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PRESS FOR MOLDING PLASTIC

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ABSTRACT OF THE DISCLOSURE
A hand press for molding a corrective appliance to be worn within the shoe of a user and made in complete conformity with the contour and profile of a positive mold to match the surfaces of a foot to which the appliance is to be applied.

This invention relates to a device for producing, though not restrictively, orthopedic corrective appliances in accordance with prescriptions of Doctors of Podiatry. It is one of the principal objects of the present invention to provide a device of this character, in the nature of a plastic press, which is of simple, efficient, durable, compact construction, positive and fool-proof in operation, and self-locking in various stages of its cycle of operation.

The device is designed for convenient and effective use as a table top unit and as such along with the self-locking feature leaves the hands of the operator free to work material being dealt with in an accurate and more expeditious manner and in less time than heretofore.

The foregoing and other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof and in which:

FIGURE 1 is a top plan view of an appliance of the character described made in accordance with my invention.

FIGURE 2 is a side elevational view of FIGURE 1 with two small fragments broken away for convenience of illustration.

FIGURE 3 is a fragmentary front elevational view of FIGURE 2, and

FIGURE 4 is a sectional detail plan view taken approximately along the line 4—4 of FIGURE 2.

Referring now more particularly to the drawings where-in like references of character designate like parts reference numeral 1 indicates a base plate having a socket 2 welded or otherwise permanently secured to its rearward end for removably supporting a main column 3 having a cap piece 4 permanently secured to its top end and provided with a downwardly extending internally threaded collar 5. An adjusting screw 6 extends rotatably through the collar and cap piece and is provided at its top end with an actuating handle 7. The bottom end of the screw is threadedly engaged with a projection 8 on the front face of a block 9 slidably mounted upon the column 3. Secured as at 12 to the column 3 is a detent in the form of a plate 13 having secured thereto the bottom end of a guide rod 15 whose top end is threadedly or otherwise secured to the block 9.

Surrounding the rod 15 is a compression spring 16 whose bottom end bears against the plate 13 with its top end bearing against the underside of the top wall 17 of a box-like housing indicated generally at 18 having a bottom wall 19 connected to the top wall 17 by a front wall 20 and two vertical rods 21 and 22. The housing 18 is movable upwardly and downwardly upon the column 3, and to stabilize such movement I provide the forward end of the plate 13, as at 24, for sliding engagement with a rail 25 welded or otherwise secured to the inside of the front wall 20 of the housing 18.

For effecting such vertical movement of the housing 18 throughout its operative range, I provide two pairs of identical toggle links in each of which a top arm 27 is pivotally attached at its rearward end as at 28 to the block 9 and at its forward end as at 30 to the top end of a bottom toggle arm 31 whose bottom end is pivotally attached at 32 to the top wall 17 of the housing 18 by means of a lug 33. For actuating the toggle links and hence the housing 18 and its related parts downwardly from the inoperative full line position to the operative broken line position, I provide a lever arm 35 secured at its inner end by means of a fitting 36 and set screw 41 to the outer end of an elongated pivot bolt 42 which extends through the block 9 and provides the pivotal connection 25 for the top toggle arms 27 to the block 9.

Removably secured to the lower end of the front of the housing 18 by machine screws 45 and movable upwardly and downwardly therewith is a horizontally disposed substantially U-shaped frame 56. A normally flat sheet of rubber 49, or other suitable mold-conforming material, approximately ⅛ inch thick, is secured along the outside of each of the arms 47—48 of the frame by means of metallic strips 50 and fastening screws 50A, which crimp the underlying upturned side edges of the sheet 49 into channels 51 extending lengthwise of the arms.

As shown in FIGURE 2, a mold-supporting pedestal 52 is removably secured to the base plate 1 by thumb screws 53. As clearly shown in FIGURE 1 the length and width of the pedestal is less than that of the frame 46 and the flexible sheet 49 carried by the frame. The top surface of the pedestal is shaped as shown in dotted lines and of such length and width as to accommodate molds of the feet of an adult as well as those of children of all ages. The rearward end of the pedestal is of generally conoidal shape in plan view so as to accommodate the radius of curvature of any size heel within the approximate range indicated to maintain the vertical centerline of the mold and hence the molded appliance in alignment with that of the pedestal when the flat bottom surface of the mold 55 is seated upon a flat rubber pad 56 which is placed upon the top of the pedestal, as illustrated in FIGURE 5.

The corrective appliance to be worn within the shoe of a patient or to be otherwise applied to the patient's foot is indicated at 57 in FIGURE 2 and comprises a sheet of acrylic plastic, preferably a cylinder, of generally semi-softened flexible and moldable in the presence of heat and including water-softerned leather which can be molded in the absence of heat after a stiffening agent has been added thereto.

When the positive mold 55 is placed upon the top of the pedestal as aforesaid with the sheet of moldable material 57 placed thereover, a downward swing of the actuating lever 35 will move the U-shaped frame 46 downwardly as indicated in broken lines in FIGURE 2 and to an extent necessary to pull the material 57 downwardly into complete conformity with the contour and profile of the positive mold 55. The frame and housing 18 are locked into this downwardly disposed molding position by the over center locking relationship of the toggle links 27 and 31 as shown in broken lines in FIGURE 2 and thus leave the hands of the operator free for other purposes.

The range of vertical movement of the frame 46 relative to the pedestal 52 and the molding instrumentality mounted thereupon is regulated by the bolt 6 acting upon the block 9. In other words, advancement of the bolt 6 on its threads moves the block 9, toggle links 27 and 31 and housing 18 downwardly to a lower starting position than that shown in full lines and hence to a lower terminal position as shown in broken lines. Conversely,
retracting the bolt 6 on its threads will elevate the block 9 and its related parts into relative higher starting and terminal positions.

It will be readily understood that the forming of articles other than that shown in FIGURE 2 of the drawing may require sheet mounting means of a configuration other than parallel arms of the frame 46.

For example, the forming of orthopedic appliances such as artificial joints requires the substitution of a circular sheet-supporting member or frame for the one shown. Similarly, the pedestal 52 may be easily replaced merely by backing out the thumb screws 53 and substituting a matching or circular pedestal (not shown) provided with matching mounting holes.

Although I have shown and described the device for use in the production of an orthopedic correctional instrumentality for application to deformities or other physical imperfections of a patient's foot, it is to be understood that such disclosure does not necessarily prescribe any limits of utility of the invention since it could be just as effectively used in the molding of artificial joints wherein the positive mold 55 would be of generally bulbous formation and the resilient web and supporting frame would be of circular formation to circumscribe the positive mold with sufficient clearance to permit of stretching the web over the positive mold in full conformity therewith in the same manner as its counterparts shown in FIGURE 2.

While I have shown and described a particular form of embodiment of my invention, I am aware that many minor changes therein will readily suggest themselves to others skilled in the art without departing from the spirit and scope of the invention. Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In a molding press having a base, a vertical column secured to one end of the base and a lever actuated box-like housing mounted for vertical slidable movement on the column, the improvement comprising: a horizontally disposed U-shaped frame, means securing said frame to said housing for vertical movement therewith along said column, a flexible sheet of mold-conforming material secured to said frame along both sides thereof, a pedestal removably secured to said base and adapted to support a positive mold with an overlying sheet of moldable material, said pedestal and a positive mold supported thereon being of less length and width than said frame, whereby downward movement of said frame under pressure will, by its contained said sheet of flexible material, force said moldable material into complete conformity with the contour and profile of said positive mold.

2. The improvement as claimed in claim 1 wherein said pedestal has a forward end, and a rearward end, the latter being of generally conoidal shape in plan view to thereby accommodate the radius of curvature of any size heel portion of a positive mold supported upon the pedestal.

3. The improvement as claimed in claim 1 including a resilient covering for the top of said pedestal.

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