

K. RAMMELSBERG.
RECORDING STYLUS.

APPLICATION FILED MAR. 9, 1916. RENEWED SEPT. 27, 1920.

1,373,635.

Patented Apr. 5, 1921.

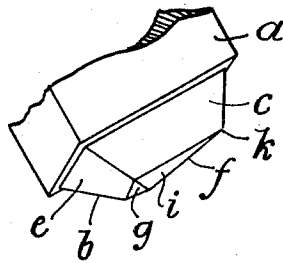


Fig. 1.

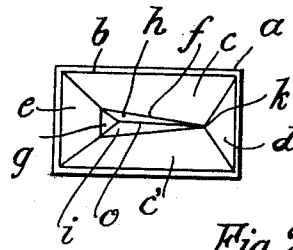


Fig. 2.

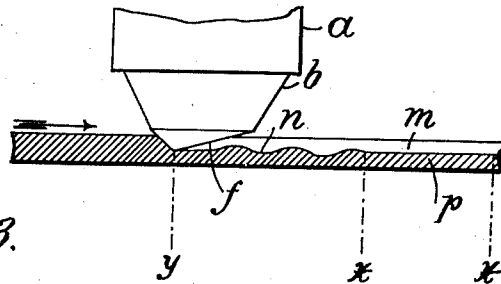


Fig. 3.

INVENTOR:

Karl Rammelsberg
by *Paul Hülling*
his attorney.

UNITED STATES PATENT OFFICE.

KARL RAMMELSBERG, OF CASSEL, GERMANY.

RECORDING-STYLUS.

1,373,635.

Specification of Letters Patent.

Patented Apr. 5, 1921.

Application filed March 9, 1916, Serial No. 83,105. Renewed September 27, 1920. Serial No. 413,160½.

To all whom it may concern:

Be it known that I, KARL RAMMELSBERG, a citizen of Germany, and a resident of Cassel, Germany, have invented certain new and useful Improvements in Recording-Styli for Sound-Recording Machines, of which the following is a specification.

The present invention has reference to improvements in the stylus of instruments for recording the vibrations of sound, such as the phonograph, graphophone, gramophone, and the like, and the invention relates more particularly to a new construction of such recording style and its operation, as will now be described with reference to the accompanying drawing, in which Figure 1 shows a perspective view of the operative head of the new stylus; Fig. 2 represents the stylus seen from below, and Fig. 3 a side elevation of the stylus in operation on a record, the latter being shown in fragmental section.

According to the present invention the new stylus is used for making sound records on films or foils of celluloid by impressing or indenting the sound vibrations into the record material in a succession of inequalities or undulations in vertical or horizontal extent.

In the prior art there is employed almost exclusively a wax composition for receiving the sound undulations, and the latter are cut into, or plowed or cleaved out of the wax material, the broken up waste material being suitably removed in the measure of its production.

I use highly polished films or foils of celluloid or similar ground material, which is not apt to crumble or otherwise break up under the action of the recording stylus, and I force the sound undulations home into the surface of such foil in the shape of a series of indentations or undulations, compressing thereby the record material more or less, but not removing any part of it. The record groove thus obtained is of V-shaped cross-section, offering a clearly defined track which the suitably shaped reproducing stylus (almost always a needle) will readily follow by gliding solely on the groove bottom, without danger of being jumped-out and also without encountering any lateral frictional resistance on the flaring side walls of the groove.

For the purposes of my invention the stylus in its shaft portion may be of any

desirable cross-section; as shown it is, by way of example, of oblong rectangular shape. The stylus head consists of a prismatic taper portion *b*, composed of the two side walls *c, c'*, the front wall *e*, and the rear wall *d*, which together present a triangular pedestal from which extends the working nose *f*. This latter is composed of a front face *g*, which does practically all effective work in the impressing operation; it is triangular in shape and is inclined rearwardly, relative to the direction of operative travel, from its base line where it meets the taper face 2. The two side walls *h* and *i*, starting from the respective edges of the front panel *g* and from the support *b*, taper rearwardly and toward the support or pedestal, converging to form the median line *o*, and finally merging into the support at the point *k*, thus presenting substantially a wedge of triangular cross-section, with the tip of its receding working face of largest cross-section extending farthest from the base, and the rear wedge point lying substantially in the same plane with the base of the front wedge face.

In operation, the stylus is placed onto the celluloid foil *p*, and the latter is advanced in any suitable manner in the direction of the arrow (Fig. 3). If no sound is admitted to the soundbox diaphragm, the operative nose triangle *g*, owing to the regulable weight of the soundbox, will cause a V-groove *m* of even conformation to be impressed into the foil, as indicated by section *x-x* in Fig. 3, the rearwardly inclined panel *g* forcing down the impressible record material. On sound now being caused to impinge upon the diaphragm, the stylus will accordingly be actuated in a series of quick reciprocations, and the stylus nose will correspondingly act on the record material and produce therein a continuous series of indentations *n* (section *x-y*, Fig. 3) or, with a "Berliner" recorder, of horizontally extending undulations (zig-zag groove), which faithfully represent and record the original sound vibrations.

It is to be clearly understood that the stylus does not remove any part of the record material, as in the recorders of the prior art, but solely depresses and compresses it; and as thus no waste material is to be taken care of, the operative functioning of the stylus is not detrimentally interfered with by waste material, and a perfectly

smooth record groove is the result, which needs no after-polishing or any other dressing operation to make it available for the further operative steps, and in which the
5 reproducing stylus will travel without any lateral friction, resting and sliding solely on the bottom of the groove.

What I claim is:—

- 10 1. A stylus for recording apparatus, comprising a supporting member, and a member extending therefrom, said latter member being substantially in the shape of a wedge having a receding front face and two tapering converging side faces.
- 15 2. In combination with a sound recording apparatus employing impressible record material, such as celluloid film or foil, a recording stylus for impressing the record undulations into the record material in the
20 form of a V-groove with sufficient flare to

its side walls to offer no lateral frictional resistance to the reproducing stylus, comprising a supporting member, and a nose portion extending therefrom, said nose being formed of a front face of triangular
25 shape rearwardly inclined relative to the direction of operative movement, and two side faces starting from the respective edges of said front face, gradually tapering rearwardly toward said support and converg-
30 ing into a median line which finally merges into said supporting member at a point situate substantially on a plane with the base line of said front triangle.

In testimony whereof I have signed my
name to this specification.

KARL RAMMELSBERG.

Witnesses:

JEAN GRUND,
CARL GRUND.