

T. A. EDISON AND C. G. KIRCHER.
MOLD.

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1,417,463.

Patented May 23, 1922.

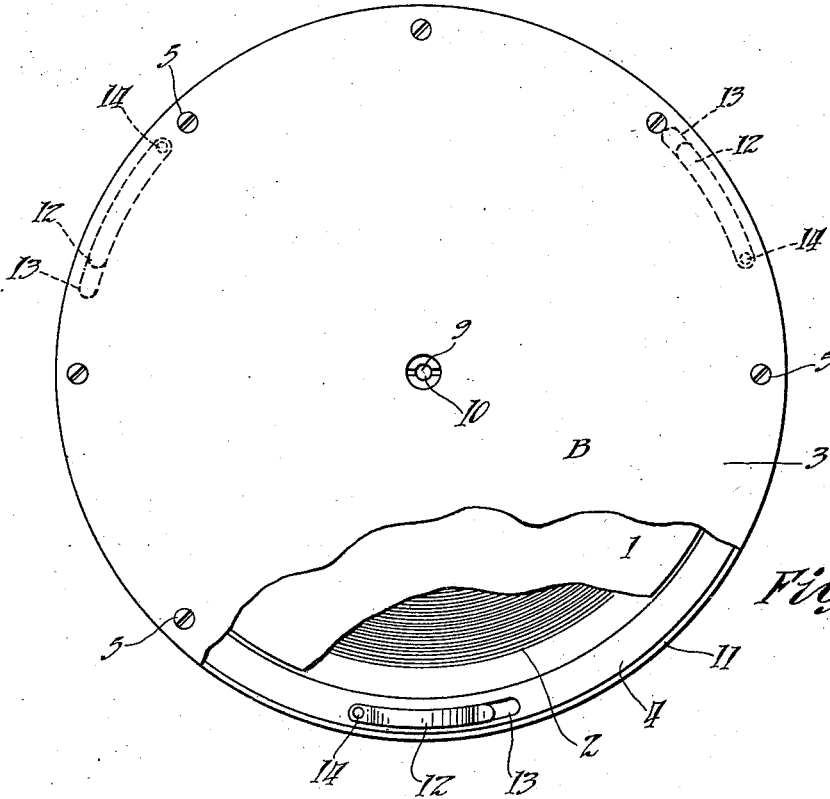


Fig. 1

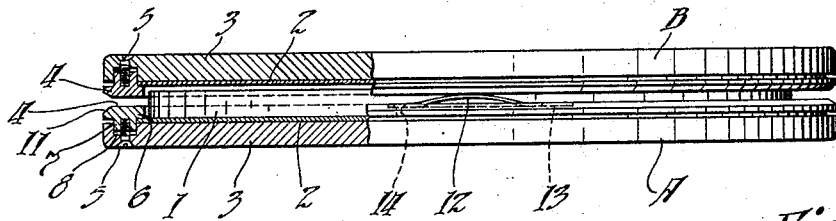


Fig. 2

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UNITED STATES PATENT OFFICE.

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MOLD.

1,417,463.

Specification of Letters Patent. Patented May 23, 1922.

Application filed July 3, 1919. Serial No. 308,380.

To all whom it may concern:

Be it known that we, THOMAS A. EDISON, a citizen of the United States, and a resident of West Orange, Essex County, New Jersey, and CHARLES G. KIRCHER, a citizen of the United States, and a resident of Irvington, Essex County, New Jersey, have invented certain new and useful Improvements in Molds, of which the following is a description.

Our invention relates to molds and more particularly to molds for use in the manufacture of sound records of the disc type and which are adapted to impress a sound record into either or both faces of the sound record material or blank. In forming these records, it is customary to make a matrix of copper or other suitable metal by electroplating the metal on a master record previously rendered electro-conductive by a coating of graphite or other suitable material, and to mount this matrix in a suitable mold holder preferably comprising a heavy backing such as a plate of steel, to which the matrix is secured as by means of a clamping ring, in order to give the matrix sufficient rigidity for use as a stamp or die to impress the record into the record material or blank. When it is desired to produce a record on both faces of the disc, a mold assembly comprising a pair of such dies arranged in opposed relation with the record material or blank disposed therebetween is employed, and the dies are forced together under high pressure and heat. When it is desired to produce a record on but one face of the disc, a blank matrix is substituted for the sound record matrix in one of the dies of the mold assembly.

In mold assemblies of this character, the upper dies are usually supported by the material or blank to be molded, with the minute delicate projections of the negative sound records formed on the surfaces of the matrices directly engaging such material or blanks. Where blanks having a hard surface are employed, as for example, blanks from which Edison disc records are molded and which are provided with a veneer or surface layer consisting of a hard phenolic condensation product which is only slightly thermo-plastic, these minute projections of the sound record matrices are subjected to considerable wear and are very apt to be

injured by the record blanks disposed between the dies previous to the rendering of such blanks plastic by the application of heat. Moreover, it is practically impossible for the workmen to assemble the dies and blanks in such a manner as to prevent injury to the molding surfaces of the matrices and to so handle the mold assemblies as to prevent further injury to such surfaces. The result is the surfaces of these matrices soon become defaced or impaired to such a degree that it is impossible to mold satisfactory sound records therefrom, and the number of sound records it is possible to obtain from a given matrix is therefore quite limited.

The principal object of our invention is to provide an improved construction for molds whereby the above objections will be obviated and whereby the number of satisfactory sound records or other molded articles obtainable from a given sound record or other matrix is greatly increased; and in general our invention resides in the provision of means whereby the dies of a mold assembly within which is the blank to be molded, will, previous to the application of the molding pressure, be maintained in a position with the opposed mold surfaces spaced apart a distance in excess of the thickness of the main body portion of the article or blank to be molded so that the molding surfaces of the dies will be relieved of all pressure due to the weight of the upper die.

In order that our invention may be more clearly understood, attention is directed to the drawing accompanying and forming a part of this specification, and in which:

Figure 1 is a plan view, partly broken away, of a disc record mold assembly having our invention applied thereto and consisting of a pair of opposed mold dies with a record blank disposed therebetween; and

Figure 2 is a view in side elevation, partly in section, of the mold assembly shown in Figure 1.

Referring to the drawing, reference character 1 represents a sound record blank each face of which is adapted to be impressed with a sound record by means of a mold comprising a pair of dies or stamps between which the blank is disposed. The dies arranged with the record blank disposed therebetween as shown, constitute the mold assembly. Each of the dies or stamps of the

mold preferably comprises a substantially flat circular matrix 2 bearing against a heavy substantially flat backing or plate 3 formed of steel or other suitable material.

5 A ring or annular clamping member 4 is secured to each backing plate 3 by a plurality of screws or other suitable fastening members 5, the ring 4 extending inwardly beyond the matrix 2 and the extending portion thereof being provided with a lip or flange 6 overlying the peripheral portion of the matrix. The backing plates 3 and the corresponding clamping rings 4 respectively constitute a pair of mold holders represented by reference characters A and B. The portion of each ring 4 into which the screws extend is preferably provided with an annular flange or projection 7 which fits within a correspondingly shaped recess 8 formed in the respective backing plate 3. The portion of each ring 4 which extends above or beyond the corresponding matrix 2 is preferably slightly less in thickness than one-half the thickness of the records which are designed to be formed in the mold.

The two mold dies and the record blank disposed therebetween are maintained concentric by means of the usual centering pin 9 which extends through suitable openings provided in the dies and blank at the center thereof, and each of the matrices 2 is suitably secured at its center to the respective backing plate 3, by means comprising a bushing or sleeve 10 secured in the openings at the center of the backing plate and matrix and through which the pin 9 extends.

Each of the rings or clamping members 4 is provided with a bevel 11 at its outer edge portion, whereby an annular wedge-shaped groove is formed between the rings of the mold assembly, which enables the mold dies to be readily separated by means of wedges or the like and the record removed.

In order to prevent damaging contact of the molding surfaces of the dies and the record blank 1 disposed therebetween, we preferably provide means whereby, in the absence of the molding pressure, the dies of the mold assembly are maintained in a position with the molding surfaces of the matrices 2 thereof spaced apart a distance in excess of the thickness of the main body portion of the blank 1, as shown in Figure 2. In the preferred embodiment of our invention, this means comprises a plurality of resilient members carried by one of the dies and arranged to yieldingly support the other die in the desired spaced relation. As shown in the drawing, these resilient members are in the form of leaf springs 12 carried by the clamping ring 4 of the mold holder of the lower die. The leaf springs 12 are respectively disposed in correspondingly shaped recesses 13 formed in the upper face of the ring and are respectively secured at one end to the ring adjacent one end of the respective recesses, as by means of pins or rivets 14, and are free at their other end. The intermediate portions of the springs 12 normally bow upwardly so as to extend a considerable distance above the face of the ring 4 to which they are secured. It will therefore be apparent that when the upper die is placed in position in assembling the mold, the clamping ring 4 thereof will engage and rest on the upwardly bowed portions of the leaf springs 12, which are of sufficient stiffness to yieldingly support the upper die in the position shown with the matrix 2 thereof spaced from the record blank 1. When the molding pressure is applied, the mold dies of the mold assembly will be forced toward each other and the leaf springs 12 will be pressed flat into the recesses 13.

It will be obvious that the springs 12 may be applied to the upper mold die instead of to the lower die. It is also to be understood that the construction shown is subject to numerous other changes and modifications without departure from the spirit of the invention and the scope of the appended claims.

Having now described our invention, what we claim as new and desire to protect by Letters Patent of the United States is as follows:—

1. A mold die provided with means distinct from any working or molding portion of said die and adapted to coact with a second mold die when said dies are disposed in proper co-operative position to maintain the dies in opposed spaced relation, substantially as described.
2. A mold die comprising a matrix and having applied thereto adjacent the periphery of the matrix resilient means a portion of which normally extends beyond the die forwardly of the face thereof corresponding to the molding surface of the matrix, substantially as described.
3. A mold die for use in molding flat articles and provided with means adapted to coact with a molding member which is co-operative with said die in molding such an article, so as to maintain such molding member, prior to the application of the molding pressure, in a position with the molding face thereof spaced from the molding face of said die a distance in excess of the thickness possessed by such article prior to the molding thereof, substantially as described.
4. A mold die comprising a mold holder, a flat sound record matrix applied thereto, and a plurality of resilient members applied to the mold holder adjacent the periphery of said matrix and adapted to be engaged by a second die and to yieldingly maintain the said dies with their molding faces spaced apart a distance in excess of the thickness possessed by the record blank to be mold-

ed prior to the molding thereof, substantially as described.

5. In a mold die, a mold holder comprising a substantially flat backing member, a disc-shaped matrix applied to said backing member, and a plurality of spaced resilient members applied to said holder beyond the edge of the matrix, said resilient members having portions normally extending beyond and forwardly of the face of the die, substantially as described.

6. In a mold die, a mold holder comprising a substantially flat backing member, a disc-shaped matrix applied to said backing member, and a plurality of spaced leaf springs applied to said holder beyond the edge of the matrix, said leaf springs having portions normally extending beyond and forwardly of the face of the die, substantially as described.

7. In a mold die, a mold holder comprising a substantially flat backing member, a disc-shaped matrix applied to said backing member, said holder being provided with a plurality of spaced recesses located adjacent and beyond the edge of the matrix, and a plurality of leaf springs, said leaf springs being respectively secured at one end to the mold holder within said recesses, said leaf springs being free at the other end and having portions normally extending above the mold holder and matrix, and said recesses being adapted to respectively receive said leaf springs when the latter are pressed flat, substantially as described.

8. In a mold die, a substantially flat backing member, a disc-shaped matrix, a ring securing said matrix at its periphery to said backing member, the upper face of said ring being provided with a plurality of spaced recesses, and a plurality of leaf springs respectively secured at one end to said ring within said recesses and being free at the other end, said leaf springs having portions normally extending above the ring, substantially as described.

9. In a mold assembly, the combination

of a pair of opposed dies having substantially flat matrices and adapted to be forced together to mold a tablet or blank disposed between said matrices, and means tending to yieldingly maintain said dies spaced apart so that said matrices will be separated a distance in excess of the thickness possessed by such tablet or blank prior to the application of the molding pressure, substantially as described.

10. In a mold assembly, the combination of a pair of dies provided with opposed substantially flat matrices and adapted to be forced together to mold a tablet or blank disposed therebetween, and means comprising a plurality of resilient members applied to one of said dies and coacting with the other die so as to yieldingly maintain said matrices spaced apart a distance in excess of the thickness possessed by such tablet or blank prior to the application of the molding pressure, substantially as described.

11. In a mold assembly, a pair of dies provided with opposed substantially flat matrices, a substantially flat article to be molded disposed therebetween, and means tending to maintain said dies in a position with said matrices spaced apart a distance in excess of the thickness possessed by the main body portion of said article prior to the application of the molding pressure, substantially as described.

12. A mold assembly, comprising a pair of opposed dies with a substantially flat article to be molded disposed therebetween and provided with means effective in the absence of the molding pressure to maintain said dies in a position with the molding faces thereof spaced apart a distance in excess of the thickness of the main body portion possessed by said article prior to the molding thereof, substantially as described.

This specification signed this 25th day of June 1919.

THOS. A. EDISON.
CHARLES G. KIRCHER.

Certificate of Correction.

It is hereby certified that in Letters Patent No. 1,417,463, granted May 23, 1922, upon the application of Thomas A. Edison, of West Orange, and Charles G. Kircher, of Irvington, New Jersey, for an improvement in "Molds," errors appear in the printed specification requiring correction as follows: Page 1, line 86, after the word "due" insert the word *to*; page 3, lines 87 and 88, claim 12, for the words "of the main body portion possessed by" read *possessed by the main body portion of*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 20th day of June, A. D., 1922.

[SEAL.]

KARL FENNING,

Acting Commissioner of Patents.