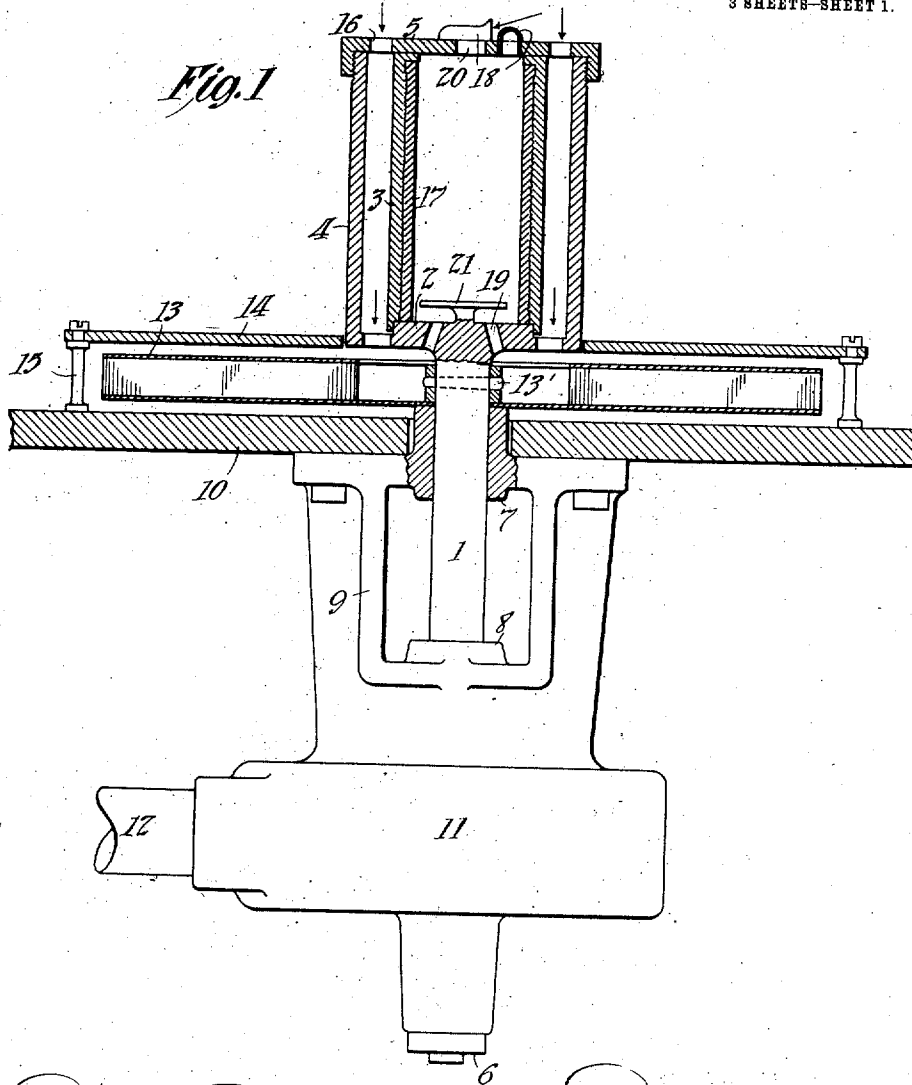


J. W. AYLSWORTH & E. L. AIKEN.  
 PHONOGRAPH RECORD MOLDING APPARATUS.  
 APPLICATION FILED MAY 11, 1909.

1,041,948.

Patented Oct. 22, 1912.

3 SHEETS—SHEET 1.



*Witnesses:*  
 Frank D. Lewis  
 Dyer Smith

*Inventors:*  
 Jonas W. Aylsworth  
 Edward R. Aiken  
 by Frank L. Dyer  
 Att'y.

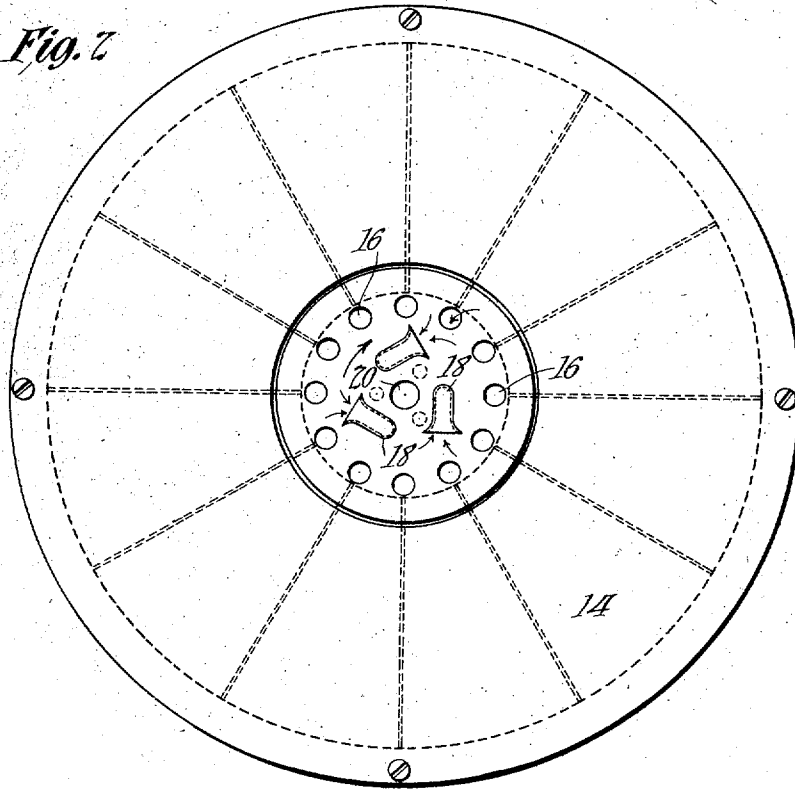
J. W. AYLSWORTH & E. L. AIKEN.  
PHONOGRAPH RECORD MOLDING APPARATUS.  
APPLICATION FILED MAY 11, 1909.

1,041,948.

Patented Oct. 22, 1912.

3 SHEETS—SHEET 2.

*Fig. 7*



*Witnesses:*  
Frank O. Lewis  
Dyer Smith

*Inventors:*  
Jonas W. Aylsworth  
Edward L. Aiken  
by Frank L. Aiken *Att'y.*

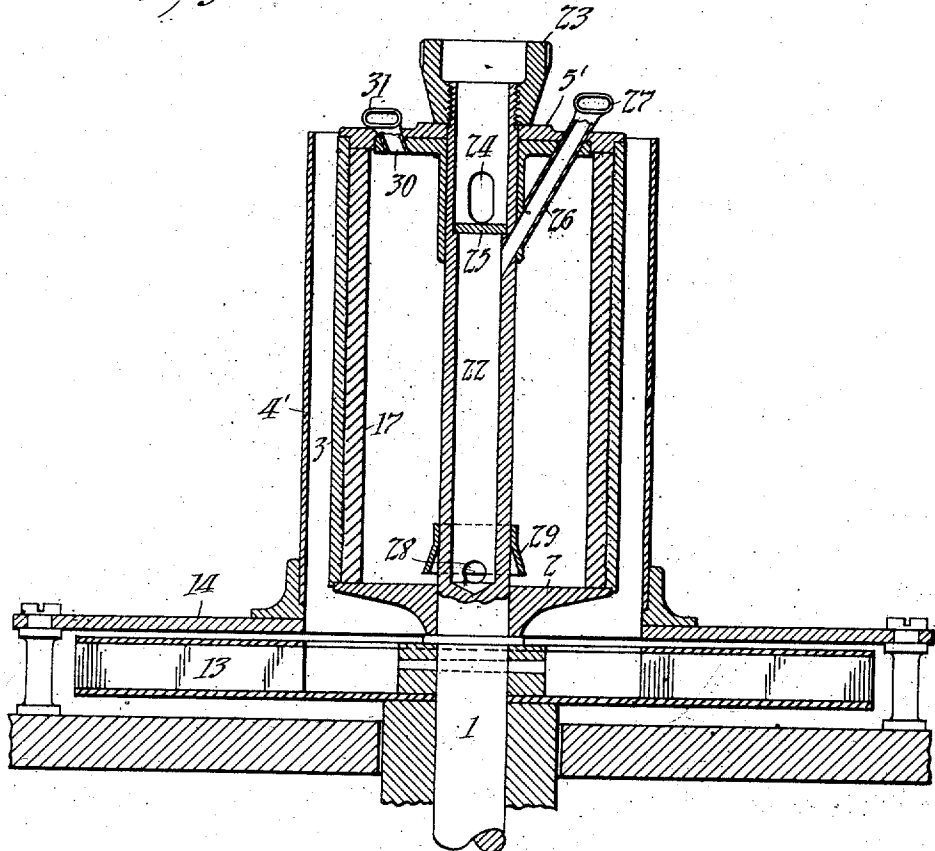
J. W. AYLSWORTH & E. L. AIKEN.  
 PHONOGRAPH RECORD MOLDING APPARATUS.  
 APPLICATION FILED MAY 11, 1909.

1,041,948.

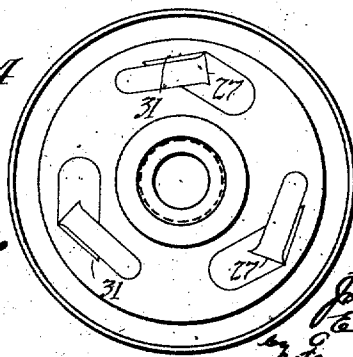
Patented Oct. 22, 1912.

3 SHEETS-SHEET 3.

*Fig. 3*



*Fig. 4*



*Witnesses:*  
 Frank Dwyer  
 Dym Smith

*Inventors:*  
 Jonas W. Aylsworth  
 Edward L. Aiken  
 Frank L. Aylsworth

# UNITED STATES PATENT OFFICE.

JONAS W. AYLSWORTH, OF EAST ORANGE, AND EDWARD L. AIKEN, OF ORANGE, NEW JERSEY, ASSIGNORS, BY MESNE ASSIGNMENTS, TO THOMAS A. EDISON, INCORPORATED, OF WEST ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## PHONOGRAPH-RECORD-MOLDING APPARATUS.

1,041,948.

Specification of Letters Patent.

Patented Oct. 22, 1912.

Application filed May 11, 1909. Serial No. 495,301.

### *To all whom it may concern:*

Be it known that we, JONAS W. AYLSWORTH, a citizen of the United States, and residing at East Orange, Essex county, New Jersey, and EDWARD L. AIKEN, a citizen of the United States, and residing at Orange, Essex county, New Jersey, have made a certain new and useful invention in Improvements in Phonograph-Record-Molding Apparatus, of which the following is a description.

Our invention relates to means for molding sound records by centrifugal action, and the object of our invention is to provide improved and efficient means for this purpose.

In its preferred form, our invention embodies apparatus in which cylindrical sound records are rotated at high speeds about a vertical axis during the formation of the record.

Other objects of the invention consist in the provision of means for cooling the record during its formation and the mold in which the same is formed by the circulation of the atmosphere or any desired gas of sufficiently low temperature past the mold and through the same during the rotation thereof, whereby the diffusion of heat from the hot mold and record composition will be greatly hastened.

In pursuance of these objects, in the preferred embodiment of our invention, we mount a centrifugal fan or equivalent device on the rotating spindle adjacent to one end of the mold and by this means draw the air through the bore of the mold and also longitudinally of the mold on the outer side thereof, suitable means for guiding and leading in the air being provided. Or, in another embodiment of our invention, the air for cooling the record during its formation and the interior of the mold, is drawn into the same and expelled therefrom by the provision of suitably shaped and positioned conduits, and by taking advantage of the rotary motion of the mold without the use of a fan or other external means.

Another object of our invention is the

equipment of a rotatable support for a record mold with individual driving means therefor.

Various of the objects enumerated above, it should be noted, may be carried out in an apparatus rotating about a horizontal axis, although we consider the rotation about the vertical axis superior to the horizontal rotation, where high speeds are necessary.

Other objects of our invention reside in the construction of parts and combinations of the same as described in the following specification and particularly pointed out in the appended claims.

Attention is hereby directed to the accompanying drawings, forming part of this specification, in which like parts are denoted by corresponding reference characters throughout, and in which—

Figure 1 is a side elevation, partly in section, of one form of apparatus embodying our invention. Fig. 2 is a plan view of the same. Fig. 3 is a view similar to Fig. 1 showing a modified form of our invention, and Fig. 4 is a partial top plan view of the same.

Referring to the drawings, the vertical spindle 1, shown in Fig. 1, is formed at its upper end with the horizontal support 2, upon which the mold 3 is adapted to be set. The support 2 has formed integral therewith the hollow cylinder 4 of the same height as the mold 3, and within which the mold is placed, an annular space then separating the mold from the surrounding cylinder 4. The cylinder 4 is screw threaded at its upper periphery and the cap 5 is adapted to be threaded thereon after the mold 3 has been placed in position, the cap securely fastening all the parts enumerated together. The spindle 1 may have a step bearing 6 at its lower end, and also is represented in the drawing as being supported by bearing surfaces at 7 and 8 of the frame 9, which is secured to the stationary member 10. The spindle 1 may be rotated by any convenient means, but we prefer to use the prime mover direct connected to the spindle 1, as the

turbine which is diagrammatically indicated in Fig. 1 at 11. The steam or other motive fluid for this turbine enters through the pipe 12. It is obvious that an electric motor or other convenient means could be used in the place of the turbine shown.

The centrifugal fan 13 is mounted upon the spindle 1 just below the horizontal support 2 at the upper end of the spindle 1, the fan being suitably secured to the said spindle as by means of the pin 13', the fan resting upon the upper surface of bearing 7. This fan is designed to draw air in at its center and throw the same out radially at its periphery, a deflecting plate 14 being provided above the fan and supported by members 15 mounted on the support 10, so that air drawn into the fan 13 can only be expelled at the periphery thereof. As a result of this construction, when the spindle and fan are in rotation, a continuously moving sleeve of air will be drawn in at the upper end of the annular space between the mold 3 and the cylinder 4, the air passing into the fan as indicated by the arrows and expelled at the periphery thereof. The cap 5 is provided with perforations 16 leading into the annular chamber described for the entrance of air into the same.

Circulation of air through the bore of the mold, whereby diffusion of heat from the molten or hot material forming the record 17 on the record surface of the matrix 3 is hastened, is provided for in the embodiment of our invention shown in Figs. 1 and 2 by the employment of openings 18 in the cap 5 for the entrance of the air and by the formation of passages 19 extending through the support 2, and leading into the central portion of the fan 13 for the withdrawal of the air from the bore of the matrix. The entrance members 18 of any desired number are so formed that the rotation of the mold causes air to rush into the same. Accordingly, the mouths of the conduits 18 are directed horizontally approximately at right angles to the direction of movement of the mold, the mouths of the conduits 18 also preferably being bell-shaped. A central orifice 20 in the cap 5 is provided for the insertion of the record material, a baffle plate 21 being provided on the upper surface of the support 2 to prevent the record material inserted through the opening 20 falling into the passages 19 through which the air drawn within the bore of the mold through conduits 8 is drawn out of the same into the fan 13. The material inserted through orifice 20 forms the record 17 on the bore of the matrix 3, spreading out in molten or fluid condition to form the record cylinder of uniform thickness, as indicated. Gravity will be overcome by the centrifugal action if the rate of rotation of the vertical

spindle is sufficiently great, this rate varying with the diameter of the mold.

In the device shown in Figs. 3 and 4, the vertical spindle 1 is provided with an axial passageway extending partway through the same, as shown at 22. In this case, the spindle 1 extends up through the mold 3, which may be mounted on the support 2 in the same manner as in the figures already described, the cap 5' in this case being placed in position on the hollow spindle 1 and resting upon the upper surface of the mold 3, the upper periphery of the spindle 1 being threaded and the nut 23 screwed thereon to securely fasten together the mold, cap and support. The nut 23 is hollow and the record material may be inserted into the mold through the same. Preferably, the hollow spindle 1 is provided with radial openings 24 leading from the bore thereof into the interior of the mold, these openings 24 being in the upper portion of the bore of the hollow spindle and the horizontal partition 25 being provided immediately below the same to divide the bore of the spindle into an upper and a lower portion. Record material dropped into the upper end of the bore of the spindle, falls upon partition 25, and is thrown outwardly by centrifugal force through openings 24 into the matrix, the material falling upon the support 2 and upon the record surface of the matrix 3, and forming the record 17 on the record surface of the matrix under centrifugal action, as explained in connection with the first two figures of the drawings. The fan 13 is mounted on the spindle 1 in this form of our invention in the same manner as in the form already described, but the surrounding cylinder 4' concentric with the mold 3 is, in this case, mounted upon the stationary plate 14, instead of being rotatable with the spindle, as in the first described form of the invention. The circulation of air for cooling the outside of the matrix 3, in this case is the same as that described in the first species. The cooling of the inside of the mold is, however, provided for in a somewhat different manner. The conduits 26 are provided extending from the cap 5' and having horizontally extending mouths 27 above the cap, said mouths extending substantially in a radial direction for drawing in the air, as in the first case. This air is led by the conduit 26 into the lower chamber of the hollow bore of the spindle 1, the air issuing thence into the interior of the matrix through orifices 28 adjacent to the upper surface of support 2 upon which the matrix is carried. These openings 28 may be protected, if desired, by the conical baffle plate 29 formed about the hollow spindle adjacent to the said openings. The air having been admitted into the matrix

through openings 28, proceeds upwardly through the matrix outside of the hollow spindle, and is ejected through conduits 30 formed in the cap 5' near the bore of the record 17, the said conduits 30 being provided with mouths 31 which are directed backwardly as regards the direction of rotation of the matrix and substantially in a tangential plane or at right angles to the mouths 27 of the conduits 26, the air being expelled centrifugally from the mold by this means.

It is to be noted that the necessity for a cooling jacket of water is obviated by the provisions of our invention, and thereby a very considerable cause of defects in centrifugally molded records, as generally made prior to our invention, is eliminated, namely, the formation of bubbles beneath the surface of the record due to small drops of water used in cooling the record flying into the record material during the molding operation. It is difficult, in the methods of centrifugal molding, as previously practised, to prevent this water sometimes finding its way into the record material, and its presence cannot readily be detected until the possible freezing of the same during the transit of the records in cold weather or otherwise, these bubbles, when freezing, ruining the records. Also, the use of a jacket of solid metal surrounding the mold for cooling the same is objectionable, since at the very high speeds of rotation necessary for vertical spinning, there is danger that such a jacket may be burst by centrifugal action.

It is obvious that various modifications may be made in our invention without departing from the spirit thereof, and we therefore do not wish to limit ourselves other than by the language of the appended claims.

Having now described our invention, what we claim and desire to protect by Letters Patent is as follows:

1. In record molding apparatus, a hollow mold, means for supporting and rotating the same, and means for moving a gas and causing the same to affect directly both the inside and the outside of the mold for hastening the diffusion of heat from the inside and outside of the mold and the molten material therein during rotation, substantially as described.

2. In record molding apparatus, a hollow mold, means for supporting and rotating the same, and means for moving a gas past the mold during rotation for cooling the same, substantially as described.

3. In record molding apparatus, a hollow mold, means for supporting and rotating the same, and means for moving a gas past the mold and through the same

during rotation for cooling the same, substantially as described.

4. In record molding apparatus, a hollow mold, means for supporting and rotating the same, and means for forming a sleeve of air about the mold during rotation of the latter and causing the continuous longitudinal movement thereof, substantially as described.

5. In record molding apparatus, a hollow mold, means for supporting and rotating the same, and means for drawing air longitudinally past the mold and through the same during rotation, substantially as described.

6. In record molding apparatus, a hollow mold, a vertical spindle upon which said mold is secured, a prime mover mounted upon said spindle to rotate the same, and means for moving a gas past the mold during rotation thereof for cooling the same, substantially as described.

7. In record molding apparatus, a hollow mold, a rotatable spindle to which said mold is secured, and means mounted upon said spindle and rotating therewith for drawing air past said mold for cooling the same, substantially as described.

8. In record molding apparatus, a hollow mold, a rotatable spindle to which said mold is secured, and an air-jacket surrounding said mold, means for moving air therethrough, and means for rotating said spindle, substantially as described.

9. In record molding apparatus, a hollow mold, a rotatable spindle to which said mold is secured, and means for drawing air into the interior of said mold during rotation, and centrifugal means for withdrawing said air from the mold, substantially as described.

10. In record molding apparatus, a hollow mold, a rotatable spindle to which said mold is secured, and a cap covering said mold, and means in said cap for drawing air therethrough into the interior of said mold during rotation, substantially as described.

11. In record molding apparatus, a hollow mold, a rotatable spindle to which said mold is secured, and a hollow cylinder surrounding said mold, and a centrifugal fan secured to said spindle and arranged to draw air through said cylinder, substantially as described.

12. In record molding apparatus, a hollow mold, a rotatable support for the same upon which the mold is secured, and a cap covering said mold, said cap having conduits arranged therein for drawing air into the mold during rotation, substantially as described.

13. In record molding apparatus, a hollow mold, a vertical rotatable spindle upon

which said mold is mounted, said spindle extending through the upper end of said mold and having a passageway extending therethrough with radial openings there-  
 5 from into said mold for the introduction of the material to be molded, substantially as described.

This specification signed and witnessed this 10th day of May, 1909.

JONAS W. AYLSWORTH.  
 EDWARD L. AIKEN.

Witnesses:

DYER SMITH,  
 JOHN M. CANFIELD.

Correction in Letters Patent No. 1,041,948.

It is hereby certified that in Letters Patent No. 1,041,948, granted October 22, 1912, upon the application of Jonas W. Aylsworth, of East Orange, and Edward L. Aiken, of Orange, New Jersey, for an improvement in "Phonograph-Record-Molding Apparatus," an error appears in the printed specification requiring correction as follows: Page 1, lines 67-68, for the word "donated" read *denoted*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 26th day of November, A. D., 1912.

[SEAL.]

C. C. BILLINGS,

*Acting Commissioner of Patents.*

which said mold is mounted, said spindle extending through the upper end of said mold and having a passageway extending therethrough with radial openings there-  
 5 from into said mold for the introduction of the material to be molded, substantially as described.

This specification signed and witnessed this 10th day of May, 1909.

JONAS W. AYLSWORTH.  
 EDWARD L. AIKEN.

Witnesses:

DYER SMITH,  
 JOHN M. CANFIELD.

Correction in Letters Patent No. 1,041,948.

It is hereby certified that in Letters Patent No. 1,041,948, granted October 22, 1912, upon the application of Jonas W. Aylsworth, of East Orange, and Edward L. Aiken, of Orange, New Jersey, for an improvement in "Phonograph-Record-Molding Apparatus," an error appears in the printed specification requiring correction as follows: Page 1, lines 67-68, for the word "donated" read *denoted*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 26th day of November, A. D., 1912.

[SEAL.]

C. C. BILLINGS,

*Acting Commissioner of Patents.*