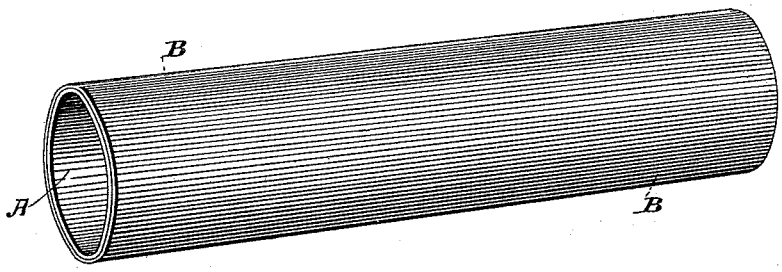
(No Model.)

C. S. TAINTER.

GRAPHOPHONE TABLET.

No. 421,450. Patented Feb. 18, 1890.



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UNITED STATES PATENT OFFICE.

CHARLES SUMNER TAINTER, OF WASHINGTON, DISTRICT OF COLUMBIA.

GRAPHOPHONE-TABLET.

SPECIFICATION forming part of Letters Patent No. 421,450, dated February 18, 1890.

Application filed November 14, 1887. Serial No. 255,082. (No specimens.)

To all whom it may concern:

Be it known that I, CHARLES SUMNER TAINTER, of Washington, in the District of Columbia, have invented a new and useful Improvement in Graphophonic Tablets, which improvement is fully set forth in the following specification.

This invention has reference to the preparation of a recording surface or medium for graphophones or apparatus for recording and reproducing speech and other sounds wherein the sound-record is cut or graven by a cutting-style in a surface, such as wax or waxy composition. For a description of such apparatus reference may be had to Letters Patent No. 341,214, dated May 4, 1886, No. 375,579, dated December 27, 1887, and No. 341,288, dated May 4, 1887.

The recording medium or composition is spread in a thin layer on a suitable base or foundation—such as paper or pasteboard—constituting what is termed the "tablet." The form of the tablet is usually either cylindrical or flat, though of course they could be of other forms, and the shape of the tablet forms no part of this invention.

There are certain properties or characteristics in the recording medium that are desirable or essential to the successful operation, and which are difficult, owing to their somewhat contradictory nature, to find combined in one substance. It is necessary that the substance be of the right degree of hardness and toughness without being brittle, and that it should not be susceptible to changes of temperature. Some waxes are too brittle, and instead of cutting smoothly and accurately under the cutting-style chip or break off, producing, of course, an inaccurate record. Even a slight degree of brittleness will unfit the substance for the use designed, and as a general rule those waxes that are sufficiently hard and fine in texture for the purpose have also the undesirable property of brittleness and lack toughness and coherence. Other waxes—such as beeswax, for example—while cutting smoothly and evenly, are too soft and too susceptible to alternations of conditions under changes of temperature. Such waxes also become sticky, the shavings adhere to the record and other parts of the machine, and their use is attended with other inconveniences. Soft waxes, moreover, do not give in reproducing as loud or distinct articulation as harder waxes.

Heretofore a composition of beeswax and paraffine has been used with good results, but it does not possess the essential characteristics in as high degree as desirable.

I have found after a long series of experiments that a certain natural or earth wax known as "ozocerite" is eminently suitable for the purpose of forming graphophonic recording-surfaces, particularly when treated as hereinafter described. This wax is tough and smooth in texture. In recording it cuts out in a continuous shaving without breaking into short pieces or adhering to the tablet or other part of the machine, and it cuts off close to the point of the cutting-style without chipping off below the same, and therefore produces an accurate record. In color it is brownish black in its crude state, but when treated as hereinafter described it becomes quite black and has a glossy surface and is opaque. This characteristic of color is useful, as it makes the lines of the record more distinct. On a light-colored surface the fine lines are very difficult to recognize. Defects or irregularities in the paper base or foundation, which are discernible through a semi-transparent wax, are completely hidden by the ozocerite.

In making a tablet the wax surface is applied by melting the wax and applying it while in a fluid state. On cooling the wax contracts more than the paper foundation, and on this account many of the compositions tried have cracked on cooling, rendering the tablet useless. The use of the ozocerite wax, however, is not attended with this disadvantage.

In forming a tablet with ozocerite wax it is advantageous to concentrate the crude wax by the application of heat until it loses from ten to thirty per cent. of its weight, which renders it much more suitable for the purposes of the invention. After concentration by boiling it becomes harder and tougher, changing in color from a brownish black to a deep black. It is then applied in a thin layer or coating to the foundation of paper or other material, and on cooling is turned down until a perfectly smooth surface is obtained.

In heating the ozocerite wax a high tem-

perature is necessary, in order to produce the concentration desired. At 250° Fahrenheit the vaporization proceeds very slowly, and it is customary to employ a temperature of 400° Fahrenheit and upward. The duration of the treatment will, of course, depend on the temperature employed.

The ozocerite wax may be employed alone, and it is sufficiently cheap for the purpose. It may, however, be combined with other waxes. It mixes readily with beeswax, carnauba-wax, and others, and its use in such compositions would be within the scope of the invention.

In the drawing, which is a perspective view, I have shown, by way of example, a cylindrical tablet. A is a base of paper or other suitable material, which may be constructed, as described, in my patent, No. 374,133, dated November 29, 1887. B represents a coating or layer of ozocerite wax. The latter having been concentrated, as before explained, is applied to the tablet in any suitable way. This may be done by immersing the tablet in the liquefied wax a number of times until a coating of sufficient thickness is obtained. The wax coating is then turned down until the surface is perfectly smooth. It is not necessary that the coating B should be more than one-fiftieth of an inch in thickness.

I claim—

1. A tablet for graphophonic records, having a recording-surface consisting, essentially, of ozocerite wax, substantially as described.

2. A tablet for graphophones, comprising a foundation of paper or other suitable material having a surface coating of concentrated ozocerite wax, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CHARLES SUMNER TAINTER.

Witnesses:
R. M. READ,
PHILIP MAURO.