April 23, 1946. H. L. IMELMANN 2,399,035

PHONOGRAPH STYLUS

Filed June 18, 1942

Fig. 1.

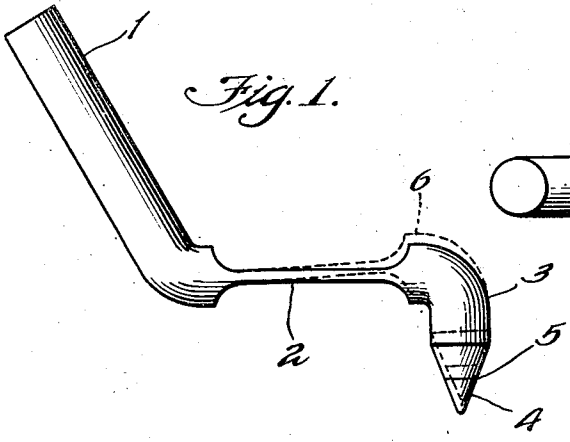


Fig. 2.

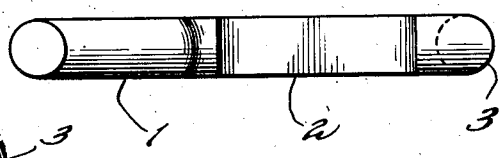


Fig. 3.

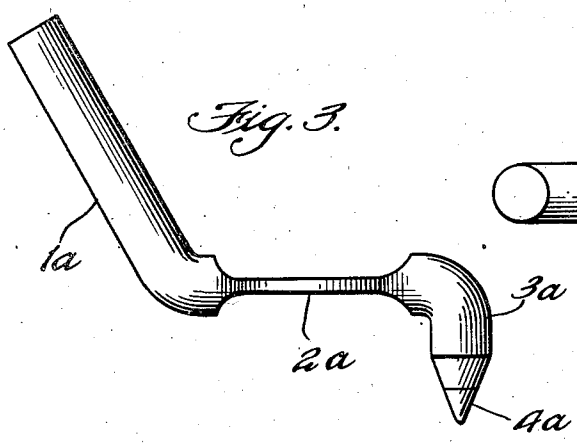


Fig. 4.

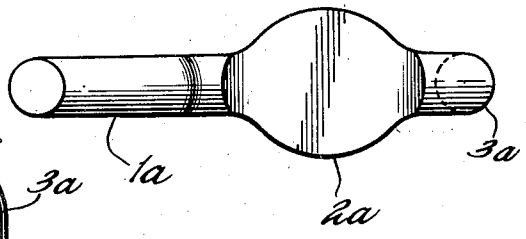


Fig. 5.

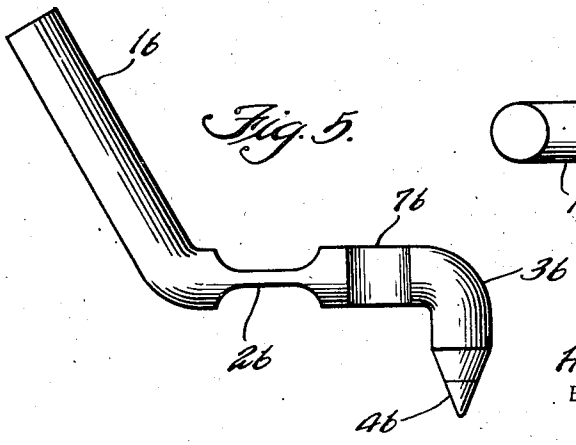
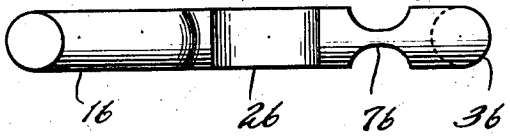


Fig. 6.



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Patented Apr. 23, 1946 2,399,035

UNITED STATES PATENT OFFICE

2,399,035

PHONOGRAPH STYLUS

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Application June 18, 1942, Serial No. 447,533

1 Claim. (Cl. 274—38)

This invention relates in general to phonograph styli and more particularly to a stylus for phonograph reproduction.

The problem of producing a phonograph stylus, which inherently has wear-resistant characteristics and with controlled high frequency transmission, has long been desired by the phonograph industry. Previous attempts to solve this problem resulted in the construction of phonograph styli which comprises several parts assembled into a single unit in an effort to obtain a predetermined vertical and lateral resilience. These multi-part styli resulted in unfavorable operation largely due to symphathetic resonance and the difficulty in producing a composite stylus having a relatively small mass.

In the present invention the above objections are completely overcome through the novel construction of a one-piece stylus formed in a manner whereby compliance in both vertical and lateral directions, as well as its period of sympathetic vibration, is predetermined and constitutes a principal object of the invention.

A further object of the invention is the construction of a phonograph stylus having a predetermined resilient section offset with relation to its shank.

A further object of the invention is the provision of a one-piece stylus having an offset portion for carrying the reproducing point, with said offset portion resilient in two directions with respect to the shank.

Further objects and advantages of the invention will appear in the following description and drawing, in which:

Fig. 1 is a side elevation of the stylus.

Fig. 2 is a top plan view of the stylus shown Fig. 1.

Figs. 3 and 4 are side and top views of an alternate form of construction of the stylus shown Fig. 1.

Figs. 5 and 6 are side and top views of a second alternate form of construction of the stylus shown Fig. 1.

The stylus shown Fig. 1 consists of a shank member 1 adapted to be affixed in a conventional type pick-up through the means of a chuck. An integral offset extension portion 2 of the shank 1 joins the point carrying end 3 of the stylus which terminates in a conical tip having its axis substantially vertically positioned with respect to the surface of a record (not shown). This tip is usually of hard, wear-resistant metal and is welded to the end 3 at a junction 5. The thickness of the extension 2 is proportioned to provide vertical resilience of the end 3 when the tip 4 is engaged in the groove of a record. The stylus is intended to be placed in the pick-up in the usual manner with the offset portion 2 placed substantially parallel with the record grooves. Since the width of the groove in conventional records varies, the resilience provided by the extension 2 enables the tip 4 to readily comply with vertical movement which is usually of such frequency and amplitude not readily absorbed by the mass of the pick-up in which the shank of the stylus is secured. The dotted line 6 shows an outline of the displaced position of the end 3. The vertical movement of the tip 4 is thus absorbed and this transient vibration is not transmitted in the shank 1 and to the pick-up.

In Figs. 3 and 4, the identical result is obtained by merely flattening the offset portion 2A, rather than machining away the metal of the shank as shown Fig. 1. By controlling the thickness of the flattened portion 2A, the desired vertical resilience of the end 3A is obtained.

In the second alternate form shown Figs. 5 and 6, a second resilient section 1B is formed in the offset at right angles to the resilient section 2B which provides for the lateral deflection of the end and tip 3B and 4B. The resilience imparted by the section 1B provides for limited lateral movement of the end 3B in order to eliminate certain predetermined high frequency undulations encountered by the tip 4B, in record grooves, from being transmitted to the shank 1B and thence to the pick-up.

It has been found that the vertical resilience of the tips 4, 4A, and 4B, in the styli described, with respect to their shanks 1, 1A, and 1B, greatly minimzes the wear between the tip and the record when in operation and through controlling the thickness of the section 1B, shown Figs. 5 and 6, high frequency discrimination is afforded which minimzes the transmission of undesirable frequencies to the shank 1B, which greatly improves the quality of reproduction obtained by the pick-up.

Having described my invention, I claim:

A phonograph stylus comprising a substantially rigid straight shank portion adapted to be secured in a pick-up, an integral offset extension portion extending substantially normal to said shank portion, said offset extension terminating in a playing portion extending substantially at right angles to said extension portion, said playing portion having a conical tip at its end for engaging a groove in a record, said extension having a flattened portion in its length for providing predetermined vertical resilience of said playing portion with respect to said shank, a second flattened portion in said offset extension at right angles to said first flattened portion for providing predetermined lateral resilience to said playing portion with respect to said shank.

HENRY L. IMELMANN.