

V. H. EMERSON.
SOUND RECORD MATERIAL.
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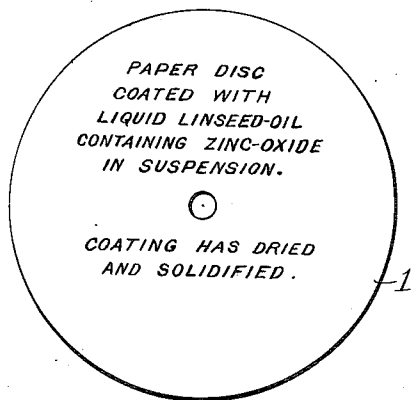


Fig. 1

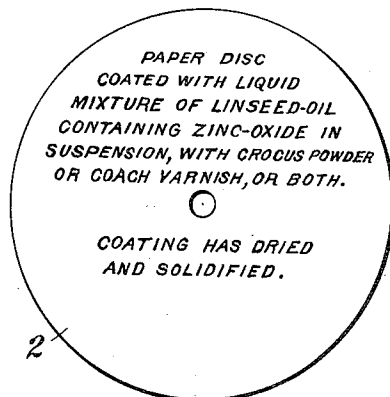


Fig. 2

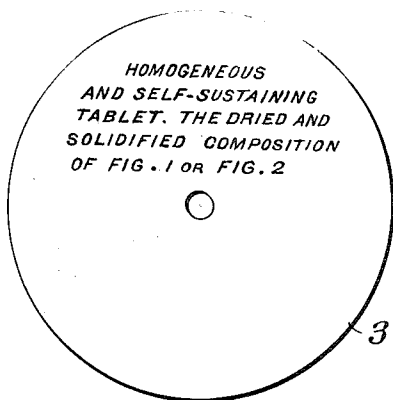


Fig. 3

Witnesses:
Rappeel Jetter
A. C. Hook

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By his Attorneys
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UNITED STATES PATENT OFFICE.

VICTOR H. EMERSON, OF NEW YORK, N. Y., ASSIGNOR TO AMERICAN GRAPHOPHONE COMPANY, OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF WEST VIRGINIA.

SOUND-RECORD MATERIAL.

1,084,138.

Specification of Letters Patent.

Patented Jan. 13, 1914.

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To all whom it may concern:

Be it known that I, VICTOR H. EMERSON, a citizen of the United States, and resident of New York city, New York, have invented a new and useful Sound-Record Material, which invention is fully set forth in the following specification.

My invention relates to the material or surfacing for sound-records for talking-machines. In its simplest form, my new material (or class of materials) is especially adapted for use as a recording-surface for original sound-records, from which only one or two audible reproductions are desired, as in case of dictating business correspondence and the like (to be transcribed upon a typewriter), and also for making original sound-records, from which duplicate copies are to be produced in quantities, generally without any audible reproductions whatever from such originals. And my new materials, particularly in modified forms, are adapted for making duplicate copies of sound-records.

For the purpose of recording original sound-records, various materials and compositions have heretofore been employed; and the necessary properties of such compositions are well recognized in this art under the designation "waxlike". But, so far as I am aware, no suitable record-composition heretofore employed is sufficiently adhesive and pliable to be employed successfully as a surfacing upon paper or other pliable support or backing. The materials and compositions heretofore employed practically and commercially for duplicates or copies of sound-records have either required melting (so as to be introduced into the record-mold in a liquid condition), or at least heating (so as to be presented to the record-matrix in a plastic or semi-plastic condition).

My present invention is based on the discovery of a class of materials that are, for the purpose of original recording, sufficiently rigid yet cuttable to be classed as "waxlike", and at the same time are sufficiently adhesive and pliable to serve as a permanent coating for paper or the like, without cracking or chipping off therefrom; and yet have sufficient density or body or rigidity to yield audible reproductions from a record-groove produced therein. And moreover these new materials are at normal

temperature sufficiently yielding, under high pressure, to receive the impressions from a suitable record-mold or record-matrix, without having to be heated up; yet they are without any appreciable elasticity, so that they will retain indefinitely the impressions imparted to them by the mold or matrix.

My invention, broadly stated, then, consists of a class of sound-record materials that are waxlike, adhesive and pliable, dense and rigid, non-elastic and practically unyielding, yet yielding under high pressure.

The invention consists more particularly of the employment of an oil, particularly a drying oil, and specifically linseed-oil, as a binder for finely-comminuted solids (such as oxid of zinc or of other metals, classified by painters as "pigments") thoroughly and homogeneously mixed therein, the mixture being allowed to dry.

The invention consists further of the various features and combinations herein-after more particularly set forth and claimed.

My invention will be best understood by describing certain specific embodiments thereof, and the manner of applying the same, with reference to a disk of paper coated with my new record material and carrying a spirally-arranged record-groove of uniform depth, commonly known as zigzag disk sound-records, although my invention is not limited to this specific form and type of sound-record. As a simple example, oxid of zinc is finely ground and thoroughly mixed in linseed-oil; and while it is still in suspension in the liquid oil, the mixture is applied in the form of a smooth coating to the surface of a disk of paper and then allowed to dry; after which the coated paper is ready to be recorded upon by the stylus of any suitable talking-machine. This composition is the ordinary inside white zinc paint; and it is applied to one or both sides of the paper in the consistency usually employed by house painters. Ordinarily the coating will require about a couple of days to dry out thoroughly; and, if desired, the coating may be applied more than once, and its surface may be smoothed or calendered after the paint is thoroughly dry; but I have found a single coating, and without any subsequent treatment, to give good results. Although the thickness or depth of the coating of paint is very slight, yet it is sufficient to permit a zigzag record-groove

of the usual dimensions (or perhaps a little shallower than usual) to be produced therein by the lateral undulations of the recording stylus of any well-known zigzag recording-apparatus.

The oil (linseed-oil), particularly when exposed in a thin sheet or film, oxidizes to produce a tough cohesive substance; and this appears to confer upon the composition the pliability and adhesiveness referred to. It would further appear that the finely-powdered zinc-oxid affords the necessary body or rigidity or substance. And the oxidized oil and pigment together render the composition "waxlike". So far as I have been able to ascertain, other finely-powdered solids, and particularly other finely-powdered pigments such as oxid of lead, may be employed in lieu of the zinc pigment; and other liquid oils, and particularly other drying oils, might take the place (in whole or in part) of the linseed-oil as the vehicle or binder. But the best results have been obtained by the mixture of zinc-oxid and linseed-oil.

Care should be taken, in making a record, that the coated disk be held perfectly flat upon the turn-table of the recording-machine.

In the act of recording in this composition or surfacing, the stylus removes the material from the tablet in the form of small shavings, which separate freely from the body of the surfacing, leaving a record-groove with smooth and cleanly-cut side-walls that contain or constitute the undulations corresponding to the sound-waves.

This new material (pigment with oxidized oil as a binder) is excellent for recording purposes, on account of its homogeneous and waxlike qualities. And, moreover, it adheres perfectly to the paper, and is so pliable that the coated paper may be bent or folded without cracking the record-surface. This enables the coated paper sheets to be employed for the purpose of correspondence through the mails; and they are well suited for dictation purposes, where the tablet may be discarded after only one or two audible reproductions.

The material or class of materials just described, while in every way desirable for original records, does not seem sufficiently rigid or durable to withstand a number of audible reproductions; therefore, to adapt it for that purpose, I incorporate (into the simple mixture of pigment and oil) one or more other finely powdered solids, such as oxid of iron ("crocus powder") or other metallic substance, clays or other earths, and in fact even starch,—which additional bodies will hereafter be referred to as "hard" or "solid" bodies. Moreover, coach-varnish or piano-varnish may be incorporated into the mixture (with or without any additional

solid body, as above) to give a harder and tougher "glaze" to the material,—these last-named ingredients being hereinafter referred to as "glazing." The composition (or class of compositions) thus produced is not affected by the natural changes of heat and moisture, and is sufficiently hard or rigid to retain its shape, except under extreme pressure, as in a stamping press (which is usually a hydraulic press); yet it is not elastic, but when once impressed will permanently retain the impression and will withstand many audible reproductions. This last-named class of materials, comprising the additional ingredients (besides the simple pigment-and-oil) may be applied to a paper disk, and then used for making an original record; or for being impressed by means of a record-matrix, which is usually obtained from an original record by the well-known electroplating process.

Instead of embodying my invention in the form of a coating or surfacing upon a paper disk, the new material may constitute a homogeneous tablet of sufficient thickness to be self-sustaining, to which end the liquid mixture may be molded (as in shallow pans) into the desired form, and allowed to dry and become solidified, after which the surface of the disk tablet will be smoothed in obvious manner. But the new materials are particularly adapted for a surfacing as first above set forth. Owing to the comparative thickness of the prepared disks (which are preferably coated upon both sides), and to the fact that they can be impressed without the use of heat (and the subsequent cooling, and the indispensable delay attending the operation), duplicate disk records can be pressed up from these new tablets with great rapidity.

In the annexed drawings, to illustrate conventionally the nature of my invention, Figures 1, 2, and 3 are face views of separate disk-record tablets embodying or containing different forms of my invention.

In Fig. 1 is shown the record-tablet 1, a paper disk that has been coated with the liquid composition consisting of zinc-oxid in suspension in linseed-oil, which has been allowed to dry, the oil oxidizing in the process. In Fig. 2, 2 represents a similar record-tablet, consisting of a paper disk coated with a liquid composition consisting of the simple mixture of zinc-oxid in suspension in linseed-oil, in which crocus powder, (with or without other finely-comminuted solids) or coach varnish (or other glazing), or both, have been incorporated. The coating has been allowed to dry, the oil oxidizing in the process.

In Fig. 3, 3 represents a homogeneous record-tablet of sufficient thickness to be self-sustaining. It may consist of the solidified mixture of zinc-oxid in oxidized linseed-

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oil, with crocus powder or other hard body, and varnish, or both.

I have described my invention with some particularity of detail, but only for the sake of clearness; since I do not limit myself to any precise material or ingredient, or to any given proportions thereof, or to the precise form of the record-tablet, etc.; and—
 10 with the exception of some finely comminuted solid with an oil as a binder—any or all of the remaining ingredients may be omitted, without departing from the spirit of my invention.

Having thus described my invention, I claim:

1. A sound-record tablet having a record surface consisting essentially of a pigment and oxidized linseed-oil.

2. A sound-record tablet having a record surface comprising a metallic-oxid and an oil.

3. A sound-record tablet having a record surface comprising a metallic-oxid and a drying-oil.

4. A sound-record tablet having a record surface comprising a metallic-oxid and linseed-oil.

5. A sound-record tablet having a record surface comprising a metallic-oxid and oxidized linseed-oil.

6. A sound-record tablet having a record surface comprising zinc-oxid and an oil.

7. A sound-record tablet having a record surface comprising zinc-oxid and a drying-oil.

8. A sound-record tablet having a record surface comprising zinc-oxid and linseed-oil.

9. A sound-record tablet having a record surface comprising zinc-oxid and oxidized linseed oil.

10. A sound-record tablet having a record surface comprising a pigment and an oil with an additional hard body in comminuted condition.

11. A sound-record tablet having a record surface comprising a pigment and an oil with an additional glazing.

12. A sound-record tablet having a record surface comprising a pigment and an oil with an additional hard body in comminuted condition and an additional glazing.

13. A sound-record tablet having a record surface consisting of a homogeneous mixture comprising metallic pigment in comminuted condition, a drying oil, and a varnish.

14. A sound-record tablet having a record surface consisting essentially of finely-comminuted solid material held together by an oxidized drying-oil as a binder.

15. A sound-record tablet comprising a support or backing coated with a composition consisting of metallic pigment in an oil as a binder.

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

VICTOR H. EMERSON.

Witnesses:

MAX B. MARKS,
RALPH L. SCOTT.