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V. H. EMERSON

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METHOD OF PRODUCTION OF SOUND RECORDS

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Fig. 1.

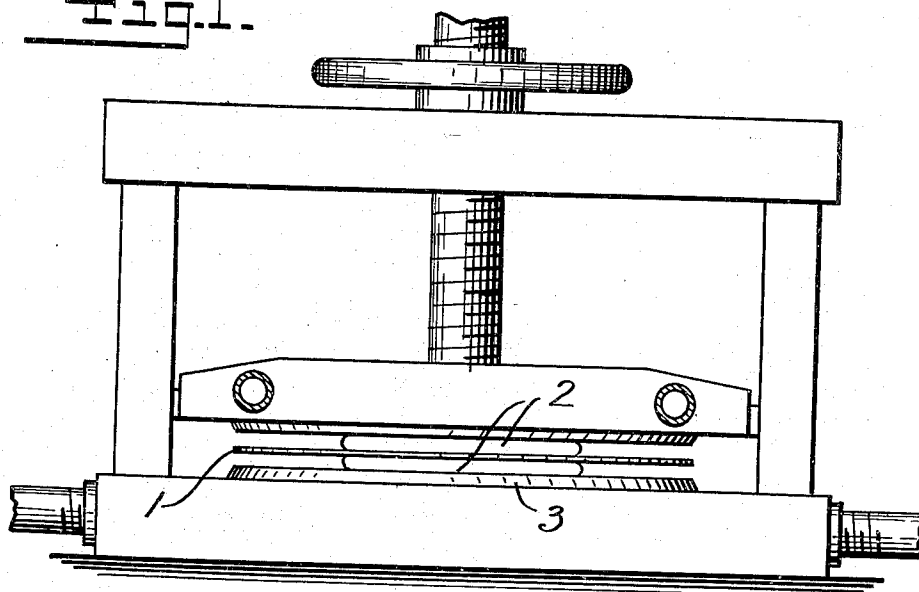
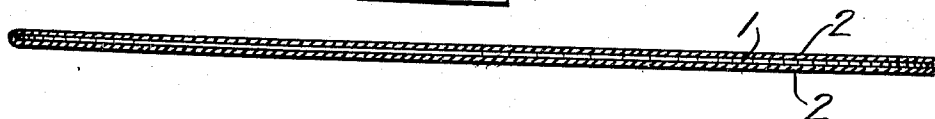


Fig. 2.



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METHOD OF PRODUCTION OF SOUND RECORDS.

Application filed April 20, 1920. Serial No. 375,244.

To all whom it may concern:

Be it known that I, VICTOR H. EMERSON, a citizen of the United States, residing at the city, county, and State of New York, have invented new and useful Improvements in Methods of Production of Sound Records, of which the following is a specification.

My invention relates to phonograph records and methods of production, and more particularly to disk records made up of layers of different materials suitable for respective functions and has for an object to produce a record possessing a maximum of efficiency and durability at a minimum cost of labor and material.

More specifically described, my improved process contemplates the formation of a record having a layer of paper or other fibrous material treated by a method that not only improves its inherent properties adaptable to record construction, but is conducive to a more perfect union with record material upon the surfaces thereof.

To the attainment of this end in following a preferred form of my improved method the following several distinctive steps are to be taken:

First, I form a disk of paper board or other suitable material of the desired diameter of the record to be made therefrom, and provide the disk thus formed with the usual central orifice for use both in connection with phonograph machines when it has been produced, and also in facilitating the making of the record having reference particularly to the pressing operation. This paper should be sufficiently porous for the absorption of material in solution and for this purpose I have found blotting paper of the form in general commercial use most convenient and adaptable.

A liquid cement is then made of a solution of magnesium oxide in powdered form in magnesium chloride in the proportion of about 100 grams of magnesia dissolved in 65 cubic centimeters of the chloride, which solution I shall hereinafter refer to as magnesium cement; and then the disk of blotting paper is impregnated with the solution either by immersing into the cement until the pores, that is, the interstices between the fibres of the paper board, become sufficiently filled and saturated with the cement, or by introducing the cement in the form of a

paste which may be spread upon both surfaces of the paper accomplishing practically the same result as by placing in the bath. Thus the paper disk becomes completely transformed, especially at and immediately below its surface areas, into a clayey or stone-like body, having taken on the properties of hardness, toughness and general firmness necessary to a perfect pressed record.

After the paper has been thus saturated with the magnesium cement, it will be found upon examination that the earthy consistency is more in evidence at the surface than within the body portion of the disk member, and therefore the deeper the paper is penetrated the less will be the amount of the magnesia found to have been incorporated therein. This is due to the very simple and obvious tendency of natural laws. As the liquid chloride of magnesium is drawn by capillary attraction between the fibres of the material, the farther it travels the less of the solid material it carries with it, the solid portions being lost in the process of infiltration that ensues.

The inability of the blotting paper to carry the solid materials uniformly into its interior is beneficial rather than injurious for the reason that the paper in its natural form is somewhat yielding, and to that extent presents a more yielding body portion to the action of the stamping matrix plates. It should be understood, however, that the yielding property referred to as conducive to better stamping results does not interfere with the correctness and permanence of the record groove stamped upon the surface. The property of the paper is such as to take and hold impressions that have been impressed into its surface. But while I wish to point out, on the other hand, that this retaining quality or characteristic of the paper is enhanced by the addition of the cement to its fibrous formation, the cushioning feature of the less thoroughly saturated middle portions of the paper does not prevent the remaining portions of the paper from functioning in the manner pointed out.

While the foregoing step relative to the application of the cement to the paper body portion has been described in its essential aspects, it will be found serviceable in accelerating the saturation of the paper with the cement if the former be first dampened

throughout with water or other suitable liquid agent.

The disk having thus been prepared with the cement solution, it is dried out thoroughly, and thereupon, after sufficiently drying and hardening the disk thus prepared, one or both of its stone-like surfaces are covered with record material which may be applied in any of the well-known methods, but preferably in the form of a centrally applied thermo-plastic ball which as the matrix plate, heated to the required degree, is pressed into its surface is spread centrifugally until the surface of the disk is entirely covered. Most commercial disks are provided upon both faces with records for phonograph reproduction, and in applying the thermo-plastic record material to both the upper and under surfaces of the body layer in substantially equal quantities the two masses will spread co-extensively, each thus counteracting the pressure of the other, and in this manner both of the outwardly expanding masses will counterbalance the clayey or stone-like layer which is thus held between them as they expand.

The record material employed in this manner is preferably composed of shellac and other ingredients and as the shellac comes in contact with the lithic surface of the magnesium cement with which the disk has previously been treated in the manner described, a firm and intimate union takes place which permanently fixes the record material to the surface of the disk.

In the accompanying drawings illustrative of apparatus employed in the practice of my process, and a form of the product thereof, Figure 1 is an edge view of a record in a press in process of being formed, and

Fig. 2 is an edge view of the record after having been pressed into final shape.

Referring to the drawings: The numeral 1 represents a disk formed preferably from a sheet of blotting paper of the desired thickness which has been died out to the required diameter with the usual central orifice.

The disk 1 is preferably first dampened with water and then treated with a cement composed of 100 grams of magnesia made into a paste by being dissolved in approximately 65 grams of magnesium chloride, with which amounts I am able to treat three disk surfaces, each of ten inches diameter, but by increasing the solution in substantially the proportion indicated any desired quantity may be adequately treated. The cement is most conveniently applied by spreading it over the surfaces which are de-

signed subsequently to receive the coating of record material. I then thoroughly dry, and with a thermo-plastic record material preferably in the form of a mass or ball 2 centrally applied to the surface of the disk, the disk is placed in a press for stamping records and the mass after being spread over the surface is then impressed permanently thereon. When it is desired to form a double faced record two masses 2 of record material are applied as shown in Fig. 1 where they are seen in process of being impressed upon the respective surfaces of the disk, while the usual degree of heat is being applied in any convenient way.

In Fig. 2 is illustrated the record as produced by my process, having layer 2 of record material shown in exaggerated thickness upon both its surfaces, into which the matrices 3 forming the upper and lower plates respectively of the stamper press have impressed a sound record groove.

The record material may be applied in any convenient manner but owing to the comparatively firm nature of the body portion or layer of the record to be formed, I find it most advantageous and therefore have given as the preferred method of my improved process to use the record material in the mass forms 2 of thermo-plastic material applied and impressed upon the surface as shown in Fig. 1 in process of formation.

Having described my invention, what I claim is:

1. A method for making sound records which consists in dieing out a disk from blotting paper of suitable thickness, immersing the disk in a solution of magnesia in the chloride of magnesium in the proportion of substantially 100 grammes of the former to 65 cubic centimeters of the latter, applying a thermo-plastic record to the surfaces of the disk so treated with magnesia, and impressing upon the surface thereof a sound record.

2. A method for making sound records which consists in preparing a disk of blotting paper, immersing the disk in a solution of the proportion of 100 grammes of magnesia to 65 cubic centimeters of magnesium chloride, applying a mass of thermo-plastic record material centrally to the opposite faces of the disk so treated with magnesia and pressing said masses between sound matrices with the application of heat until said record material covers the faces of the disk to a substantially uniform and equal depth.

In testimony whereof I have hereunto set my hand.

VICTOR H. EMERSON.