

# UNITED STATES PATENT OFFICE.

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## PRODUCTION OF MOLDED ARTICLES.

1,377,193.

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 the same.

The principal object of the invention resides in the production of a comparatively cheap 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 oxidizing any of a number of different resins, but preferably ordinary pine rosin. In oxidizing the resin, the same is preferably boiled for a considerable period with an oxidizing agent, such, for example, as peroxid of lead, the amount of peroxid of lead preferably being from 2½% to 6% by weight of the resin. The resin so oxidized constitutes 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 oxidized resin binder, about 3% by weight of cotton flock, and from 72% to 77% by weight of china clay. Under some circumstances, however, I find it desirable to increase the amount of cotton flock to as much as 10% or 12% by weight of all the ingredients used and to correspondingly reduce the amount of

china clay. Hence I do not wish to be limited to the proportions just stated.

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 resin binder. The material is subjected to the action of the current of hot air until the proper degree of oxidization 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 hexamethylene-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. Blanks formed of my improved material including the oxidized resin binder, will not "flow" to any great extent during the imprinting of the sound record in this manner. 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 herein 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 an oxidized resin, substantially as described.

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

3. A composition adapted for use in forming molded articles, comprising finely divided filler material held together by a binder consisting of oxidized rosin, substantially as described.

4. A binder adapted for material from which the molded articles are formed, the binding agent of which consists of an oxidized resin, only substantially as described.

5. A binder adapted for material from which molded articles are formed, the binding of which consists of oxidized rosin only, substantially as described.

6. 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 an oxidized resin, substantially as described.

7. A composition adapted for use in forming molded articles, comprising a mixture of powdered china clay and fibrous material as a filler, held together by a binder comprising an oxidized resin, substantially as described.

8. 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 an oxidized resin, substantially as described.

9. The method of producing material adapted for use in making molded articles, which consists in oxidizing a resin, and then

mixing the oxidized resin with a finely divided filler material, substantially as described.

10. The method of producing material adapted for use in making molded articles, which consists in oxidizing a resin, and then mixing the oxidized resin with a finely divided filler material and a fibrous material, substantially as described.

11. The method of producing material adapted for use in making molded articles, which consists in oxidizing a resin, mixing the oxidized resin with a finely divided filler material, grinding the mixture and subjecting the same to an oxidizing action, substantially as described.

12. The method of producing material adapted for use in making molded articles, which consists in oxidizing a resin, mixing the oxidized resin with a finely divided filler material, grinding the mixture, and subjecting the same to a current of hot air, substantially as described.

13. The method of producing material adapted for use in making molded articles, which consists in boiling a mixture of a resin 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.

14. A sound record blank formed from a composition comprising finely divided filler material held together by a binder comprising an oxidized resin, substantially as described.

15. A sound record blank formed from a composition comprising finely divided filler material held together by a binder comprising oxidized rosin, substantially as described.

16. A sound record blank formed of a composition comprising finely divided material containing fibrous material as a filler, held together by a binder comprising an oxidized resin, substantially as described.

17. A sound record blank formed of a composition comprising finely divided material containing cotton flock as a filler, held together by a binder comprising an oxidized resin, substantially as described.

18. A sound record blank formed of a composition comprising a mixture of powdered china clay and fibrous material as a filler, held together by a binder comprising an oxidized resin, substantially as described.

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

This specification signed this 15th day of January, 1919.

THOS. A. EDISON.