

# UNITED STATES PATENT OFFICE.

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## PROCESS OF MAKING GRAPHOPHONE-BLANKS.

SPECIFICATION forming part of Letters Patent No. 626,709, dated June 13, 1899.

Application filed August 23, 1898. Serial No. 689,351. (No specimens.)

*To all whom it may concern:*

Be it known that I, THOMAS H. MACDONALD, of Bridgeport, Connecticut, have invented a new and useful Improvement in Graphophone-Tablets and Processes of Manufacturing the Same, which improvement is fully set forth in the following specification.

My invention relates to the art of manufacturing blanks or tablets upon which sound-records may be cut or engraved, and more particularly to the process of treating the composition of matter of which the tablet is composed to the end that the same may be perfectly amorphous, free from all fibrous or other organic impurities, and without tendency to crystallization.

In forming a sound-record the method described in United States Patent No. 341,214 is now commonly employed, which method consists in cutting or engraving an undulatory groove in the surface of a suitable tablet by means of a cutting-style attached to a vibratory diaphragm upon which the sounds to be recorded are allowed to impinge. The force of the sound-waves is very weak, and it is essential to the accomplishment of the best results that the surface of the tablet should be such as to enable the style to cut a smooth undulatory line whose undulations shall correspond exactly to those of the recorded sound-waves. If there is any crystalline formation or any tendency thereto in the surface of the material composing the tablet, the shaving removed by the style is liable to follow the line of cleavage of the crystal, thus offering variable resistance to the action of the style and producing a groove whose irregularities do not correspond exactly to the undulations of the recorded sound-waves. It is also very important that the composition of matter composing the tablet should be free from all fibrous or other organic matter, as such offers uneven resistance to the cutting action of the style, causing it to form a rough and inaccurate record. In some cases the style rides over the fiber and makes no record at all, causing what is known as "blind spots." In other cases the style fails to cut the fiber, but pulls it out bodily, leaving a hole or depression where there should have

been a smooth cut. Again, the style, instead of cutting the fiber or removing it bodily, tears through it, leaving rough jagged ends which when the rubbing-style of a reproducer rubs over them give a rough harsh quality to the reproduced sound. Moreover, the organic matter is liable to ferment and mildew, greatly lessening the value of the blank and destroying the record cut therein.

In my Patent No. 606,725, dated July 5, 1898, I have described and claimed a process for making blank tablets whereby a superior tablet may be produced which is to a large extent lacking in the objectionable features above described and upon which records of a high order of merit may be produced. I have found, however, that there is often a tendency to form crystals upon the surface of blanks made by such process, which tendency is due to the presence in the blank of the "water of crystallization." I have also learned that such tablets sometimes contain fibrous or other organic impurities, such as fine dust particles, which are at all times floating in the air and which the most vigilant care could not entirely exclude.

The object of the present invention is to produce a blank tablet which shall be without any tendency to crystallization and in which all fibrous matter shall be destroyed; and to this end the invention consists in subjecting the composition of matter which is to constitute the tablet to a degree of heat sufficient to entirely drive off all water of crystallization and entirely destroy all fibrous and other organic impurities in the composition of matter.

Heretofore in the treatment of the composition of matter of which the tablets were to be formed heat has been resorted to for the purpose of eliminating the water; but great care has been taken not to exceed a temperature of about 330° Fahrenheit for fear of "charring" the composition and thereby rendering it unfit for use as a tablet material. This temperature was not sufficient to entirely eliminate the water of crystallization and would not destroy fibrous and other organic matter. I have discovered, however, that the composition of matter may be advantageously subjected to a heat of from 450° to 475° Fahrenheit



heit, and that by so doing the water of crystallization may be entirely eliminated and the fibrous and other organic impurities eliminated or disintegrated.

5 For the purpose of illustrating my invention and the best method known to me for putting the same into practice I will describe one composition of matter and the process of forming and treating the same preparatory to  
10 molding it into tablet form.

Formula: Stearic acid, free from oleic acid and glycerin, four hundred and eight pounds; aluminic hydrate, seven pounds; caustic-soda lye, eighty-five pounds. To this is added for  
15 the purpose of "tempering" paraffin, ozocerite, or similar material, seventy-two pounds. The caustic soda is incorporated in water until a lye of 37.5° Baumé is obtained, and this is heated to its boiling-point, about 242° Fahrenheit. The aluminic hydrate is added and  
20 is quickly taken up by the lye. The stearic acid is melted and raised to about the same temperature, and the compound of lye and aluminium slowly added thereto. It will  
25 unite readily therewith. It is preferred to employ about the temperature indicated, as thereby the formation of the composition proceeds gradually and without violent ebullition. The temperature of the molten mass  
30 is then raised to a point somewhere between 450° and 475° Fahrenheit. When the desired temperature has been reached, I allow the same to fall about 100° and then pour the mass into the molds in the usual manner. The fall  
35 of the temperature may be conveniently secured by putting out the fire and allowing the mass to stand a few moments.

It is not, of course, essential that all the ingredients constituting the compound material should first be incorporated in the mixture before heating the same to the high temperature required to drive off the water of crystallization and destroy all organic matter, as the ingredients may, if it is found ad-  
45 vantageous, be heated separately to the high degree necessary, or partial combinations may be formed, these heated to a high degree, and then the partial combinations united to form the finished compound. I prefer, however,  
50 to first incorporate and thoroughly unite all

the ingredients forming the compound and then raise the entire mass to the high degree of heat necessary to drive off the water of crystallization and disintegrate the fibers and similar impurities, as hereinbefore described. 55

Not only do the blanks thus produced stand extremes of heat and cold better without molding or cracking, but they give better results at all times on account of their being more nearly amorphous and homogeneous. 60

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

1. In the process of making a sound-recording material, the improvement consisting in  
65 partially saponifying stearic acid, and then heating the mass to a temperature of about 460° Fahrenheit, substantially as described.

2. In the process of making a sound-recording material, the improvement consisting in  
70 mixing stearic acid with caustic-soda lye, and then heating the mass to about 460° Fahrenheit.

3. The improvement in the process of making sound-recording material which consists  
75 in heating such material to about 460° Fahrenheit, then cooling the same down to about 360° Fahrenheit, and then molding the material into the desired shape, substantially as described. 80

4. The process of making a sound-recording material consisting in dissolving aluminium in soda-lye, adding the solution to stearic acid, and raising the temperature of the mass to about 460° Fahrenheit, substantially as described. 85

5. The process of making a sound-recording material, said process consisting in adding to stearic acid soda-lye with which a metal has been united, the lye being in such quantity as to produce partial saponification, and heating the mixture to about 460° Fahrenheit, substantially as described. 90

In testimony whereof I have signed this specification in the presence of two subscribing witnesses. 95

THOMAS H. MACDONALD.

Witnesses:

HENRY A. HUBBELL,  
E. W. SULHIE.