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F. E. SINCERE

PROCESS OF MAKING PHONOGRAPH RECORDS

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Fig. 1.

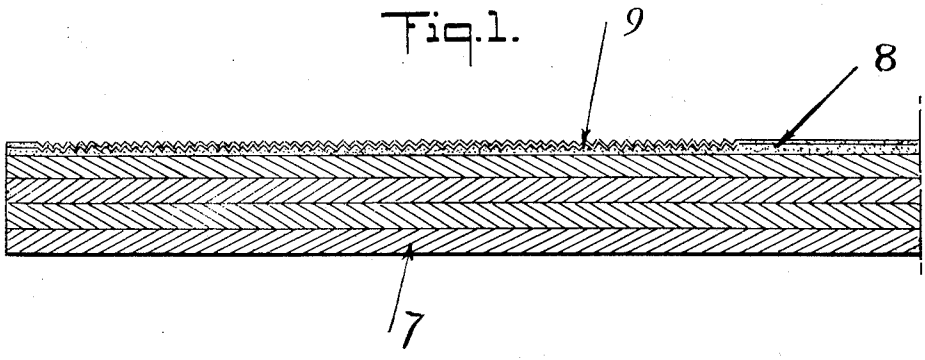
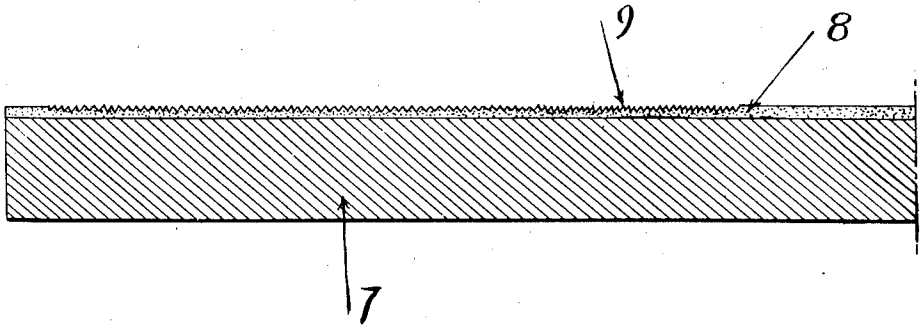


Fig. 2.



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PROCESS OF MAKING PHONOGRAPH RECORDS.

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This invention relates to phonographic records and one of the objects of the invention is to provide a new and improved phonographic record and a new and improved process for producing the same.

Another object of the invention is to provide a phonographic record and process of producing it, such that the records are less expensive to manufacture than are records as hitherto produced.

Another object of the invention is to provide phonographic records which are unbreakable, non-warpable and of a lighter weight than are records now being employed.

More particularly my invention contemplates the production of a phonographic record which will produce a quality of tone fully equal or superior to the present-day record and which will also possess many valuable improvements, both from the manufacturing standpoint and from the standpoint of supplying the trade with a cheaper and more durable record than the present-day phonographic records.

Other objects and aims of the invention, more or less specific than those referred to above, will be in part obvious and part pointed out in the course of the following description of the elements, combinations of materials, and the various steps employed in the process of producing the phonographic record and relation of each step to one or more of the other steps employed in carrying out my improved process.

For the purpose of affording a clear understanding of my invention, I have elected to show two forms of discs made in accordance therewith, it being clearly understood, however, that my invention may be practiced in other ways, as set forth in this disclosure without departing from the spirit and scope thereof.

In the drawings:

Fig. 1 is a transverse section of a half portion of a phonographic disc record made in accordance with my invention, in which the base or foundation is composed of laminated fibrous material such as paper or wood;

Fig. 2 is a view similar to Fig. 1, in which the base or foundation member is composed of a single thickness of material.

In carrying out my process of producing phonographic records, I first provide a suitable base member or blank upon which the material for carrying the record indentures is to be deposited. This blank or foundation member shown at 7 is preferably formed of a carbonaceous material, such, for instance, as wood or paper, although I preferably utilize the latter material. I have found in practice that paper such as employed in the ordinary photographic mounts, of a thickness varying from one-eighth (1/8) to one-quarter (1/4) of an inch to be suitable for my purpose. From this paper I cut out discs of suitable size, which discs are punctured in the centre (not shown) whereby said disk takes on the form of the customary phonographic records.

I next prepare a solution containing the following ingredients, in approximately the proportions set forth, although, of course, it will be understood that these proportions may be varied to some extent without departing from the scope of my invention:

12 parts of 16 oz. solution of nitrated cotton with amyl acetate used as a solvent,

12 parts of 16 oz. solution of nitrated cotton with wood or methyl alcohol used as a solvent,

12 parts of a thinner, consisting of a mixture of acetone, benzol and amyl acetate.

1⅕ parts of zinc oxide, which has been first mixed with a 6 oz. solution of a thinner, consisting of a mixture of acetone, benzol and amyl acetate.

2 parts of a suitable black pigment, such, for instance, as carbon black, which is employed as a coloring agent for the entire mass.

I then mount any desired number of the cut-out and punctured discs upon a spindle or other supporting device, allowing sufficient space between neighboring discs so that they will not touch one another during the carrying out of the process. I then submerge the mounted discs into a vessel of the prepared chemical ingredients above set forth. After this submergence I raise the discs from the liquor and preferably spin them for a few moments to remove the surplus liquor, discharging the latter into the original dipping vessel. I then move the discs into a suitably heated chamber or enclosure, allowing the same to remain in the presence of heat for a certain time to allow them to thoroughly dry. This method of application of the liquor is repeated a num-

ber of times until a sufficient thickness of the nitro-cellulose composition has been deposited on the surface of the paper or wood core or blank utilized. It will be noted that both the sides and edges of the blank may be simultaneously treated, although for the sake of clearness in the drawings, I have shown the coating applied only to one side of the blank.

Having thus treated the discs I preferably form a second liquor in which the discs are given the same treatment as above described. This liquor consists of the following ingredients, in approximately the following proportions:

12 parts of 16 oz., solution of nitrated cotton with amyl acetate as a solvent.

8 parts of 16 oz., solution of nitrated cotton with wood or methyl alcohol as a solvent.

1⅕ parts of zinc oxide which has first been mixed with a 6 oz., solution of a thinner, consisting of a mixture of acetone, benzol and amyl acetate.

2 part of a suitable black pigment, such, for instance, as carbon black, which is employed as a coloring agent for the entire mass or body of liquid.

Having thus deposited upon the disc several layers of said last described liquor, I then preferably prepare a third liquor in which said discs are treated in the manner and according to the operations described in connection with the first described liquor. This third mixture consists of the following ingredients mixed approximately in the following proportions:

12 parts of 16 oz., solution nitrated cotton with amyl acetate as a solvent.

5 parts of 16 oz., solution of nitrated cotton with wood or methyl alcohol as a solvent.

1⅕ parts of zinc oxide, mixed with a 6 oz., solution of a thinner consisting of equal parts of acetone, benzol and amyl acetate.

2 parts of a suitable black pigment, such, for instance, as carbon black, used as a coloring agent for the entire mass.

It will therefore be seen that the paper or wood core or blank has been coated with a plurality of layers of a nitrated cellulose base material, together with the various other ingredients described as shown at 8. The viscosity of the various solutions varies according to the manner in which it is to be applied to the paper or wood blanks or cores. In the present instance I have described a preferred method or process employed in the coating of the blanks, although it will be understood that the said coating may be applied by impregnating the blank or by spraying or brushing the material thereon until a sufficient thickness has been produced to receive the required indentures.

The requirement as to the thickness of the coating upon the blank is that said coating be of sufficient thickness to allow for a thorough importation or impression of the sound-wave indentures 9, which indentures are intended to be impressed in the coating only and not in the surface of the core or blank.

While I have described the production of the coating upon the blank by repeated submergences of the blank in the three solutions or liquors in the order set forth, I also contemplate the provision of a single liquor or solution which will embody all the qualities of the three solutions, it being understood that the application of the blank to the liquor or liquors is repeated until a sufficient thickness of the nitro-cellulose composition is deposited upon the surface of the blank or core to permit of the impressing thereon of the indentures in the coating only.

It will be noted that the blank or core as described, being formed of paper or wood, is comparatively light in weight and in some cases it may be desired to produce a heavier record. In such cases I propose, before the blank is treated with the coating material, to fill or impregnate the same with a suitable filler to add to the weight thereof. Various substances or mixtures may be employed to impregnate the blank. In practice I have found a mixture of petrolatum, paraffine and barytes to be suitable for this impregnating operation upon the blank. This impregnating operation is also of advantage in that aside from adding weight and body to the blank, a suitable color can be imparted to the said core or blank before the coating is applied thereto. Moreover, this impregnation of the blank or base members, filling all the interstices of the material renders it proof against the entrance of moisture, the presence of which might cause the blank or foundation member to warp.

It will accordingly be seen that I have provided a phonographic record and a process for producing the same wherein, among others, all the ends and objects above pointed out are accomplished in a very simple and facile manner. The material of the coating is such that it will soften to receive the sound-wave indentures produced by the pressure of the heated master record or matrix and will again harden, preserving the indentures as impressed therein. The coating composition will not peel off, crack, or become otherwise affected during the operation of impressing the indentures therein. It is glossy, rich in lustre, is not affected by the ordinary changes of temperature or varying climatic conditions. Nor will phonographic records produced according to the process above described warp, crack, chip or break under the ordinary conditions encountered in shipping or usage. Moreover, by regulating the amount of impregnation of the

blank before the coating operations are performed thereon, phonographic records of any desired weight may be produced. The material comprising the coating, when once hardened, will not be altered by evaporation nor will the indentures become distorted.

While in the foregoing I have described my process as applied to phonographic records, it is evident that said process may be carried on to produce other articles of commerce. Thus it is within the purview of my invention to produce articles such as photographic trays, table dishes and other articles in which such a surface and quality are desired.

In carrying out my improved process producing phonographic discs, I do not intend to limit myself to the use of a blank or disc cut out of relatively thick felted or laminated paper or wood stock. For instance, the material comprising the indenture coating may be applied in any desired manner upon one surface of a relatively thin sheet of paper or cloth, allowed to dry or harden and the free surface of the paper or cloth cemented or otherwise affixed to a base or foundation member. In some respects a fabric material so coated has many advantages, one of them being that the plastic coating material entering the interstices of the fabric is more firmly anchored to its support than when held thereon solely by adhesion. Moreover, the use of such a coated strip of cloth or paper makes it possible to construct a photographic record or like article wherein one surface only is treated to receive the indentures.

It will be noted that in the various liquors employed for coating the blanks several volatile solvents are employed. These solvents I contemplate recovering by means of apparatus incorporated in the chamber or oven in which the coated blanks are dried during the carrying out of the process.

As many changes could be made in this construction without departing from the scope of the following claims, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative only and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The herein described method of producing a phonographic record which consists in providing a foundation member of inflexible fibrous material, impregnating said foundation member with a filling material, immersing said foundation member in a liquid containing nitrocellulose solution, withdrawing said coated foundation member and removing surplus liquid therefrom, drying the coated foundation member and repeating said immersing operation a sufficient number of times to provide a coating sufficiently thick to receive sound wave indentures.

2. The herein described method of producing a phonographic record consisting in providing a rigid foundation member of laminated fibrous material, impregnating the same with a suitable filling material and successively immersing the impregnated foundation member in a nitrocellulose solution and drying the same until a plurality of layers of the nitrocellulose coating material are superimposed upon the foundation member.

3. The herein described process of producing a phonographic record which consists of providing a centrally apertured disc of inflexible fibrous material, and coating said disc with a coating containing nitrocellulose and zinc oxide, amyl acetate, methyl alcohol, acetone and benzol, and exposing the coated disc to a minimum temperature of 125 degrees F. to evaporate the volatile constituents of said solution.

4. The herein described process of producing a phonographic record, which consists of providing a sheet of inflexible fibrous material, forming the same into a disc to provide a foundation member and then forming upon said foundation a coating sufficiently thick to receive sound-wave indentures, said coating being composed of nitrocellulose dissolved in a suitable solvent, zinc oxide, and a pigment.

5. The herein described process of producing a phonographic record, which consists of providing a disc of inflexible fibrous material and coating the same with a solution consisting of nitrated cotton with amyl alcohol as a solvent, nitrated cotton with wood or methyl alcohol as a solvent, zinc oxide mixed with a thinner consisting of acetone, benzol and amyl acetone, and a suitable pigment, and treating said foundation member so coated to drive off the volatile constituents of the coating material.

6. The herein described process of producing a phonographic record, which consists of coating a suitable disc or foundation member with a plurality of applications of a mixture of substantially the following composition: 12 parts of 16 oz. solution of nitrated cotton with amyl acetate used as a solvent; 12 parts of 16 oz. solution of nitrated cotton with wood or methyl alcohol used as a solvent; 12 parts of a thinner, consisting of a mixture of acetone, benzol and amyl acetate; 1⅕ parts of zinc oxide, which has been first mixed with a 6 oz., solution of a thinner, consisting of a mixture of acetone, benzol and amyl acetate; 2 parts of a suitable black pigment, such, for instance, as carbon black, which is employed as a coloring agent for the entire mass; and driving off the solvent after each application of said mixture until a coating

is provided upon the disc or foundation member sufficiently thick to receive sound-wave indentures.

7. The herein described process of producing a phonographic record, which consists of providing a suitable disc or foundation member, then coating the same with a plurality of applications of a composition composed of the following approximately proportioned ingredients: 12 parts of 16 oz., solution of nitrated cotton with amyl acetate used as a solvent; 12 parts of 16 oz., solution of nitrated cotton with wood or methyl alcohol used as a solvent, 12 parts of a thinner, consisting of a mixture of acetate, benzol and amyl acetate; 1⅕ parts of zinc oxide, which has been first mixed with a 6 oz., solution of a thinner, consisting of a mixture of acetone, benzol and amyl acetate; 2 parts of a suitable black pigment, such, for instance, as carbon black, which is employed as a coloring agent for the entire mass; next adding to the coating of said disc by a plurality of applications of a mixture containing the following approximately proportioned ingredients: 12 parts of 16 oz., solution of nitrated cotton with amyl acetate as a solvent; 8 parts of 16 oz., solution of nitrated cotton with wood or methyl alcohol as a solvent; 1⅕ parts of zinc oxide which has first been mixed with a 6 oz., solution of a thinner, consisting of a mixture of acetone, benzol and amyl acetate; 2 parts of a suitable black pigment, such, for instance, as carbon black, which is employed as a coloring agent for the entire mass or body of liquid; next adding to the coating of said disc by a plurality of applications thereto of a mixture containing the following approximately proportioned ingredients: 12 parts of 16 oz., solution nitrated cotton with amyl acetate as a solvent; 5 parts of 16 oz., solution of nitrated cotton with wood or methyl alcohol as a solvent; 1⅕ parts of zinc oxide, mixed with a 6 oz., solution of a thinner consisting of equal parts of acetone, benzol and amyl acetate; 2 parts of a suitable black pigment, such, for instance, as carbon black, used as a coloring agent for the entire mass; and driving off the volatile constituents of each of said mixtures after each application thereof to said foundation member.

8. As a new article of manufacture, a phonographic record comprising a disc of substantially non-warpable and non-flexible fibrous material having filling material and a layer of nitro-cellulose material deposited thereon in a plurality of coatings, said nitro-cellulose being of sufficient thickness to receive the impression of the phonic line.

In testimony whereof, I affix my signature.

FRANK E. SINCERE.