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F. L. CAPPS

2,187,512

RECORDING STYLUS

Original Filed May 12, 1937

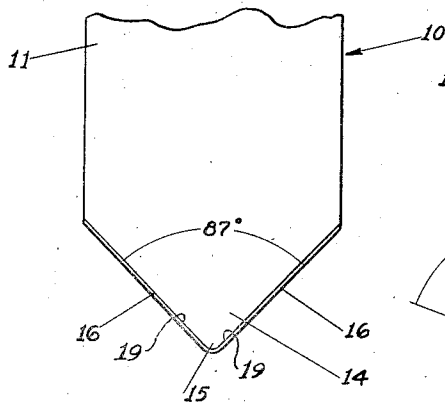


Fig. 1

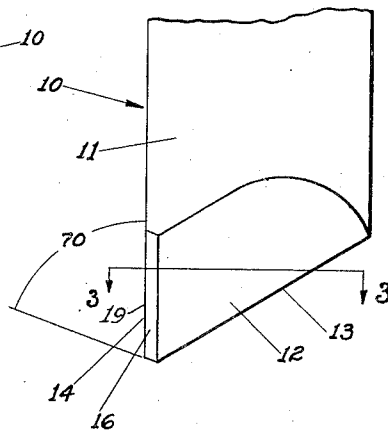


Fig. 2

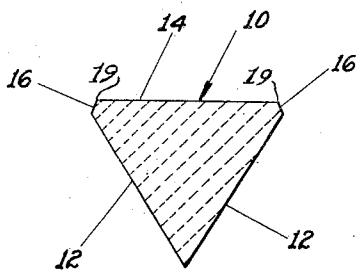


Fig. 3

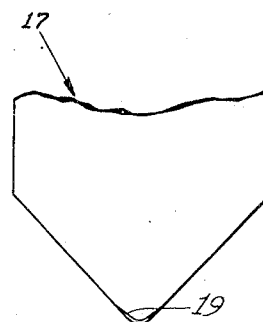


Fig. 4

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RECORDING STYLUS

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Original application May 12, 1937, Serial No. 142,132. Divided and this application May 17, 1938, Serial No. 208,350

3 Claims. (Cl. 274—38)

This invention relates to new and useful improvements in sound recording apparatus and has particular relation to a stylus for the engraving of a sound groove in a record body.

An object of the invention is to provide an engraving stylus particularly adapted for recording sound in a record body of Celluloid or other soft flexible material and which stylus has its edges so ground as to cut the material of the record body in a manner providing a smooth clean groove.

Other objects and advantages will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawing wherein a satisfactory embodiment of the invention is shown. However, it is to be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawing—

Fig. 1 is a front elevational view of the lower portion of the stylus, the view being on a greatly enlarged scale;

Fig. 2 is a side elevational view of the stylus of Fig. 1;

Fig. 3 is a transverse sectional view taken as along the line 3—3 of Fig. 2; and

Fig. 4 is a view similar to Fig. 1 but showing a slight modification.

This application is a division of my application Serial Number 142,132 filed May 12, 1937.

Referring in detail to the drawing and at first more particularly to Figs. 1 through 3, the improved stylus, generally designated 10, is preferably a sapphire and includes an elongated body or shank 11. The stylus while particularly adapted for the formation of a complete record by engraving a sound groove in a body of Celluloid or other soft flexible material, may be used for the engraving of a sound groove in wax, afterwards to be processed in the usual manner. Obviously, the Celluloid record may be processed for the duplication of the record if so desired.

Through the use of the stylus of the invention an improved sound groove may be engraved and when the groove is engraved in a body of Celluloid or the like the record thus formed is instantly ready for use without further processing. Such records are permanent or substantially so and may be cheaply made either at a studio or in the home. The record body may be in the form of a disc or a cylinder although the former is more generally used.

Stylus shank 11 is of the desired length and cross sectional configuration and its upper end portion is received, as usual, in any suitable holder (not shown).

At its lower end the shank 11 is cut or ground away on its rear side at opposite sides of its longitudinal center line as at 12. The cutting or grinding being at an angle so that the surfaces 12 converge toward their lower ends, the formation of such surfaces results in the back portion of the lower end portion of the stylus being cut back at a sharp angle to provide clearance as indicated at 13. Also the front or face of the lower stylus portion is ground flat as at 14, such lower portion of the stylus being V-shaped as viewed in Fig. 1.

The cutting edge 19 of the stylus is at the juncture of the face 14 with the faces 12 and the cutting edge is therefore substantially V-shaped. In the drawing the size of the stylus is greatly exaggerated as the shank across its front face is in the neighborhood of .035 inch wide and the diverging arms of its cutting edge are at approximately 87 degrees to one another while the point 15 of the cutting edge is on a radius of approximately .002 inch.

According to the present invention the cutting edge of the stylus is ground back at 16 leaving the sharp edge 19 at the junctures of surfaces 16 with surface 14. The portion 16 is approximately .001 inch wide ranging from .0005 to .0014 inch wide. The wider the surface 16 the greater the loss of the high frequencies during recording. The surface of portion 16 is at an angle of approximately 70 degrees to the face 14 of the stylus or of approximately 20 degrees to the surface of a record blank being recorded on, it being understood that during a recording operation the face 14 of the stylus is at an angle or 90 degrees to the surface of the blank being engraved or cut, although the 90 degree angle may be varied approximately 5 degrees forward or backward.

For best results the angle of the surface 16 with respect to the surface 14 should not exceed a minimum and maximum angle of 70 to 75 degrees. However, in softer and less critical material commercial results may be obtained if the angle is kept between 65 and 82 degrees.

A stylus ground back as described gives a smoother cut when engraving Celluloid or the like. There is little or no sound generated due to the cutting action and the stylus seems to cut with less resistance than styli heretofore in use and in which the cutting edge is not ground back as herein disclosed. The use of the present

stylus results in a record having less surface noise in reproduction.

In making the stylus the surfaces 12 and 14 being ground or lapped a sharp edge results at their junctures. Then such edge is ground off with great care so that the edge is in the neighborhood of .001 inch wide although this may vary as above described, and at the angle given. This grinding gives the desired edge which results in the smooth silent cutting action above referred to.

Fig. 4 shows a slight modification wherein the stylus generally designated 17 is of the construction of the stylus 10 except that the cutting edge of stylus 17 is ground back only at and in the immediate vicinity of its point as at 18. It is noted that the cut back, in the case of stylus 17 tapers out as it leaves the actual point of the stylus. Stylus 17 gives satisfactory results although it is preferred that the entire cutting edge of the stylus be ground back as at 16 in Figs. 1 through 3.

Having thus set forth the nature of my invention, what I claim is:

1. A sound recording stylus comprising an elongated body having at one end a substantially V-shaped flat side face with a rounded point, said body having a second flat face extending rearwardly from each edge of the first flat face and merging together at said rounded point, said second flat faces at angles of less than ninety degrees to said first flat face and forming sharp cutting edges therewith, and said body having rearwardly extending faces arranged at angles

greater than ninety degrees to the first mentioned face and forming sharp edges with the rear edges of the respective second flat faces.

2. A sound recording stylus comprising an elongated body having at one end a substantially V-shaped flat side face, said body having a second flat face extending rearwardly from each edge of the first flat face at angles of less than ninety degrees thereto and forming sharp cutting edges therewith, and said body having rearwardly extending faces arranged at angles greater than ninety degrees to the first mentioned face and forming sharp edges with the rear edges of the respective second flat surfaces.

3. A sound recording stylus comprising an elongated body having at one end a substantially V-shaped flat side face, said body having a second flat face extending rearwardly from each edge of the first flat face at angles of less than ninety degrees thereto and forming sharp cutting edges therewith, said second flat faces merging together at the vertex of said first flat face, said body having rearwardly extending faces arranged at angles greater than ninety degrees to the first mentioned face and forming sharp edges with the rear edges of the respective second flat surfaces, said third mentioned faces meeting in a sharp line, said line at an angle materially less than ninety degrees to said first flat face and extending upwardly and rearwardly from the lower end of the stylus and the said lower end meeting in a sharp line with the rear edge of the merged portions of the second flat faces.

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