

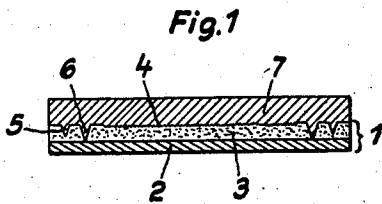
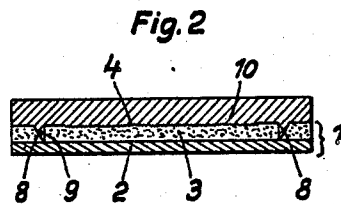
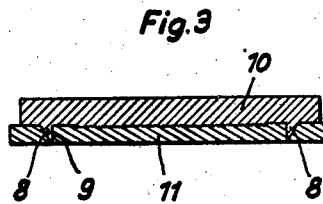
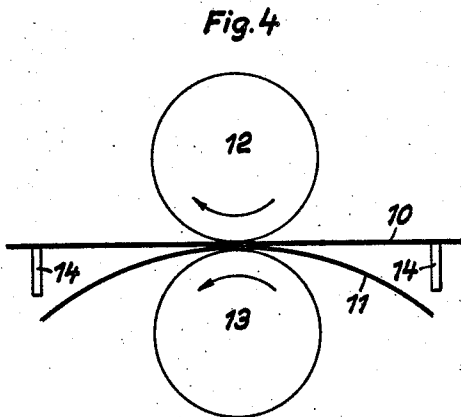
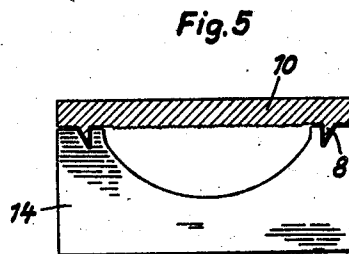
Feb. 24, 1942.

H. WESTERKAMP

2,274,570

PROCESS FOR PRODUCING SOUND FILMS AND MATRIX THEREFOR

Filed May 14, 1940



Inventor:

Hugo Westerkamp
By: Mason, Porter
Attorneys

UNITED STATES PATENT OFFICE

2,274,570

PROCESS FOR PRODUCING SOUND FILMS
AND MATRIX THEREFOR

Hugo Westerkamp, Cologne-Braunsfeld, Germany

Application May 14, 1940, Serial No. 335,194
In Germany June 28, 1939

5 Claims. (Cl. 18—5.3)

The invention relates to a process for producing sound films with mechanical sound recording by pressing a ribbon-shaped matrix on a ribbon capable of being pressed, and to a pressing matrix for carrying out this process.

The object of the invention is to reduce the quantity of the material required for producing sound films to a small amount, particularly also in the case of sound films produced by means of a pressing matrix with lateral guide ridges.

For this purpose, the invention provides continuous pressing of the matrix on a ribbon whose width exceeds that of the sound track area, at the same time cutting off the margin of the ribbon outside the sound track area by means of ribs on the matrix extending along the sound record. In using a pressing matrix with lateral guide ridges, the invention furthermore provides for dimensioning these ridges so as to simultaneously fulfill the function of the ribs of cutting the margins of the pressed films.

In this respect it is observed that it is known in producing gramophone records by means of a pressing matrix to provide the circular matrix at its circumference with a rib for limiting the circumference of the gramophone record. Such matrices are, however, merely used for producing gramophone records from a formless material placed below the pressing matrix which is flattened by the pressure exerted, the material flowing irregularly from the centre of the pressing matrix to its edge and beyond this edge, thus not only thickening this edge but also giving it a quite irregular shape. The outer rib of the pressing matrix in the present case serves to produce a circular disc with a smooth edge, whereas the rib does not, as in the case of the process according to the invention, serve to cut a sound carrier having a smooth edge merely for the purpose of saving material, considering also that in the case of the mentioned production of gramophone records no considerable saving of material is effected, the discs neither being provided from the beginning with a broad unrecorded margin nor requiring such a margin, whereas the production of perfectly reproducible sound ribbons by pressing with a ribbon-shaped matrix is only possible if the width of the unrecorded sound ribbon exceeds that of the sound track area to such a degree that the unrecorded marginal zones amount to nearly half the width of the entire ribbon being pressed.

A ribbon-shaped pressing matrix according to the invention is provided, on both sides of the sound track area, with preferably knife-shaped

ribs running in longitudinal direction of the ribbon and having a height equal to or greater than the thickness of the films to be pressed. Preferably, the ribs are shaped so as to be steep towards the sound tracks, thus serving at the same time as guide ridges for the matrix.

Pressing matrices according to the invention are suitably produced by cutting a guide groove into the wax layer of the original record with a depth equal to the height of the ribs to be produced for cutting the films and by providing in known manner a galvanoplastic coating on the original record.

The drawing illustrates by way of examples the production of a pressing matrix according to the invention and the production of pressed films with the aid of such a matrix.

Fig. 1 is a section through a recorded original wax ribbon and a matrix corresponding to this ribbon.

Fig. 2 is a corresponding view of a modified arrangement.

Fig. 3 shows the pressing of the matrix into an impressible ribbon.

Fig. 4 is a conventional showing of the apparatus for pressing the matrix into a ribbon.

Fig. 5 is a transverse sectional view showing the employment of the guiding gauge in Fig. 4.

The wax ribbon 1 consists of a carrier 2 with a wax layer 3 thereon. This wax layer bears the sound tracks 4 cut into it. Parallel to the edges of the sound ribbon on either side of the sound track area runs a guide groove 5 whose depth is greater than that of the sound tracks. Between the guide groove 5 and the sound tracks 4 there is another groove 6 parallel to both edges of the sound ribbon. The depth of this groove 6 is greater than that of the groove 5, the cutting depth of the groove 5 being equal to or greater than the thickness of the films to be pressed.

The surface of the sound ribbon with the sound tracks 4 and the grooves 5 and 6 is next provided with a conductive coating, for example by graphitizing or by cathode atomizing, whereupon the matrix 7 is prepared in the galvanic bath. This matrix has then in its central portion the sound tracks 4 and on either side of these tracks of guide ridge 5 and a rib 6. The guide ridges 5 serve for guiding the matrix ribbon in pressing the sound film copy, whereas the ribs 6 cut the pressed copy at the sides.

Instead of providing a matrix with guide ridges 5 and ribs 6, it is also possible to give the ridges 5 the shape of ribs for cutting the film copy. Fig. 2 shows an original sound record ribbon 1,

for example a wax ribbon, consisting of a carrier 2 and a wax layer 3 into which the sound tracks 4 are cut. At the side of the sound tracks and parallel to the edges of the original sound ribbon there are cut two deep grooves 5, the depth again being equal to or greater than the thickness of the films to be pressed. The surface 6 of the groove adjacent to the sound tracks 4 is perpendicular or nearly perpendicular to the surface of the film.

In Fig. 2, the matrix produced by means of such an original sound ribbon, for example, in the manner described above, is marked 10. After being removed from the original sound record ribbon, the matrix is used for pressing the sound film copy.

This pressing is illustrated diagrammatically in Fig. 3, in which 10 signifies the pressing matrix and 11 the film to be pressed. The matrix ribbon, illustrated by way of example in Fig. 4, is passed together with the ribbon to be pressed between two pressing rollers 12 and 13, so that the matrix and impressible ribbon advance longitudinally together at the same rate; there being arranged gauges 14 before and behind the rollers for guiding the matrix ribbon. These gauges are illustrated in cross section in Fig. 5; the lateral guiding of the matrix ribbon by the ribs 8 is clearly visible in Fig. 5.

As the height of the ribs 8 is equal to or greater than the thickness of the ribbon to be pressed, the latter is simultaneously pressed and cut at the sides to provide a central impressed sound record portion and lateral trimmed-off portions.

What is claimed is:

1. A process of producing sound films with mechanical sound record grooves therein, which comprises preparing a flexible ribbon-shaped matrix having on a restricted central portion of its width sound track ribs corresponding to the grooves to be formed and also having further ribs located at both sides of and outside the area of the sound track ribs, said further ribs being parallel and straight when the matrix is held in flat position and being spaced apart a distance corresponding to the desired width of the sound film, and pressing the matrix upon an impressible ribbon whose width exceeds that of the spacing between said further ribs whereby to reproduce the sound track ribs of the matrix as sound track grooves in the impressible ribbon, said further ribs being effective during the pressing for cutting through the ribbon and separating a central impressed sound record portion from lateral trimmed-off portions.

2. A process of producing sound films with mechanical sound record grooves therein, which comprises preparing a flexible ribbon-shaped matrix having sound track ribs thereon corre-

sponding to the grooves to be formed and also having further ribs located laterally outside the area of the sound track ribs, said further ribs being parallel and straight when the matrix is held in flat position and being spaced apart a distance corresponding to the desired width of the sound film, advancing the matrix and an impressible ribbon lengthwise and at the same rate while employing the said further ribs for guiding the matrix in its lengthwise advancing movement, said ribbon having a width greater than the spacing between said further ribs, and pressing the matrix upon the ribbon whereby to reproduce the sound track ribs of the matrix as sound track grooves in the impressible ribbon, said further ribs being effective during the pressing for cutting through the ribbon and separating a central impressed sound record portion from lateral trimmed-off portions.

3. A process of producing sound films with mechanical sound record grooves therein, which comprises mechanically cutting longitudinal sound record grooves into a restricted central portion of the width of a wax layer of an original record in accordance with the sound record to be produced, cutting deep guide grooves into said wax layer at each side of the area occupied by the sound record grooves, preparing a flexible matrix from said original record having thereon ribs as the counterpart of said grooves, concurrently longitudinally advancing said matrix and an impressible blank record ribbon of width greater than the width of the desired sound film while employing the counterparts of said guide grooves for guiding the matrix during its advancement, and pressing the matrix and blank together for producing the sound record grooves in the blank and for severing a central portion as a sound film from lateral trimmed-off portions.

4. A flexible matrix for producing sound films with mechanical sound record grooves therein, comprising a ribbon-shaped member having a plurality of sound track ribs extending along its length for a restricted central portion of the width thereof, said member also having further ribs of knife-like shape which in the flat position of the matrix extend parallel and straight along its length outside and at each side of said central portion for providing longitudinal guides for handling the matrix, said further ribs being higher than the sound record ribs and providing means for cutting an impressible ribbon blank to a predetermined definite width with the sound tracks positioned at a predetermining definite location thereon.

5. A matrix as in claim 4, in which the said further ribs are each shaped to have a steep face at the side thereof adjacent the sound track ribs.

HUGO WESTERKAMP.