

No. 763,564.

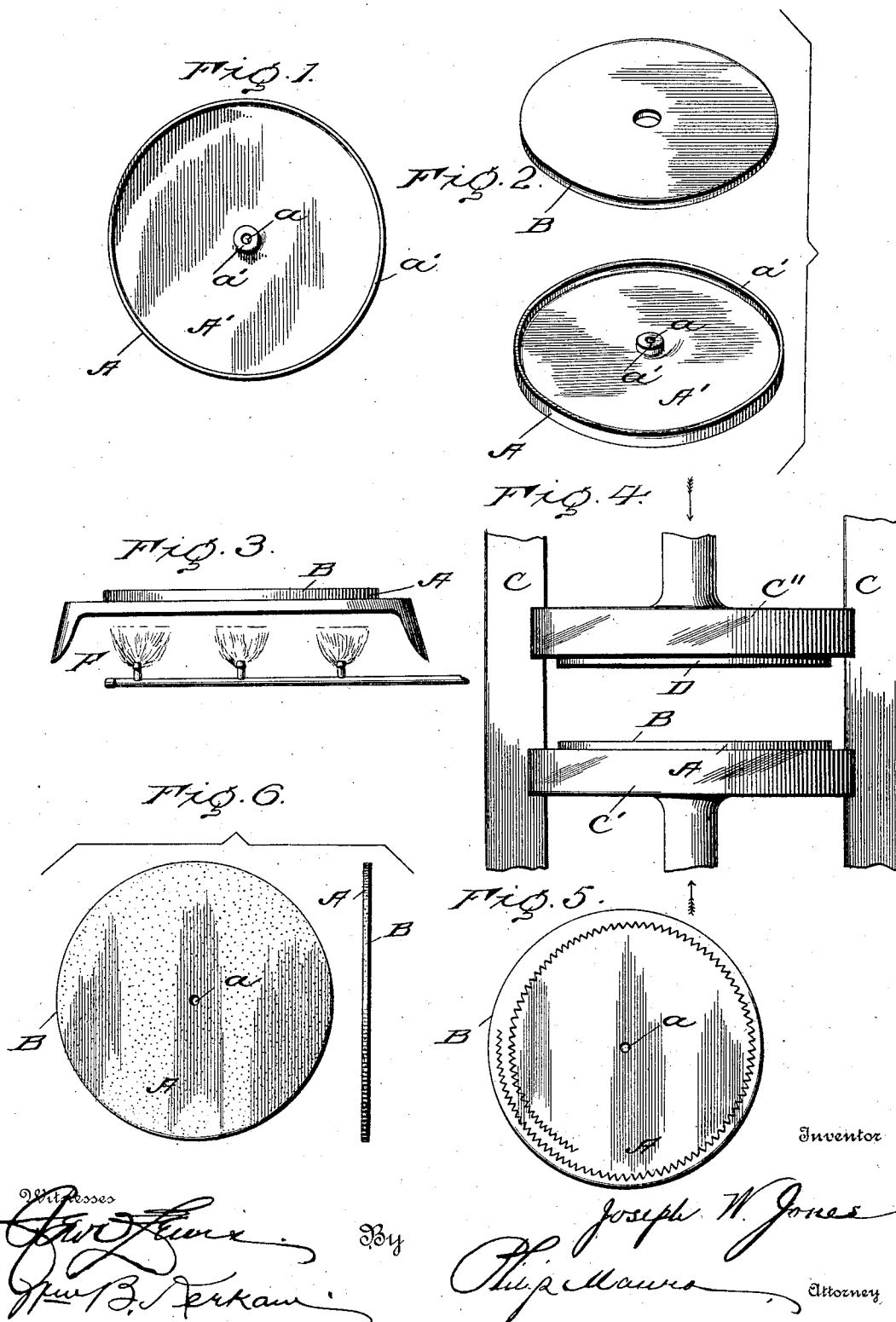
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J. W. JONES.

PRODUCTION OF SOUND RECORDS.

APPLICATION FILED MAR. 27, 1902.

NO MODEL.



UNITED STATES PATENT OFFICE.

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PRODUCTION OF SOUND-RECORDS.

SPECIFICATION forming part of Letters Patent No. 763,564, dated June 28, 1904.

Application filed March 27, 1902. Serial No. 100,319. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH W. JONES, a resident of the borough of Manhattan, city of New York, State of New York, have invented a new and useful Improvement in the Production of Sound-Records, which invention is fully set forth in the following specification.

This invention relates to the production of disk sound-records; and it consists in improvements in the method of impressing into hard material copies from flat matrices made in the ordinary manner, preferably sound-records in which the sound is represented by a groove of uniform depth containing lateral undulations corresponding to sound-waves.

As the invention consists in improvements over the process now employed, it becomes necessary to state briefly the method now used for this purpose. In impressing records from matrices by the present process a hydraulic press and two steel dies are employed. The lower die contains a recess a little larger in diameter than the matrix and considerably deeper. The matrix is placed in this recess face upward, and a sheet of vulcanite, electrose, or the like, commonly spoken of as "fibrous material," is placed over it, rising above the face of the die. The upper die has a flat smooth face and is placed upon the top of the lower die, so as to rest upon the material. These parts, the upper and lower dies, and the matrix and material are then heated. The whole after being thus heated is placed between the plates of the hydraulic press, and upon forcing the two dies together the material is impressed into the matrix. It must then stand for several minutes in order to permit the material to cool and become set. After this the press is opened and the dies removed, and then it is a work of considerable time and difficulty to remove the record from the seat in the lower die. The production of one record consumes at least five minutes, so that twelve records per hour is a good average.

The present invention consists in an improved process of making sound-records of the character above described, which process, broadly stated, consists in placing a thin blank of impressible material in solid form upon a

suitable backing and then simultaneously uniting the blank and its backing while impressing a sound-record into the surface of said blank by means of a suitable matrix.

The invention will best be understood by reference to the accompanying drawings, which illustrate the various steps.

Figure 1 represents a blank which ultimately forms the backing or core. Fig. 2 represents such a blank with the record material to be placed on it. Fig. 3 shows the same being heated. Fig. 4 shows the same in place in a press. Fig. 5 shows the same after it has received the impression of the record, and Fig. 6 shows the same with its edge burnished and its edge and back rendered waterproof.

I first take a blank A of suitable material, to be more fully explained hereinafter, but preferably of pasteboard. This is cut into a circular form with an opening *a* in the center. Preferably the surface of this blank is depressed, as at A', so as to produce the outer and inner circular rims *a'*. The cutting of the blank and the depressing of portion A' may be performed at a single operation. A sheet B of the recording material whose requirements will be more particularly described hereinafter, but which is preferably of duranoid or of any substance commonly called "fibrous material," is laid upon the blank or in the annular depression A' in case the rims *a'* are present. The thickness of the blank is preferably about one thirty-second of an inch and the height of the rims is about the same, while the thickness of the sheet B of fibrous material fills in the annular space to the height of the rims—that is, about one thirty-second of an inch thick—the whole article, which I designate a "tart," being thus about one-sixteenth of an inch thick. This tart is then heated, as at F, so as to maintain the plastic or impressible condition of the sheet B, and is ready for the press. The press C is any suitable quick-moving press, as a compound toggle-press or the like.

C' represents the lower plate, and C'' the upper. These plates do not require to be either cooled or heated. The matrix D is secured in any desirable manner to the upper plate or

plunger on the press. The warm tart is now placed on the lower plate of the press, and the plunger descending compresses the tart to about one-half its former thickness, or to
 5 about one thirty-second of an inch, at the same time impressing the matrix D into the material B. Owing to the thinness of the sheet B, there is no necessity to wait any appreciable time for the material to cool. More-
 10 over, the quickness of the stroke prevents the material from adhering to the face of the matrix. It is also a peculiarity of pasteboard and similar cellular bodies that under pressure they simply flatten and do not spread out or
 15 "creep." The record thus made is at once removed from the press and may now be employed for reproduction. It is better, however, to give the record a finish, as in the following manner: It is placed between two rapidly-revolving circular plates of the same di-
 20 ameter as the record and the outer edge trimmed off and then burnished and coated with waterproofing. The back of the pasteboard is similarly waterproofed, so that the
 25 blank becomes in fact a "core." This article weighs about one-third of the disk sound-record now made.

According to my method, inasmuch as no delay is necessary for cooling the material and
 30 as no manipulation is required to remove the record from a die and also owing to the fact that I can employ a quick-action press, I have been able to make records at the rate of at least ten per minute, which is six hundred per
 35 hour, as contrasted with the twelve per hour by the present process, or fifty to one. Owing to the thinness of sheet B, I use only one-fourth the quantity of plastic material heretofore employed. My invention thus reduces
 40 the cost both of material and labor.

While I have referred to the blank or core as consisting of pasteboard, yet I may employ any suitable and inexpensive backing that is light and durable and not liable to warp or
 45 crack, such as wood fiber and the like, or even metal. Another requirement is that the material of the backing or core should preferably be a poor conductor of heat and should not adhere under pressure to the lower plate
 50 of the press; but it must be such material that the plastic substance employed will adhere closely to it after they are compressed together. It is also desirable that the material employed for this backing should be of such
 55 construction that under pressure it merely flattens and does not spread out or creep. Its coefficient of expansion should approximate that of the recording material. Asbestos fulfills all the foregoing conditions admirably, and
 60 I prefer to employ this material for my blank or core.

I have referred to the material in which the impression is made as "plastic material." I
 65 may employ for this purpose any material normally hard and that can be rendered im-

pressible (or plastic) by treatment, as with heat, in order to receive the impression.

The term "plastic material" as employed by me includes the materials commonly known and used for this purpose, such as celluloid, 70 vulcanite, hard rubber, duranoid, fibrose, electrose, &c.

The article produced as above consists of a thin plate whose face is composed of a sheet of fibrous material (in the sense just described) 75 and which contains a backing or core of a lighter and less expensive material and is entirely waterproof. This article gives reproductions just as good as any records on the market and is equally durable. It is far lighter 80 and is far less expensive, and I may produce fifty of these in the time heretofore required for producing one of the articles now on the market.

The essential feature of the process consists 85 in doing away with the use of the confining-dies and their necessary heating, in enabling me to employ a quick-action press instead of an expensive and slow-moving hydraulic press, in dispensing with the delays necessary for 90 cooling and for removing the record from the die, and particularly in enabling me to employ a comparatively very thin sheet of the plastic material. The lighter and cheaper but equally durable and effective sound-record 95 which I can obtain forms also an essential feature of the invention.

I do not limit myself to the exact steps and devices precisely as pointed out, for changes may be made in details of construction and 100 procedure without in any case departing from the spirit of my invention.

Having thus described my invention, I claim—

1. The process of impressing a sound-rec- 105 ord from a suitable matrix, which consists in placing a thin blank of impressible material in solid form upon a suitable backing and simultaneously impressing the matrix into the surface of the blank and uniting the blank 110 and backing.

2. The process of impressing a sound-rec- ord from a suitable matrix, which consists in placing a thin blank of impressible material in solid form upon a suitable backing, heating 115 said backing and blank thereby softening the latter, and simultaneously compressing the backing and blank together and impressing the matrix into the blank.

3. The process of producing a flat sound- 120 record from a suitable matrix which consists in placing a thin blank sheet of fibrous material such as duranoid or the like upon a backing of asbestos, pasteboard or the like, and then compressing the two together while si- 125 multaneously impressing into said fibrous material the record from the matrix.

4. The improvement in the production of flat sound-records from a suitable matrix, which consists in simultaneously compressing 130

together a thin blank sheet of plastic material
and a thin sheet of suitable backing therefor,
and pressing the plastic material against a
suitable matrix, whereby at a single action
5 the record is produced and its backing secured
thereto.

5. The improvement in the production of
flat sound-records from a suitable matrix
which consists in placing a blank sheet of
10 plastic material upon a suitable backing, then
heating the two, then placing the same be-
tween the plates of a press at normal temper-

ature, and then causing the matrix carried by
one of said plates to be impressed into said
plastic material while said material and back- 15
ing are stamped together by the same action,

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

JOSEPH W. JONES.

Witnesses:

C. A. L. MASSIE,
ELISHA K. CAMP.