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STYLUS FEED MECHANISM FOR PHONOGRAPHS

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FIG. 1

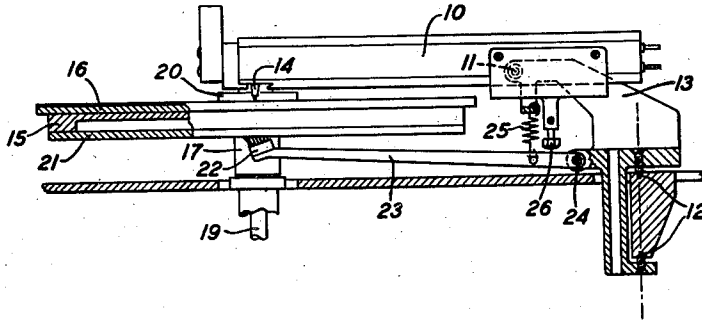
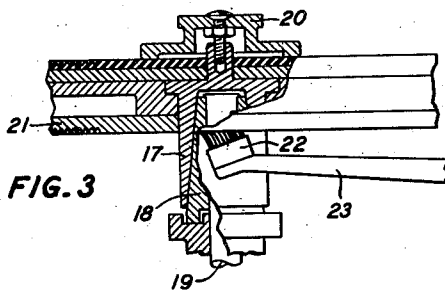
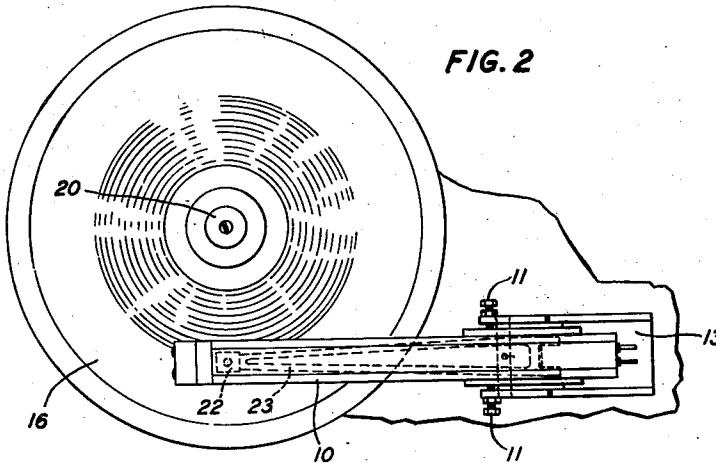


FIG. 2



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STYLUS FEED MECHANISM FOR
PHONOGRAPHS

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3 Claims. (Cl. 274-13)

This invention relates to sound recording machines and particularly to the stylus feed mechanism thereof.

It is well known in the art that a recording stylus can be fed regularly across a record blank by connecting it to a second stylus which is made to follow a groove of the desired pitch cut into a disc of hard material. Such a disc may be located on a separate mandrel or it may be placed underneath the turntable and concentric with it as is shown for example in United States Patent No. 1,008,605 to T. H. Macdonald, November 14, 1911.

Heretofore, however, it has been impractical to use this type of stylus feed for very fine pitch recording without employing reduction gearing for the feed disc which immediately increases the complexity of the device and decreases the accuracy of the groove in the record blank.

It is the object of this invention to provide a stylus feed mechanism which is extremely simple and rugged, and which may be used for either the fine pitch or coarse pitch type of recording with equal facility.

The means whereby this object is attained comprises a disc having a spiral groove of the desired pitch cut thereon and a brush engaging the groove and secured to the recorder arm to drive the latter across the turntable at a rate determined by the pitch of the groove on the disc.

Referring to the accompanying drawing which illustrates one form of the invention:

Fig. 1 is a side elevation of a turntable and recorder;

Fig. 2 is the corresponding plan view; and

Fig. 3 is an enlarged view of the brush and turntable hub.

In Fig. 1, 10 is a recorder arm pivoted for vertical motion at 11 and for horizontal motion at 12 through the supporting member 13. The recorder 14 may be of any well known make for either the lateral or hill-and-dale type of recording. A turntable 15 supports a record blank 16 and is driven from a suitable source of power, not shown, through a cone friction drive arrangement 17, 18. The hub 17 of the turntable is hollowed out to fit over a conical cap 18 which is secured to the drive shaft 19, the frictional force between the two being relied upon to transmit the required driving power to the turntable. The friction drive makes possible rapid removal and replacement of turntables whenever desired. A clamping nut 20 holds the record blank in place.

Underneath the turntable and concentric with it is a grooved disc 21 of metal or other wear resistive material capable of holding its shape

with rough handling and varied air conditions. The groove is simply a spiral of the desired length, cut, stamped, or pressed into the surface of the disc and extending over an area equivalent to or slightly larger than the one to be recorded on. Cooperating with the groove is a follower 22 attached to an arm 23 which is pivotally secured to the recorder arm support 13 at 24. A spring 25 holds the follower 22 upward against the grooved disc 21 while an adjustable extension 26 limits the vertical movement of the arm 23.

The follower 22 is preferably formed of a number of bristles of various lengths inclined away from the direction of rotation, and arranged according to length so that the shortest enter the grooves first. From the standpoint of transmission of power, it would be desirable to have all of the bristles short and stiff, but such a follower would have a tendency to chatter and therefore would be somewhat irregular in its action. It has been found that by making the forward bristles short and stiff to carry the load and the succeeding bristles longer with a slight initial flexure, the longer bristles will contact the groove under conditions which tend to throw the short stiff bristles out of contact and hence this arrangement makes the action of the follower more regular.

The diameter of the bristles should not exceed the width of the narrowest groove for which the machine is designed but should be large enough to give the bristles maximum stiffness. The shortest bristles may be only $\frac{1}{8}$ " long and the longest $\frac{3}{8}$ ", with the intermediate bristles tapering off evenly to give the follower a flat surface. For the ordinary recorder a surface area of $\frac{1}{4}$ of a square inch for the follower 22 is ample.

To operate the recorder a turntable with a disc having a groove of the desired pitch is selected and placed over the cone 18 of the drive shaft. A record is clamped in place and the turntable rotated. The recording is preferably done from the inside out to the edge of the record and accordingly the recorder is swung to the inside of the record and the brush raised until it engages the innermost groove in the disc at which point the brush will instantly begin to move across the disc. Just as soon as the brush is in contact with the disc the recorder can be lowered onto the blank and the sound controlled electrical currents allowed to actuate the recorder. If it is desired to make several short records on one disc, this can be done simply by pushing the recorder over a short distance without lifting it and the recording begun from that point immediately. When the record is finished the recorder is lifted

and carried over beyond the edge of the record in the usual manner.

The many advantages of a feed mechanism of this type are apparent. The total amount of normal pressure on the follower is approximately 5 200 grams, which is comparable to that required by a stylus performing the same functions, and as the pressure is distributed over a much larger area, wear on both follower and feed disc is reduced to an almost negligible amount. The resili- 10 ence of the bristles causes the follower to act as a filter for vibrations arising out of irregularities in the grooves with the result that the grooves cut in the record are often more perfect 15 than those in the feed disc itself. The follower, in addition, can be subjected to rough usage without material damage to itself or to the feed disc. For example, it can be pushed laterally across the disc without being raised from it, a procedure 20 which would be exceedingly harmful to a single-stylus feed mechanism. It can be started anywhere on the disc without overlapping speech grooves or scratching the feed disc.

Although this invention has been described 25 with reference to a disc and brush as the essential components of the feed mechanism, I wish it understood that the mechanism can be modified considerably without departing from the spirit of the invention. The follower, for example, need not be limited to a brush but can take 30 the form of a block of fibrous or wire-like material which is capable of entering the grooves of

the disc in a manner similar to that of the bristles of a brush, and the groove itself can be cut into a separate cylinder instead of a concentric disc without altering the mode of operation of the mechanism. 5

What is claimed is:

1. In a phonographic recording machine a turntable, a record blank, a recording stylus and means for driving the stylus across the record blank comprising a rotatable disc concentric with 10 the turntable and having formed in its surface a spiral groove, a follower contacting a plurality of substantially adjacent sections of the groove, and means for securing the follower to the stylus.

2. In a phonographic recording machine, a recording stylus, and means for driving the stylus laterally comprising a member having formed thereon a groove, a follower for the groove comprised of a plurality of bristles, and means for 15 securing the follower to the stylus. 20

3. In a phonographic recording machine a record blank, a turntable, a recording stylus cooperating with the record blank, and means for driving the stylus across the record blank, said means comprising a rotatable disc beneath the turn- 25 table and having formed in a surface thereof a spiral groove, a resilient follower for the groove contacting substantial adjacent sections of the groove, and means for securing the follower to the stylus. 30

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