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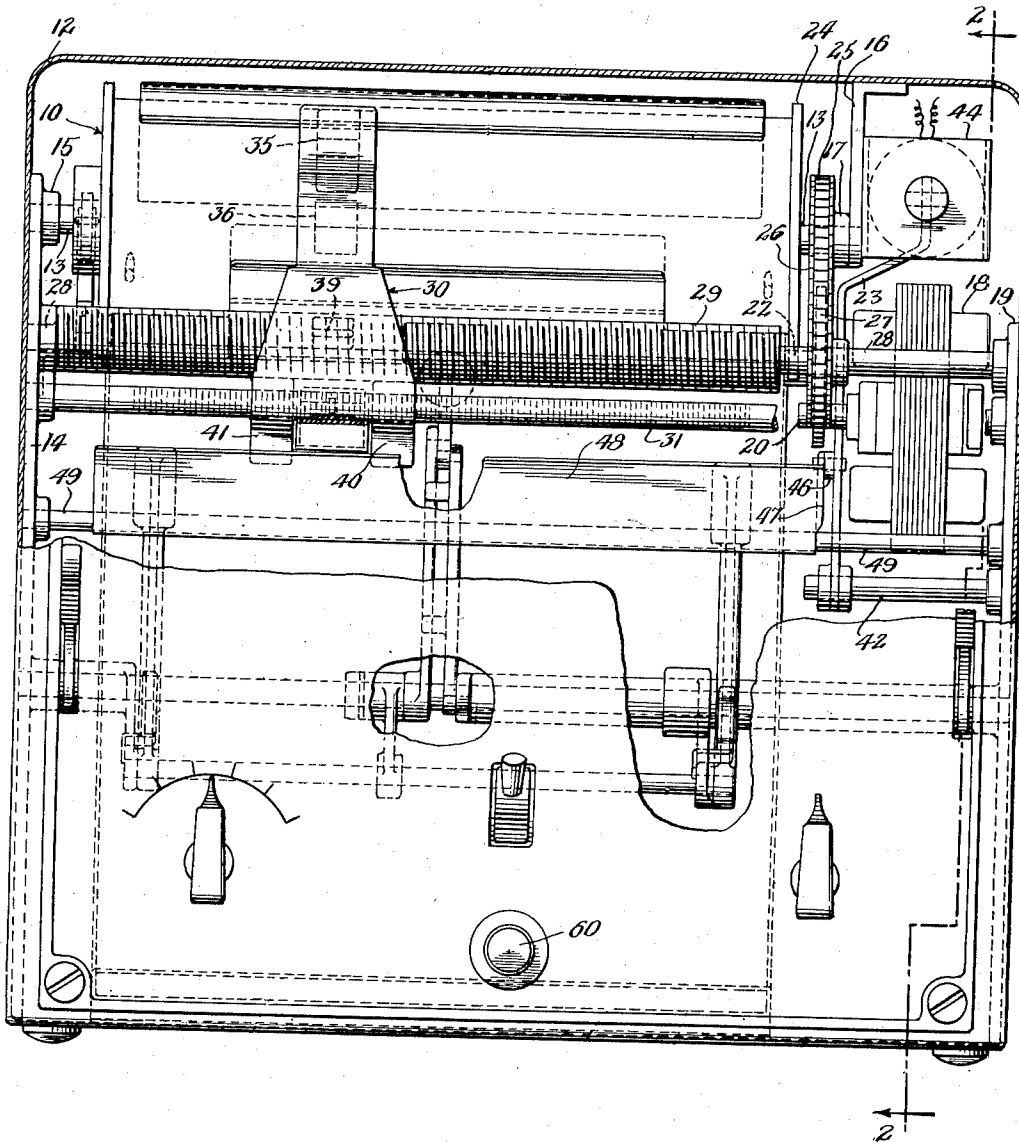
2,581,499

BACK-SPACING DEVICE FOR DICTATING MACHINES

Original Filed Dec. 21, 1946

2 SHEETS—SHEET 1

Fig. 1.



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2 SHEETS—SHEET 2

Fig. 2.

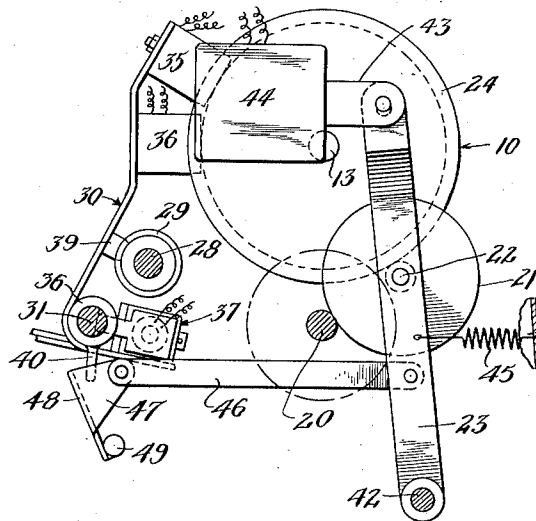
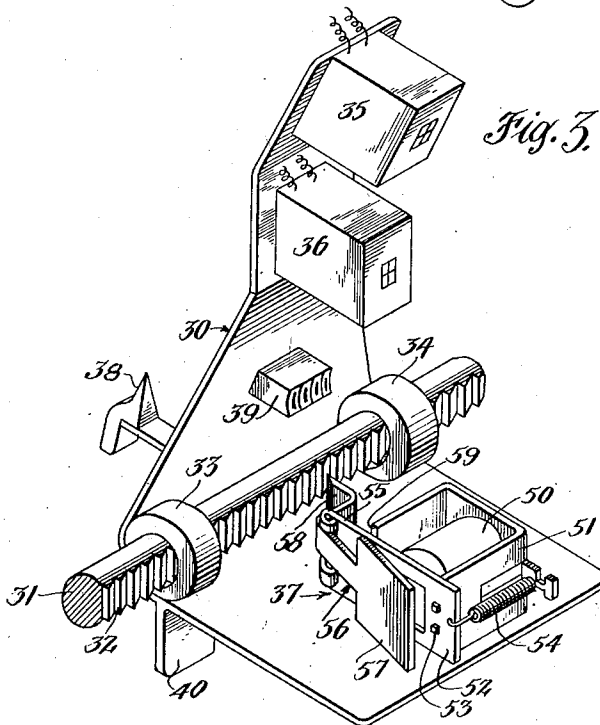


Fig. 3.



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BACK-SPACING DEVICE FOR DICTATING MACHINES

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Original application December 21, 1946, Serial No. 717,754. Divided and this application March 27, 1947, Serial No. 737,694

2 Claims. (Cl. 274—21)

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This invention relates to sound recording equipment, and, more particularly, to carriage mechanisms for office dictation machines. The invention is particularly applicable to dictating machines adapted to scan a helical track on a record in cylindrical form, for instance the magnetic dictating machine described in my copending application, Serial Number 717,754, filed December 21, 1946, of which this application is a division.

It is a primary object of the invention to provide for the selective control of the translational movements of a head element axially of a cylindrical record in either direction.

Another object of the invention is a dynamic arrangement of the parts of the carriage carrying the recording head wherein the masses of the several components of the carriage cooperate with other elements of the machine to provide for engagement and disengagement of the translation-effecting mechanism.

Another object of the invention is to provide for reverse translation of the recording carriage in a single step or series of steps of predetermined length, whereby to provide for reproduction and/or redictation of all or a selected portion of the record in the machine, as will further appear.

How the foregoing objects and others are attained will be more clearly understood upon reference to the description contained hereinbelow and the drawings, in which:

Figure 1 is a view, partly in elevation and partly in broken section, of a dictating machine incorporating the present invention;

Figure 2 is a sectional view of portions of the dictating machine of Figure 1 taken along the line 2—2 of Figure 1 and showing the carriage drive engaging mechanism; and

Figure 3 is a perspective of the carriage of the present invention on an enlarged scale.

The dictating machine illustrated in the drawings is adapted for use with removable, rectangular record sheets, as is fully described in my copending application, Serial Number 717,754. As there disclosed, such a record sheet carries dispersed magnetizable particles, and the sheet is wrapped upon and secured to a cylindrical form or drum 10, the sheet thereby presenting a cylindrical recording surface. The cylinder 10 and other parts of the machine are mounted in a casing 12. Cylinder 10 is provided with a shaft 13, whose left end is journaled for rotation in side frame 14 and a pad 15 formed integrally therewith. The opposite or right end of shaft 13 is journaled in bracket 16 and pad 17.

Immediately below shaft 13 and to the right of drum 10 may be seen a driving motor 18 mounted on side frame 19. Motor shaft 20 is in peripheral engagement with drive puck 21 (see

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Figure 2) which is mounted for rotation with a shaft 22, which shaft is journaled in shift arm 23. The operation of arm 23 will be described more fully hereinbelow; but it should be observed at this time that motion of arm 23 is adapted to carry puck 21 into and out of engagement with flange 24 of drum 10, thus providing a selectively engageable drive from motor 18 to cylinder 10.

In addition to cylinder 10, shaft 13 also carries for rotation therewith a driving sprocket 25 located on the shaft between flange 24 and pad 17. Sprocket 25 carries a chain 26, which is in engagement with driven sprocket 27 secured to shaft 28 of lead screw 29. Lead screw shaft 28 is journaled at its left end in side frame 14 and at the opposite end in side frame 19.

It will thus be seen that the drive train for all rotating parts is: motor shaft 20, movable puck 21, puck shaft 22, flange 24, shaft 13, sprocket 25, chain 26, sprocket 27, shaft 28 and lead screw 29.

Lead screw 29 provides translational force for effecting movement of a portion of the mechanism axially of cylindrical form 10. This portion is mounted on a carriage 30 (see Figure 3 for large scale view). Carriage 30 is supported by and free for axial and oscillatory movement upon axial way 31, having a rack 32 cut along one side thereof. The actual bearing surfaces upon which the carriage rides are the internal surfaces of sleeves 33 and 34.

Mounted on carriage 30 is a magnetic erase head 35, a magnetic recording head 36, back spacing mechanism generally indicated at 37, pointer 38 (which projects exteriorly of casing 12), half nut 39 and a pair of tabs 40 and 41. According to the invention, the mass of carriage 30 and its associated parts is distributed around axial way 31 in a manner to retain heads 35 and 36 against surface 11 of cylindrical form 10, and to retain half nut 39 in engagement with lead screw 29 by gravity. Tabs 40 and 41, which extend below axial way 31, provide a lever to which torque moments may be applied to remove the heads from the cylinder and the half nut from the lead screw, as will appear more fully hereinbelow.

Both the rotational drive train and the oscillation of carriage 30 about axial way 31 are controlled by a single electromechanical control system, which is clearly illustrated in Figure 2. Shift arm 23 is mounted for swing motion at its lower extremity on shaft 42, which constitutes a fixed pivot for the arm. At its upper end, arm 23 is connected with armature 43 of solenoid 44, and intermediate its end, arm 23 carries puck shaft 22, discussed above, a spring 45 and cross link 46.

Spring 45 normally tends to pull arm 23 toward the right as viewed in Figure 2; but exerts less

force on the arm than does solenoid 44 when it is energized, with the result that the arm is held in its righthand position unless the solenoid is energized, under which condition it is pulled toward the left.

The left end of cross arm 46 is connected to tab 47 of trip bar 48, which is capable of rocking motion on shaft 49. As may be seen in Figure 1, trip bar 48 extends practically the full length of axial way 31, so that regardless of the position of carriage 30, trip bar 48 may be brought into position against tabs 40 and 41 of carriage 30. Figure 2 shows the parts in the position they assume when solenoid 44 is energized—that is, with drive puck 21 in driving position and trip bar 48 rocked forward, permitting the recording heads 35 and 36 to contact the surface of cylinder 10 and permitting half nut 39 to engage with lead screw 29. Under these conditions, the cylinder rotates and the carriage is moved axially of the cylinder by the lead screw. Now, if the circuit to solenoid 44 be broken, spring 45 will pull arm 23 toward the right (see Figure 2), disengaging the drive puck and rocking trip bar 48 to the right. The trip bar, as will be seen, comes in contact with one or both of tabs 40 and 41, exerting a torque moment on carriage 30 around axial way 31, thus lifting the heads from the sheet and removing half nut 39 from engagement with lead screw 29.

A second control system 37 is completely carried by carriage 30 and serves to effect back spacing. This mechanism is shown in detail in Figure 3 and includes an electromagnet 50, a housing 51, and a non-magnetic member 52 hinged to the housing member at 53. A spring 54 exerts a turning moment on member 52, tending to carry free end 55 of member 52 away from the electromagnet. Hinged to member 52 at end 55 is an armature 56, one end 57 of the armature being in alignment with the core of the electromagnet and the other end bearing a pawl 58 adapted to engage rack 32 of axial way 31.

When electromagnet 50 is energized, member 52 is at first unaffected, but end 57 of armature 56 is drawn toward the core of the electromagnet, thereby forcing pawl 58 into engagement with rack 32. However, as soon as end 57 comes in contact with member 52, the turning movement on point 55 terminates and the full force of the magnet on the armature is now transmitted to member 52, which turns on pivot 53. Tooth 58 now exerts an axial pressure on rack 32, advancing carriage 30 until member 52 abuts on housing 51 at point 59.

The operation of the machine as a whole is fully described in my copending application above identified, and only certain parts of the operation need be considered herein. When the machine is to be used for dictation, the associated equipment is adjusted, for example, to condition the equipment for recording. A record is made by energizing solenoid 44, which engages the drive from motor 18 to drum 10 and lead screw 29. When pauses occur in dictation, the solenoid 44 is deenergized, and then energized again (by a switch disclosed in my copending application) just prior to the continuation of dictation. If it should be desired to redictate a portion of the material, push button 60 (see Figure 1), which is connected to electromagnet 50 by a circuit disclosed in my copending application above identified, is depressed once for each backward step

desired, until, for example, the carriage 30 has been carried back to a point somewhat before the point at which the redictation is to commence. The associated equipment is then adjusted to condition the dictating machine for reproduction, and the forward drive engaged until the last of the material which is to be retained is heard, whereupon the circuit to solenoid 44 is opened, recording conditions reestablished, and dictation resumed. Inasmuch as erase head 35 is energized during the dictation (by circuits disclosed in my copending application above identified), the previously recorded material will be erased just prior to rerecording.

The carriage 30 may also be manually moved along way 31 by means of pointer 38, which projects exteriorly of the casing 12 of the machine. This means serves as a quick action device, in contrast to the step-by-step back spacing provided by the push button 60.

Either the push button 60 or the pointer 38 may also be used for "playback," without redictation.

I claim:

1. In dictating equipment including means for effecting translational movement of a head element relative to a record element, back spacing means comprising a toothed rack in fixed relationship with one of said elements with its longitudinal axis parallel to the direction of translation, and, associated with the other element, an electromagnet, an armature in the field of the electromagnet, a non-magnetic member between the electromagnet and one end of the armature having a first pivotal connection with said other element and a second pivotal connection with the armature, and a pawl adapted to be moved toward the rack by swinging motion of the armature on the second pivotal connection and to be moved axially of the rack by swing motion of the non-magnetic member on the first pivotal connection.

2. In a dictation machine having a head adapted to scan a helical track on a cylindrical record carried by a rotatable support, back spacing mechanism for the head comprising engageable and disengageable back space operating elements, an electromagnet, an armature in the field of the electromagnet and connected with one of said elements to effect engagement thereof upon motion of the armature toward the electromagnet, and an operating member connected to the same element disposed in the path of movement of the armature and operable to impose a back spacing force on said element after engagement of said elements by motion of said armature.

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