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A. BURCKARD.

PRESS FOR MAKING PLASTIC PRODUCTS.

APPLICATION FILED SEPT. 21, 1921.

1,436,941. Patented Nov. 28, 1922.

2 SHEETS—SHEET 1.

Fig. 1

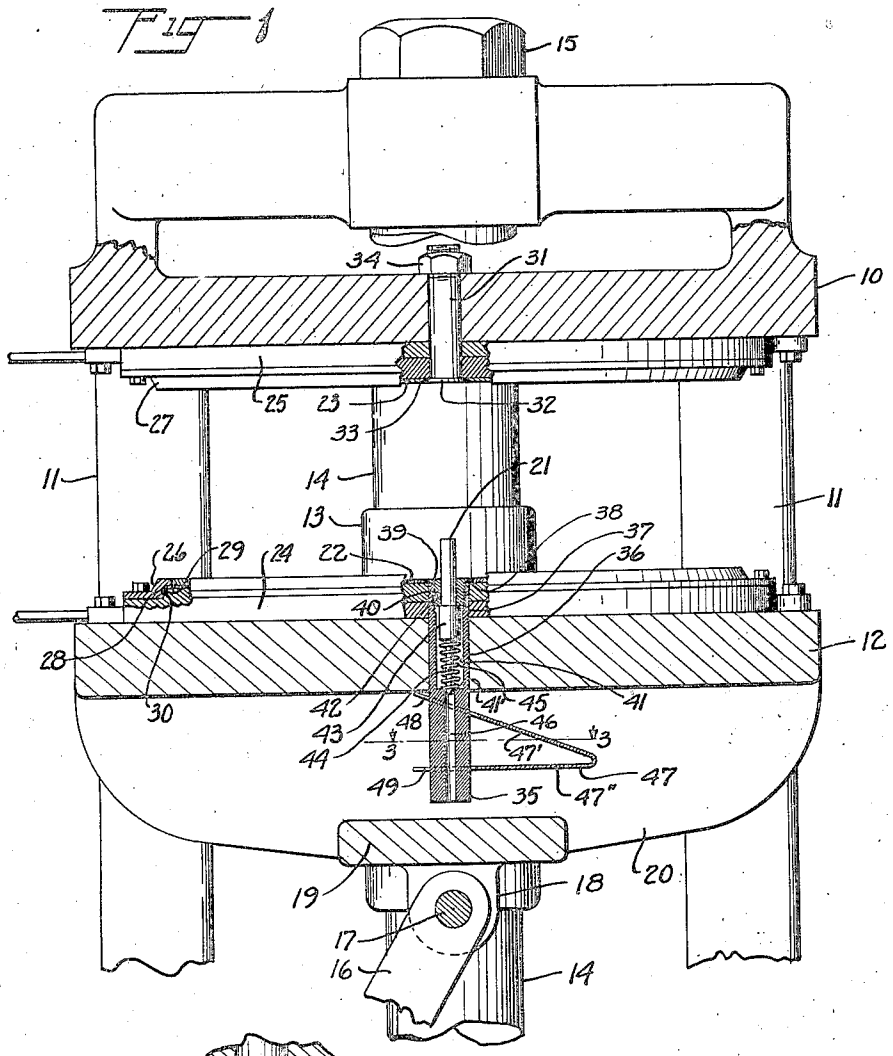


Fig. 2

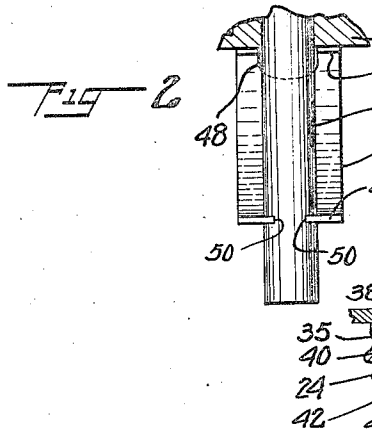


Fig. 3

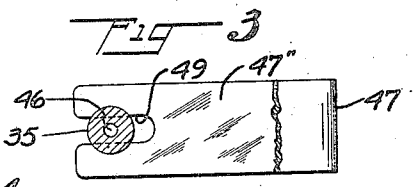
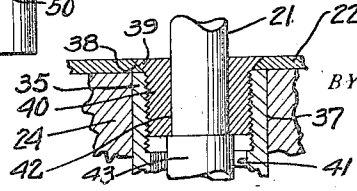


Fig. 4



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2 SHEETS—SHEET 2.

Fig 5

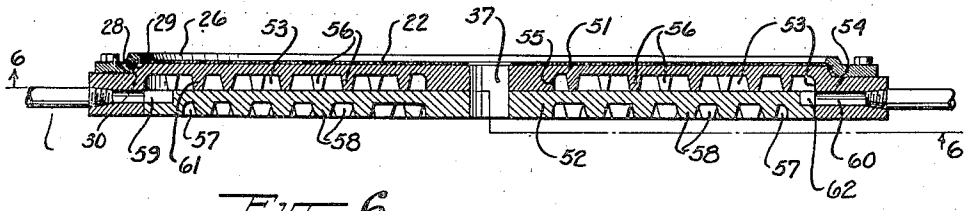
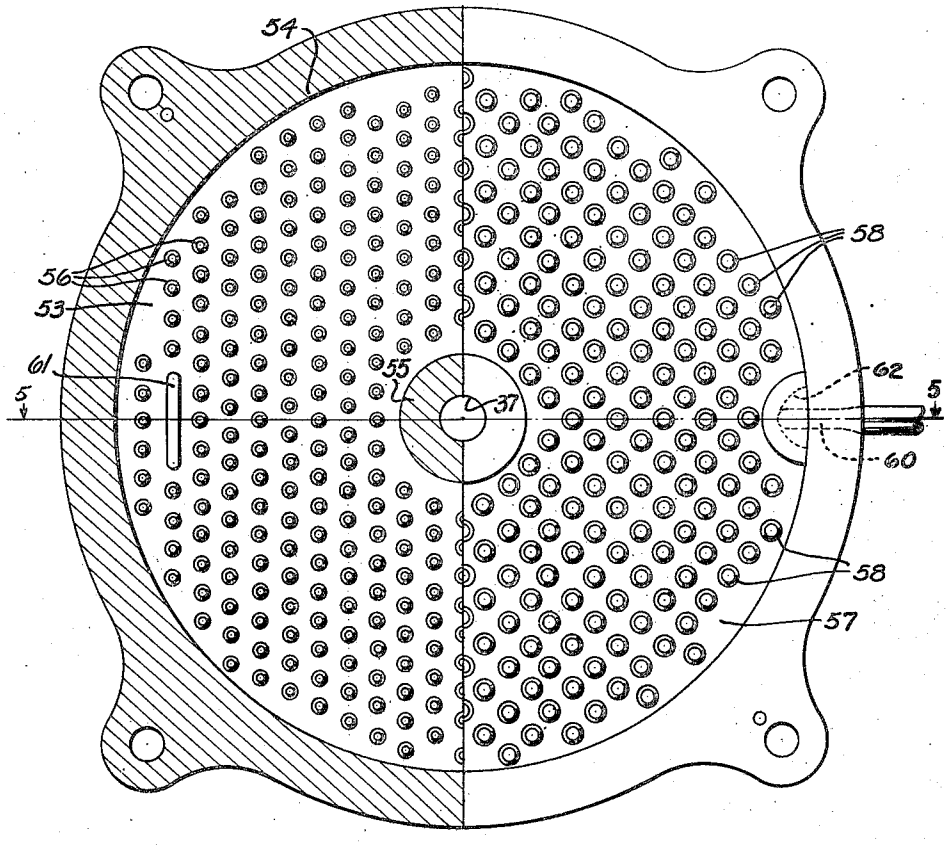


Fig 6



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Patented Nov. 28, 1922. 1,436,941

UNITED STATES PATENT OFFICE.

ALBERT BURCKARD, OF BROOKLYN, NEW YORK, ASSIGNOR TO PATHE FRERES PHONOGRAPH COMPANY, A CORPORATION OF DELAWARE.

PRESS FOR MAKING PLASTIC PRODUCTS.

Application filed September 21, 1921. Serial No. 502,303.

To all whom it may concern:

Be it known that I, ALBERT BURCKARD, a citizen of the United States, and a resident of Brooklyn, county of Kings, and State of New York (whose post-office address is 222 Washington Ave., Brooklyn, New York), have invented a certain new and useful Improvement in Presses for Making Plastic Products, of which the following is a specification.

My invention relates to a press for making plastic products, and while the invention is capable of broad application, an embodiment thereof is disclosed herein adapted for use in the manufacture of disk phonograph records.

In pressing disks, such as phonograph disk records, with holes in the center, a retreating pin is required to make the hole. Also when a thin matrix is used, and same is provided with a central hole in order to permit the use of such retreating pin, holding means are required to hold the central part of the matrix, and such holding means should be adapted to be readily removed and put back into place for changing matrices. The present invention is directed to the provision of a simple matrix holder and pin device which meets these and other requirements.

Another object of my invention consists in the provision of an improved heating and cooling die adapted for rapid, uniform and efficient application of heating and cooling media, such as steam and cold water, close to the surface of a thin unbacked matrix, whereby the same may be rapidly heated for use in pressing records and quickly cooled to permit the removal of the record.

In the drawings, Fig. 1 is a vertical, sectional, fragmentary view of a press embodying one form of my invention. Fig. 2 is an end view of the lower part of the matrix holder and its spring. Fig. 3 is a cross sectional view on the line 3—3, Fig. 1. Fig. 4 is an enlarged sectional view of the retreating pin and adjacent holder parts. Fig. 5 is a vertical sectional view of the press die taken substantially on the broken line 5—5, Fig. 6, and Fig. 6 is a horizontal sectional view of the die taken substantially on the broken line 6—6, Fig. 5.

Reference character 10 is applied to the fixed press member, here shown as a press head located at the top or upper end of the vertical press. Press head 10 is supported upon corner columns 11. The movable press member 12 has the slides 13 rigidly fixed thereto and adapted to slide up and down on posts 14 secured at their upper ends to the press head 10, as by nuts 15.

Any desired means may be resorted to for imparting up and down movement to the reciprocable press member 12. In the form shown, mechanical means are indicated for this purpose, comprising a toggle lever 16 pivoted at 17 on lugs 18 projecting downwardly from the cross bar 19, from the press member 12. The cross bar 19 is joined to the press member 12 by ribs 20 which are spaced apart leaving an open space at the center where the centering pin 21 is located.

The thin unbacked matrices 22, 23 are secured in place upon press dies 24, 25 by means of rings 26, 27 which may be bolted or otherwise secured to the dies. These rings have undercut bevelled portions 28 which are adapted to hold the periphery of the thin matrix in place by clamping the bevelled peripheral flanged portion 29 of the matrix over the similarly bevelled portions 30 of the press die.

For the stationary die 25, the matrix is held in place at its center by the flat headed bolt 31 extending through aligned openings in the press head 10, die 25 and matrix 23, the flat head 32 being received in the taper opening 33 in the matrix 23, and the bolt 31 being secured in place by means of nut 34.

For the movable die 24, a spring retracted holder 35 is provided. The holder 35 is preferably of cylindrical form and passes through aligned openings as follows: opening 36 in press member 12, opening 37 in die 24, and the taper opening 38 in the matrix 22. The taper head 39 for the holder 35 is formed on a plug 40 screwed in the threaded bore 41 of the holder 35. Plug 40 has an opening 42 formed therein for the passage of pin 21. Pin 21 is spring supported within the bore of the holder 35 and is held against outward movement under the influence of the spring, by the plug 40. In the form shown, pin 21 has an enlargement 43 just back of the plug 40, providing a stop against outward movement, and further back the pin 21 is made of reduced diameter, as shown at 44. The reduced diameter portion 44 is encircled by the coil spring 45 which is interposed between the inner end

41′ of the bore 41 of holder 35 and the pin enlargement 43. When the pin 21 is pushed inwardly the part 44 thereof enters the smaller bore 46 of holder 35 which is in alignment with and forms an extension of the bore 41.

With this construction, it will be seen that the pin 21 is readily put in place in the holder 35 and readily removed therefrom, if desired, for cleaning or oiling, or the like.

Spring means are provided for holding the central part of the matrix 22 in place by means of the holder 35. In the form shown, a spring 47 of substantially U-form is provided for this purpose. The leg 47′ of the spring 47 has a slot 48 formed therein for straddling the holder 35 and reacts against the underside of press member 12, to give an inward thrust to the holder 35. The other arm 47″ of the spring 47 has a somewhat narrower slot 49 therein and the edges of the spring adjacent to the slot 49 are received in the saw cuts or kerfs 50 in the holder 35. With this arrangement, the spring 47 continuously exerts an inward thrust upon the holder and the matrix held thereby, and at the same time the holder and spring can be put in place or removed with extreme readiness and convenience.

The press dies 24 and 25 are made in two parts 51 and 52. Part 51 includes the face of the die and has an annular recess 53 on its back between the outer wall 54 and the central wall 55, which receives the opening 37 for the central matrix holder. Member 52 provides a closure for the recess or chamber 53 and is secured in place in any desired way to prevent leakage, as for example, by welding.

Die member 51 is provided in its back with a plurality of pins 56 which are integral with the die member 51, and extend into and preferably across the fluid circulation chamber 53, so as to readily conduct heat to or from the die member 51, and to and from the thin unbacked matrix detachably secured thereto. These pins 56 are preferably round and may be more or less tapered, substantially as shown. They are preferably substantially symmetrical in form and spaced at substantially equal distances apart, as for example, in checkered arrangement, and with the closure member 52 preferably abutting against the ends thereof form a network of passages for circulating fluid, serving to bring the heating or cooling media into intimate contact with the pins or lugs 56 formed on the die member 51 and to secure uniform heating and cooling of the die and matrix.

The closure member 52 preferably is recessed at its back as shown at 57, to reduce the amount of metal to be heated and cooled, and provided in such recessed portion 57 with a series of pins 58, which are preferably somewhat heavier and thicker than the pins 56. The pins 58 rest on the press member and provide nonconducting air spaces therebetween. Inlet opening 59 to chamber 53 is preferably arranged at one side of the die, and outlet opening 60 is preferably placed diametrically opposite inlet opening 59. Adjacent to the inlet 59 a short baffle 61 is preferably provided in order to spread the incoming fluid and prevent its passing directly from side to side of the die, the central wall 55 also serving to produce a similar effect. A preferably rounded recess 62 is provided to give easy passage of outgoing fluid from all directions to the outlet passage 60.

It will be seen that a die constructed as described is a simple casting job and requires very little machining, machine working being confined principally to facing up the parts so as to fit accurately together, which can be readily accomplished.

Various changes and modifications may be resorted to without departing from the principle and scope of my invention.

I claim:

1. In a press, a die, a thin flexible matrix, and a spring retracted holder for holding the matrix to the die.

2. In a press, a press member, a matrix having a central aperture, and a spring retracted holder passing through said aperture and serving to hold the matrix in place.

3. In a press, a press member having an opening therein, a matrix also having an opening, a matrix holder passing through said openings, and spring means back of the press member for retracting the holder and keeping the matrix in place.

4. In a press, a press member, a matrix, a holder for holding the matrix in place on the press member, and a substantially U-shaped spring applied to said holder.

5. In a press, a press member, a matrix, a holder for holding the matrix to the press member, and a substantially U-shaped spring having one leg applied to the holder and the other leg bearing against the back of the press member.

6. In a press, a press member, a matrix, aligned apertures provided in the press member and matrix, a headed holder passing through said apertures and serving to hold the matrix to the press member, and a substantially U-shaped spring having two slots therein, one adapted to straddle the holder and one adapted to have its edges enter kerfs in the holder.

7. In a press, a matrix having a taper opening, a holder having a threaded bore and a plug threaded in said bore, and having a taper head to engage the opening in the matrix.

8. In a press, a matrix having a taper opening, a holder having a threaded open-

ing, a plug screwed in the bore and having a taper head to engage the opening in the matrix, a screw projected pin in said holder and passing through an opening in said plug, and spring means for retracting the holder.

9. In a press, a matrix having an opening therethrough, a press member having an opening therethrough, a holder passed through said openings, a plug screw-threaded in the holder and having a head to engage and hold the matrix to the press member, and a pin in said holder and projecting through an opening in said plug, and spring means within the holder for normally projecting the pin beyond the head.

10. A press die comprising a fluid circulation chamber and a die member having pins on its back extending into said fluid circulation chamber.

11. A press die comprising a fluid circulation chamber and a die member having substantially closely spaced, relatively small pins on its back extending into said fluid circulation chamber.

12. In a press, a press die comprising a fluid circulation chamber and a die member having means for detachably securing a thin unbacked matrix thereto, and having a plurality of integral, substantially closely spaced, relatively small pins on its back, extending into and coming in direct contact with the fluid in said fluid circulation chamber.

13. A press die for making disk phonograph records, comprising members providing an annular flat fluid circulation chamber between them, said chamber being crossed by substantially round pins at substantially equal intervals throughout the chamber.

14. A press die for forming flat plastic bodies, comprising members providing a fluid circulation chamber between them, one of said die members being provided with a plurality of substantially evenly spaced pins extending across said chamber, and said pins providing fluid paths therebetween throughout the chamber, whereby the die can be rapidly and uniformly heated or cooled.

15. A press die for making disk phonograph records, comprising a recessed outer member provided with integral pins extending across the recess, and a closure member for said recess, whereby a flat chamber is provided with paths for circulating fluid between the pins.

16. A press die for making disk phonograph records, comprising a flat die member provided with means for detachably securing a thin, unbacked matrix thereto, and having an annular recess in its back and provided with a plurality of integral pins of substantially uniform size and shape extending across the recess, and a closure plate for the recess in the die abutting against the ends of the pins, said closure plate likewise having a plurality of studs on its back and adapted to rest on a press member with the last named studs in contact therewith.

17. A press die for making disk phonograph records, comprising an outer member recessed on its back and having a plurality of integral pins of substantially uniform cross section and substantially evenly spaced extending across the recess, and a closure for the recess abutting closely against the ends of the pins, whereby a flat chamber is provided with paths for circulating fluid, extending substantially uniformly throughout the chamber between the pins.

18. A press die for making disk phonograph records, provided with an annular flat fluid circulation chamber extending entirely about the interior of the die, and said chamber crossed by a plurality of substantially round pins integral with the outer face member of the die and spaced at substantially equal distances apart, whereby fluid passages are provided therebetween of substantially uniform extent throughout all parts of the chamber.

19. A press for making disk phonograph records, comprising an outer flat member provided with means for detachably securing a thin, unbacked matrix on its outer face, and provided on its back with an outer wall and a central wall providing an annular recess therebetween extending entirely around the die, and also provided with a plurality of substantially evenly spaced substantially round pins or lugs extending across the recess, a second die member forming a closure for the recess and abutting against said pins or lugs and having a plurality of separated pins or lugs on its back adapted to rest directly upon a press member, an inlet opening and an outlet opening at substantially opposite sides of the recessed chamber in the die, and a short baffle plate opposite the intake opening.

In testimony that I claim the foregoing, I have signed my name hereto.

ALBERT BURCKARD.