Nov. 28, 1939. L. D. NORTON 2,181,437

DICTATING MACHINE

Original Filed Oct. 5, 1936

Fig. 1.

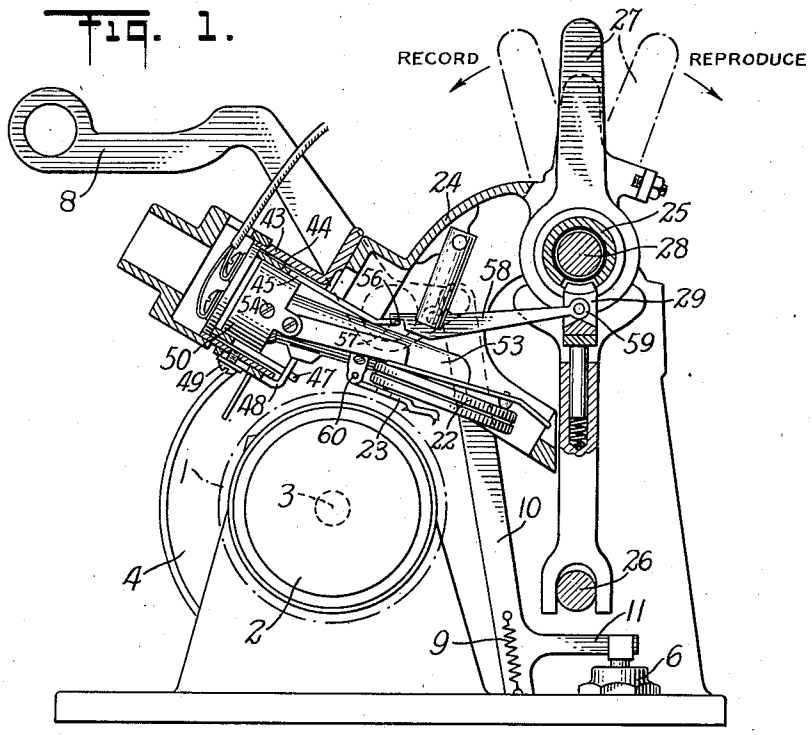


Fig. 2.

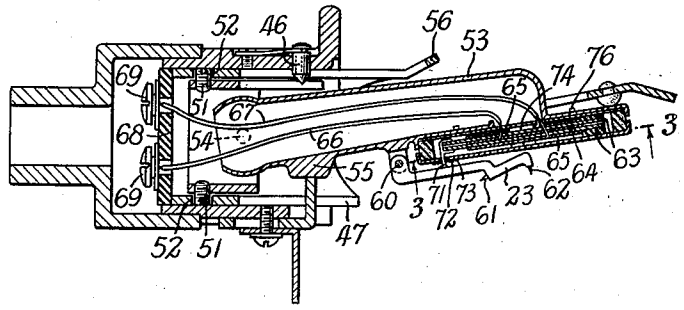
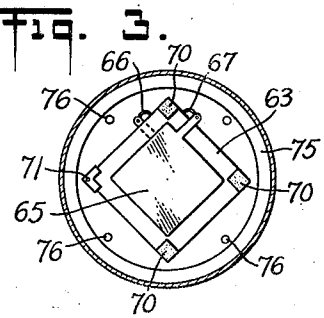


Fig. 3.



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DICTATING MACHINE

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Original application October 5, 1936, Serial No. 103,960, now Patent No. 2,143,819, dated January 10, 1939. Divided and this application March 9, 1938, Serial No. 194,807

3 Claims. (Cl. 179—100.41)

The present invention relates to an improvement in dictating machines. One object thereof has been to provide apparatus which presents more flexible adaptability to dictating voices of different volumes or having different tonal or other properties or qualities. A further object has been to provide a dictating machine of the universal type, i.e., for recording and reproducing, which may combine satisfactory or accepted general features of construction of known types of acoustical machines with novel features affording certain advantages inherent in electrical over purely mechanical recording and transmitting.

This application is a division of application Serial No. 103,960, filed October 5, 1936, patented Jan. 10, 1939, No. 2,143,819.

One embodiment of my invention is illustrated in the drawing appended hereto and in which—

Fig. 1 is an end elevation with parts shown in cross-section;

Fig. 2 is an enlarged detail in longitudinal section of the electric recorder-reproducer unit and mounting therefor; and

Fig. 3 is a section on the line 3—3 of Fig. 2.

The apparatus shown in the drawing includes conventional mechanisms (*a*) for holding and controlling rotation of the record cylinder upon which the dictation is to be recorded; (*b*) for automatically moving the electric recorder-reproducer unit and stylus carrier longitudinally thereof during recording and reproducing; and (*c*) for manually moving the recorder-reproducer unit and stylus carrier transversely thereof, i. e., to and from their recording, neutral, and reproducing positions, respectively.

The drawing also illustrates more particularly mechanisms according to my invention for electrical recording and reproducing and for shifting readily from recording to reproducing and vice versa or to neutral.

Referring to Fig. 1, the record cylinder 1 is removably mounted in a well known manner on a mandrel 2 driven by shaft 3 having a clutch connection with a driving pulley 4 which is actuated as by a belt from a motor, not shown. A switch 6 closes the motor circuit in a known manner when a mouthpiece (not shown) is removed from its supporting hook 8. A tension spring 9, Fig. 1, tends to yieldingly retain switch 6 in circuit closing position. For this purpose, said spring has one end attached to the frame of the machine and its other end to the link 10 which operatively connects hook 8 with switch 6 through arm 11.

With the motor in operation, shaft 3 and consequently mandrel 2 are operated at will by a suitable clutch interposed between the motor and said shaft.

In adapting a dictating machine having the known features as above described for electrical recording and reproducing according to the invention forming the subject matter of this application, I employ, in one embodiment, a recorder-reproducer unit mounting having certain features of construction like those of the sound-box mounting described and shown in Patent No. 1,606,744 and illustrated in a form suitable for present purposes in Figs. 1, 2 and 3.

As shown in Fig. 1, a recorder-reproducer unit casing 22 and a stylus arm 23 are mounted in conventional manner on carriage 24 for combined transverse and up-and-down or toward-and-away movement in relation to the periphery of record cylinder 1 operatively positioned on mandrel 2. Carriage 24 travels longitudinally of said cylinder upon an upper carriage rod 25 and a lower carriage rod 26. A manually operated control lever 27 mounted on carriage 24 is actuated by the operator to move the casing 22 to and from its recording, neutral and reproducing positions, respectively; to engage carriage 24 with the feed screw 28 by means of a nut 29 when the casing is in its recording and reproducing positions; and to disengage said carriage from said feed screw while the casing is in neutral position, all in accordance with well known practice involving similar operation of a sound-box and the styli connected therewith.

Referring to Figs. 1 and 2, a casing 43, mounted on carriage 24, supports a sliding sleeve 44 provided with an upper longitudinal slot 45 engaged by a guide pin 46. A lower longitudinal slot 47 accommodates an adjustable guide plate 48 secured in position on the casing 43 by a screw 49. An inner sleeve 50 is pivotally supported on the sliding sleeve 44 by screw studs 51 bearing in holes 52. A hollow conduit 53 is pivotally mounted on sleeve 50 by opposed pins 54 engaging bearings at opposite sides of said conduit near its inner end. The recorder-reproducer casing 22 is supported at the outer end of said conduit 53. A rib or fin 55 extends downwardly from conduit 53 with its free edge riding on the upper edge of guide plate 48 to impart up-and-down rocking movement to said conduit 53 during the longitudinal or to-and-fro movement thereof which accompanies the adjustment of control lever 27 into and out of its several positions.

As shown in Fig. 1, sleeve 50 has a pintle 56

extending across the outer end of slot 45 and in position to be engaged by a terminal hook 57 on a link 58 pivoted at 59 to move with lever 27.

It will be noted that the stylus arm 23 is pivoted at 60 to a bracket carried on the underside of conduit 53 and that the recording stylus 61 and the reproducing stylus 62 are mounted in conventional relation on stylus arm 23.

In apparatus according to my invention, I employ along with the above described conventional or known devices or equivalent operative structure an electric recorder-reproducer or translation unit which, in the illustrated embodiment, is supported in casing 22, Figs. 2 and 3, and cooperates with the stylus arm 23 in transmitting vibrations thereto and receiving vibrations therefrom. This unit, in a preferred form known as a bimorph element, comprises a pair of piezo-crystal plates 63 and suitable electrodes including a plate 64 of metal foil, for example, connected to a conductor wire 66 and interposed between said crystal plates. An outer metal plate 65 connected to conductor wires 67 is mounted against the outer surface of each of said crystal plates 63. A terminal plate 68 is conveniently located at the inner end of sleeve 50 and provided with binding posts 69.

As shown in Figs. 2 and 3, the crystal plates 63 are retained between the opposed walls of the casing 22 by resilient supports, as rubber spacers 70 engaging said plates at three corners. A pin 71 is secured to the free corner of the crystal plates and to an intermediate portion of the stylus arm 23 after passing through an opening 72 in the casing 22, said opening being sealed against passage of moisture by a membrane 73 extending across and covering said opening and closely embracing the shank of pin 71, being preferably adhesively secured thereto. The opening in the opposite wall of casing 22 and through which the conductor wires are led to the interior thereof, may be substantially sealed to exclude moisture by a thin sheet 74 of suitable moisture resistant material lying against the inner face of said wall and with its edges held down under the annular gasket 75 of rubber or other suitable resilient material. A passage for the conductors 66 and 67 to the interior of the casing may be provided in any suitable way, here shown as through the sealing sheet 74, care being taken to minimize leakage of air into the casing.

As shown in Fig. 2, the casing 22 is in effect a shell made up of cooperating shallow cup-shaped members one of which is secured to the outer end of hollow conduit 53. The other or outer cup-shaped member serves as a cover and when held in position, as by bolts 76, Fig. 3, retains the gasket 75 and the crystal plate assembly in operative position inside the casing 22.

As many embodiments might be made of the above invention, and as many changes might be made in the embodiment above described, it is to be understood that all structure hereinbefore described or shown in the accompanying drawing is to be considered as illustrative only and not in a limiting sense.

I claim:

1. For use in a commercial phonograph, an electro-mechanical translating device adapted to operate alternatively as a recorder and reproducer element, comprising, in combination, a support including a casing, at least one piezo-electric crystal disposed in said casing, said crystal having the form of a polygonal plate supported at certain of its angles within the walls of said casing, resilient means interposed between said angles and the casing, a lever mounted on said support for oscillation relative thereto, a substantially rigid connection between said lever and another angle of said crystal, a recording stylus mounted on said lever at a point more remote from the point at which said lever is attached to said support than the point on said lever which is connected to said crystal, and a reproducing stylus mounted on said lever at a point more remote from the point at which said lever is attached to said support than said recording stylus, whereby the load arm of said lever when conditioned for recording is greater than the load arm of said lever when conditioned for reproducing.

2. For use in a commercial phonograph, an electro-mechanical translating device adapted to operate alternatively as a recorder and reproducer element, comprising, in combination, a support including a casing, at least one piezo-electric crystal disposed in said casing, said crystal having the form of a polygonal plate supported at certain of its angles within the walls of said casing, resilient means interposed between said angles and the casing, a lever mounted on said support for oscillation relative thereto, a recording stylus mounted on said lever, a reproducing stylus mounted on said lever, and a substantially rigid connection between another angle of said crystal and said lever at a point nearer to said support than said styli, the lever arm of said recording stylus being shorter than the lever arm of said reproducing stylus.

3. A combination recorder and reproducer element adapted for alternative use in a commercial phonograph, comprising, in combination, a flexing piezo-electric crystal, a support for said crystal, a lever flexibly mounted at one end on said support, a reproducing stylus mounted at the other end of said lever, a recording stylus mounted on said lever intermediate said support and said reproducing stylus, and a driving member operatively connecting said crystal to said lever at a point intermediate said support and said recording stylus.

LELAND D. NORTON.