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## ARTICLE OF MANUFACTURE AND METHOD OF FORMING THE SAME

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This invention relates to an article of manufacture and a method of forming the same, and is particularly concerned with an article especially adapted for use as a sound reproduction record, the sound track of which is formed in a hardened lacquer surface.

It is among the objects of the present invention to provide a new article of the character set forth, which is durable, inexpensive and which has a surface of a type which lends itself readily to the formation thereon of a sound track which will faithfully reproduce a sound record.

Another important object is to provide an article of manufacture adapted to receive a sound record which may be used to directly receive the record from a scribing instrument or which may receive the record by pressing from a metal stamp.

Another object is to provide an article which may be directly scribed with a sound track and which thereafter may be used directly for reproduction as a "play back" record or to form a metal stamp from which similar records may be struck.

The object of the method employed is to provide a means and method of simply and economically forming an article having the desirable feature hereinbefore set forth.

Another object of the method is to provide a method of applying a hardening liquid to base surfaces so as to produce a finished surface of greatly enhanced durability—fineness consistency and kindred qualities especially applicable to sound reproduction.

A further object of the method is to provide a laminated lacquered sound recording surface of uniform smooth and homogeneous characteristics.

Another object of the method is to provide a practical and inexpensive surface especially adapted to give durability and faithfulness of sound recording.

Numerous other objects of the invention will be apparent from a consideration of the following specification.

In general terms, the article consists of a base, which may be of any suitable material ranging in characteristics from that of paper to hard metal such as steel, not exclusive of rubber, wax, aluminum and the other present day materials from which sound records are not made. This base has upon it a series of laminations of lacquer produced by the method herein set forth; and it has been found that by this method the laminated lacquer surface is particularly adapted for

receiving sound records which are improved not only in their fidelity as to the original impression, but in their ability to reproduce over a long useful life and their ability to be used not only as "play back" records for instantaneous recording but also as "master" records and as records formed from pressings from a metal stamp.

The method employed consists in applying to the base, a series of separately applied lacquer coatings which are preferably applied in conjunction with the rotary motion of the base so that centrifugal force acts in spreading the lacquer and insuring a uniform smooth homogeneous surface.

In particular, as an illustration of one embodiment of the invention, I use a thin, aluminum disk and apply thereto a series of lacquer coatings. The disk is first prepared by suitable smoothing operations, as by grinding and/or polishing and may be distinguished from such base members as heretofore used in that no center hole is provided in the disk, the hole being a source of trouble in that bubbles may arise through the hole during the coating operation and distort the finished surface.

The disk is mounted upon suitable rotating means and is rotated during the application of the lacquer thereto; the desired rotary speed being widely variable in conformation with the consistency of the lacquer, the temperature, viscosity and the drying qualities thereof and in accordance with the thickness of the layer of lacquer desired. The speeds may be thus varied from as much as 1 to 3000 R. P. M.

I use the term lacquer herein as it is used in the sound recording trade rather than as a technical term. The coating material may actually contain no "lac" whatsoever and I use this term to indicate flowing materials which have a drying quality, thus paints, oils, varnishes and other lacquers which have a drying quality are intended, no thought being to limit the invention to any specific material. In a preferred embodiment of my invention, I prefer to use a specific lacquer which forms the subject matter of a separate patent application filed July 14, 1936, Serial No. 90,488.

While the base disk is rotated at the desired speed, preferably on a horizontal plane, I apply thereto the lacquer by dropping the same from a receptacle above the plate on to the center of the plate and moving the receptacle radially from the center as the material drops upon the plate. I preferably vary the speed of rotation of the disk and/or speed of travel of the lacquer container in

accordance with the diameter of the disk at the place where the lacquer is being applied. Thus, as the container moves outwardly, its movement is reduced so that the linear travel of the surface is uniform from the center to the periphery of the disk. Furthermore, I prefer to retard the speed of the disk as the lacquer moves outwardly thereover so that the centrifugal force acting on the lacquer on the center of the disk is equal to the centrifugal force acted on the lacquer as it is applied further from the center of the disk.

In the application of the lacquer to the outer periphery of the disk, centrifugal force will drive some of the lacquer from the periphery and this may be received in an annular trough associated with the disk revolving apparatus.

After the disk is coated and permitted to dry, a further application is similarly applied. The lacquer which I prefer to use will normally dry in ten minutes to an hour and a half, and the disk will then be ready for a second application. During the drying operation, I prefer to keep the disk at approximately 160° F., but in accordance with the lacquer used, I may apply greater heat or none at all.

The number of layers of lacquer applied may, of course, vary widely, but I prefer to use between three and twenty layers of lacquer each of which may range from one-half ( $\frac{1}{2}$ "') to three thousandths (.003") of an inch thick. When the final layer is applied, and dried, the article is ready for immediate recording, or for the stamping thereon of a sound record from a metal die or stamp. In the practice, I have found that a record made by this method is of greatly improved durability and has improved qualities for

receiving the sound record and/or for reproducing sound therefrom. A record also has the great advantage of being ready for immediate use after it is manufactured, and it is also practical for either the original recording or as a commercial record produced by a pressing operation.

From the foregoing it will be understood that the article and method referred to are subject to wide variations, changes and modifications and full use of equivalents in the article or method outlined are permitted without departure from the spirit or scope of the appended claims.

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

1. A method of producing a phonograph record blank which consists in providing a relatively thin, flexible, smooth, metallic disk, rotating the disk on a substantially horizontal axis, applying a coating of lacquer which will normally dry in ten minutes to one hour and a half to the face and the peripheral edge of the disk, while the latter is rotating, retarding the speed of the disk as the lacquer is applied thereto so that the centrifugal force acting on the lacquer adjacent the center of the disk is substantially equal to the centrifugal force acting on the lacquer as it is applied further away from the center of the disk, and drying said coating.

2. The method as set forth in claim 1, including repeating of the coating application and the drying step a sufficient number of times so that a laminated coating sufficiently thick to receive sound wave indentures will be formed on the disk.

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