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T. A. EDISON.

PHONOGRAPH RECORD AND METHOD OF MAKING THE SAME.

APPLICATION FILED JUNE 29, 1904.

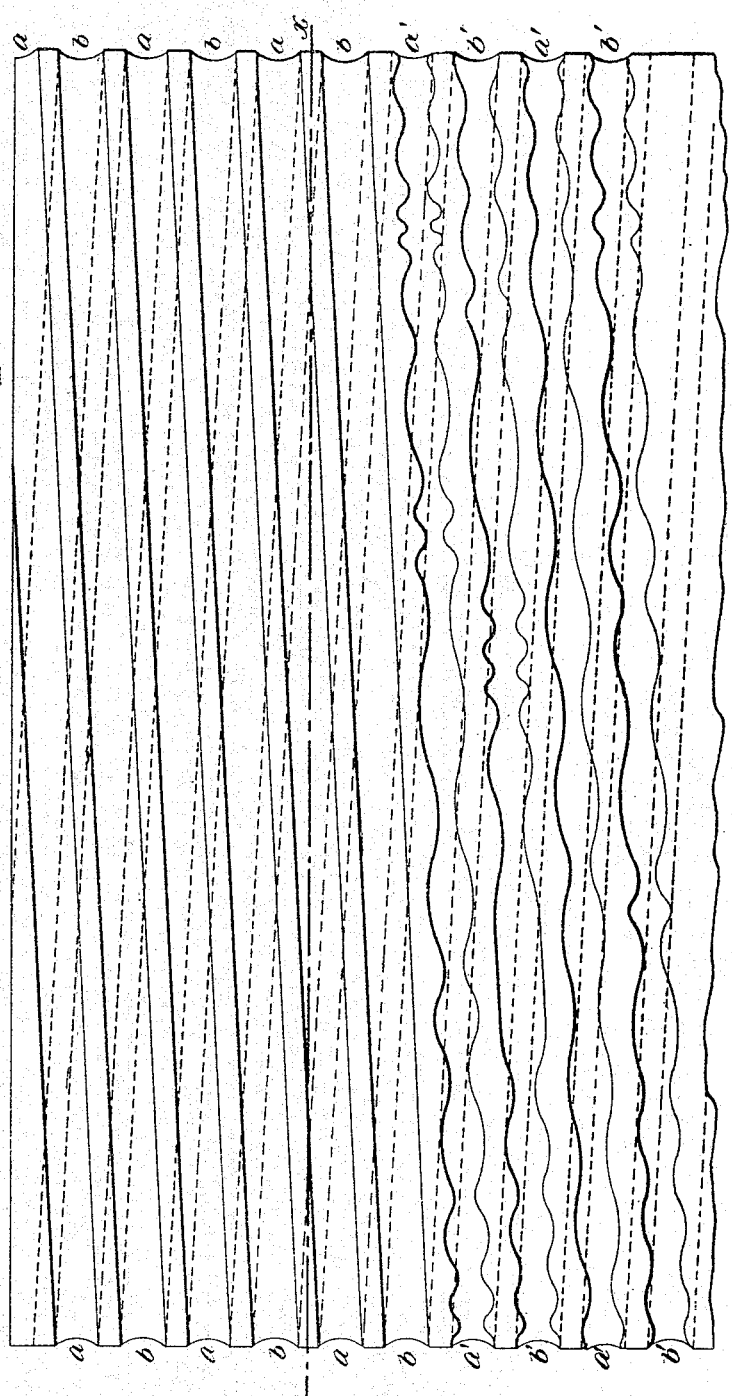

Fig. 1

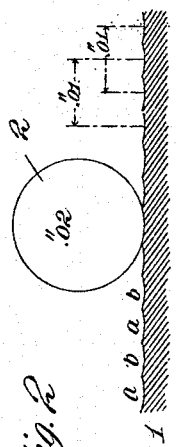

Fig. 2

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UNITED STATES PATENT OFFICE.

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PHONOGRAPH-RECORD AND METHOD OF MAKING THE SAME.

No. 800,800. Specification of Letters Patent. Patented Oct. 3, 1905.

Application filed June 29, 1904. Serial No. 214,650.

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, a citizen of the United States, residing at Llewellyn Park, Orange, county of Essex, and State of New Jersey, have invented a certain new and useful Improved Phonograph-Record and Process of Making the Same, of which the following is a description.

My invention relates, first, to an improved phonograph-record, whether of the cylinder or disk type, in which a plurality of independent record-grooves are formed in the recording-surface, whereby it becomes possible to secure a plurality of phonographic reproductions from the same record, and, second, to an improved process for producing such records.

In an ordinary phonograph-record the available space in which the record-groove may be formed is one one-hundredth of an inch in width, and in this space the very shallow record-groove is cut by a circular recording-tool (actuated by the diaphragm) of about four one-hundredths of an inch in diameter. I find that by properly reducing the diameter of the recording-tool it becomes practically possible to cut as deep a record-groove as that now formed in a space whose width is only half or even one-quarter as great as that now utilized, or from about one two-hundredths to one four-hundredths of an inch. I am therefore enabled to form on a record-surface two or more complete record-grooves, any one of which may be engaged by a proper reproducer-stylus of small diameter, so that a reproduction from any record-groove can be secured. In this way without increasing the size of the records and without changing the reproducing-machines, except to the extent of using a reproducer-stylus of reduced diameter, I am enabled to make use of multiple records with the obvious commercial advantages incident thereto.

The improved process consists in cutting the plurality of record-grooves in the recording material either simultaneously or successively, and it involves a preferred preliminary adjustment of the recording tool or tools in order that the records may not conflict or interfere with one another, but may be entirely independent, so that the reproducer-stylus may be engaged with any one of them throughout the entire reproduction. A record formed in this way can be used directly on a reproducing-machine, or it may be obviously duplicated by any suitable process and any number of copies obtained therefrom, care being of course observed that the pitch of each record-groove shall correspond with the feed-screw of the phonograph, so that the reproduction may be perfect throughout.

In order that the invention may be better understood, attention is directed to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a side elevation, on an enlarged scale, of a cylindrical phonographic recor embodying my present improvements an showing the formation of two complete record grooves thereon greatly exaggerated; and Fig. 2, a detail elevation, on the same scale, of a part of this record, illustrating the process of making the same.

In the views corresponding parts are represented by the same numerals and letters of reference.

The duplex records are formed on a blank 1, which is of the usual recording material. This blank is somewhat longer than those ordinarily employed, so as to provide a clear space at the left of the line X X on which the proper adjustment may be secured. The recorder 2 is of smaller diameter than those ordinarily used, one of a diameter of .020 of an inch being shown, with which a sufficiently deep record can be formed in a space only one two-hundredths of an inch in width. Obviously by reducing the diameter of the recording-tool the depth of the record may be increased. Preferably the recorder is engaged with the blank 1, which is then rotated to form a smooth groove *a* in a space at the left of the line X X, and when this line is passed the recording-diaphragm will be subjected to the effect of sound-waves to form a complete record-groove *a'* on the blank. Obviously between the record-groove so formed a blank space will be left in which one or more record-grooves may be cut. After the record-groove *a'* has been formed the recorder is again engaged with the blank at the left of the line X X to form a smooth groove *b*. The position of this groove with respect to the groove *a* may be observed under the microscope and the recorder adjusted until the groove *b* is located exactly between the groov *a*, so that when the line X X is passed a co

plete record-groove b' may be cut in the blank. It will be evident that if three or more record-grooves are desired these operations will be correspondingly modified, necessitating, of course, the employment of a smaller recording-tool. After the desired records are formed on the blank the latter is cut off at the line X X and may then be used in a reproducing-machine, or it may be employed as a master from which duplicate copies may be secured by any known process. Records of this sort are capable of use on standard phonographs, it being only necessary to make use of a reproducing-stylus of a sufficiently small diameter. It is desirable that the materials used for making duplex records of this kind should be harder than the materials which are at present employed for this purpose, and I prefer, therefore, to use the original record as a master from which duplicate copies in celluloid or other hard material can be secured. By making the records very hard a small reproducing-stylus can be made use of without undue wear.

While I prefer to form a record-groove in he way described by first cutting one groove n the blank and then adjusting the recorder nd then cutting a second record-groove alternately arranged with respect to the first record-groove, it will be understood that two or more diaphragms may be used actuating separate recording-tools, which diaphragms are simultaneously subjected to the different sound-vibrations, whereby all of the record-grooves may be formed simultaneously on the blanks.

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

1. As a new article of manufacture, a sound-record tablet carrying on its surface a continuous sound-record extending around the axis of said tablet a plurality of times and an independent sound-record lying between the windings of said first-named record and extending about the axis of said tablet a plurality of times, substantially as set forth.

2. As a new article of manufacture, a cylindrical sound-record tablet carrying on its surface a continuous sound-record extending around the axis of said tablet a plurality of times and an independent sound-record lying between the windings of said first-named record and extending about the axis of said tablet a plurality of times, substantially as set forth.

3. As a new article of manufacture, a sound-record having an extended portion carrying a plurality of continuous alternately-arranged grooves and on its main portion, a continuous extension of such grooves, alternately arranged representative of sound-vibrations, substantially as set forth.

4. The process of making duplex sound-records which consists in cutting in the face of a blank tablet a continuous sound-record groove extending around the axis of said tablet a plurality of times, and an independent sound-record groove between the windings of said first-named record-groove and extending about the axis of said tablet a plurality of times, substantially as set forth.

5. The process of making duplex sound-records which consists in cutting in the face of a blank cylindrical tablet a continuous sound-record groove extending around the axis of said tablet a plurality of times, and an independent sound-record groove extending about the axis of said tablet a plurality of times, substantially as set forth.

6. The process of making duplex sound-records, which consists in cutting a sound-record groove on a blank cylinder with a space between the groove, and in then cutting one or more continuous sound-record grooves on the space presented between the first groove, substantially as set forth.

7. The process of making duplex sound-records, which consists in cutting a smooth groove on a blank cylinder, and in then subjecting the cutting-stylus to the action of sound-waves to cut a sound-record on the cylinder as a continuation of the smooth groove, then in adjusting the recorder to cut a smooth groove on the blank in the space presented between the first smooth groove, and finally in subjecting the recorder to sound-vibrations to cut a second sound-record on the blank in the space presented between the first record-groove, substantially as set forth.

This specification signed and witnessed this 24th day of June, 1904.

THOS. A. EDISON.

Witnesses:
FRANK L. DYER,
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