

UNITED STATES PATENT OFFICE

2,216,970

PHONOGRAPH RECORD BLANK

William T. Walker, Riverton, N. J., assignor to
Radio Corporation of America, a corporation
of Delaware

No Drawing. Application April 30, 1937,
Serial No. 140,047

4 Claims. (Cl. 106—1.5)

This invention relates to phonograph record blanks, and more particularly to blanks in which the original recordings are made.

For commercial purposes, it has been generally recognized that various wax compositions are most suitable for recording sound. According to best practice, the sound grooves are cut in the wax by means of a sapphire recording stylus. I have found that the friction between the recording stylus and the wax generates static electricity which, when discharged, introduces so-called "ticks" in the wax either by influencing the stylus to jump or by affecting the wax through the heat of the discharges. Prior to the advent of high fidelity recording and reproducing equipment, this was not a very serious limitation for the reason that the surface noise introduced by the disturbances in the wax as a result of the electrical discharges is of such order as to be lost in the surface noises introduced from other causes. However, with the elimination of most of the latter causes, and the introduction of equipment which can successfully record up to 15,000 cycles, for example, the surface noise resulting from the discharges of static electricity in the recording operation becomes serious.

The primary object of my present invention is to provide an improved phonograph record blank which will be free from the foregoing objections.

More specifically, it is an object of my invention to provide an improved phonograph record blank of a wax or other suitable composition which will prevent intermittent discharges of static electricity generated by friction between itself and the recording stylus.

Another object of my invention is to provide an improved phonograph record blank as aforesaid which will have improved cutting qualities.

Still another object of my invention is to provide an improved phonograph record blank from which duplicates may be made having a minimum amount of surface noise consistent with reproduction of a high quality and over a wide range within the audio spectrum.

A further object of my invention is to provide an improved recording wax for use in making phonograph records which has improved flow characteristics.

It is also an object of my invention to provide an improved recording wax as aforesaid which is economical in cost and highly efficient in use.

The foregoing and other objects of my invention I accomplish by incorporating into wax of suitable composition an electrically conductive material. The wax may, for example, be com-

pounded from pure Montan wax and numerous other chemicals which may serve as plasticizers, fillers, etc., while the electrically conductive material is preferably carbon black having a particle size no greater than 25 millimicrons. About 15% of carbon black, by weight, is preferably initially introduced into the wax and is uniformly distributed therethrough by milling with suitable rolls, for example. After the carbon black has been thoroughly suspended in the wax by milling, the resulting wax may be mixed with pure wax, free from carbon black, to reduce the carbon black content to from ½% to 3% by weight. This is preferably done by melting both the milled and unmilled wax and thoroughly mixing the two together by agitation. During the melting of the milled wax, the carbon black particles do not settle out, but remain in suspension like a colloid.

By incorporating the carbon black as an ingredient into the wax, the wax is made sufficiently conductive to permit leakage therethrough of the static electricity which is generated during the recording operation. As a result, no electrical discharges take place and therefore there is no unintentional disturbance in the surface of the wax to introduce extraneous noises. Moreover, I have found that wax in which carbon black has been incorporated as above possesses greatly improved cutting qualities, and this further aids in the formation of a record having very high fidelity.

While I have found that a carbon black content of about ½% to 3% by weight is satisfactory, I have obtained best results with a carbon black content of one per cent. by weight. However, I wish it to be distinctly understood that I do not necessarily limit myself to this proportion. I also wish it to be understood that, within the scope of my invention, other conductive materials of extremely fine particle size may be employed, as may also suitable recording materials other than wax. I therefore desire that my invention shall not be limited except insofar as is made necessary by the prior art and by the spirit of the appended claims.

I claim as my invention:

1. A phonograph record blank comprising a wax composition having a suspension of carbon black uniformly distributed therethrough, said carbon black having a particle size of the order of 25 millimicrons.
2. A phonograph record blank comprising a wax composition having carbon black incorporated therein, the carbon black content being in

the neighborhood of from $\frac{1}{2}\%$ to 3% by weight.

3. A phonograph record blank comprising a wax composition having carbon black incorporated therein, the carbon black content being approximately 1% by weight.

4. A phonograph record blank comprising a

wax composition having a suspension of carbon black uniformly distributed therethrough, said carbon black having a particle size of the order of 25 millimicrons and constituting from $\frac{1}{2}\%$ to 3% of the content of said blank by weight.

WILLIAM T. WALKER.