Feb. 28, 1950 G. M. MENCKE 2,499,196

PHONOGRAPH NEEDLE

Filed Dec. 21, 1946

Fig. 1.

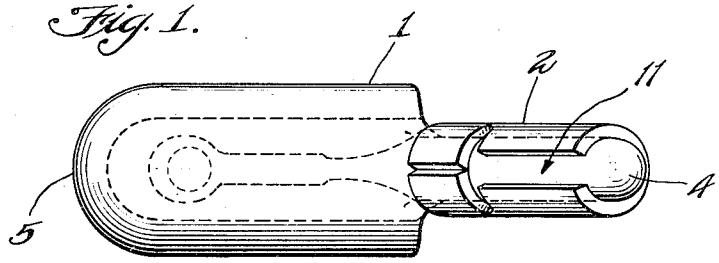


Fig. 5.

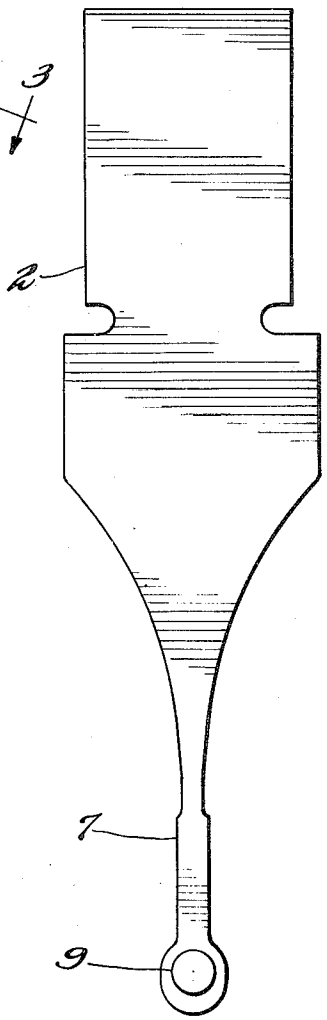


Fig. 3.

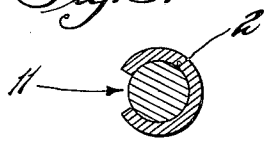


Fig. 2.

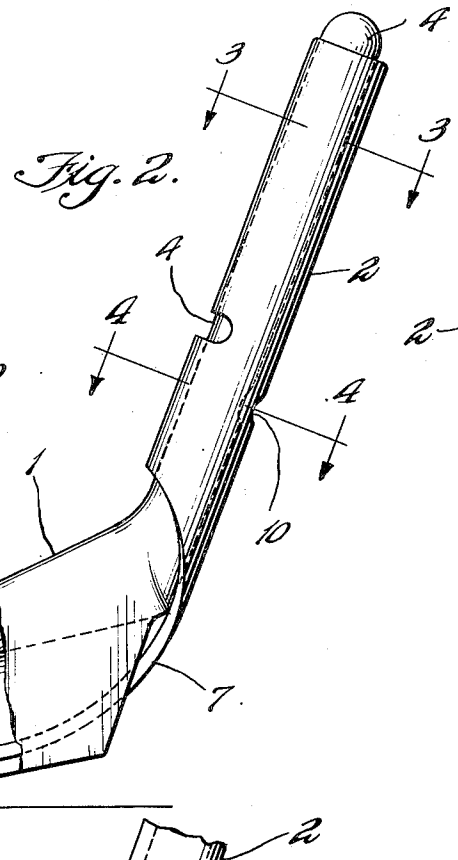


Fig. 4.

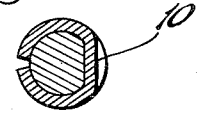
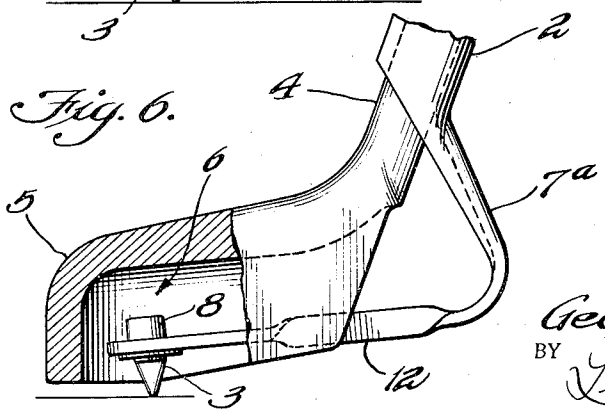


Fig. 6.



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PHONOGRAPH NEEDLE

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Application December 21, 1946, Serial No. 717,763

3 Claims. (Cl. 274—38)

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This invention relates in general to phonograph needles and more particularly to a phonograph needle having a relatively sensitive playing portion which portion is provided with guard means preventing deformation thereto when subjected to accidental shock.

It has been found that certain desirable results are obtained when the playing portion of a needle is provided with predetermined degrees of lateral and vertical compliance, and heretofore it was necessary either to provide construction in the playing portion to withstand accidental shocks which limited the compliance of the playing point, or provision for protecting the playing point usually increased the mass of the entire needle structure to a point where the advantages of controlled compliance were lost because of excessive mass.

In the present invention these problems are completely overcome in the novel construction which provides a relatively low mass needle which inherently permits the use of a sensitively suspended playing portion adequately protected both from vertical and lateral shock, which construction constitutes a principal object of the invention.

A further object of the invention is the provision of a two-piece structure involving the use of a sheet metal stamping and a plastic insert which lends itself to low-cost production. These and other objects in one embodiment of the invention are described and shown in the following description and drawings in which:

Fig. 1 is an enlarged plan view of the needle.

Fig. 2 is a side elevation in partial section of the needle shown Fig. 1.

Fig. 3 is a cross-sectional view of the needle shown Fig. 2 taken through section line 3—3.

Fig. 4 is a cross-sectional view of the needle shown Fig. 2 taken through section line 4—4.

Fig. 5 is a plan view of one of the elements of the needle shown Figs. 1 and 2 prior to forming.

Fig. 6 is a fragmentary view of an alternate form of construction of the playing portion of the needle shown Figs. 1 and 2.

Referring to Figs. 1 and 2, the needle consists of three principal parts, namely a plastic body member 1, preferably moulded from light thermoplastic material such as "nylon," "Lucite" or the like, a supporting member 2 formed from resilient sheet metal such as steel Phosphor bronze, beryllium copper, or the like, and a playing point 3 made from sapphire or metal tipped with well-known wear-resistant alloy.

The body member 1 includes a cylindrical

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shank core 4 at one end and an offset guard portion at its opposite end, which guard contains a cavity 6 therein for housing the flexible extended playing portion 7 of member 2 with the playing point 3 projecting therefrom for engagement with a record.

The playing point 3 and its retaining cup 8 are integrally secured by solder, cement or other well known means in a hole 9 near the end of playing portion 7. The member 2 shown Fig. 5 is formed by well known die means around the cylindrical core 4 as is shown Figs. 1, 2, 3 and 4, which forming tightly secures member 1 with member 2 in relative positions as shown, with the flexible playing portion 7 formed offset to the cylindrical portion. A deformation 10 is applied to the member 2 and the core 4 to secure the two parts in proper relation. The opening 11, Fig. 1, in the member 2 provides means for the proper registration of a set screw when the shank is inserted in a conventional reproducer.

It is now apparent that the spring action of the playing portion 7 will permit predetermined degrees of both lateral and vertical movement of the playing point 3 with reference to the relatively rigid supporting member 2, thus providing for controlled frequency response of the needle. It is also apparent that should the needle be subjected to vertical shock, the playing portion 7 will retract into cavity 6 permitting the guard portion 5 to absorb the shock, thus protecting the playing point from damage. It is also apparent that the playing portion 7 will be protected from permanent deformation in both lateral and vertical directions by virtue of the walls and lower edge of the guard portion 5.

Fig. 6 is a showing of an alternate form of the playing portion 7a to provide greater lateral compliance to the playing point 3 with reference to the supporting member 2. This is accomplished by including a double-twist or a flat portion 12 and/or increasing the length of the playing portion 7a appropriately. It is to be noted that the same protection is afforded the playing point as in the first described construction shown in Fig. 2.

Having described my invention, I claim:

1. A phonograph needle comprising a body member having a shank core at one end and an offset guard portion at its opposite end, said guard portion forming a cavity having an opening in its base and depending side walls, a supporting shank coaxially secured around said core, said shank having an integral offset resilient playing portion extending into said cavity, a

playing point having a tip secured in the outer end portion of said playing portion with the said tip normally projecting from said guard portion for engaging a record.

2. A phonograph needle comprising a plastic body member having a shank core at one end and an offset guard portion at its opposite end, said guard portion having a cavity therein with an opening in its base and depending side walls, a sheet metal supporting shank coaxially formed integrally around said core, said shank having a flexible offset playing portion extending from one end of said shank and positioned in said cavity, a playing point having a tip secured in the outer end portion of said playing portion with the said tip projecting from said cavity for engaging a record whereby excessive lateral movement applied to said tip will be arrested by contact of the playing portion with the inner surface of the said guard portion.

3. A phonograph needle comprising a thermoplastic body member having a cylindrical core at one end and an offset guard shoe at its opposite end, said shoe portion having a cavity therein with an opening in its base and depending side walls, a supporting shank coaxially formed

around said core having a flexible offset playing portion freely extending into said cavity substantially at the junction of said core and said shoe, a playing point having a conical tip secured in the outer end portion of said playing portion near its end with said tip projecting from said shoe for engaging a record whereby said tip and said playing portion are capable of predetermined movement in both vertical and lateral directions with respect to said shank and said shoe.

GEORGE M. MENCKE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,391,425	Steinert	Sept. 20, 1921
1,475,227	Ferguson	Nov. 27, 1923
2,249,713	Imelmann	July 15, 1941
2,320,416	Dally	June 1, 1943
2,325,343	Semple	July 27, 1943
2,473,374	Hutter	June 14, 1949