Jan. 13, 1942. J. DE NORONHA 2,269,758

MECHANICAL PRESS

Filed Oct. 12, 1938

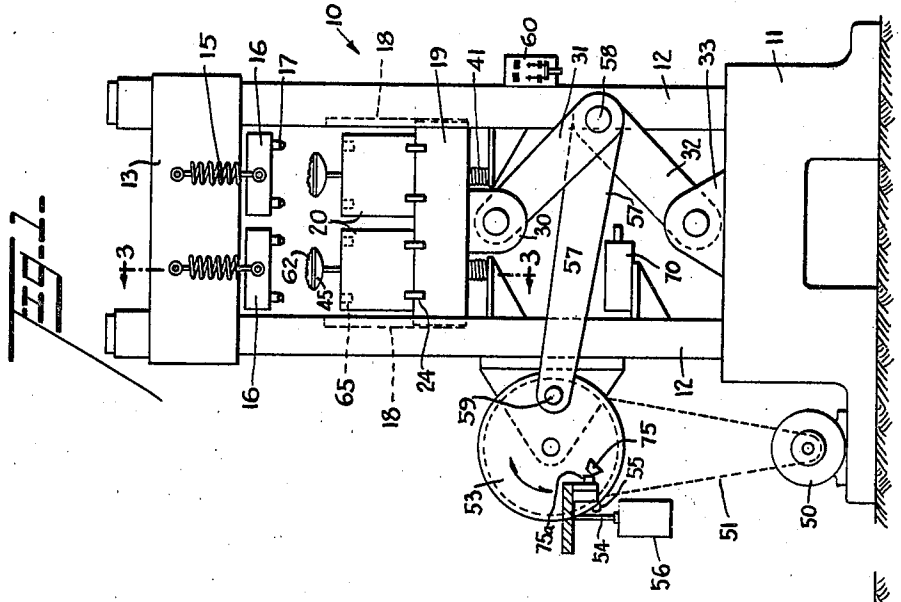


Fig. 1

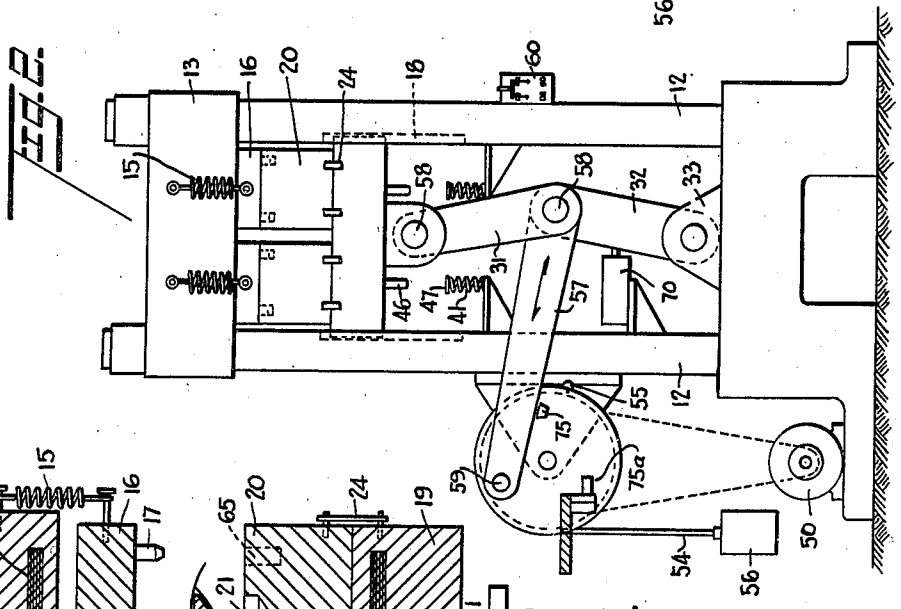


Fig. 2

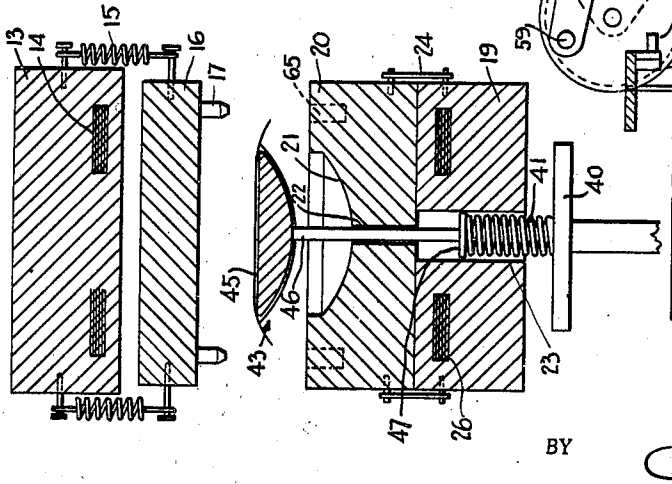


Fig. 3

INVENTOR.
Joaquin de Noronha.

BY

Carl Miller
ATTORNEY.

Patented Jan. 13, 1942 2,269,758

UNITED STATES PATENT OFFICE

2,269,758

MECHANICAL PRESS

Joaquin de Noronha, New York, N. Y., assignor to De Noronha Rubber Products Corporation, New Brunswick, N. J., a corporation of New Jersey

Application October 12, 1938, Serial No. 234,614

6 Claims. (Cl. 18—17)

This invention relates to mechanical presses, and is particularly directed to an electrically driven press for molding and curing articles of rubber, Bakelite, and the like plastic material, under heat and pressure.

An object of this invention is to provide a press of the character described, having gravity actuated means for aiding the electric motor to exert pressure for the molding operation, said gravity actuated means being arranged to hold the pressure constant after the electric motor ceases operation, upon obtaining a predetermined pressure.

A further object of this invention is to provide a press of the character described in which it is not necessary to remove the molds from the press for the purpose of removing the cured articles therefrom.

Yet another object of this invention is to provide a motor driven press having means for automatically shutting off the motor when a predetermined pressure is obtained.

Yet another object of this invention is to provide a motor driven press of the character described, having gravity actuated means to hold the press under pressure, the motor being arranged to open the press against the action of the gravity actuated means, means being provided to lock the gravity actuated means against movement when the press is opened to a predetermined position.

Still another object of this invention is to provide in a press of the character described, a pair of mold members adapted to receive the material to be compressed and molded therebetween, one of said mold members being connected by springs to the press, whereby after the molding operation, separation of the mold members will not damage the molded article, by reason of the fact that the spring connected mold member will yieldingly pull away from the molded article, thus eliminating sudden or abrupt pulls, which often tear the molded article.

A still further object of this invention is to provide a strong, rugged and compact press of the character described, which shall be relatively inexpensive to manufacture, smooth and positive in operation, and yet practical and efficient to a high degree in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the following claims.

In the accompanying drawing, in which is shown one of the various possible illustrative embodiments of this invention,

Fig. 1 is a front view of a press embodying the invention, showing the press in open position;

Fig. 2 is a view similar to Fig. 1, but showing the press in closed or molding position; and

Fig. 3 is an enlarged, cross-sectional view taken on line 3—3 of Fig. 1.

Referring now in detail to the drawing, 10 designates a press having a base 11, supporting a plurality of upstanding guiding walls or members 12. Fixed to the upper ends of the walls 12 is a head table 13 provided with electric heating means 14, or steam heating means, or any other suitable heating means.

Suspended from the head table by means of coil tension springs 15, are a pair of mold covers or members 16, each provided with downwardly extending aligning pins 17.

The upstanding guide members 12 are formed with guide grooves 18 to slidably receive a sliding table 19. Mounted on the sliding table 19, are a pair of matrix molds 20, aligned with mold members 16, each formed with a central curved recess 21 and a central opening 22, communicating therewith. The sliding table 19 is formed with a pair of vertical through openings 23, aligned with the openings 22. The sliding table may be rigidly connected to the matrix molds 20 by means of connectors 24, of any suitable construction. The sliding table 19 may be provided with electric heating means 26, or steam heating means, or any other suitable heating means.

At the lower side of the sliding table 19 is a central perforated ear 30, to which is pivotally connected, by pin 58, a link 31. The link 31 is connected to a link 32 which is pivoted at its lower end to an upstanding central ear 33 on the base 11. The links 31, 32 form a toggle, as will appear hereinafter.

Fixed to the supports 12 are a pair of aligned brackets 40 supporting coil compression springs 41, which are fixed thereto in suitable fashion in position to project into the openings 23 of the sliding table 19. Supported by the springs 41 are mold members 43. Each mold member 43 comprises a core 45 adapted to fit within the recess 21 of the matrix mold 20. The surfaces of the core 45 may be flat or of any other suitable configuration, depending upon the shape of the article to be molded. Extending down from each core 45 is a central stem 46. At the lower end

of each stem 46 is a disc 47, resting at the top of one of the springs 41.

Mounted on the base 11 is a reversible motor 50, connected through a belt 51 and suitable reduction gearing, (not shown) to a drum 53 mounted for rotation on a horizontal axis. Wound around the drum is a cable or flexible member 54, having one end 55, attached to the drum. Attached to the other end of the cable 54, is a suspended weight 56. The connecting member 57 connects the pivot pin 58 for the links 31, 32 to an eccentric pin 59 on the drum 53.

In Fig. 1, the press is shown in open position, with the sliding table 19 moved downwardly to the lower ends of the grooves 18. In such position, the connecting member 57 is to the right, and the toggle is open. When the sliding table 19 is down or in retracted position, the springs 41 supported by the brackets 40, press the mold members 43 upwardly to lift and project the cores 45 out of the recesses 21 and to support said cores in projected position when table 19 is in retracted position.

A suitable double throw switch 60 may be provided to reverse the motor.

Beginning with the parts as shown in Fig. 1, when it is desired to mold articles, the raw plastic material, such as rubber compound, is placed as at 62, on top of the cores 45. The motor is then started to rotate drum 53 in the direction of the arrow shown in Fig. 1, pulling the connecting member 57 to the left and pressing the sliding member upwardly. During the operation, the cores 45 will move within the recesses 21. The matrix molds will then be pressed upwardly against the mold members 16, carrying along with them the cores 45 already in position. The matrix molds 20 are provided with sockets 65 to receive the aligning pins 17 of the mold members 16.

The weight 56 aids the motor in moving the slide member upwardly during the closing operation. As the links 31, 32 move into co-alignment when the toggle is substantially projected, a very high pressure is exerted on the parts of the mold for performing the molding operation.

On one of the supports 12 is a switch 70 which by coming into contact with the link 32 shuts off the motor when the slide table 19 moves upwardly to a predetermined position, and a predetermined pressure is obtained.

After the motor is shut off, the weight 56 retains the mold members in pressed together condition.

The rubber articles are vulcanized by heat in the tables 13 and 19, while the press is under pressure. The excess rubber is known in the trade as "splash." This "splash," and also the upper surface of the molded articles adhere to the upper mold members 16, and if an abrupt separation is caused between said upper mold members and the lower mold members, the upper surfaces of the molded articles might be easily torn, or otherwise damaged. However, with the present construction, when the slide table 19 is brought down, the adhesion between the molded articles or the "splash" with the member 16 will cause member 16 to pull downwardly against the yielding springs 15. With this construction, the pull is not abrupt, but builds up sufficient pressure to cause separation of the mold member 16 from the molded articles without damaging the latter. Similarly, springs 41 prevent an abrupt projection of cores 43 from molds 20.

To open the press, the motor 50 is reversed, turning the drum 53 in a clockwise direction, and pulling up the weight 56, causing the toggle to open for lowering the table 19. On the drum 53 is a projection 75 adapted to actuate a switch 75a when the slide member 19 moves down to the bottom ends of the grooves 18, to shut off current to the motor 50, and automatically lock the drum for retaining the press in open position. The molded articles may then be readily removed from the cores 45 by pulling them off by means of the "splash."

It will now be readily seen that the molds do not have to be removed from the press in order to remove the molded articles therefrom.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a press, a pair of mold members, electric motor operated means to press said mold members together and to move them apart, means to automatically shut "off" the motor upon a predetermined movement of one of said mold members, and gravity actuated means operatively connected to one of said members to aid the motor to press said mold members together and to hold the mold members pressed together when the motor is shut "off" and until the motor is reversed.

2. In a press of the character described, a pair of mold members, toggle means movable to projected position for moving one of said mold members toward the other, an electric motor for operating said toggle means, means controlled by the operation of said toggle means to turn the motor "off," and gravity actuated means operatively connected to one of said members to hold the toggle means against movement from projected position when the motor is shut "off" and until the motor is reversed.

3. In a press, a pair of mold members mounted for relative movement, toward and away from each other, toggle means for causing relative movement between said mold members, a drum, said toggle means being operatively connected to said drum, a flexible member connected at one end to said drum and wound around said drum, a weight connected to the other end of said flexible member, an electric motor, and means interconnecting said motor with said drum to rotate the latter when the motor is operated.

4. A press of the character described, comprising a base, a frame structure fixed to said base, a top member fixed at the upper end of said frame structure, a mold member suspended by springs from said top member, a sliding table slidably mounted in the frame structure for vertical movement, a mold member supported by said slide table adapted to be moved against the first mentioned mold member, a link pivoted to said slide table, a second link pivoted to said base, said links being pivoted to each other, an electric motor, a drum pivoted about a horizontal

axis, means interconnecting said motor to said drum for rotating the latter when the motor is operated, a cable attached at one end to the drum and wrapped around the drum, a suspended weight at the other end of said cable, and an interconnecting member pivoted at one end thereof to the pivotal connection for said links and connected at the other end thereof to said drum.

5. A press of the character described, comprising a base, a frame structure fixed to said base, a top member fixed at the upper end of said frame structure, a mold member suspended by springs from said top member, a sliding table slidably mounted in the frame structure for vertical movement, a matrix mold member supported by said slide table adapted to be moved against the first mentioned mold member, a core member slidably mounted on said matrix mold member, a bracket fixed to said frame structure, a spring on said bracket supporting said core member by means of a slide member attached thereto, a link pivoted to said slide table, a second link pivoted to said base, said links being pivoted to each other, an electric motor, a drum pivoted about a horizontal axis, means interconnecting said motor to said drum for rotating the latter when the motor is operated, a cable attached at one end to the drum and wrapped around the drum, a suspended weight at the other end of said cable, and an interconnecting member pivoted at one end thereof to the pivotal connection for said links and at the other end thereof to said drum.

6. In a press, a frame, a platen fixed in said frame, a slidable platen mounted for movement in said frame toward and away from said fixed platen, and a three-piece mold in said frame between said platens, said mold comprising a matrix operable by said slidable platen for movement toward and away from said fixed platen, said matrix having a cavity and an outer bearing surface around said cavity, a cover mounted for movement in said cavity, a cover for said bearing surface of the matrix movable toward and away from the latter between said matrix and said fixed platen, and means for resiliently supporting said cover from said fixed platen comprising springs connected to said fixed platen and to the opposite side edges of said cover.

JOAQUIN DE NORONHA.