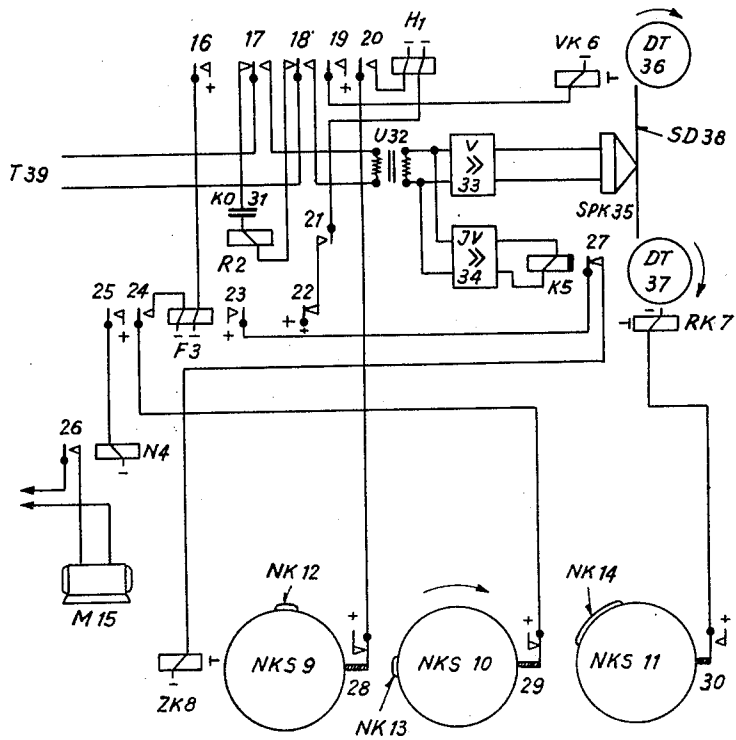


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DEVICE FOR ELIMINATING SILENT PERIODS
BETWEEN INTERMITTENT RECORDINGS
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DEVICE FOR ELIMINATING SILENT PERIODS
BETWEEN INTERMITTENT RECORDINGSMax Handschin, Kusunacht-Zurich, Switzerland,
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The known types of apparatus for the recording of impulses, as for instance, so-called dictaphones, telephonographs, and also the devices which record trains of impulses of other types on sound-carriers, possess the great disadvantage that if somewhat prolonged intervals elapse between the individual recordings, considerable portions of the sound-carrier are run off without being utilised. One result of this is that, in order to record given lengths of trains of impulses, the sound-carrier has to be made disproportionately long, and another is that, when reproduction takes place, it includes, naturally, the intervals which occurred during the recording process.

The object of the present invention is the creation of a device with which it is sought to eliminate these disadvantages. This object is achieved, in accordance with the invention, by the provision of electrical agencies for the supervision of the incoming impulses, which said electrical agencies, when the impulses cease to arrive, operate a time-limit coupling set to function for a pre-determined period, at the end of which agencies provided for the winding back of as much of the carrier which receives the impulse-recordings as has been run off in this pre-determined time are operated, the apparatus being switched off when the process of winding back is completed.

For the supervision of the incoming impulses a speech control relay with time-lag can conveniently be used. The time-limit coupling can also take the form of a time-lag relay. When the time-limit coupling comes into operation, cam-discs are set in rotation through gearing, the contacts of which cam-discs switch off the microphone at the end of a pre-determined period and effect the switching off and, subsequently thereto, the winding back of the wire-drum and, when the winding back is completed, the switching off of the apparatus itself.

The enclosed drawing depicts a typical embodiment of a device in accordance with the present invention.

Let it be assumed that the microphone T39 is connected to an impulse-recording apparatus, and that a calling current excites the relay R2 in the known manner through the circuit:

(1) Microphone T39, contact 17, condenser KO31, relay R2, contact 18, microphone T39.

Through the excitation of the relay R2, relay H1 is excited through the following circuit:

(2) Battery positive, contact 22, contact 24, relay H1, operating winding, battery negative.

Relay H1 locks via the circuit:

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(3) Battery positive, cam contact 28, contact 20, relay H1, holding winding, battery negative.

Through the excitation of relay H1, relay F3 is excited, which through its contact 25 excites the mains relay N4. Through this the motor M15 is connected up to the mains and operates in the known manner gearing which is not depicted in the drawing.

Relay F3 is excited through the circuit:

(4) Battery positive, contact 16, relay F3, operating winding, battery negative.

Relay F3 is held through the circuit:

(5) Battery positive, cam contact 29, contact 24, relay F3, holding winding, battery negative.

The mains relay N4 is excited from the circuit:

(6) Battery positive, contact 25, mains relay N4, battery negative.

The motor is excited by the circuit:

(7) Mains, contact 26, motor M15, mains.

Through the excitation of relay H1 the forward coupling VK6 of the sound-carrier is engaged with the forward-running gear. The wire-drum DT36 is driven forward in the direction shown by the arrow. The wire SD38 is wound from wire-drum DT37 on to wire-drum DT36. The forward coupling is excited from the circuit:

(8) Battery positive, contact 19, forward coupling VK6, battery negative.

The microphone T39 can now deliver a recording, or message, in the known manner, to the impulse-recording apparatus, through the circuit:

(9) Microphone T39, contact 17, repeater U32, amplifier V33, speech recording-head SPK35 and back through amplifier V33, repeater U32, contact 18, to microphone T39.

Parallely to the repeater U32, the speech control relay K5 is excited via the impulse amplifier JV34, i. e., the time-lag relay K5 remains excited whilst the speech impulses of the microphone T39 are arriving. If the person speaking now hangs up having completed the recording, i. e., if the microphone T39 passes on no further speech impulses, the speech control relay K5 becomes dead.

Through the dropping of relay K5 contact 27 is closed and thus the time-limit coupling ZK8 is switched on through the circuit:

(10) Battery positive, contact 23, contact 27, time-limit coupling ZK8, battery negative.

Through the excitation of the time-limit coupling ZK8 the cam-discs NKS9, NKS10 and NKS11 are driven by means of a gearing, in the direction indicated by the arrow. The sound-carrier (wire-drum DT36) continues to turn. It

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is assumed that after, for instance, ten seconds the cam NK12 opens the contact 28; this results in the holding circuit 3 being cut off from relay H1, in addition to which the forward coupling VK6 becomes dead (circuit 8) and wire-drum DT36, and with it the wire SD38, ceases to move.

The microphone T39 is also switched off from the speech recording head SPK35 and amplifiers V33 and JV34 (circuit 9).

If contact 30 is now closed by the cams 14, the reverse coupling RK7 is engaged with the gearing. Wire-drum DT37 is unwound in the direction opposite to that indicated by the arrow, for a period of, say 10 seconds. The reverse coupling RK7 is excited from the circuit:

(11) Battery positive, reverse coupling RK7, battery negative.

If contact 30 is opened, circuit 11 becomes dead once more.

Finally, cam NK13 will open contact 29, with the result that the holding current is cut off from relay F3. Through this, circuits of the relays F3 and N4 and the motor M15 also become dead, and the impulse-recording apparatus is ready for further recordings.

The device herein described and depicted prevents the sound-carrier from continuing to run whilst not being used. On the contrary, its entire length is utilised for the recording of successively recorded impulse-signals or messages, so that reproduction of the recording without intervals of silence becomes possible.

I claim:

1. A device for the recording of electrical audio signals, comprising a recording head, a record carrier, an electrically operated drive for moving said record carrier forwardly and rearwardly relatively to said recording head, a time delay switch, control means for said time delay switch responsive to the ceasing of the signals to be recorded and becoming operative after a comparatively short time interval and a comparatively longer time interval after the ceasing of the signals to be recorded, and electrical circuit means connecting said time delay switch with said drive to switch off the forward drive and to switch on the rearward drive when the time delay switch becomes operative after said comparatively short time interval, and to switch off the rearward drive when the time delay switch becomes operative after said longer time interval, whereby the return movement of the record carrier which is thus produced substantially coincides with the forward movement thereof during said short time interval.

2. In a device for the recording of electrical audio signals in combination, a recording head, a record carrier cooperating with the recording head for the recording of the signals, a drive for advancing said record carrier with respect to the recording head, means for reversing the direction of movement of the record carrier, a time delay control device comprising electrical relay means responsive to the signals being recorded,

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driving means to be actuated by said relay means after the ceasing of signals to be recorded, control means operatively connected with said driving means and operable by the latter for a fixed interval a predetermined time after the actuation of the driving means, to operate said means for reversing the direction of movement of the record carrier during said interval, the lengths of said predetermined time and of said interval being chosen, to effect a reverse movement of the record carrier substantially equal to its forward movement occurring after the ceasing of signals to be recorded.

3. In a subscriber station of a telephone system in combination, a recording head, a record carrier cooperating with the recording head for recording electrical audio signals arriving over the line, driving means for advancing the record carrier in a forward direction with respect to the recording head, further driving means for advancing the record carrier in a backward direction with respect to the recording head, a ringing set responsive to ringing currents arriving over the line to start the first-named driving means, a time delay control device comprising electrical relay means responsive to the signals being recorded, a source of motion to be started by said relay means after the ceasing of audio signals arriving over the line, a first control means operatively connected with said source of motion to be rendered inoperative a predetermined time after the ceasing of audio signals arriving over the line and adapted to maintain in its operative position the first-named driving means actuated independent of said ringing set, and a second control means operatively connected with said source of motion, to be rendered operative during a predetermined time, when said first control means is in its inoperative position and adapted to maintain in its operative position said further driving means actuated to reverse the movement of the record carrier and to stop this reverse movement, when the position of the record carrier substantially coincides with its position at the ceasing of audio signals arriving over the line.

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