

June 16, 1942.

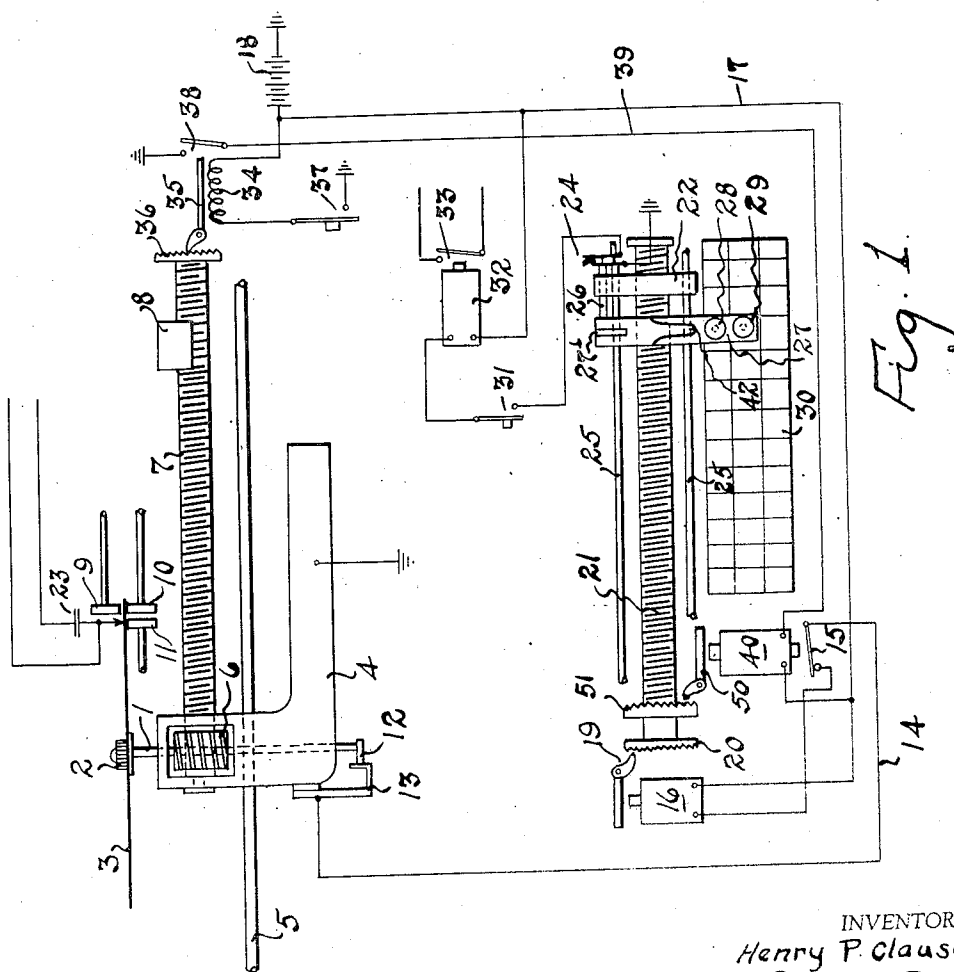
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2,286,347

MARKING CONTROL SYSTEM FOR DICTATION MACHINES

Filed Jan. 13, 1941

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

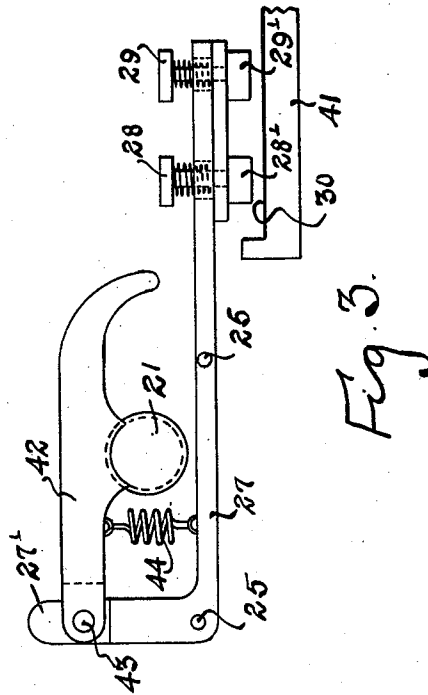


Fig. 3.

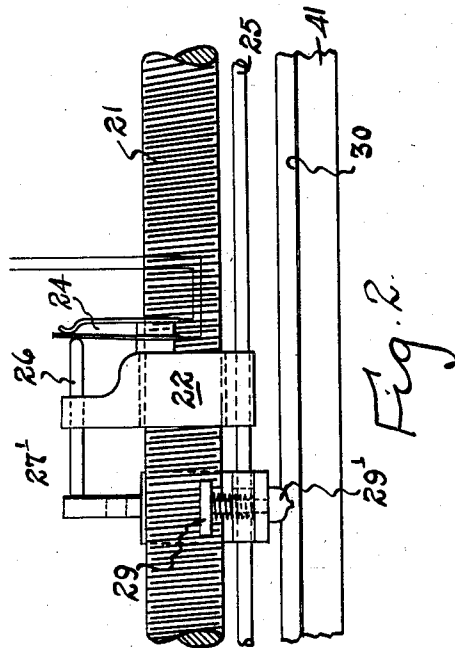


Fig. 2.

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UNITED STATES PATENT OFFICE

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MARKING CONTROL SYSTEM FOR
DICTATION MACHINES

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9 Claims. (Cl. 274—9)

This invention is concerned with improvements in dictation machines with particular relation to the marking device by which the dictator and transcriber may note corrections and other information with regard to the recorded dictated matter.

The general object of this invention is the provision of a marking apparatus and control mechanism therefor to be associated with a dictation recording machine either adjacent the machine or remote with respect thereto.

An object of this invention is the provision of a combination of this type in which the marking apparatus is operated both in a forward or in a reverse direction in timed relation with the relative motion between the record tablet and the recording head so as to indicate their relative position at all times.

A further object of the invention is the provision of relatively simple apparatus of this nature so constructed that in the event the dictator back spaces the recording platen machine a visible indication and guide is provided so that he may reset the machine to its initial position when he is ready to proceed with his dictation.

A further object of the invention is to provide an automatic control whereby during the back spacing period the recording device is held off the record tablet until the recording device gets back to the position from which back spacing began.

Additional objects will be apparent from the following description when taken in connection with the attached drawings.

This invention resides substantially in the combination, construction, arrangement and relative location of parts, as will be described in detail below.

In the accompanying drawings:

Figure 1 is a diagrammatic view of one form of mechanism in accordance with this invention;

Figure 2 is an enlarged front elevational view of a detail of the invention; and

Figure 3 is an end elevational view of the mechanism of Figure 2.

At the outset it may be noted that this invention is particularly applicable to the type of sound recording or dictation recording machine of the type disclosed in the copending application of Barton A. Proctor and Ferdinand C. W. Thiede, Serial No. 218,082, filed July 8, 1938. As diagrammatically disclosed herein, and in full detail in the above mentioned application, the recording machine is of the type employing a thin disc of cellulose acetate initially smooth on

both sides and adapted to have formed or impressed thereon a sound record groove beginning near the center of the disc and gradually increasing in diameter spirally to the periphery thereof. As will be clear as the description proceeds, the invention herein disclosed is not limited, however, to use with a machine of this type since it may readily be employed with the type of sound recording machine using a wax cylinder.

The general combination herein disclosed is similar to that set forth in my copending application Serial No. 371,069 filed December 21, 1940, but includes other practical features as will appear below.

In the design of a marking apparatus for dictation recording machine, and particularly in the case where the thin cellulose acetate disc is employed as the record tablet, difficulties are presented because of the variation in radial extent of the record convolutions for a given number of words. To state it another way, the number of convolutions of record required for one hundred words at the beginning of the record, that is adjacent the center thereof, is about twice the radial extent of the number of convolutions necessary to record one hundred words near the periphery of the record tablet. In the form of marking system disclosed in my above mentioned application there is disclosed the fact that because of these variations the indicating and marking apparatus will have a similar variation in its movement thereby requiring a record tab or sheet graduated in a gradually decreasing scale. This practical condition when taken together with the fact that the radial extent of the complete record on a record disc is relatively short, that is slightly over three inches in the case of the machine disclosed in the application of Proctor and Thiede referred to above, presents a problem which is relatively unfavorable as compared with a similar problem as applied to dictating machines using wax cylinders where the longitudinal extent of the adjacent convolutions of the record for a given number of words is uniform. As will appear later, the invention herein disclosed overcomes these difficulties when used with the machine of the type set forth, but is nevertheless equally practical for use with the wax cylinder type of machine.

In accordance with this invention the marking apparatus is so related to the dictation recording machine that it is automatically operated both forwardly and in reverse so as to at all times give an instantaneous indication of the relative

position between the record platen and the recording head. The marking and indicating apparatus is so constructed as to operate over a uniformly ruled chart. More specific objects of the invention will be described as the description proceeds.

Referring to Figure 1 of the drawings, there is indicated diagrammatically only so much of the machine as disclosed in full detail in the above mentioned Proctor and Thiede application as to make clear the invention herein disclosed. As shown, the machine includes a carriage 4 which is mounted for sliding movement on guide rods or supports 5. Journaled on the carriage is a vertical spindle 1 which terminates at its upper end in a toothed member 2 upon which the record disc 3 is impaled so that they rotate together. Mounted on the spindle 1 is a worm wheel 6 which meshes with a threaded shaft 7 connected to the carriage 4 while being able to rotate with respect thereto. The threaded shaft 7 is engaged by a fixed nut 8 so that as the shaft revolves it, as well as the carriage 4, moves longitudinally on the supporting rods 5, depending upon the direction of rotation of the shaft 7. At 9 and 10 are a pair of friction wheels positioned so as to engage the record disc 3 on opposite sides thereof. The lower wheel 10 driven from a suitable power source, not shown, engages the disc at all times, while the upper wheel 9 is mounted on a yoke, not shown, so that when it is desired to rotate the record disc it is swung down into engagement therewith over the wheel 10. By this means the record disc 3 is caused to revolve and with it the spindle 1 and the worm wheel 6. Rotation of the worm wheel causes rotation of shaft 7, and as a result the carriage 4 travels along the rods 5. The sound recording head 23, which may be of the piezoelectric crystal type, has a stylus adapted to engage the upper surface of the disc 3, and will, of course, in accordance with usual practice, be connected to a microphone or other sound converting device. The thin flexible disc 3 is backed up opposite the stylus by means of a hardened rotatable platen or anvil wheel 11. To start recording with this machine the carriage 4 is shifted to the extreme right so that the stylus of the sound recorder engages the disc 3 at a point near its center. As the wheels 9 and 10 revolve the disc 3, the carriage 4 moves slowly to the left so that a spiral record groove is impressed on the disc in the form of a plurality of adjacent convolutions gradually increasing in diameter at the rate of about 0.01 inch per turn. On the lower end of spindle 1 is a contact 12 adapted to engage the contact 13 mounted on the carriage 4 and insulated therefrom once for each revolution of the spindle. The carriage 4 is grounded as indicated. Contact 13 is connected by wire 14 through a normally closed switch 15 to one terminal of the electro-magnet 16. The other terminal of this magnet is connected by wire 17 to the ungrounded terminal of a grounded feeder or current source 18. Magnet 16 when energized operates a pawl 19 engaging a ratchet wheel 20 secured to the end of a threaded shaft 21 in the marking apparatus. The shaft 21 is journaled in suitable supports, not shown in order to keep the disclosure as simple as possible. Upon each energization of magnet 16 the pawl 19 causes shaft 21 to have an increment of rotation in one direction.

A support 22 is slidably mounted on the rods 25 and either has a passage therethrough or

is so constructed as not to engage the threads of rod 21. Mounted on the support 22 and insulated therefrom is a switch 24 having one terminal grounded and the other connected through a normally open switch 31 to a magnet 32 which is connected to the power source by wire 17. The magnet 32 controls a normally open switch 33, which is in circuit with the device for controlling the operation of the recording machine, not shown, including movement of the recording head into and out of engagement with the record tablet.

Also slidably mounted on the rods 25 is a support 27 for the marking devices 28 and 29. This support is shown in more detail in Figure 3. It is of L shape, the horizontal arm thereof extending sufficiently so that the marking devices may move over a support 41 on which the marking tab or sheet 30 may be placed. The marking devices consist of manuals 28 and 29 having cutters or punches 28' and 29' respectively so that when the manuals are depressed punch or other marks will be made on the sheet 30. The upstanding arm 27' of the support has pivotally mounted thereon at 43 a lever 42 which is urged downwardly by a spring 44. The lower surface of the lever 42 is shaped and threaded so as to have a mating engagement with the threads of the shaft 21. The support 22 has slidably mounted therein a pin 26 positioned to engage and close switch 24 in a manner to be described later.

Attached to the free end of threaded shaft 7 is a ratchet wheel or disc 36 engaged by a pawl 35. The pawl 35 is caused to have impulse operation by energization of a magnet 34 which is connectable to the current source 18 through what may be termed a back spacing push button 37. The magnet 34 also controls a normally open switch 38 which when closed completes a circuit through the magnet 40 to the current source 18 by way of wires 39 and 17. The switch 15 in the circuit of magnet 16 is part of the relay of which the magnet 40 is a part, so that when the magnet 40 is energized switch 15 opens. A pawl 50 is also associated with the magnet 40 and engages a ratchet wheel or disc 51 mounted on the shaft 21. The pawls 19 and 50 are both normally out of engagement with their respective ratchet wheels 20 and 51.

In the operation of this machine it will be remembered that at the start of a recording carriage 4 is moved to the right after a record disc 3 is placed on the spindle 1 to a position where the recording stylus may engage it near its center. Lever 42 of the marking device is raised and the support 27 is shifted to the extreme left on the rods 25. The support 22 is likewise shifted to the left until the pin 26 engages the end 27' of the support 27, thereby closing switch 24. A fresh index sheet 30 is applied to the support 41 (see Figure 3), so as to lie under the arm 27 in position so that the marking devices 28 and 29 are at the extreme left side of the sheet 30. To start the machine for the purpose of recording switch 31 is closed, energizing magnet 32 and closing switch 33 in an obvious manner. The closing of switch 33 starts the drive motor which rotates the drive wheel 10 and wheel 9 is moved into engagement with disc 3. These devices are disclosed in the above mentioned Proctor and Thiede application, as well as such other necessary adjuncts including mechanism for moving the recording head 23 so that its stylus engages the record tablet 3. The dictator then speaks into the microphone (not shown) connected to

the machine and the recording proceeds. As spindle 1 revolves the switch 12-13 is momentarily closed, once for each revolution thereof with the result that magnet 16 is rapidly energized, causing pawl 19 to act on the ratchet wheel 30 to rotate threaded shaft 21 in small increments of rotation. The threaded portion of lever 42 engages the threads of shaft 21 so that as a result the support 27 slowly proceeds to the right, pushing the support 22 ahead of it and keeping switch 24 closed. At this point it may be noted again that neither pawl 19 or 50 interferes with the rotation of shaft 21 by the other. If during the dictation the dictator wishes to make a correction in the dictation, he operates one or the other of the manuals 28 and 29 to make a mark on the sheet 30, which relative to a position of the stylus on the disc 3 is in a corresponding position with respect to the index sheet 30. Likewise, at the end of a particular piece of dictation the proper one of the manuals is operated to indicate this.

Should the dictator wish to back space the record disc 3 for any reason, including for example the playing back of a previous portion of the record, he operates the back spacing switch 37. It may be noted that in machines of this type, as disclosed in the above mentioned Proctor and Thiede application, a reproducing head is included which may be moved into engagement with the record disc when desired. The dictator repeatedly closes switch 37 until the record is back spaced the desired amount. The repeated closing of switch 37 causes repeated energization of the magnet 34 which operating the pawl 35 causes shaft 7 to be rotated in a reverse direction in steps through the cooperation of the ratchet wheel 36 with the pawl 35. Each energization of the magnet 34 closes switch 38, thereby energizing the magnet 40. Each time the magnet 40 is energized switch 15 is open and pawl 50 is operated. The opening of switch 15 breaks the circuit to magnet 16 so that should the switch 12-13 be closed at that instant magnet 16 cannot be energized. This is necessary because, of course, switch 12-13 will close once for each revolution of spindle 1, even though it be in the reverse direction. The operation of pawl 50 will cause reverse rotation of shaft 21 through its action on ratchet wheel 51, causing support 27 to move slowly back towards the left hand end of the machine. As soon as the support 27 begins to move back it disengages the pin 26 and switch 24 opens so that the circuit controlled by switch 33 may not be completed during this time, and therefore the recording head may not be moved into engagement with the record tablet. Or, if an automatic control for placing it in contact with the record is employed, this circuit may include switch 33 to prevent moving the recording head into engagement with the record disc. When the machine has been back spaced the desired amount the dictator may move the reproducing head into engagement with the disc and play back the desired portion. It will be noted that although the support 27 moved backwardly the support 22 remains stationary. Therefore, as the support 27 moves up to the support 22, that is to the right during the play back, the dictator can readily observe the approach of the mechanism to the point at which back spacing began. At the end of the play back the support 27 will have moved up so that it forces pin 26 to the right to close switch 24. The operator then gains control of

the circuit including switch 33. The dictation may then proceed as before to the end of the recording on that particular disc. The support 27 may be shifted about at will by simply raising lever 42, and of course, the follower is free to be shifted as desired.

From the above description it will be apparent to those skilled in the art that the principles of this invention may be embodied in various physical forms without departure from the novel subject matter thereof. I do not, therefore, desire to be strictly limited to the disclosure as given for purposes of illustration, but rather to the scope of the claims granted me.

What is claimed is:

1. In a machine of the type described, the combination including a sound recording machine having a record tablet support, a sound recording head, means for effecting relative movement therebetween in either direction, a marking apparatus, electromagnetic means for operating the marking apparatus and means operated by said first means for energizing said electromagnetic means whereby the marking apparatus is at all times positioned to correspond to the relative position between the record tablet and the recording head.

2. In a machine of the type described, the combination including a sound recording machine having a record tablet support, a sound recording head, means for effecting relative movement therebetween in either direction, a marking apparatus, electrical means controlled by said first means for interconnecting the marking apparatus with the sound recording machine, and an index sheet associated with the marking device whereby the marking device is at all times in a position with respect to the index sheet corresponding to the relative position between the record tablet and the recording head.

3. In a machine of the type described, the combination including a sound recording machine having a record tablet support, a sound recording head, means for effecting relative movement therebetween in either direction, a marking device, means actuated by said first means for effecting step by step movement of the marking device in either direction, and means operated by said first means for controlling the means for moving the marking device whereby the marking device moves in either direction concurrently with the recording machine to indicate the relative position between the recording head and the record tablet.

4. In a machine of the type described, the combination including a sound recording machine having a rotatable record tablet support, a sound recording head, means for effecting relative rotational and longitudinal movement therebetween, a marking device, means for effecting movement of the marking device in either direction, and means controlled by the rotation of the record tablet support for controlling the means for moving the marking device whereby the marking device moves in either direction concurrently with the recording machine to indicate the relative position between the recording head and the record tablet.

5. In a machine of the type described the combination including a sound recording machine having a movable record support, a recording head, means for causing rotational and rectilinear movement of said support, a remotely situated indicating and marking device, and means subject to the rotational movement

of the record support for operating the marking device with the rectilinear movement of the record support whereby the marking device is at any instant in a position corresponding to the relative position between the record support and the recording head.

6. In a machine of the type described the combination including a sound recording machine having a movable record support, a recording head, means for causing rotary and linear movement of said support in either direction, a remotely situated indicating and marking device, means actuated by the rotation of the record support for operating the marking device conjointly with the linear movement of the record support whereby the marking device is at any instant in a position corresponding to the relative position between the record support and the recording head, and means controlled by the marking device for rendering the recording head inoperative upon backward linear movement of the record support.

7. In a machine of the type described, the combination including a carriage supported for linear movement, a rotatable record spindle mounted on said carriage, means for causing movement of the carriage and spindle in a forward direction, an electromagnetically operated marking device, means operated by said spindle for actuating said marking device in timed relation with the movement of said carriage, and manually controlled electromagnetic means for causing synchronous reverse movement of said carriage and marking device.

8. In a machine of the type described, the

combination including a carriage supported for linear movement, a rotatable record spindle mounted on said carriage, means for causing movement of the carriage and spindle in a forward direction, an electromagnetically operated marking device, means operated by said spindle for actuating said marking device in timed relation with the movement of said carriage, manually controlled electromagnetic means for causing synchronous reverse movement of said carriage and marking device, a recording head, and means controlled by said marking device for rendering the recording head inoperative when the marking device is operated in a reverse direction.

9. In a machine of the type described, the combination including a carriage supported for linear movement, a rotatable record spindle mounted on said carriage, means for causing movement of the carriage and spindle in a forward direction, an electromagnetically operated marking device, means operated by said spindle for actuating said marking device in timed relation with the movement of said carriage, manually controlled electromagnetic means for causing synchronous reverse movement of said carriage and marking device, a recording head, and means controlled by said marking device for rendering the recording head inoperative when the marking device is operated in a reverse direction, said last means rendering the recording head operative upon return of the marking device to the position from which it began reverse movement.

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