Feb. 6, 1923. 1,444,147

W. S. ZAAYER.
STYLUS.
FILED APR. 19, 1921.

Fig. 1

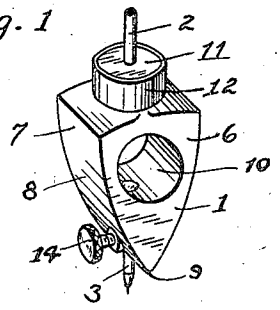


Fig. 5

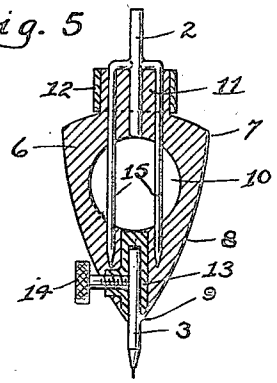


Fig. 3

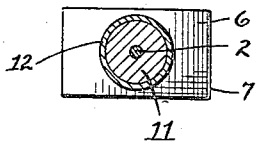


Fig. 4

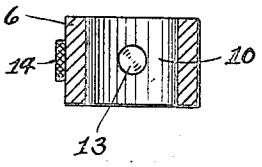


Fig. 2

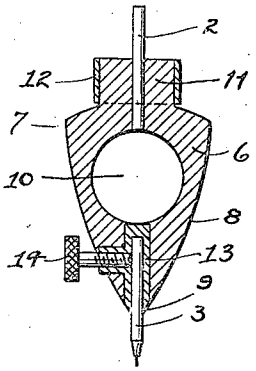
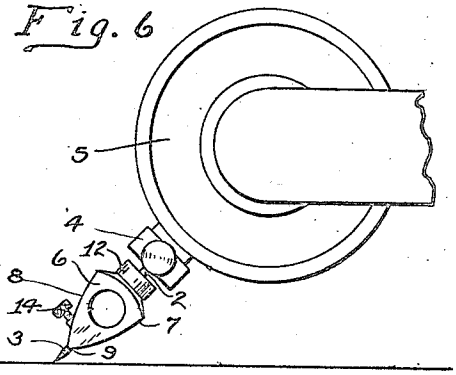


Fig. 6



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UNITED STATES PATENT OFFICE.

WILLIAM S. ZAAYER, OF COLUMBUS, OHIO.

STYLUS.

Application filed April 19, 1921. Serial No. 462,646.

To all whom it may concern:

Be it known that WILLIAM S. ZAAYER, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, has invented certain new and useful Improvements in Styli, of which the following is a specification.

This invention relates to an improved stylus adapted for use in conjunction with the sound box of a talking machine, the primary object being to provide a stylus which will operate to properly vibrate in accordance with the sound undulations provided in the grooves of a record and yet to be so formed as to eliminate grating or scratching noises produced by undue frictional contact between the needle end of the stylus and the record surfaces, particularly to walls of the grooves of said records.

Another object of the invention resides in the provision of a stylus primarily designed for the purpose aforesaid and which is formed to include a pair of locally aligned yet spaced sections, one of said sections being designed for connection with the sound box and the other section being disposed for cooperation with the record grooves, and to provide a relatively flexible body of novel formation for uniting said sections, the said flexible body permitting of substantially uniform vibration of the stylus as a whole and yet being capable of allowing the said sections to move relatively, a feature of construction which serves to enable the lower needle section of the stylus to be at all times properly maintained in the approximate center of a record groove, in order that undue friction between the stylus and the walls of the record grooves will be prevented, the construction thus serving to permit the stylus to faithfully reproduce the sound undulations of the record, without involving the reproduction of such extraneous and objectionable sounds that are frequently created by reason of improper frictional contact or improper positioning of the stylus within the record grooves.

For a further understanding of the invention, reference is to be had to the following description and to the accompanying drawing, in which:

Figure 1 is a perspective view disclosing the improved stylus comprising the preferred form of the invention.

Figure 2 is a vertical sectional view taken through the stylus.

Figure 3 is a horizontal sectional view taken through the upper end of the stylus.

Figure 4 is a similar view taken through the central portion thereof.

Figure 5 is a sectional view disclosing a slightly modified form of the invention.

Figure 6 is a side elevation of the device showing the same attached to a sound box.

Referring more particularly to the details of the invention, the numeral 1 designates the improved stylus comprising the present invention in its entirety. Essentially this stylus consists of a needle structure formed to include vertically aligned upper and lower sections 2 and 3 respectively, the said sections being formed from metal and adapted to be connected in the usual manner with the needle socket 4 of a sound box 5, and in the provision of an improved substantially resilient body 6, which is adapted to unite the sections 2 and 3 so that relative movement between said sections may be permitted.

The body 6 is preferably formed from rubber or a composition thereof so as to be relatively flexible or resilient in operation, the upper part of said body being relatively wide, as indicated by the numeral 7, and this widened portion is provided with downwardly curved and tapering side walls 8, which converge toward the lower edge 9 of said body. Also, the intermediate portion of the body is formed to include a transversely extending opening 10, which serves to weaken the body locally and to render said intermediate portion relatively resilient.

The upper section 2 is embedded in the reduced upper part 11 of the body 6, and projects an appreciable distance above said upper part of the body in order that the stylus may be positioned within the socket 4 and removably secured therein. The part 11 is surrounded by means of a metal band 12, which operates to reinforce the upper part of the body and to securely retain the section 2 in connection therewith. The lower section passes through the body 6 between the lower part of the opening 10 and the edge 9, the extreme lower end of the section 3 projecting a considerable distance beneath the edge 9 so that the stylus may be positioned within the grooves of a record without permitting the body 6 to contact with the upper surface of the record. It will be appreciated that the lower section 3 may terminate in any suitable type of a record engag-

ing point, such for example as a jewel end, an ordinary needle point construction or the so-called tungsten type of needle. The section 3 is removably positioned within the sleeve 13 passing through the lower part of the body. This sleeve cooperates with a laterally adjustable, manually operated screw 14, which is capable of entering the sleeve 13 so as to frictionally engage with the needle shank positioned therein. Manifestly, by means of this construction, any suitable type of a playing needle may be removably connected with the stylus.

In operation, the stylus is adapted to be connected in any suitable manner with the sound box 5, and is so positioned that its edge 9 will extend radially of a cooperative record and not circumferentially of the record. By this position, the body 6 may be of any desired proportions and yet will not frictionally engage with the upper surface of the record.

It will be manifest that by reason of the proportions of the body 6, the vibration of the lower section will cause the entire stylus to vibrate in unison therewith, thus transmitting the sound vibrations in the usual manner to the diaphragm of the reproducer 5. However, practical tests have disclosed that by the presence of the resilient body, relative movement between the sections 2 and 3 may take place, and it is believed that this relative movement is of such character as to permit the lower section to be at all times properly positioned within the groove of a record, so that undue friction between the section 3 and the record grooves will be precluded. The stylus, therefore, serves to permit a record to be reproduced in such manner that the natural sounds may be properly portrayed, but all undue harshness will be eliminated. A stylus constructed in this manner does not produce the same volume as does the ordinary rigid needle construction but the reproduction is rendered more pleasing by reason of the reduction of all frictional noises, and is consequently better adapted for ordinary usage where volume or loudness of sound is not especially desired. However, if desired, the volume may be increased by providing the construction disclosed in Figure 5, wherein the upper section terminates in a pair of spaced forked arms 15, which are adapted to pass through the localized resilient portions of the body 6 defined by the opening 10. The arms 15 serve to prevent extreme flexing of the body 6 and therefore provide a more rigid construction as disclosed in the preferred form of the invention. I do not claim broadly a stylus construction wherein upper and lower sections are united by means of a relatively flexible body, but do claim the specific construction of the body 6 and its cooperating elements, as hereinafter specifically defined.

What is claimed is:

1. A stylus comprising a body formed from a substantially resilient material, spaced upper and lower needle sections embedded in said body, and said body being provided with a transversely extending opening arranged to pass therethrough between said needle section, said openings serving to weaken said body to produce localized resilient portions therein.

2. In a stylus, a body formed from a substantially resilient material, an attaching member arranged to project through the upper part of said body, a sleeve formed in the lower part of said body, a needle member removably positioned within said sleeve and arranged to project beneath said body, and said body being formed to include a transversely extending opening arranged to pass therethrough between said attaching and needle members.

3. In a stylus, a body formed from a substantially resilient material, an attaching member embedded in the upper part of said stylus, a needle member removably carried in the lower part of said body and spaced from said attaching member, said member being formed to include a transversely extending opening arranged to pass through the intermediate portion thereof, and downwardly converging side walls provided upon said body.

4. In a stylus, a body formed from a substantially resilient material, spaced attaching and needle members arranged to be embedded within said body, said body having a transverse opening formed therethrough to provide a localized resilient portion in said body intermediate of its length, and means passable through the body and opening for regulating the resiliency of said localized resilient portion.

In testimony whereof I affix my signature.

WILLIAM S. ZAAYER.