage in the circuit including the secondary winding 48, the contacts 49 and 51, and the recording or scanning wheel 41. High voltage is necessary to break down the resistance of the air gaps between the knife edges and scanning wheel 41. The arcing or sparking thus produced between the contact 51 and the recording wheel 41, causes a record to be made or impressed on the chemically prepared tape 42 interposed between the contact 51 and the wheel 41, without requiring pressure as in the structure of Fig. 1, and requiring a minimum of power to rotate the spiral printing member.

Although the invention has been described and disclosed with regard to a particular type of apparatus, it is manifest that various modifications may be made without departing from the spirit and scope of the invention.

What is claimed is:

1. In a printing telegraph apparatus, a rotatable platen wheel for printing upon a tape, a movable printing member operable by received signals to print upon said tape and having a limited extent of motion when performing its function of printing, and means for preventing rebound of said printing member while under control of said signals.

2. In a printing telegraph apparatus, a rotatable printing member, a movable platen cooperable with said rotatable printing member in response to received signals to print upon a tape and having a predetermined extent of motion when performing the function of printing, and cushioning means for preventing rebound of said printing member when under control of said signals.

3. In a printing telegraph apparatus, a recording member, a platen cooperable with said member in response to received signals to make a record, and cushioning means for preventing rebound of said platen when under control of said signals.

4. In a printing telegraph apparatus, a recording member, a platen cooperable with said member, signal responsive means, and a nonmetallic elastic interconnection between said means and said platen for preventing rebound of said platen when under control of said signal responsive means.

5. In a printing telegraph apparatus, a recording member, a platen cooperable with said member, signal responsive means comprising a field magnet and a line coil instrumentality, and elastic interconnection between said instrumentality and said platen for preventing rebound of said instrumentality when under control of said means.

6. In a printing telegraph apparatus, a recording member, a platen cooperable with said member in response to received signals to make a record, and a nonmetallic cushioning means for preventing rebound of said platen when under control of said signals.

RAYMOND E. ZENNER.