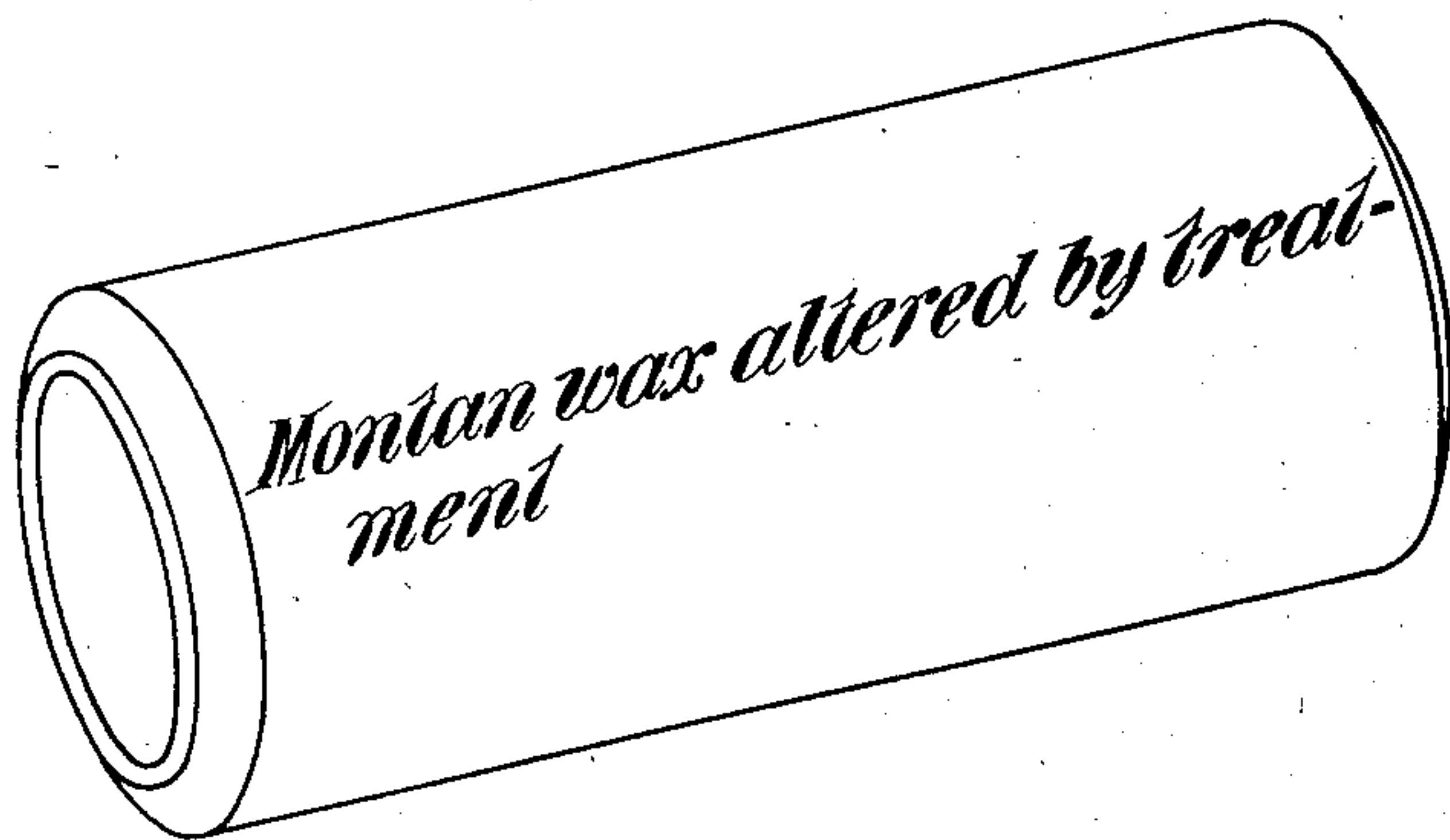


J. W. AYLSWORTH.
COMPOSITION FOR PHONOGRAPH RECORDS.
APPLICATION FILED NOV. 5, 1907.

962,878.

Patented June 28, 1910.



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UNITED STATES PATENT OFFICE

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COMPOSITION FOR PHONOGRAPH-RECORDS.

962,878.

Specification of Letters Patent. Patented June 28, 1910.

Application filed November 5, 1907. Serial No. 400,849.

To all whom it may concern:

Be it known that I, JONAS W. AYLSWORTH, a citizen of the United States, residing at 223 Midland avenue, East Orange, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Composition for Phonograph-Records, of which the following is a description.

My invention relates to an improved composition for molded phonograph records, and the principal object is to produce a composition or material for the purpose in which the capacity to resist wear or the rubbing action of the reproducer stylus, will be enormously increased, whereby it becomes commercially and practicably feasible to make phonograph records with a very fine pitch record grooves. A phonograph record having a record-groove of a pitch of 200 threads per inch made of my improved composition or material, will compare favorably in wearing qualities with a record of a pitch of 100 threads per inch made of present compositions.

A further object is the production of a composition or material which shall have an extremely smooth record surface so as to reduce as much as possible the production of foreign noises, due to the rubbing action of the reproducer stylus; and also, to produce a composition or material which shall contain no hygroscopic ingredients, such as the alkaline soaps which are present in compositions now generally in use.

In Letters Patent of the United States No. 880,707 granted Mar. 3, 1908, I disclose for the first time in the art, as a suitable material for use in compositions for molded phonograph records, the article known in commerce as "montan wax," which is a wax-like substance of a dark yellowish brown color, somewhat resembling discolored carnauba wax, and obtained, as I am informed and believe, from certain kinds of bituminous brown coal by a certain process of extraction or solution. The so-called montan wax is imported into the United States from Germany, and is a mineral wax obtained from certain kinds of bituminous brown coal by extraction with suitable solvents. Chemically, it consists of a mixture of high carbon acids combined with fatty alcohols together with some free fatty acids and hydrocarbons. While the details of the

process of manufacture are kept as secrets by the manufacturers of this material, I know that it can be obtained from certain kinds of bituminous brown coal according to the process of United States Patent No. 689,381, dated December 24, 1901. The product which is obtained after driving off the benzin or benzene, and which is described in lines 44 to 47, page 1 of the patent, is the same substance as the article known in commerce as montan wax.

In my said patent, while claiming broadly the use of montan wax as an ingredient in these compositions, the particular composition described, made use of the wax in comparatively small proportions. I have conducted experiments with the view of utilizing very much larger proportions of the montan wax, in order to secure a material for the purpose, which shall be of great hardness or toughness, and have succeeded in so treating the montan wax that it may be used alone as a material for this purpose, or admixed with small proportions of other ingredients. The montan wax in its natural state, possesses some of the properties that are desirable in the art, but I find that it cannot be molded successfully, because of its excessive shrinkage, while when mixed with other bodies, such as asphalt (to reduce the shrinkage), the resulting surface is rough and scratchy. I have discovered, however, that the objectionable features of montan wax may be overcome and the material be made eminently suitable for use in the art, by prolonged heating of the wax at a temperature of from 500° to 540° F. in the presence of a small percentage of sulfur, and preferably with the subsequent centrifuging of the product. When the montan wax is so treated, it is greatly altered in its physical properties, and may be used for the purpose either alone or admixed with small proportions of other bodies. I find that to secure the best results, there should be present in the wax about one and one-half per cent. of sulfur. Apparently, the proportion of sulfur in the crude wax varies from one and one-half per cent. to practically nothing, so that in the treatment of some bodies there will be sufficient sulfur present to secure the desired results, while in the treatment of other bodies sufficient sulfur should be added to result in a sulfur content of about one and one-half

per cent. The wax is first melted in a suitable kettle, heated by steam or gas, and the sulfur added, if necessary, and the temperature is slowly raised to from 500° to 540° F., being maintained between these points for from two to six hours, according to the particular grade of wax being treated. The percentage of sulfur may be varied within narrow limits, but, if too much is added, or is present, the resulting material will not possess sufficient shrinkage for a rapid and highly successful molding operation. On the other hand, if the percentage of sulfur present or added, is too small, the shrinkage of the material will be excessive, resulting in a too rapid clearance from the mold, in the warping of the record-groove, and in the presence of a less smooth surface than can be secured by a proper regulation of the proportion of sulfur. The temperature may also be varied within certain limits, but if too low, the time of heating must be greatly prolonged to effect the desired reduction in the normally excessive shrinking properties of the material, and furthermore, the sulfur will not, in this case, enter into such a fixed combination, and is therefore liable to deleteriously affect the matrix or mold in which the records are made. If the temperature is maintained materially above 540° F., objectionable properties are manifested in the insufficient shrinkage of the material, which is therefore less desirable. The best results are (at least with those examples of montan wax with which I have experimented) obtained when the heating is regulated between 500° and 540° F. and when the percentage of sulfur is maintained closely in the neighborhood of one and one-half per cent., as above stated. As a result of the treatment indicated, I obtain a very much tougher and less brittle substance, which has the special shrinkage properties necessary in the art, but this material contains a gummy sediment, which is very finely divided and which floats in the material when molten. I have not been able to remove this sediment by filtration or by settling operations, however carefully they may be performed or attempted. I have discovered, however, that by subjecting the molten material to the action of a centrifuge, this gummy sediment may be entirely removed, thereby resulting in a material which is vastly improved in its molding properties, and in its ability to withstand the wearing action of the reproducer stylus. The amount of the gummy sediment which seems to be always present in montan wax that has been heated to a high temperature, varies from one per cent. to five per cent. according to the grade of the wax used. Yet, notwithstanding this apparently small percentage, I find that by removing the sediment as explained, the ability of the material to withstand the

wearing action of the reproducer stylus is more than doubled, while at the same time, the material is more readily molded.

Reference is hereby made to the accompanying drawing, which shows a phonograph record tablet with the names of the ingredients inscribed thereon.

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

1. A material or ingredient for molded phonograph records, comprising montan wax which has been subjected to prolonged heating at a high temperature, as set forth.

2. A material or ingredient for molded phonograph records, comprising montan wax which has been subjected to prolonged heating at a high temperature in the presence of a small percentage of sulfur, as set forth.

3. A material or ingredient for molded phonograph records, comprising montan wax which has been subjected to prolonged heating at a high temperature and freed from the gummy sediment produced by such treatment, as set forth.

4. A material or ingredient for molded phonograph records, comprising montan wax which has been subjected to prolonged heating at a high temperature in the presence of a small percentage of sulfur and freed from the gummy sediment produced by such treatment, as set forth.

5. A material or ingredient for molded phonograph records, comprising a mineral wax obtained from bituminous brown coal by extraction with suitable solvents, and subjected to prolonged heating at a high temperature, substantially as set forth.

6. A material or ingredient for molded phonograph records, comprising a mineral wax obtained from bituminous brown coal by extraction with suitable solvents, the same comprising a mixture of high carbon acids combined with fatty alcohols together with some free fatty acids and hydrocarbons, and subjected to prolonged heating at a high temperature, substantially as set forth.

7. A material or ingredient for molded phonograph records comprising a mineral wax, the same comprising a mixture of high carbon acids combined with fatty alcohols together with some free fatty acids and hydrocarbons, and subjected to prolonged heating at a high temperature, substantially as set forth.

8. A molded phonograph record formed of montan wax so treated as to have lost the excessive shrinkage characteristic of untreated and unmixed montan wax, substantially as set forth.

9. The process of rendering montan wax suitable as a material, or predominating ingredient in a composition, for molded records, which consists in subjecting the same

to prolonged heating at a temperature of from 500° to 540° F., as set forth.

10. The process of rendering montan wax suitable as a material, or predominating ingredient in a composition, for molded records, which consists in subjecting the same to prolonged heating at a high temperature in the presence of about one and one-half per cent. of sulfur, as set forth.

11. The process of rendering montan wax suitable as a material, or predominating ingredient in a composition, for molded rec-

ords, which consists in subjecting the same to prolonged heating at high temperature, and in then centrifuging the molten material so as to remove the gummy sediment produced by such heating, as set forth.

This specification signed and witnessed this 26th day of Oct. 1907.

JONAS W. AYLSWORTH.

Witnesses:

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