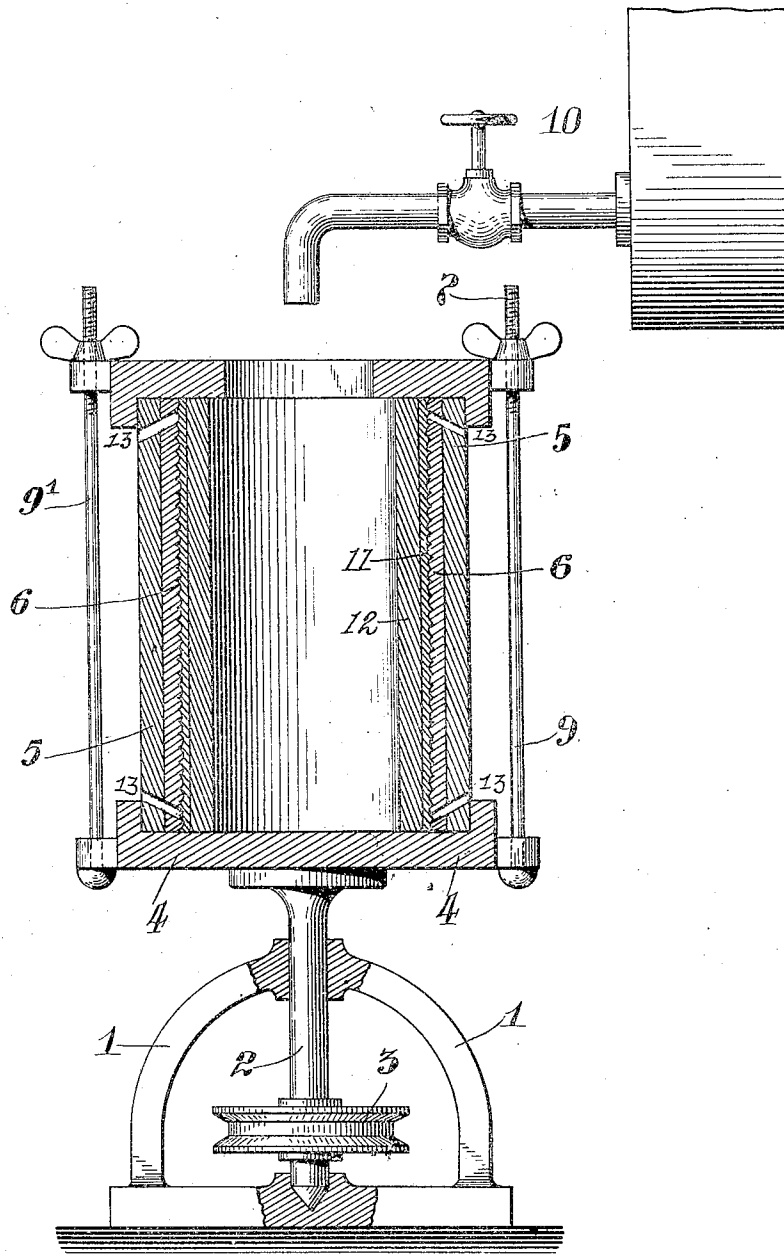


F. W. MATTHEWS.
 PROCESS OF DUPLICATING PHONOGRAMS.
 APPLICATION FILED AUG. 16, 1909.

951,483.

Patented Mar. 8, 1910.



Attest: ...
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UNITED STATES PATENT OFFICE.

FREDERICK W. MATTHEWS, OF NEW YORK, N. Y.

PROCESS OF DUPLICATING PHONOGRAMS.

951,483.

Specification of Letters Patent.

Patented Mar. 8, 1910.

Application filed August 16, 1909. Serial No. 513,193.

To all whom it may concern:

Be it known that I, FREDERICK W. MATTHEWS, a citizen of the United States, residing at the borough of Brooklyn, city of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Processes of Duplicating Phonograms, of which the following is a specification.

My invention relates to improvements in processes of duplicating phonograms of the so-called "indestructible" type and my objects are the simplification of the processes of manufacture, the cheapening of the cost of production, the use of very thin impressible material for the facing if desired, and the production of faced, backed and imprinted phonograms at one operation if desired.

The accompanying drawing is a sectional view of an apparatus by the aid of which the process may be practiced.

The process is a modification of the "spinning" process of duplicating phonograms and the apparatus comprises a frame 1 carrying a shaft 2 provided with a driving pulley 3. The upper end of the shaft carries a base 4 on which a shell 5 rests and within which shell may be placed any desired matrix 6 having a negative phonogram on its inner face. A cap 7 with a central aperture 8 covers the top of the shell and matrix while clamp rods 9, 9' hold all the parts to the base. A faucet 10 affords means for injecting centrifugal pressure material to the apparatus.

In practicing the process a film 11 of any impressible material, either in seamless tubular form, seamed tubular form, or sheet form with overlapped edges is inserted in the matrix (it may be temporarily secured in fixed relation thereto) and the apparatus is put together as shown. The entire apparatus is then revolved at a high rate of speed and any material 12 capable of exerting centrifugal pressure on the impressible film is run into the apparatus and the spinning continued long enough to imprint the negative matrix into the impressible material previously inserted therein thereby producing a positive phonogram. The trapped air between the matrix and the film escapes through the vents 13 during the spinning operation thereby avoiding bald or bare spots

in the record. The centrifugal pressure material may be run into the apparatus either before or during the spinning but in order to form the phonogram the material, film and matrix must be revolved together. By film of impressible material is meant any substance such as celluloid, xylonite, rubber, gelatin or any like material in solid form, as distinguished from a liquid, capable of receiving and retaining the imprint of the matrix either in a cold state, or in a heated state with subsequent cooling, or chemically softened with subsequent hardening.

The material for effecting the centrifugal pressure may be one which does not solidify at ordinary temperatures such as water or mercury and which, after the phonogram has been imprinted, may be removed from the apparatus before the backing is applied. Or it may be a plastic substance or a semi-solid substance which effects the pressure and then solidifies to form the backing to support the record film. The internal centrifugal pressure material may be a plug or mandrel inserted within the film of impressible material which plug or mandrel is capable of exerting centrifugal pressure by expansion when spun. The heat when necessary may be applied either externally or the centrifugal pressure material may be heated so that the heat is applied to the film internally. After the phonogram has been spun and imprinted the cap 7 is removed, the phonogram withdrawn from the matrix and if the backing has been inserted during the spinning operation it is reamed to size and finished. If no backing has been inserted any suitable backing may be put in thus completing the record.

By this process a much thinner film of impressible material may be used than is possible with heretofore existing processes thus cheapening the cost of production. If the backing is formed inside the phonogram during the spinning the cost is still further reduced.

I am aware that plastic material has been placed in a revolving matrix and phonograms imprinted directly on such plastic material by centrifugal action and do not claim any such processes, my invention being confined to imprinting phonograms on films of impressible material by centrifugal action

exerted thereon by some material inserted within the film, which material is capable of exerting centrifugal force when spun.

I claim:—

5 1. The process of duplicating phonograms comprising the introduction of a film of im-
pressible material within a matrix, intro-
ducing material capable of exerting cen-
trifugal pressure within the film, revolving
10 the matrix, film and material at a speed suffi-
cient to imprint the matrix in the film by
centrifugal action and removing the phono-
gram thus formed.

2. The process of duplicating phonograms
15 comprising the introduction of a film of im-
pressible material within a matrix, intro-
ducing material capable of exerting cen-
trifugal force within the film, softening the
film, revolving the matrix film and material
20 at a speed sufficient to impress the matrix in
the softened film by centrifugal action, har-
dening the film to retain the imprint and
removing the phonogram thus formed.

3. The process of duplicating phonograms
25 comprising the introduction of a film of im-
pressible material within a matrix, intro-
ducing material capable of exerting cen-
trifugal pressure within the film, said mate-
rial also being capable of solidifying to form
30 a backing for the phonogram, revolving said
matrix, film and material at a speed suffi-
cient to imprint the matrix in the film by
centrifugal action and enough longer to per-
mit the solidifying of the backing in inti-
35 mate contact with the imprinted film and re-
moving the record thus formed.

4. The process of duplicating phonograms
comprising the insertion of a film of im-
pressible material within a matrix, revolving
40 film and matrix, introducing material
capable of exerting centrifugal pressure
within the revolving matrix and film where-

by the matrix is imprinted in the film by
centrifugal action and removing the phono-
gram.

5. The process of duplicating phonograms
45 comprising the insertion of a film of impres-
sible material within a matrix, revolving film
and matrix, softening the film, inserting
material capable of exerting centrifugal
50 pressure within the film whereby the matrix
is impressed in the film by centrifugal ac-
tion, hardening the film to retain the im-
print and removing the phonogram.

6. The process of duplicating phonograms
55 comprising the introduction of a film of im-
pressible material within a matrix, intro-
ducing material capable of exerting cen-
trifugal pressure within the film, revolving
the matrix, film and material at a speed
60 sufficient to imprint the matrix in the film
by centrifugal action, removing the pres-
sure material, inserting material to form a
backing which backing is secured to the film
65 by centrifugal action on the continued revo-
lution of matrix, film and backing and re-
moving the phonogram.

7. The process of duplicating phonograms
comprising the introduction of a film of im-
pressible material within a matrix, intro-
70 ducing material capable of exerting cen-
trifugal pressure within the film, revolving
the matrix, film and material at a speed
sufficient to imprint the matrix in the film
by centrifugal action, permitting the trapped
75 air between the matrix and film to escape
and removing the finished phonogram.

In testimony whereof I have affixed my
signature in presence of two witnesses.

FREDERICK W. MATTHEWS.

Witnesses:

ROBT. B. KILLGORE,
F. McINERNEY.