F. L. CAPPS.

PRESS.

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1,370,185. Patented Mar. 1, 1921.

Fig. 1

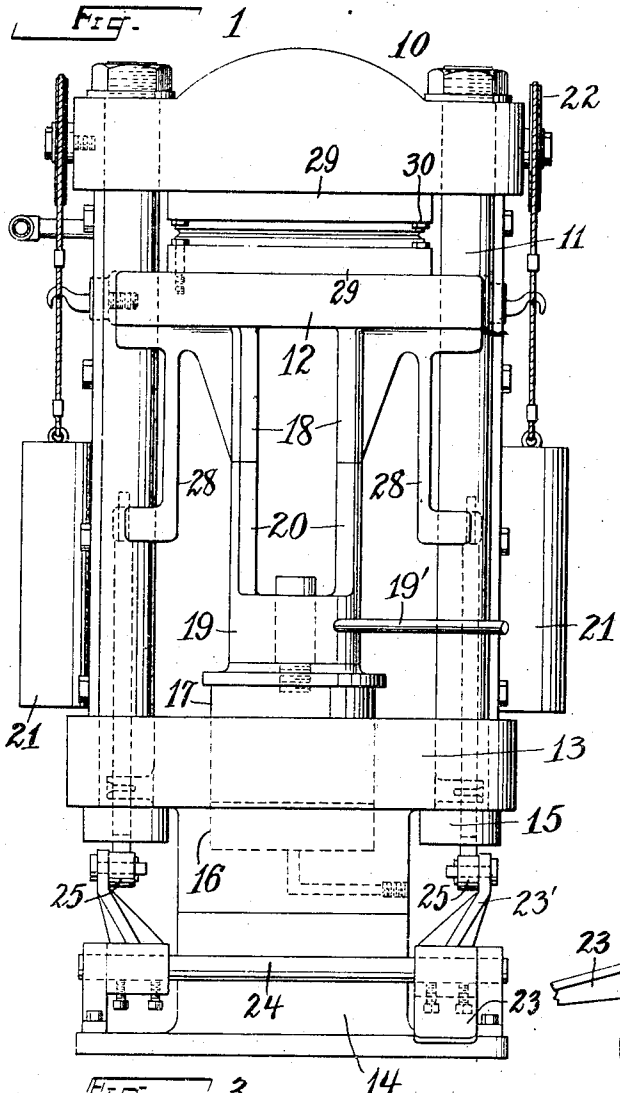


Fig. 2

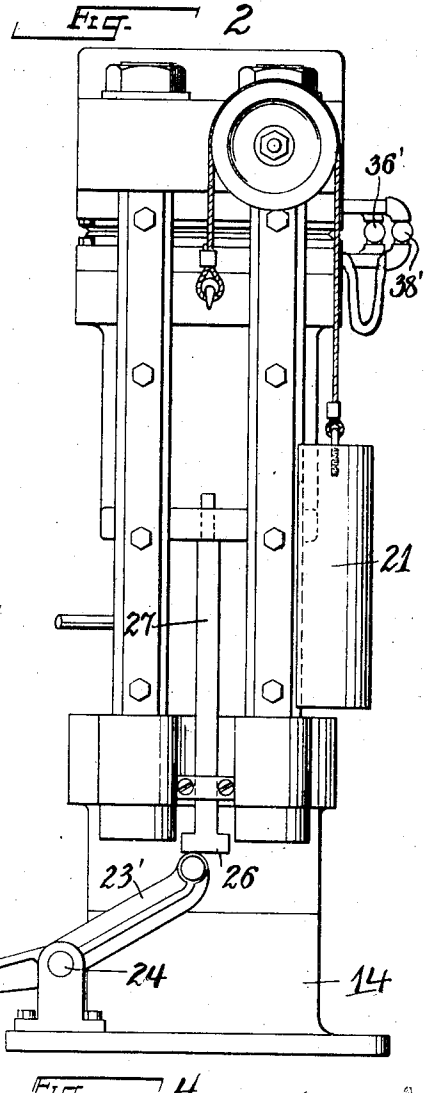


Fig. 3

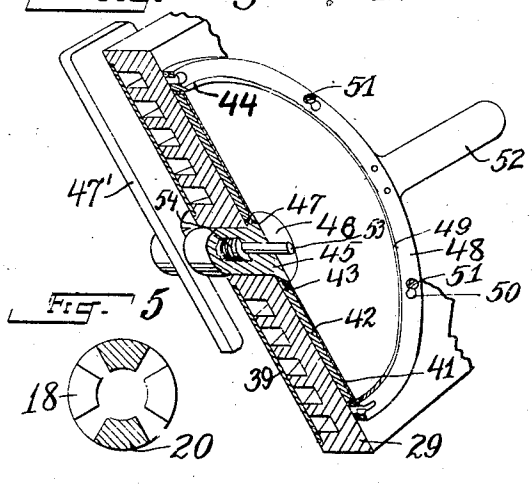


Fig. 4

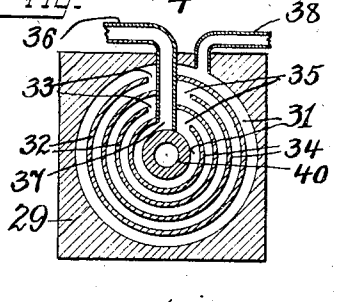


Fig. 5

INVENTOR

Frank L. Capps

By H.H. Dyke, his

ATTORNEY

UNITED STATES PATENT OFFICE.

FRANK L. CAPPS, OF BROOKLYN, NEW YORK, ASSIGNOR TO PATHE FRERES PHONOGRAPH COMPANY, A CORPORATION OF DELAWARE.

PRESS.

1,370,185. Specification of Letters Patent. Patented Mar. 1, 1921.

Application filed April 14, 1917, Serial No. 161,954. Renewed January 10, 1921. Serial No. 436,391.

To all whom it may concern:

Be it known that I, FRANK L. CAPPS, a citizen of the United States, and a resident of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Presses, of which the following is a specification.

My invention relates to presses which, while more particularly adapted for use in the production of flat bodies, such as disk phonograph records, may be made use of for other purposes.

Among the objects of the present invention is the provision of a press in which the pressing elements may be readily separated to a considerable extent so as to provide ready access thereto, and may be brought fairly close together by manually operable means before the final forcible pressure is applied, thereby decreasing the necessary expenditure of power or of fluid, as water, where hydraulic means is used to obtain the forcible pressing action.

Another object of the invention resides in the provision of novel means for securing the pressing surfaces, as the matrices for phonograph records, in position in the press.

Another feature of the invention consists in the provision of mountings for such matrices of such character that the necessity of securing stiff, heavy backing members thereto is obviated.

Still another feature of the invention resides in the provision of novel means for supplying and circulating heating and cooling media, as, for example, steam and cold water.

Other features of the invention will be pointed out in the course of the specification, and with the foregoing and related objects in view, my invention consists in the parts, improvements and combinations herein set forth and claimed.

In the accompanying drawing, forming a part of this specification, I have illustrated, for the purpose of affording a clear understanding of my invention, one form in which my invention may be embodied. In said drawing, Figure 1 is a front elevational view of one form of press embodying my invention. Fig. 2 is a side view thereof. Figs. 3, 4 and 5 are detail views.

In the form illustrated, the upper pressure member is stationary and the lower pressure member moves up against the stationary member. In the drawing 10 represents the upper pressure member, here shown as stationary, and this member is shown as secured to a plurality of guide posts 11 on which the lower pressure member 12 is shown as slidable up and down. In the form shown, the guides or posts 11 are passed through openings provided in the upper portion 13 of the machine base 14 and have heads 15 on their lower ends to hold them down.

The hydraulic pressure cylinder 16 provided in the machine base receives a piston 17 for forcibly pressing the movable pressure member 12 against the stationary pressure member 10. Means are provided for permitting the movable pressure member 12 to move through a distance in excess of the range of movement of the piston 17 and at the same time to cause the actuation of the pressure member 12 by the piston 17 when desired.

In the form shown, the pressure member 12 is provided with two downwardly projecting legs 18 which are fixed thereto, and the piston 17 is provided with a rotatable member 19 which, in turn, has projecting upwardly therefrom the two legs 20, 20. When the member 19 is turned to the position shown in Fig. 1, as by the handle 19', the pressure member 12 may be supported from the piston 17 at a position so that the lower pressure member is in contact with or only a comparatively small distance below the upper pressure member; but when the member 19 is turned substantially at right angles from the position shown in Fig. 1 to the position illustrated in Fig. 5, the pressure head 12 is no longer supported from the piston 17 but may be lowered, the legs 18 and 20 passing one another, affording an ample degree of opening between the pressure members so as to give complete access thereto. The legs 18 and 20 thus form a telescopical power transmitting means between the piston and pressure member. The same or similar results may be secured in other ways. The pressure member 12 is preferably counterbalanced as by weights 21, 21 suspended on cords running over pulleys 22, 22, or by equivalent means, and means for controlling the up and down

movement of the pressure member 12 are provided, and the same may take the form of a pedal lever 23 which may be secured to the shaft 24 mounted to turn in the machine base, and may be provided with arms 23′ carrying a roller or other anti-friction member 25, which is adapted to contact with the shoe 26 of the lower end of a slidable bar or rod 27 which is suitably guided in the machine frame and is in engagement at its upper end with means connected with the movable pressure member 12, as the downwardly projecting guide arms 28 thereof, which also serve to assist in securing correct alinement and positioning of the pressure member 12 with respect to the guide posts 11. Rods or bars 27 may be located on each side of the press, as shown, if desired.

When a press in accordance with my invention is used for pressing flat plastic articles, such as disk phonograph records, provision is made for fluid circulation adjacent to the pressing surface, and the same may be used for alternately heating and cooling the pressing surfaces, as by the supplying of steam or hot water for heating, and of cold water or similar medium for cooling. In order to secure efficient results it is desirable that these successive heating and cooling operations be carried out as rapidly as possible, and that the circulation be both rapid and complete. It is also a desideratum to make the passages as simple as possible in order to reduce the work of cutting and machining in forming the same. The preferred fluid circulatory arrangement is illustrated in detail in Figs. 3 and 4. The plates 29 are here shown as secured to the pressure heads 10 and 12 as by means of bolts 30 which may be located at their corners, and these plates 29, 29 are recessed interiorly, as by being provided with circular channels 31, 31, and make up a part of the pressure member to which they are attached. One set of walls 32, 32 between these channels is provided with a series of openings 33, and the other intermediate set of channel walls 34, 34 is provided with a series of openings 35, 35, and through all of these openings a supply pipe 36 for the admission of fluid is passed, said pipe opening at its inner end 37 into the innermost channel 31, and the openings 33 and 35 extend alternately on each side of the pipe 36, thereby providing a circuitous path for the fluid, which is admitted at substantially the center of the plate 29 and passes circuitously around and out until it is finally discharged through the discharge pipe 38, which is connected with the outer one of the set of channels 31. Such recessed or channeled plate may be readily formed, the operations being of a very simple character and performed by means of an ordinary lathe together with a small amount of cutting or drilling, no circuitous or involved lathe or milling machine work being required, and all the work being of a plain, simple character.

The channels 31 may extend only part way through the plate 29, and the back of the plate, where the open sides of the channels appear, may be closed by any suitable means, as by means of a plate or sheet 39 secured thereto in any suitable way, as by screws with packing, or by welding or in any other preferable manner. As will be readily understood, the pipes 36 and 38 are connected with a suitable liquid supply or supplies, and the same provided with proper valves as 36′, 38′, which it is unnecessary to illustrate in detail, flexible hose being preferably used to supply fluids to the movable pressure member. Both the upper and lower plates 29 are preferably constructed in the same manner, particularly where the press is to be used for pressing double faced phonograph records.

It has been the usual practice heretofore, so far as I am aware, in the manufacture of bodies such as disk phonograph records from plastic material, to provide the pressing matrices, carrying the negative of the record surface, with backing plates which have to be secured thereto at considerable expense and trouble, and which add materially to the weight of the matrices and have various objections, such as the time required for their heating and cooling, the expense of transportation, etc., due to the extra weight, and the like. In the press constructed according to the present invention the backing of such matrices is avoided, together with disadvantageous features resulting therefrom, and the thin matrix, produced as in a plating bath, is made use of for the pressing work without the necessity of securing the usual backing thereto. In the form illustrated this result is accomplished by providing the plates 29 with a central aperture 40 for the reception of means for holding the matrix at substantially its center, and by providing means on the plates 29 for clamping the thin matrix 41 at substantially the periphery thereof, the thin matrix being bent or pushed over at an angle to its general substantially plane surface to permit such clamping and holding. In the form shown, a plate 42, which may be removable or be attached to or form part of the fluid circulation member 29, has a conically flared central opening 43 formed therein, and has a tapered or substantially conical outer edge 44, and in the opening 40 in the plate 29 there is slidably received the plug or holding member 45 having a head 46 resembling the head of a wood screw and having an outer tapered surface 47 corre-

sponding to the tapered surface 43 of the opening in the plate 42. The matrix 41 with a central opening therein is placed upon the plate 42 with its central opening substantially opposite the openings 43 and 40, and the plug 45 inserted, the matrix being clamped in place by the head 46 of the plug 45. The plug 45 may be secured in place by any suitable means, as by means of the slotted wedge 47', received in a suitable cavity in the pressure head 10 or 12, as the case may be. By this or equivalent means the matrix is securely clamped in place at its interior. At the exterior of the plate 41 clamping means, such as a ring 48, is provided having an interior tapered or under cut wall 49 adapted to coöperate with the similarly tapered wall 44 of the plate 42 and to receive and hold the thin material of the matrix 41 therebetween. Means for securing the ring 48 firmly in place are provided, and in the form shown the ring 48 is provided with apertures 50 and the member 29 with headed studs 51 which are adapted to pass through a portion of the opening 50, and when the ring 48 is turned slightly, as by means of the handle 52, the shanks of the headed studs 51 pass into the narrower portions of the openings 50, thereby serving to effectively clamp the ring 48 and the matrix 41 in place. A central pin 53 projected by means of a spring 54 may be provided in one of the holding members or plugs 45, and serves the purpose of forming the usual central opening in the disk record when the pressing operation is performed, retreating in the bore provided therefor in the plug 45 when pressure is applied.

The operation of the press illustrated as affording an embodiment of my invention will be readily understood from the foregoing. To use the press the pressure member 12 is lowered, which may readily be done by turning the member 19, as by means of the handle 19', so that the legs 18 and 20 are out of alinement, permitting the downward movement of the movable member 12, the legs 18 and 20 passing or telescoping with one another. Preferably the counter weights 21 are somewhat lighter than the member 12 and parts connected therewith, so that when the handle 19' is turned to the proper position the member 12 moves downwardly by gravity. When in such lowered position, affording ample room for access to the parts, the matrices 41 are put in place and clamped by their inner and outer clamping members, whereupon the apparatus is ready for pressing records. The steam is then turned on and the pressing surface heated, and the plastic material, together with any objects to be secured thereto, such, for example, as record labels, are put in place and the table 12 is lifted, as by the pedal 13, to the position shown in Fig. 1, and the handle 19' turned to bring the legs 20 into alinement, as shown in Fig. 1, whereupon fluid is admitted to the hydraulic cylinder 16 which lifts the table 12 the necessary short distance to bring it into contact with the pressure member 10 against which it is maintained with great force by the hydraulic pressure exerted in the piston 17. The ring 51 is preferably thicker than the matrix, the outer edge of the disk being preferably provided with a comparatively sharp projecting edge for that purpose. At the proper moment, to be determined by the experience of the operator, the steam is turned off and the cold water turned on, and as soon as sufficient time has elapsed to secure the proper cooling effect, the fluid is turned off from the hydraulic pressure means and the movable member 12 lowered by turning the handle 19', as already described, and permitting the member 12 to move downward by gravity. The pressed body, as a disk record, is then removed and new material added, the surplus record material having, of course, been removed and the matrices having been preferably wiped off as each record is pressed.

I have found that with a press constructed in accordance with this invention double faced phonograph disk records may be turned out with rapidity and certainty, and the heating and cooling of the matrix is very rapid.

It is to be understood that the embodiment illustrated is for the purpose of affording a clear understanding of my invention only, and that I am not to be limited thereto, but that various departures therefrom and changes therein may be resorted to within the scope of my claims, by which my invention is defined, without departing from the invention or sacrificing any of its advantages.

Having thus described my invention, I claim:

1. In a press, a fixed pressure member and a movable pressure member, means for forcing said movable member against said fixed member, and power transmitting means adapted to be interposed at will between the forcing means and the movable pressure means.

2. In a press, an upper pressure member and a lower pressure member, hydraulic means for pressing the lower pressure means upwardly against the upper one, and extensible and contractible pressure transmitting means between the lower pressure member and the hydraulic means.

3. In a press, a fixed pressure member and a pressure member movable relative thereto through a considerable range, hydraulic means, and means for transmitting power

from the hydraulic means to the movable pressure member only when the latter is substantially close to the fixed member.

4. In a press, a fixed pressure member, a pressure member movable to and away from the fixed member, hydraulic means for pressing said movable member against said fixed member, and telescopical power transmitting means between said hydraulic means and the movable pressure member.

5. In a press, a fixed pressure member, a movable pressure member, a hydraulic piston, legs on the movable member, and legs on the piston, said legs being relatively movable so as to pass one another or to be brought into contact with one another.

6. In a press, a fixed pressure member, a movable pressure member, a hydraulic piston, a leg on the pressure member, a leg on the piston, and one of said legs being transversely movable with respect to the other leg.

7. In a press, an upper pressure member, a lower movable pressure member, a hydraulic piston, a pair of legs on said movable member, and a pair of legs on said piston, one of said pairs of legs being rotatable with respect to the other so as to be brought into and out of register therewith.

8. In a press, a fixed pressure member and a movable pressure member having projections on the side thereof away from the first named pressure member, a hydraulic piston having projections pivoted thereto, said projections on the piston being movable in and out of register with the projections on the pressure member by rotation.

9. In a press, an upper fixed pressure member, a lower pressure member movable up and down in a right line, a hydraulic piston beneath said movable pressure member, legs fixed to and extending downward from said movable pressure member, and a pivoted member comprising legs pivoted to the piston to turn on a vertical axis, the rotation of said member on the piston serving to bring the legs thereon into and out of register with the legs on the lower pressure member.

10. In a press, a fixed pressure member, a movable pressure member, manually operable means for moving said last named member through a distance sufficient to permit free access to the space between the members, and hydraulic means for pressing said movable member against the fixed member, the hydraulic means being operable through a less distance than the manually operable means.

11. In a press, a fixed pressure member, guide posts supporting said member, a pressure member slidable in said guides, a base to which said guides are secured, hydraulic pressure means in said base, manually operable means for moving said slidable pressure member in said guides, and power transmitting means adapted to be interposed at will between said slidable pressure member and said hydraulic means.

12. In a press, a fixed pressure member, guides supporting said member, a pressure member slidable in said guides, extensions on said slidable member also guided on said guides for securing correct alinement, manually operable means connected with said extensions for moving said slidable member in said guides, and hydraulic means for forcing said slidable pressure member against said fixed pressure member.

13. In a press, a fluid receiving member having a series of substantially concentric fluid passages therein, means for supplying fluid to the inner passage, means for fluid outlet from the outer passage, and connections between said passages whereby the fluid traverses alternate passages in opposite directions.

14. In a press, a fluid receiving member having a series of fluid passages, the fluid passing from one to another and traversing alternate passages in opposite directions.

15. In a press, a member for receiving heating and cooling fluid and provided with substantially concentric passages through which the fluid passes in opposite directions in alternate passages.

16. In a press, a member for receiving heating and cooling fluid provided with a plurality of substantially concentric fluid passages, the walls between said passages being cut away at one side, and a pipe passing through said cut away walls and leading to the innermost passage.

17. In a press, a fluid receiving member provided with a plurality of substantially concentric passages, walls between said passages, said walls being cut away, a pipe in said cut away part of the walls, and openings being provided in alternate walls on opposite sides of the pipe wherby fluid delivered to the innermost passage through said pipe passes outwardly in opposite directions through alternate passages.

18. In a press, a pressure member provided with a substantially central opening having a tapered enlarged end part, a plug having a tapered head adapted to be received in said opening and to clamp a thin, unbacked matrix in place about a central opening in the matrix, and means for clamping the matrix by its periphery.

19. In a press, a thin, unbacked matrix adapted to be bent out of the plane of its surface at the center and periphery, and means for clamping said matrix by the bent parts thereof.

20. In a press, a pressure member, means for clamping a thin, unbacked matrix thereto by its center, and a ring for clamping the plate by its periphery, the ring being pro-

vided with slots terminating in substantially circular openings, and the pressure member being provided with headed studs adapted to pass through the circular openings and to clamp the ring and thereby the matrix upon a slight partial revolution of the ring.

21. In a press, a pressure member provided with a central opening, a pin in said opening, and a spring normally projecting the pin beyond the pressure member, the pin being adapted to retreat into said opening against the pressure of the spring upon application of force thereto.

22. In a press, a pressure member having a central opening, a plug in said opening adapted to clamp a thin, unbacked matrix in place, a bore provided in said plug, a pin in said bore, and a spring normally projecting the pin beyond the bore.

23. In a press, a pressure member having a central opening, a plug in said opening provided with a head and adapted to clamp a matrix in place, said plug having notches therein, and a split wedge adapted to enter said notches and clamp the plug in place.

24. As an article of manufacture, a thin unbacked phonograph record matrix having a peripheral flange extending at an angle to the plane of its surface, whereby same is adapted to be clamped and held in place on a press die or the like.

25. As an article of manufacture, a thin unbacked phonograph record matrix having a central opening and provided about said opening with a flange extending at an angle to the plane of its surface, and having a peripheral flange extending at an angle to the plane of its surface and in the same general direction as the first named flange, the matrix being adapted to be clamped by said flanges to a press die or the like.

In testimony that I claim the foregoing, I have hereto set my hand, this 12th day of April, 1917.

FRANK L. CAPPS.