Oct. 27, 1953

F. R. SMITH

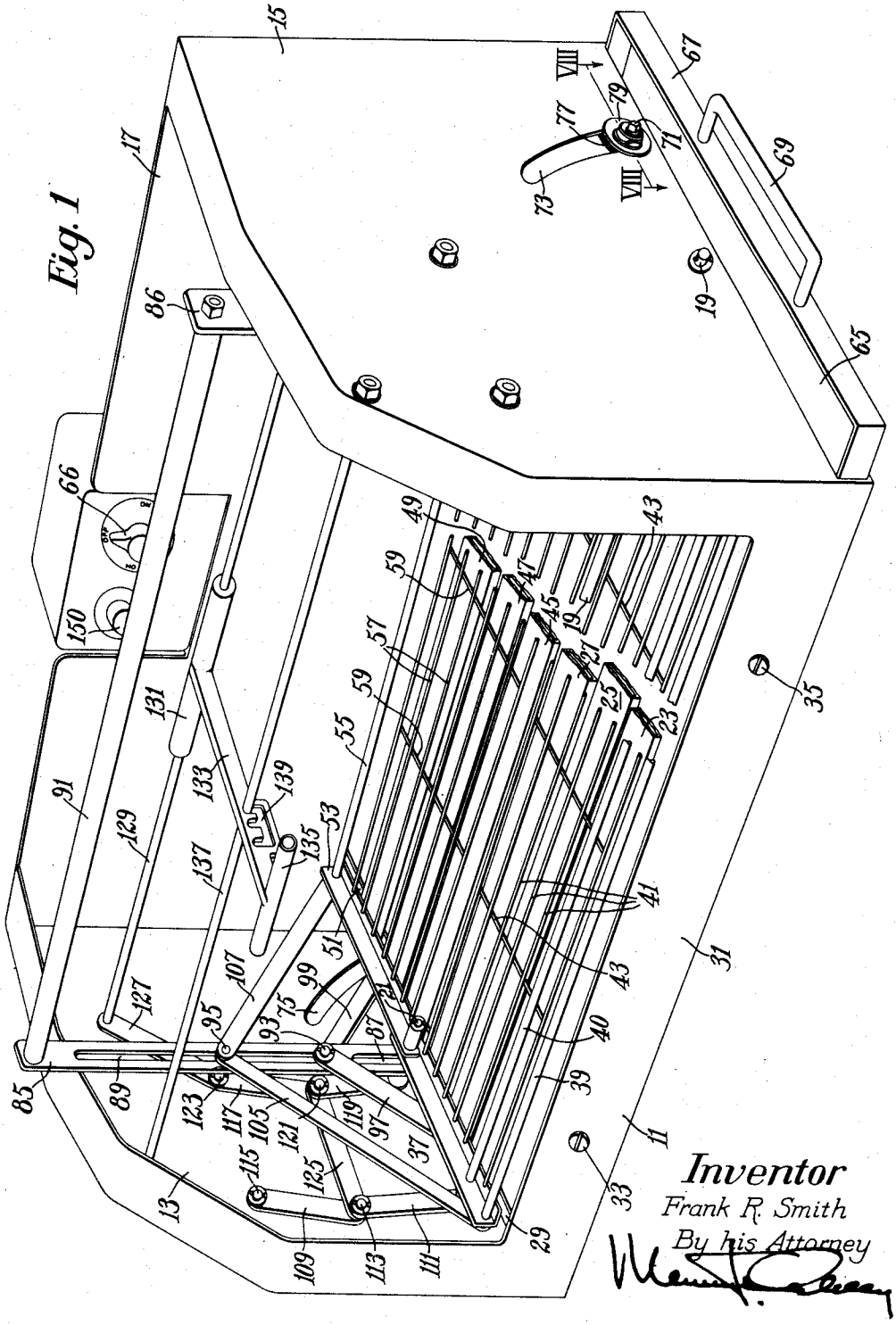
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SHOE BOTTOM HEATER WITH LINKS FOR ADJUSTING HEATING-GRID SUPPORTS

Filed Nov. 20, 1951

6 Sheets-Sheet 1

Fig. 1



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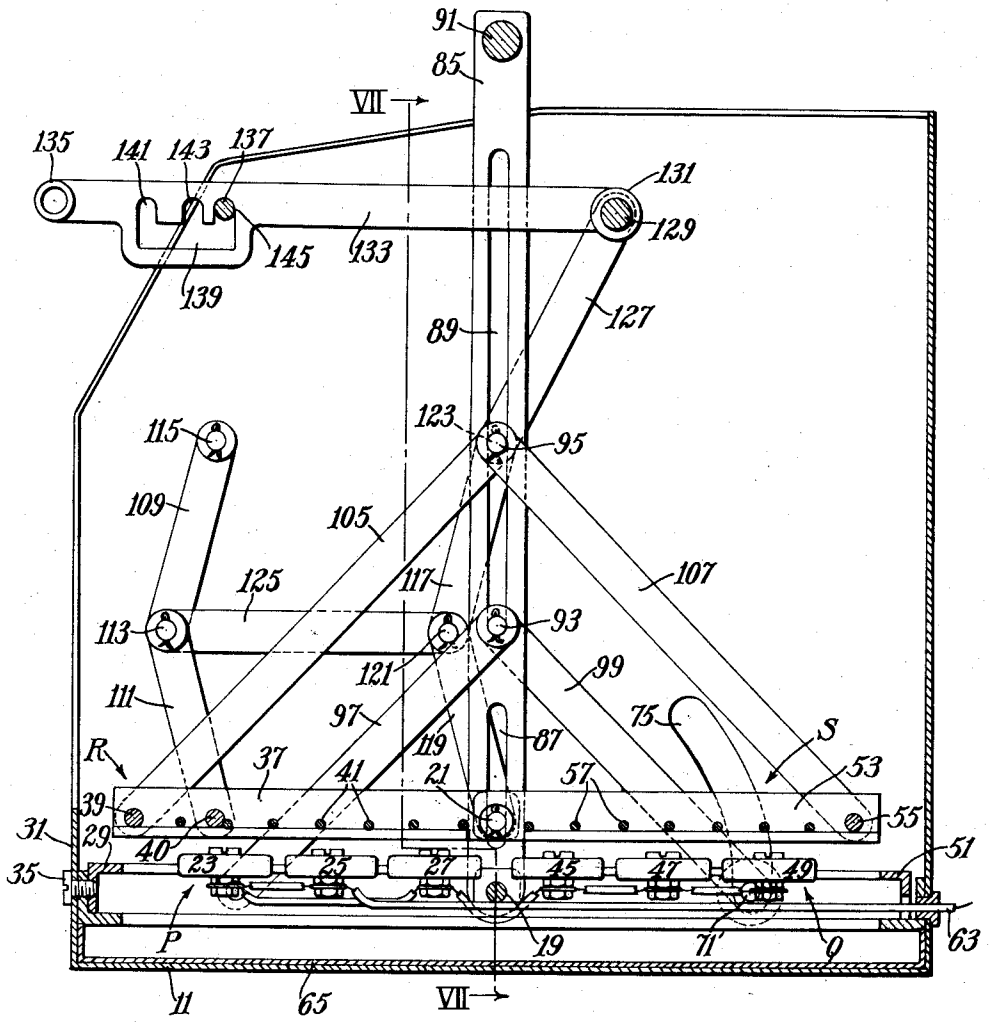
By his Attorney

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SHOE BOTTOM HEATER WITH LINKS FOR ADJUSTING HEATING-GRID SUPPORTS

Filed Nov. 20, 1951 6 Sheets-Sheet 2

Fig. 2



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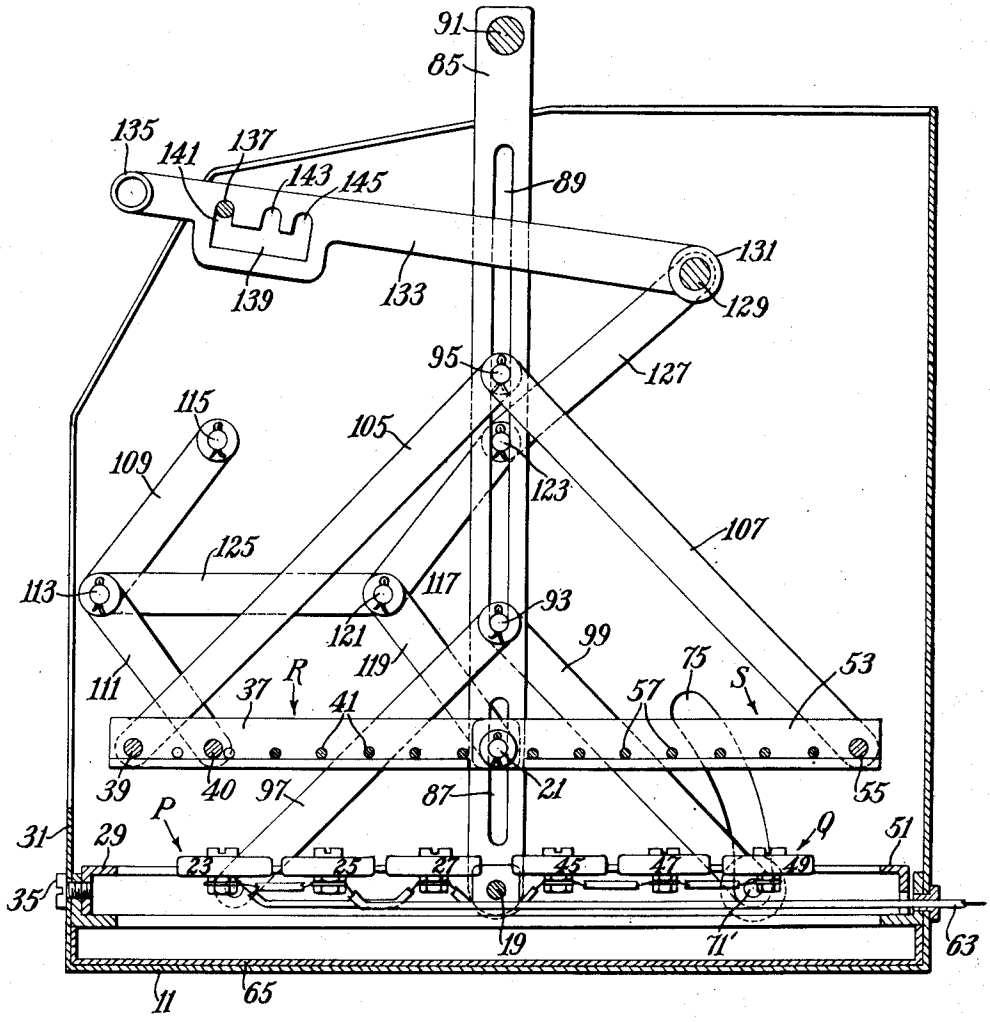
SHOE BOTTOM HEATER WITH LINKS FOR ADJUSTING HEATING-GRID SUPPORTS

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6 Sheets-Sheet 3

Fig. 3



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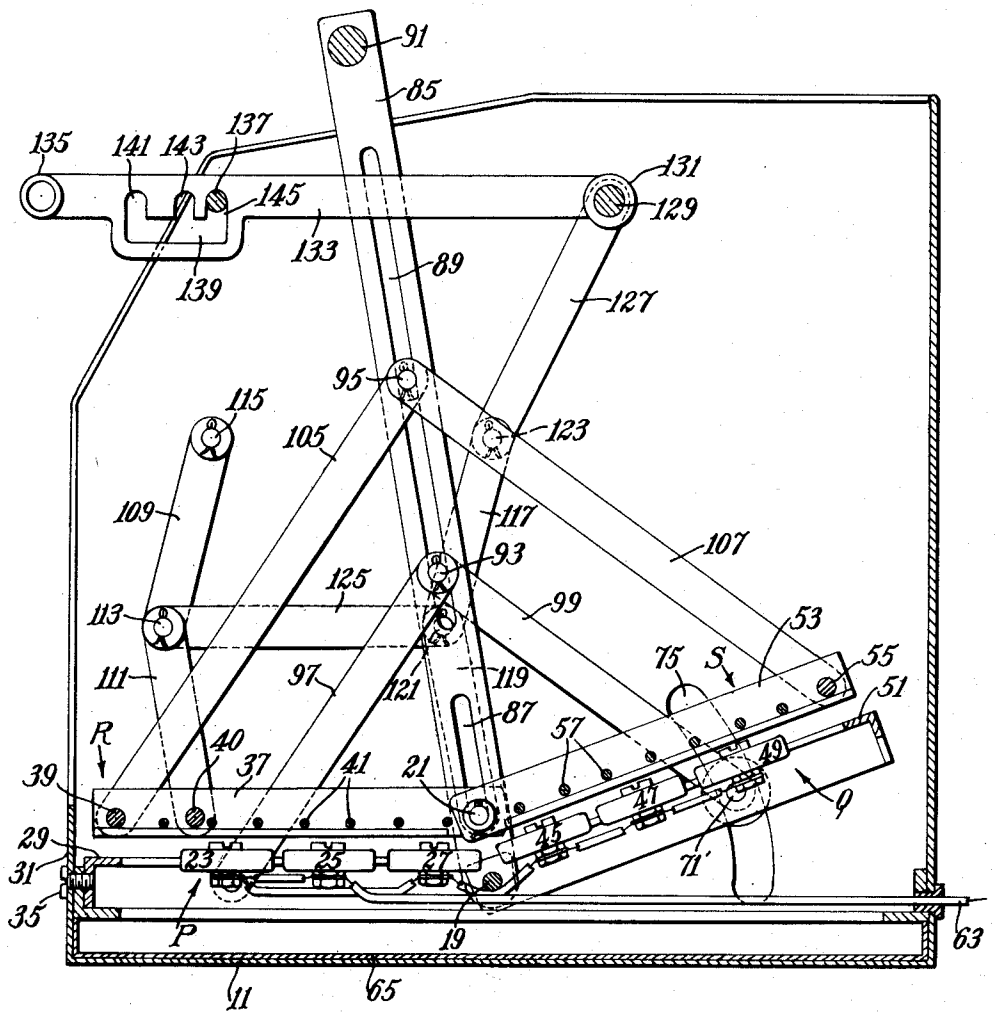
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SHOE BOTTOM HEATER WITH LINKS FOR ADJUSTING HEATING-GRID SUPPORTS

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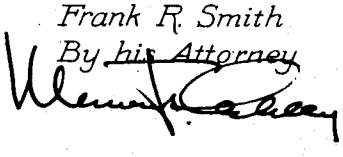
Fig. 4



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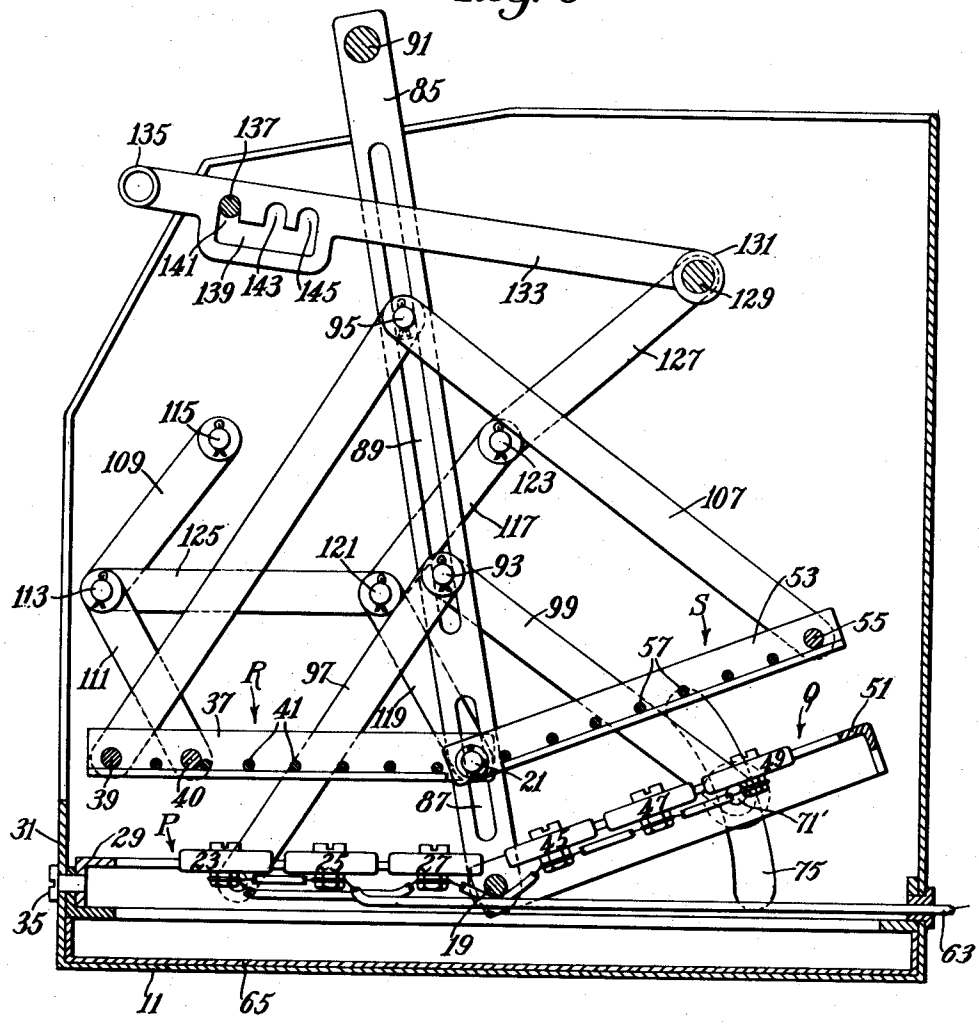
SHOE BOTTOM HEATER WITH LINKS FOR ADJUSTING HEATING-GRID SUPPORTS

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Fig. 5



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SHOE BOTTOM HEATER WITH LINKS FOR ADJUSTING HEATING-GRID SUPPORTS

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Fig. 6

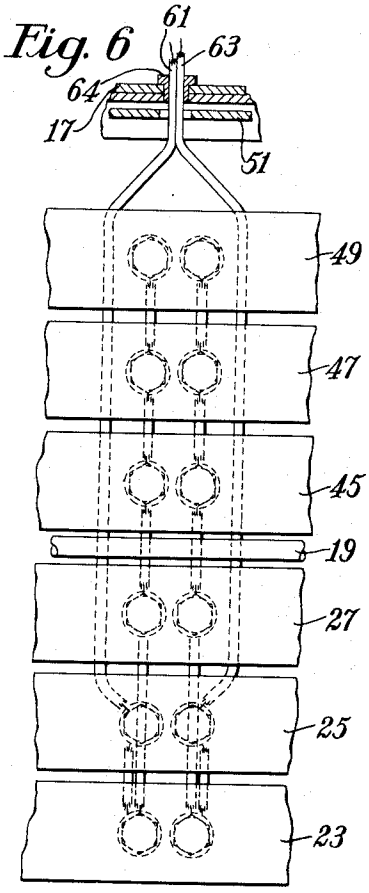


Fig. 7

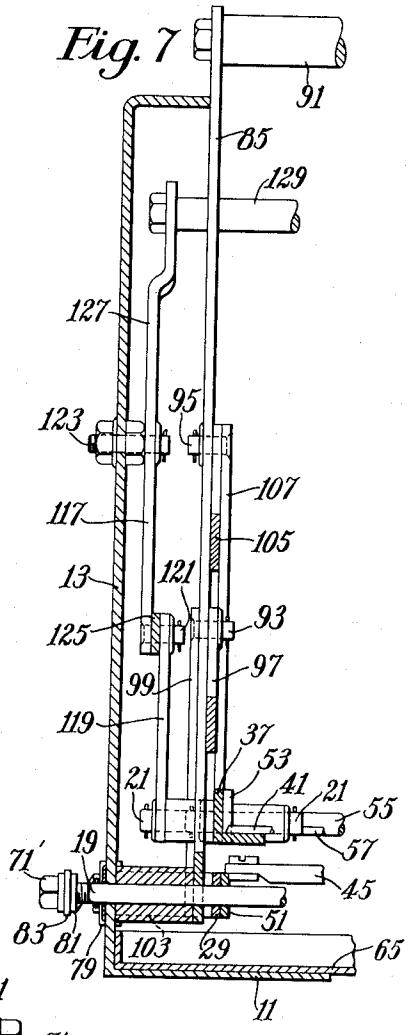


Fig. 8

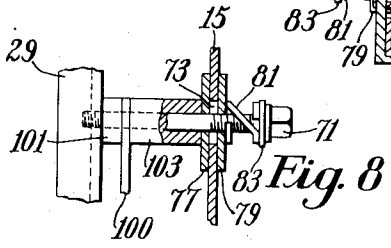
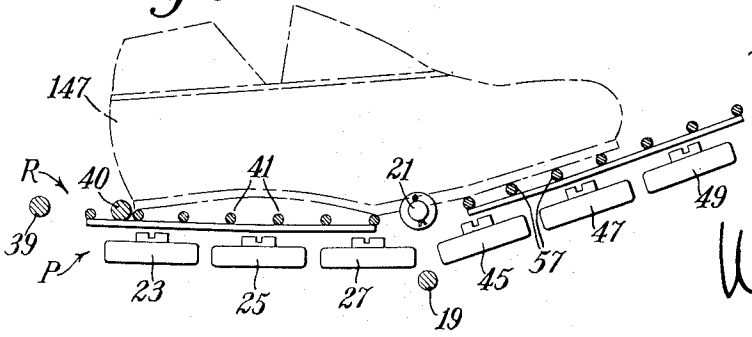


Fig. 9



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2,657,029

SHOE BOTTOM HEATER WITH LINKS FOR ADJUSTING HEATING-GRID SUPPORTS

Frank Richard Smith, Leicester, England, assignor to United Shoe Machinery Corporation, Flemington, N. J., a corporation of New Jersey

Application November 20, 1951, Serial No. 257,400
In Great Britain December 14, 1950

6 Claims. (Cl. 263—2)

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This invention is concerned with improvements in or relating to apparatus adapted for heating shoes, the word "shoe" being used herein to denote outer footwear generally whether completed or only partially completed; the invention will be hereinafter described with reference to heating the bottoms of shoes which have been lasted but which have, as yet, no outsoles.

At the present time a considerable proportion of the shoes being manufactured are "cement-soled" shoes, that is to say shoes which have leather outsoles secured in place upon their shoe bottoms by cement, for example, pyroxylin cement, rather than by stitching or metallic fasteners. Thus a cement-soled shoe may be made by a process in which both the outsole and the shoe bottom are first roughed and are then given marginal applications of pyroxylin solution, the solvent therein being thereafter allowed to evaporate to leave marginal coatings of pyroxylin on the two workpieces. Subsequently, at a convenient time in the shoe manufacturing process, a suitable activator, comprising a volatile solvent for the pyroxylin, is applied to the outsole and the outsole and shoe are, very shortly thereafter, brought together and placed under pressure in a cement sole press. The activator brings the pyroxylin coatings on the outsole and shoe bottom into an adhesive condition and the outsole and shoe are held together under pressure in the press until the solvent has largely evaporated and a sufficiently firm bond has been produced to allow the work to be removed from the press.

In making a cement-soled shoe by the process just referred to, the period of time for which the outsole and shoe must be held together under pressure is one factor which determines the number of pairs of shoes which a cement sole press is capable of handling in a given time. In order to shorten this period and so to increase the capacity of the press, it has been a common practice to subject the outsole to moist heat immediately prior to application of the activator with a view to hastening evaporation of the solvent when the work is in the press. Such heating is difficult to accomplish, especially in the case of outsoles of leather of the quality commonly available at the present time, without considerable risk of discoloring, for example staining, the outsole. It has therefore been proposed to heat the shoe bottom, rather than the outsole, immediately prior to bringing together the shoe and outsole and placing them in the press.

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Accordingly, one of the various objects of the invention is to provide an improved apparatus comprising a shoe support and a heating unit for heating the bottoms of lasted shoes.

Lasted shoes may have different bottom contours, that is, the angular relation between the forepart and shank portions of the bottom at the break may differ substantially, thus necessitating adjustment of the heating unit to provide even heating of the forepart and shank portions. At the same time, it is advantageous to provide for simultaneous adjustment of the shoe support as a gage for locating the shoe in operative position and as a gage for adjustment of the heating unit. Further, to provide for changes in the routine of removal of shoes from the apparatus and replacement of other shoes therein, such as may be occasioned by enforced delays, or to provide for variations in the nature of the shoe bottom, cement, or solvent, it is highly advantageous that the over-all heating of the shoes may be rapidly varied. Because of the thermal capacitance or lag of the usual electric heating elements, this rapid variation cannot be provided merely by switching of the electric power.

Another object of the invention, accordingly, is the provision of shoe bottom heating apparatus in which such adjustments may be speedily and conveniently effected.

In accordance with a feature of the invention, an embodiment thereof hereinafter described comprises a shoe support, a two-section heating unit, manually-operated means for adjusting the relative disposition of the heating sections, and manually-operated means for providing bodily relative movement of approach or separation between the heating sections and the support.

In accordance with another feature of the invention, the apparatus comprises a two-section shoe support, a two-section heating unit, manually-operated means for simultaneously adjusting the relative dispositions of the sections of the support and of the sections of the heating unit, and manually-operated means for providing bodily movement of approach or separation between the support and the heating unit.

As viewed in another aspect in the specific embodiment disclosed herein, the adjusting means cooperates with the means providing bodily movement of approach or separation between one support section and one heating section to maintain the said relative dispositions of the sections during the relative movement to provide bodily movement of approach or separation between the support and the heating unit.

Thus bodily relative movement of approach or separation may be caused to take place between the shoe support and the heating unit with the sections at any relative disposition to which they may have been adjusted, or the relative disposition of the sections may be adjusted with the heating unit and the shoe support set apart at any distance of separation.

The above and other of the various features and advantages of the present invention will become more clear from the following description, to be read with reference to the accompanying drawings, of the said illustrative apparatus. It will be realized that this apparatus has been selected for description by way of example and not of limitation of the invention.

In the accompanying drawings,

Fig. 1 is an angular view of the illustrative apparatus with parts broken away;

Figs. 2, 3, 4 and 5 are views, partly in side elevation and partly in section, showing parts of adjusting means and controlling means of the apparatus;

Fig. 6 is a plan view, partly in section, of a fragment of the heating unit, showing electrical connections of the apparatus;

Fig. 7 is a view, partly in section substantially along VII—VII of Fig. 2, showing parts of adjusting means and controlling means of the apparatus;

Fig. 8 is a plan view, partly in section along VIII—VIII of Fig. 1, showing a frictional device of the apparatus; and

Fig. 9 is a diagrammatic side view showing a shoe in position on the apparatus.

The illustrative apparatus has a box-like base 11 (Fig. 1) having a left-hand side wall 13, right-hand side wall 15, and back wall 17. The base has a bracket, not shown, by which it may be conveniently supported over a cement sole press. Within the base 11 is a shoe support comprising two support sections R and S (Fig. 3), and a heating unit comprising two heating sections P and Q disposed beneath the support sections. The heating sections P and Q are hinged together by a pivot 19 and the support sections R and S are connected by pivots 21, of which only one is visible in the drawings.

The heating section P is held in substantially horizontal relation to the base 11 and comprises three conventional metal heating plates 23, 25, 27 secured at their ends to a rigid frame 29, L-shaped in cross section, which is bolted to a front flange 31 of the base 11 by bolts 33, 35 (Fig. 1) and is connected to the pivot 19 which passes through the side walls 13, 15. The support section R comprises end pieces 37, L-shaped in cross section (only one is visible in the drawings), between which run crossbars 39, 40 and work-supporting wires 41 mutually strengthened by wires 43. The section R is connected to the pivots 21 and to means hereinafter described whereby relative bodily movement of approach or separation may be caused to take place between the sections P and R.

The heating section Q comprises plates 45, 47, 49 similar to the plates 23, secured to a frame 51 connected to the pivot 19 and to adjusting means hereinafter described. The support section S comprises end pieces 53 (only one is visible in the drawings), a crossbar 55 and wires 57, 59. The section S is connected to the pivots 21 and to adjusting means hereinafter described.

The heating plates 23, 25, 27, 45, 47 and 49 are electrically connected by wires in the manner

shown in Fig. 6, leads 61, 63 passing through a hollow rivet 64 (Fig. 6) set in the back wall 17 and running to a conventional switch control unit 66 (Fig. 1) which is connected to a main supply.

A flat tray 65 having a vertical edge wall 67 and handle 69 is fitted for sliding movement on the base 11 of the framework and lies closely below the heating sections P and Q.

Manually-operated adjusting and controlling means of the illustrative apparatus will now be described. The apparatus comprises adjusting means whereby the operator may adjust the relative dispositions of the support sections and of the heating sections, and controlling means for providing relative bodily movement of approach or separation between the heating unit P, Q and the shoe support R, S.

The rear heating section Q has its forward edge pivoted about the pivot 19. A bolt 71 (Figs. 1 and 8) extends sideways from the frame 51 between its rear edge and the pivot 19 and passes freely through an arcuate slot 73 in the right-hand side wall 15. A similar bolt 71' (Fig. 7) is secured to a left-hand portion of the frame 51 and passes through an arcuate slot 75 in the left-hand side wall 13. Two washers 77, 79 are mounted on the bolt 71 on either side of the side wall 15, the washer 79 (on the outside of the wall) being resiliently pressed against the wall 15 by a spring washer 81 between the washer 79 and a washer 83 next to the head of the bolt 71. The washer 79 thus provides a friction grip against the side wall 15 sufficient to keep the section Q in any position at which the operator may set it; the compression of the spring washer 81 is adjustable by turning the bolt 71 which screws into a tapped hole in the frame 51. The bolt 71' passing through the slot 75 on the left of the apparatus carries a similar assembly of washers.

The adjusting and controlling means of the illustrative apparatus comprise parts which are symmetrically disposed on each side of the apparatus. For convenience parts on the left-hand side only will be described, it being understood that there are corresponding parts on the right.

Referring now to Figs. 2, 3, 4, 5 and 7, the adjusting means of the illustrative apparatus comprises an upright bar 85 pivoted at its lower end to the pivot 19. The bar 85 is provided with two longitudinal slots 87 and 89; the pivot 21 passes through the lower slot 87. A handlebar 91 is secured at the top of the bar 85 and at the top of the corresponding bar, shown as 85 (Fig. 1), on the right of the apparatus. By the handlebar 91 the operator may adjust the bars 85, 85 forwardly of their vertical positions. In the slot 89 two pivot pins 93, 95 are free to slide; to the lower pin 93 are connected end portions of two links 97, 99 opposite end portions of which are connected for pivotal movement respectively to the frame 29 of the heating section P and to the frame 51 of the heating section Q. The latter connection is made in the manner shown in Fig. 8; thus the link on the right of the apparatus corresponding to the link 99 and indicated by the reference numeral 103 lies between collars 101, 103 on the bolt 71. End portions of two links 105, 107 are connected to the upper pivot pin 95 and opposite end portions are connected for pivotal movement respectively to a portion of the crossbar 39 projecting through one of the end pieces 37 of the support section R and to a portion of the crossbar 55 projecting through one of the end pieces 53 of the support section S. When the bar 85 is vertical, the sections P, Q, R and S

are substantially horizontal. It will be seen by a comparison of Figs. 2 and 4, and of Figs. 3 and 5, that forward tilting of the bars 85 and 86 by the operator will vary the relative angular dispositions of the support sections and of the heating sections, the sections Q, S being raised pivotally about the pivots 19, 21, respectively; a little relative sliding movement also takes place between the sections P and R, but there is substantially no change in their relative operative disposition or spacing.

The controlling means of the illustrative apparatus comprises two parallel toggle links arranged to raise and lower the front horizontal, or substantially horizontal, support section R. One toggle link comprises the links 109, 111 connected together by a pivot 113, the link 109 being pivoted to a pin 115 fixed in the side wall 13 and the link 111 being mounted for pivotal movement on an end portion of the crossbar 40 projecting through one of the end pieces 37 of the support section R. The other toggle link comprises links 117, 119 connected together by a pivot 121, the link 117 being pivoted to a pin 123 fixed in the side wall 13 at the same height above the base 11 as the pin 115, and the link 119 being mounted for pivotal movement on one of the pivots 21. In Fig. 2, the pin 123 is not shown, but a dashed line from the numeral 123 indicates its position behind pin 95. The pivots 113, 121 are joined by a connecting link 125. Integral with the link 117 is an arm 127 extending upwardly from the pin 123. A controlling bar 129 is fixed at an end of the arm 127 remote from the pivot 123, and passes from the arm 127 to the arm on the right-hand side of the apparatus corresponding to the arm 127. A central portion of the bar 129 is enclosed in a sleeve 131 integral with a bar 133 on a front end of which is a handle 135. Movement of the bar 133 by the operator to effect pivotal movement of the arm 127 and link 117 about the pin 123 causes relative movement of approach or separation to take place between the support section R and the section P, and since the links 97, 99, 105 and 107 maintain the relative dispositions of the heating sections and of the support sections while the pivot pins 93, 95 slide in the slot 89 of the bar 85, relative bodily movement is provided between the heating unit and the shoe support. A rod 137 extends across the apparatus between the side walls 13, 15 and through an aperture 139 in the bar 133. The aperture 139 comprises three recesses 141, 143, 145 whereby the bar 133 may be set in fixed relation to the rod 137 and the shoe support R, S set apart from the heating unit P, Q at any of three distances of separation. A comparison of Figs. 2 and 3, and of Figs. 4 and 5, shows how the relative bodily movement of approach or separation is effected. Furthermore, it will be clear that such relative movement of approach or separation may be caused to take place with the sections set at any angular disposition to which they may have been adjusted, or the relative angular disposition may be adjusted with the heating unit and shoe support set apart at any distance of separation at which they may have been set by the controlling means.

In using the apparatus, the operator conveniently turns on the switch of the unit 66, takes a first shoe 147 (Fig. 9) of a batch on which he is working and lays it on the support section R in the manner shown in Fig. 9; he then grasps the handlebar 91 and adjusts the angular disposition of the sections so that the support section S is

brought adjacent to the forepart of the shoe 147. He then sets the bar 133 with the rod 137 in the one of the recesses 141, 143, 145 which he desires. The operator then places five more shoes alongside the first one. In using a shoe press it is customary to take about fifteen seconds to remove one shoe, with its outsole, from the press and to replace it by another, so that when the illustrative apparatus is used with a press as referred to, each shoe bottom is heated for about a minute and a half.

Periodically it is desirable that the operator clean the apparatus, and this is readily effected by removing the tray 65 upon which most of any cement or waste matter which has dropped from the shoe bottoms through the shoe support R, S will have been collected.

It will be appreciated that the illustrative apparatus is adapted for evenly heating the bottoms of shoes having different angular relationships of the shank and forepart by the provision of means for adjusting the relative angular disposition of the heating sections and further that by the controlling means the heat imparted to the bottom of a shoe may be varied according to the nature of the shoe bottom, or of any cement applied thereto or of any solvent with which the shoe bottom may subsequently be associated or for any other reason requiring rapid variation of such heating.

Advantageously, for conditions requiring heat adjustment but not rapid variation, a rheostat 150 or other means for controlling the supply of electric energy may be incorporated in the illustrative apparatus whereby the heat imparted to shoe bottoms resting on the shoe support R, S may be regulated. Thus, the support R, S may be set closely above the heating unit P, Q, i. e., with the rod 137 in the recess 145 and the regulating means 150 set so that the desired amount of heat is imparted to the shoe bottoms in, say, a minute and a half. If, with the apparatus so arranged, the operator wishes to pause in his work, with the shoes resting on the shoe support R, S, he is then able, by grasping the handle 135 and setting the bar 133 with the rod 137 in the recess 141, to raise the shoes away from the heating unit and prevent any risk of the shoes being damaged by overheating. By raising the shoe support R, S away from the heating unit P, Q, the rate at which heat is imparted to the shoe bottoms is reduced almost immediately to a rate at which there is no risk of overheating of the shoe bottoms, whereas if the shoe support R, S were to remain at a fixed distance from the heating unit P, Q and adjustment of the regulating means relied upon to reduce the rate of heating, a longer period of time would elapse before the rate of heating would be reduced to a rate at which there would be no risk of overheating of the shoe bottoms.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In apparatus for heating the bottom of a shoe, a support for a shoe, two heating sections disposed beneath said support, manually-operated means operable to adjust the relative disposition of said sections, prior to the disposition of a shoe on said support, to equalize substantially the heating of the bottoms of shoes having different angles at the break between the forepart and shank portions, and manually-operated means for providing relative bodily movement of approach or separation between the heating sec-

tions and the support without disturbing the relative disposition of said sections.

2. In apparatus for heating the bottom of a lasted shoe, a shoe support comprising two support sections, a heating unit comprising two heating sections disposed beneath the shoe support, manually-operated means for adjusting simultaneously the relative dispositions of the support sections and of the heating sections to accommodate shoes having different angles at the break between the forepart and shank portions, and manually-operated means for providing relative bodily movement of approach or separation between the support and the heating unit.

3. In apparatus for heating the bottom of a lasted shoe, a shoe support comprising two substantially flat support sections adapted to be disposed in edge-to-edge relation, a heating unit comprising two substantially flat heating sections adapted to be disposed in edge-to-edge relation beneath the support sections in parallel relation thereto for heating the bottom of a shoe, manually-operated means for providing relative bodily movement of approach or separation between the heating unit and the shoe-supporting means to adjust their spacing, and manually-operated means for adjusting in parallel relation the relative angular disposition of the heating sections and the relative angular disposition of the support sections and for maintaining such dispositions during relative bodily movement of approach or separation between a support section and a heating section.

4. In apparatus for heating the bottom of a shoe, a shoe support comprising two support sections adapted to be disposed adjacent to each other in adjustable relative disposition to accommodate shoes of different bottom contour, a heating unit comprising two heating sections adapted to be disposed beneath the support sections in a predetermined operative relation thereto for radiating heat to the bottom of a shoe on the supporting means, manually-adjustable parallel toggle links to provide relative bodily movement of approach or separation between a support section and a heating section for adjusting their spacing, and manually-operated linkage connected to the support sections and the heating sections for adjusting simultaneously the angular dispositions of the support sections relative to each other and of the heating sections in said operative relation and for maintaining said dispositions during said bodily movement.

5. In apparatus for heating the bottom of a lasted shoe, two support sections hinged together to form an angularly-adjustable shoe supporting means, two heating sections hinged together to form an angularly adjustable-heating unit, first means including adjustable parallel toggle linkage for holding one support section substantially parallel to and in variably-spaced operative relation to a heating section, and second means comprising a slotted bar pivoted at one end and four links each connected at one end to a section and at the other end to a pivot sliding in the slot of the bar for adjusting simultaneously the relative angular dispositions of the support sections and of the heating sections and for maintaining said dispositions during operation of the first means.

6. Apparatus adapted for heating the bottom of a shoe, said apparatus comprising angularly-adjustable supporting sections upon which a plurality of lasted shoes may rest bottoms down, angularly-adjustable heating sections beneath the supporting sections, manually-operated means for simultaneously adjusting the relative angular dispositions of the support sections and of the heating sections and for maintaining such dispositions while providing a free scope for relative bodily movement of approach or separation between the support sections and the heating sections, and manually-operated controlling means cooperating therewith for providing relative bodily movement of approach or separation between the support sections and the heating sections.

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