

UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF WEST ORANGE, NEW JERSEY, ASSIGNOR TO NEW JERSEY PATENT COMPANY, OF WEST ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

PRODUCTION OF MOLDED ARTICLES.

1,377,192.

Specification of Letters Patent.

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No Drawing.

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To all whom it may concern:

Be it known that I, THOMAS A. EDISON, a citizen of the United States, and a resident of West Orange, Essex county, New Jersey, have invented certain new and useful improvements in the Production of Molded Articles, of which the following is a description.

My invention relates to the production of molded articles, especially phonograph record blanks, and more particularly to an improved material or composition for such molded articles, an improved binder for said material, and the processes of making such material and binder.

The principal object of the invention resides in the production of a material for molded articles which is of superior quality so that when formed into a molded article under heat and pressure, it will be hard, tough, substantially non-crystalline, very smooth and of substantially uniform density and texture throughout.

In carrying out my invention, I first make the binder for the material to be molded by mixing any of a number of different resins, but preferably ordinary pine rosin, with any of a number of different drying oils but preferably linseed oil, and boiling the same. The mixture preferably is made up of one part by weight of the resin and one part by weight of the drying oil. The drying oil is preferably partially oxidized, either before mixing the same with the resin or during the boiling of the mixture of resin and drying oil. In oxidizing the drying oil before mixing with the resin, the same is boiled for a considerable period with an oxidizing agent such, for example, as peroxid of lead, the amount of peroxid of lead employed preferably being from 2½% to 3% by weight of the oil. One part by weight of the oxidized drying oil is then mixed and boiled with one part by weight of the resin. When the drying oil is oxidized during the boiling of the mixture of the resin and drying oil, an oxidizing agent, such as peroxid of lead, equal to from 5% to 6% by weight of the mixture, is boiled therewith. The resin, of course, is also partially oxidized. In either case, the resulting product is a binder of superior quality in the form of a

stiff liquid which is neither too sticky nor too brittle when hardened.

The binder produced as described above is then mixed with a filler material comprising any suitable finely divided inert substance, such as china clay, and a small quantity of fibrous material, preferably cotton flock, in a mixer which is heated to about 325 degrees F., the mixer being operated until the ingredients are thoroughly mixed. When china clay and cotton flock are used for the filler of my improved material, I find that good results are obtained by using from 20% to 25% by weight of the resin oil compound or binder, about 3% by weight of cotton flock, and from 72% to 77% by weight of china clay.

The material is now removed from the mixer, cooled, and then ground fine in a ball or pebble mill. During the grinding of the material, it is subjected to a stream of hot air in order to still further oxidize the ingredients of the binder, especially the drying oil. The material is subjected to the action of the current of hot air until the proper degree of oxidation is attained. Instead of oxidizing the material during the grinding thereof, it may be oxidized after being ground, by removing the same from the grinding mill and putting it into a revolving cylinder through which hot air is forced.

After being ground, the material is ready for molding. In making disk record blanks, the powdered material produced by the ball or pebble mill is placed in suitable molds and formed under hydraulic pressure and heat into disks. The surfaces of the disks thus produced are very smooth and the disks are hard and tough and of substantially uniform density, being entirely free of "hard spots" such as are sometimes present in disk record blanks of a similar character heretofore produced.

Disk record blanks formed as described above may be covered with a suitable veneer or coating designed to be impressed with a sound record matrix, such as the varnish consisting of a mixture of phenol resin and hexa-methylene-tetra-amin described in Patent No. 1,098,608 to Aylsworth. This varnish is preferably applied by brushing or

painting the same onto the blank. After the varnish has dried, the sound record is impressed therein under great heat and pressure in a suitable mold provided with a sound record matrix. Sound records thus produced will be free from "run outs" due to the absence of "hard spots" in the blanks formed of my improved material. Moreover, such records, when reproduced, are substantially free from "scratch". This I believe is due to the fact that a blank formed of my improved material is substantially perfectly smooth, with none of the fibers or particles of the "filler" projecting from the body of the blank, with the result that when the sound record is impressed into the varnish coating, none of the particles of the fibrous or other material of the blank will be forced through the varnish coating or any appreciable distance thereinto so as to form irregularities in the surface of the record grooves.

While my improved material is especially designed for use in making sound record blanks, the same is adapted for use in making numerous other molded articles. Moreover, it is to be understood that I am not limited to the use of the particular ingredients described in forming my improved material, nor to the exact method described for making such material, but that my invention is subject to various changes and modifications without departure from the spirit thereof or the scope of the appended claims.

Having now described my invention, what I claim as new and desire to protect by Letters Patent is as follows:—

1. A composition adapted for use in forming molded articles, comprising a finely divided filler material held together by a binder comprising substantially equal parts of a resin and a drying oil, substantially as described.

2. A composition adapted for use in forming molded articles, comprising a mixture of finely divided material and cotton flock as a filler, held together by a binder comprising a resin and a drying oil, substantially as described.

3. A composition adapted for use in forming molded articles, comprising a finely divided filler containing cotton flock held together by a binder comprising a resin and a drying oil, substantially as described.

4. A composition adapted for use in forming molded articles, comprising a mixture of powdered china clay and cotton flock as a filler, held together by a binder comprising a mixture of a drying oil and a resin, substantially as described.

5. The method of producing material adapted for use in making molded articles, which consists in mixing a resin with a drying oil with the application of heat, then

mixing the resulting product with a finely divided filler material, grinding the mixture, and subjecting the same to an oxidizing action, substantially as described.

6. The method of producing material adapted for use in making molded articles, which consists in mixing a resin with a drying oil with the application of heat, then mixing the resulting product with finely divided filler material, grinding the mixture, and subjecting the same to a current of hot air, substantially as described.

7. The method of producing material adapted for use in making molded articles, which consists in boiling a mixture of a resin, a drying oil and an oxidizing agent, then mixing the resulting product with a finely divided filler material and fibrous material with the application of heat, cooling the mixture, and then grinding the mixture and subjecting the same to an oxidizing action, substantially as described.

8. A sound record blank formed from a material comprising finely divided material containing cotton flock as a filler, held together by a binder comprising a mixture of a drying oil and a resin, substantially as described.

9. A sound record blank formed from a material comprising a mixture of powdered china clay and cotton flock as a filler, held together by a binder comprising a mixture of a drying oil and a resin, substantially as described.

10. A sound record blank formed from a material comprising finely divided material containing cotton flock as a filler, held together by a binder comprising a mixture of an oxidized drying oil and a resin, substantially as described.

11. A sound record blank formed from a material comprising finely divided material containing cotton flock as a filler, held together by a binder comprising a mixture of oxidized linseed oil and a resin, substantially as described.

12. A sound record blank formed from a material comprising a mixture of powdered china clay and cotton flock as a filler, held together by a binder comprising a mixture of an oxidized drying oil and a resin, substantially as described.

13. A sound record blank formed from a material comprising a mixture of powdered china clay and cotton flock as a filler, held together by a binder comprising a mixture of oxidized linseed oil and a resin, substantially as described.

14. A sound record blank formed from a composition comprising a finely divided filler material held together by a binder comprising a mixture of a resin and a drying oil, substantially as described.

15. A sound record blank formed from a composition comprising a finely divided

filler material held together by a binder comprising a mixture of a resin and an oxidized drying oil, substantially as described.

5 16. A sound record blank formed from a composition comprising a finely divided filler material held together by a binder comprising a mixture of a resin and oxidized linseed oil, substantially as described.

17. A sound record blank formed from a composition comprising a finely divided 10 filler material held together by a binder comprising a mixture of rosin and oxidized linseed oil, substantially as described.

This specification signed this 14th day of January, 1919.

THOS. A. EDISON.