

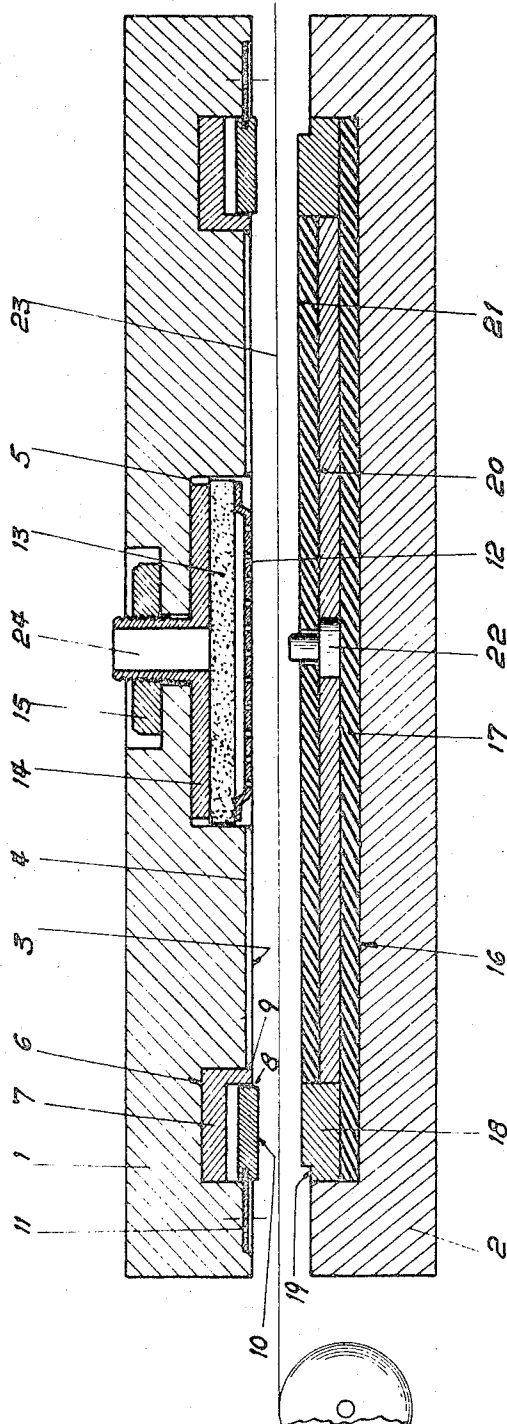
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APPARATUS FOR PRESSING GRAMOPHONE RECORDS

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The present invention has for its object means for the execution of gramophone records and covers more particularly an arrangement of this type intended chiefly but not exclusively for the pressing or molding of very thin records.

The molds generally used for holding the dies intended for the pressing of records are constituted by steel plates, the cooperating central sections of which are recessed and polished, so as to match the diameter of the dies and to form facings for the latter; said dies are held axially by a core and peripherally by a hoop. The pressure of the molding press is thus transmitted to the record through the agency of rigidly interengaging steel surfaces.

Such prior structures lead to serious drawbacks when the record to be pressed is very thin and, consequently, very brittle. Furthermore, they do not allow obtaining with a high accuracy a parallelism between the dies by reason of the very small record thicknesses to be obtained. Furthermore, said record being obtained through the pressing of a strip of plastic material, it is also necessary to resort to a cutting step for separating the record from the original strip, which cutting step has been performed hitherto as a separate operation inside a special machine.

The present invention has for its object an arrangement for pressing records even of an extremely reduced thickness with a high accuracy as to constancy of thickness, while obtaining through the same operation the cutting of the records which have been pressed.

A pressing machine according to the invention includes between the mold and a die a layer of rubber or the like deformable non-compressible material, the deformation of which in a direction parallel with the plane of the die is prevented.

Preferably, a rubber sheet fitted without any clearance inside the mold of the press is used for carrying the die.

According to a further feature of the invention, the hoop holding fast the periphery of the die rests together with the latter on the same sheet of rubber and the hoop thus fitted in the mold cooperates with the hoop of the opposite mold section, so as to form cutting means adapted to separate the record from the remainder of the plastic strip out of which it has been formed, or else it prepares such a separation by marking a dotted or the like line of separation.

When such an arrangement is intended for the pressing of only one surface of very thin records, the die corresponding to the other surface is replaced by a rubber disc.

The core of the other die or of both dies, if any, may carry a thin plate in which are provided perforated inscriptions and engaging an inking block. Under the action of the pressure exerted, the material forming the record bears against the inking block through the perforations in said plate, which allows in particular printing the title of the record during the pressing of the latter.

Further features of the invention will appear in the reading of the following description, reference being made to the accompanying drawing, given by way of example and by no means in a binding sense. The single figure of said drawing is a transverse elevational view of a preferred embodiment of the invention.

Said embodiment is intended more particularly for the production of a single surface record out of a very thin strip of plastic material. The upper mold section 1 carrying the upper die and the lower mold section 2 carrying the lower die are constituted each by a steel plate. Inside the upper section 1 is formed, for instance on a lathe, the location of the actual die 3 engaging the smooth surface 4 thus obtained. At the center of said smooth surface 4 is provided a recess housing the core 5 holding the die in position. A groove 6 at the periphery of the smooth surface 4 carries a hoop 7 having a cutting edge 8 and holding the die in position through its lower intumed lip 9 facing away from said cutting edge 8. Said hoop 7 is provided with a transverse cross-section in the shape of an L, so that it may be engaged by a blank-clamping member 10 held in position by a blade spring 11 fitted in the peripheral portion of the mold section 1.

The core 5 is provided at its inner end with a grid 12 adapted to form the letters constituting the title of the record and to the rear of said grid is positioned a plate 13 of inked porous material engaging the bottom flange 14 of the core, the whole core arrangement being held by a nut 15 engaging the outer side of the inner periphery of the mold sections 1 carrying the core.

The lower mold plate 2 is provided with a central recess 16, the diameter of which is equal to the outer diameter of the annular blank-clamping member 10 and a sheet of rubber 17 is fitted inside said recess 16 without any radial clearance with reference thereto. Over the periphery of said rubber sheet is laid the movable cutting hoop 18, the outer edge of which is provided with a rabbet 19. Said hoop is fitted around a steel disc 20 over which is laid in its turn a sheet of rubber 21, the upper surface of which is accurately coplanar with the upper surface of the hoop 18. Lastly, a punch 22 is arranged coaxially with the disc 20 through which it passes in order to form the central opening of the record.

The arrangement described operates as follows: when the very thin strip of material 23 is fed between the two sections of the mold and is subjected between the latter to pressure, the blank-clamping member 10 collapses, so that only the actual die engages the strip of material; the rubber sheet 21 which is non-compressible matches the slightest details of the die and this leads, without any risk of tearing of the plastic film, to a high grade of pressing.

This rubber sheet 21 which cannot be deformed in a direction parallel to its own plane transmits the thrust to which it is subjected to the lower sheet of rubber 17 through the agency of the steel disc 20. Said sheet 17 which cannot expand in a direction parallel with its plane is deformed in a direction perpendicular to the latter in its area underlying the movable hoop 18. The latter urges upwardly the clamping member 10 against the pressure of the spring 11 and enters slightly inwardly of the recess formed in the stationary hoop 7. The record is thus cut out as required. The movable hoop 18 abuts then against the bottom of the recess in the stationary hoop 7 and is subjected by the latter to a counter-pressure which it transmits to the sheet of rubber 21, the pressure exerted on the latter being proportional thereto, the ratio between the pressures being equal to the ratio between the compressed surfaces. The pressing operation on the film or strip 23 is thus brought to an end, the die being subjected to a pressure higher than the originally applied pressure.

During the pressing operation which has been described, the rubber sheet 21 urges the film 23 against the grid 12. The material forming the film 23 projects through the perforations in the latter, so as to produce the desired

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inscription, the letters formed engaging the inner surface of the porous block 13. The upper surfaces of said letters are thus inked, so as to form the desired inscription on the record.

As apparent from inspection of the drawing, the block 13 may be fed with ink through the channel 24. Obviously, the embodiment of the invention which has just been described has been given solely by way of example and by no means in a limiting sense and various detail modifications may be brought thereto without unduly widening the scope of the invention as defined in the accompanying claims.

What I claim is:

1. An arrangement for pressing gramophone records comprising two mold sections, a metal plate carried by one of said mold sections and facing a recess formed in the second mold section, a second plate in the said recess of said second mold section, at least one of said plates being a pressing die plate, means for feeding a strip of thin material between the two mold sections for molding a record therein between the two plates, a sheet of deformable non-compressible material inserted between one of the plates and the bottom of the recess in the corresponding mold section, means for holding said last-mentioned sheet peripherally to prevent any deformation thereof in a direction parallel with its own plane, and means for cutting said thin material into record shapes as said material is pressed.

2. An arrangement for pressing gramophone records comprising two mold sections, a metal plate carried by one of said mold sections and facing a recess formed in the second mold section, a second plate in the said recess of said second mold section, at least one of said plates being a pressing die plate, means for feeding a strip of thin material between the two mold sections for molding a record therein between the two plates, a deformable non-compressible rubber sheet inserted between the plate in said recess and the bottom of the said recess in the corresponding mold section without any clearance between the outer periphery of said rubber sheet and the wall of said recess, and means for cutting said thin material into record shapes as said material is pressed.

3. An arrangement for pressing gramophone records comprising two mold sections, a metal plate carried by one of said mold sections and facing a recess formed in the second mold section, a second plate in the said recess of said second mold section, at least one of said plates being a pressing die plate, means for feeding a strip of thin material between the two mold sections for molding a record therein between the two plates, a deformable non-compressible rubber sheet greater in diameter than one of said plates inserted between the said one of the plates in said recess and the bottom of the said recess in the corresponding section of the mold without any clearance between the outer periphery of said sheet and the wall of said recess, a hoop surrounding said last-mentioned plate and resting on said deformable non-compressible rubber sheet, and means forming a cutting surface on the die carrying mold section coacting with said hoop.

4. An arrangement for pressing gramophone records comprising two mold sections, a metal plate carried by one of said mold sections and facing a recess formed in the second mold section, a second plate in the said recess of said second mold section, at least one of said plates being a pressing die plate, means for feeding a strip of thin material between the two mold sections for molding a record therein between the two plates, a sheet of deformable non-compressible material inserted between one of the plates and the bottom of the recess in the corresponding mold section, means holding said sheet peripherally to prevent any deformation thereof in a direction parallel to its own plane, and a hoop fitted inside each recess and having its inner circular surface juxtaposed to its corresponding plate, the said two hoops being shaped

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for relative vertical motion when said mold sections are brought together, so as to form a cutting device adapted to engage the line defining the record to be obtained out of the strip and to cut out the record along said line.

5. An arrangement for pressing gramophone records out of a film, comprising two mold sections, a die carried by one of said mold sections and facing a recess formed in the second mold section, means for feeding a film of thin plastic material between the two mold sections for producing a record therein in registry with the die, a sheet of deformable non-compressible material fitted without any clearance inside the recess of said second mold section, a presser plate smaller in diameter than said sheet laid over said sheet in registry with the location of the die in the first mold section, a further sheet of deformable non-compressible material laid over said presser plate and coextensive with the latter, means for holding the said last deformable sheet peripherally to prevent any deformation thereof in a direction parallel with its own plane, and means for cutting said thin material into record shapes as said material is pressed.

6. An arrangement for pressing gramophone records out of a film comprising two mold sections, a die carried by one of said mold sections and facing a recess formed in the second mold section, means for feeding a film of thin plastic material between the two mold sections for producing a record therein in registry with the die, a sheet of deformable non-compressible material fitted without any clearance inside the recess in said second mold section, a presser plate smaller in diameter than said sheet laid over said sheet in registry with the location of the die in the first mold section, a further sheet of deformable non-compressible material laid over said presser plate and coextensive with the latter, a hoop fitted around said presser plate and second sheet and holding fast the periphery of the said second sheet from extending beyond said presser plate to prevent any radial deformation of said second sheet, and means for cutting said thin material into record shapes as said material is pressed.

7. An arrangement for pressing gramophone records out of a film comprising two mold sections, a die carried by one of said mold sections and facing a recess formed in the second mold section, means for feeding a continuous film of thin plastic material between the two mold sections for producing a record therein in registry with the die, a sheet of deformable non-compressible material fitted without any clearance inside the recess in said second mold section, a presser plate smaller in diameter than said sheet laid over said sheet in registry with the location of the die in the first mold section, a further sheet of compressible non-deformable material laid over said pressure plate and coextensive with the latter, a hoop fitted about said presser plate and said second sheet and holding fast the periphery of the second sheet from extending beyond said presser plate to prevent any radial deformation of said second sheet, a hoop surrounding the die and having a cutting surface cooperating with said hoop in the second mold section during the stamping operation to cut the formed record out of the film.

8. An arrangement for pressing gramophone records out of a film comprising two mold sections, a die carried by one of said mold sections and facing a recess formed in the second mold section, means for feeding a continuous film of thin plastic material between the two mold sections for producing a record therein in registry with the die, a sheet of deformable non-compressible material fitted without any clearance inside the recess in said second mold section, a presser plate smaller in diameter than said sheet laid over said sheet in registry with the location of the die in the first mold section, a further sheet of deformable non-compressible material laid over said presser plate and coextensive with the latter, a hoop fitted about said plate and the periphery of said last deformable sheet with the outer circumferential surface of said hoop against the outer periphery of the recess in said second

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mold section to be confined thereby, said hoop resting on the first sheet of deformable non-compressible material and preventing any deformation of the last mentioned deformable sheet peripherally thereof in a direction parallel with the plane of said last deformable sheet, and means on said die carrying mold section coacting with said hoop to cut a record circumference as a record is pressed.

9. An arrangement for pressing gramophone records out of a film comprising two mold sections, a die carried by one of said mold sections and facing a recess formed in the second mold section, means for feeding a continuous film of thin plastic material between the two mold sections for producing a record therein in registry with the die, a sheet of deformable non-compressible material fitted without any clearance inside the recess in said second mold section, a presser plate smaller in diameter than said sheet laid over said sheet in registry with the location of the die in the first mold section, a further sheet of deformable non-compressible material laid over said presser plate and coextensive with the latter, a hoop fitted about said plate and the periphery of said last deformable sheet with the outer circumferential surface of said hoop against the outer periphery of the recess in said second mold section to be confined thereby, said hoop resting on the first sheet of deformable non-compressible material and preventing any deformation of the last mentioned deformable sheet peripherally thereof in a direction parallel with the plane of said last deformable sheet, a second hoop fitted about the die of the first mold section, and having a depression and a cutting edge, and a portion of the first hoop riding into said depression of said second hoop and coacting with said cutting edge for cutting the record to the required diameter.

10. An arrangement for pressing gramophone records out of a film, comprising two mold sections, a die carried by one of said mold sections, means for feeding a film of thin plastic material between the two mold sections for producing a record therein in registry with the die, a presser plate smaller in diameter than said recess positioned in the recess of the second mold section in registry with the location of the die, a sheet of deformable non-compressible material laid over said presser plate and coextensive with the latter, a hoop fitted about said plate and the periphery of said deformable sheet with the outer circumferential surface of said hoop against the outer periphery of the recess, said hoop preventing any deformation of the deformable sheet peripherally thereof in a direction parallel with the plane of said deformable sheet, and means on said die carrying mold section coacting with said hoop to cut a record circumference as a record is pressed.

11. An arrangement for pressing gramophone records out of a film, comprising two mold sections, a die carried

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by one of said mold sections, means for feeding a film of thin plastic material between the two mold sections for producing a record therein in registry with the die, a sheet of deformable non-compressible material fitted without any clearance inside a recess in the other of said mold sections, a presser plate smaller in diameter than said sheet laid over said sheet in registry with the location of the die, a further sheet of deformable non-compressible material laid over said pressure plate and coextensive with the latter, a hoop fitted about said plate and the periphery of said last deformable sheet with the outer circumferential surface of said hoop against the outer periphery of the recess, said hoop resting on the first sheet of deformable non-compressible material and preventing any deformation of the last mentioned deformable sheet peripherally thereof in a direction parallel with the plane of said last deformable sheet, and means forming a circumferential slot in said die carrying mold section into which said hoop rides when said mold sections are brought together whereby to effect cutting of said film into the shape of a record.

12. An arrangement for pressing gramophone records out of a film, comprising two mold sections, a die carried by one of said mold sections, means for feeding a film of thin plastic material between the two mold sections for producing a record in registry with the die, a sheet of deformable non-compressible material fitted without any clearance inside a recess formed in the other of said mold sections, die coacting means supported on said sheet in registry with the location of the die, a retainer hoop fitted about said means and resting on the sheet of deformable non-compressible material, and means forming a circumferential slot in said die carrying mold section into which said hoop rides when said mold sections are brought together whereby to effect cutting of said film into the shape of a record.

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