Oct. 30, 1928. 1,689,631

M. O. JENNINGS

APPARATUS FOR CONDITIONING BOX TOES

Filed May 7, 1927

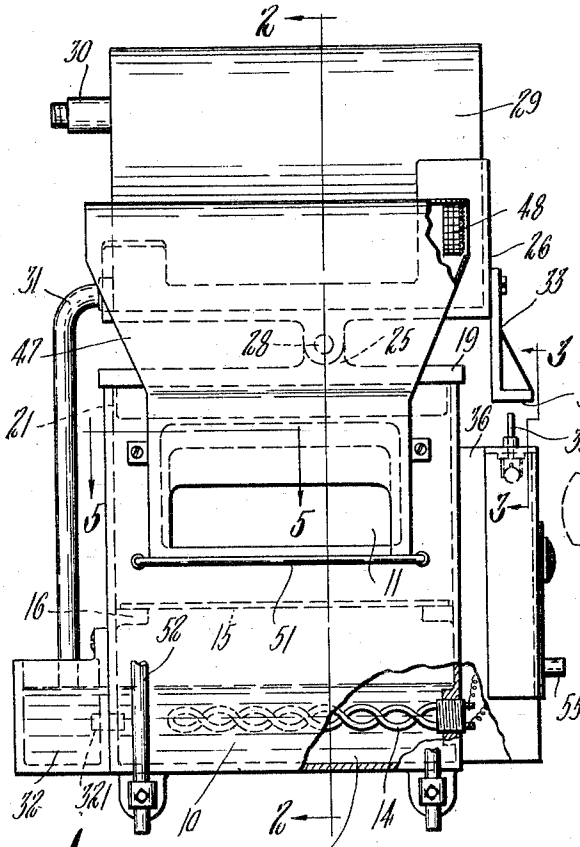


Fig. 1.

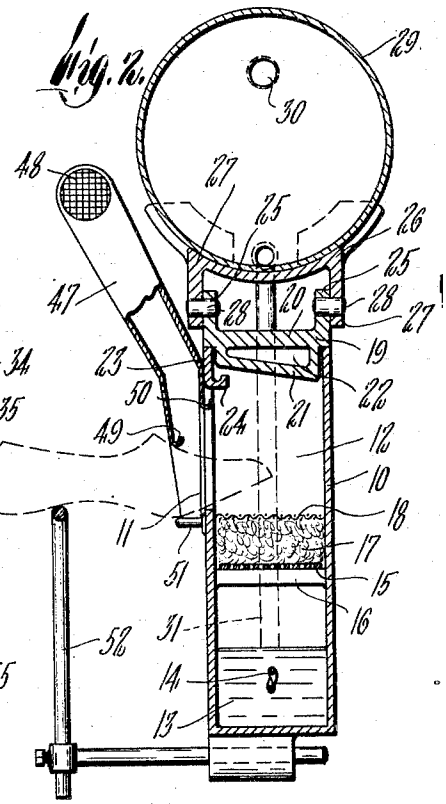


Fig. 2.

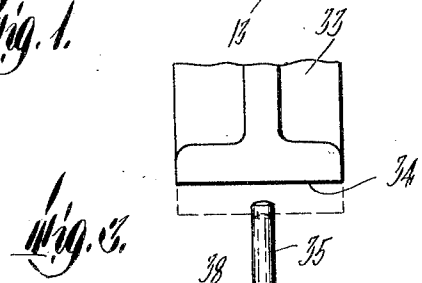


Fig. 3.

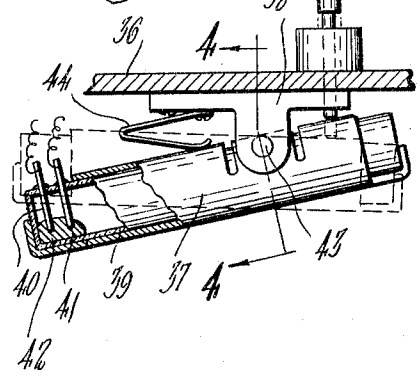


Fig. 4.

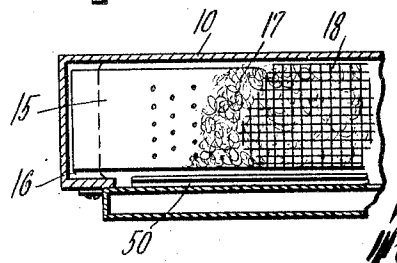


Fig. 5.

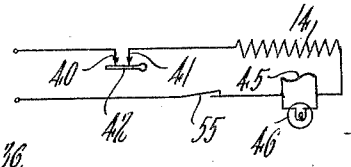


Fig. 6.

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UNITED STATES PATENT OFFICE.

MELVIN O. JENNINGS, OF EAST LEXINGTON, MASSACHUSETTS, ASSIGNOR TO HARRY H. BECKWITH, OF BROOKLINE, MASSACHUSETTS.

APPARATUS FOR CONDITIONING BOX TOES.

Application filed May 7, 1927. Serial No. 189,492.

This invention relates to apparatus for supplying moist heat to the toes of shoes in the course of construction for the purpose of conditioning box toes which have been assembled therewith or assembled and pulled over so as to be in proper condition for the further lasting operations on the shoe. Box toes made of a composition which includes a thermoplastic substance have come into wide use and such box toes must be softened and kept pliable during the formative operations on the forward portion of the shoes, such condition of the box toes being maintainable by a moderate heat preferably combined with a certain amount of moisture. The desired conditioning of the box toes may be readily effected by surrounding the forward portions of the shoes with an atmosphere of steam or hot vapor. Certain difficulties have been found to arise in the use of steaming apparatus for this purpose, one such difficulty being the danger of condensate forming on portions of the apparatus over the shoes and dripping on the shoes, thus spotting and spoiling light colored or fine leathers which may be used in the shoe uppers. In apparatus of this kind, there is also a liability on the part of the workman to concentrate his attention on his work so closely as to forget to look after the water supply for the apparatus. Failure of the water supply entails danger of burning out the water heating unit and improper treatment of the shoe through failure of moisture. By my invention, I provide apparatus which successfully overcomes these difficulties and offers a practical solution of the problems which have arisen in connection with the use of conditioning devices of this kind.

Further advantageous features and details of construction will be apparent to one skilled in the art from the disclosure of my invention in the following description and on the drawing, of which,—

Figure 1 shows a front elevation of a form of apparatus embodying my invention.

Figure 2 is a transverse section on the line 2—2 of Figure 1.

Figure 3 is a section on the line 3—3 of Figure 1.

Figure 4 is a section on the line 4—4 of Figure 3.

Figure 5 is a section on the line 5—5 of Figure 1.

Figure 6 is a wiring diagram of the electrical portion of the apparatus.

Referring to the drawing in detail, the apparatus comprises essentially a rectangular casing 10 having a suitable aperture 11 through which the forward portions of shoes may be inserted so that the toe portions project into the steam chamber 12 as shown in Figure 2. The casing 10 is adapted to hold a quantity of water in the lower portion 13 thereof, this water being heated by any suitable means, such as an electric resistance unit 14. The steam from the heated water rises through a perforated plate 15 which is supported thereabove as by a pair or brackets 16 which may comprise ribs integral with the casing ends, the plate 15 being surmounted by a layer 17 of cotton waste or other suitable pervious material. A suitable screen 18 may overlie the layer of waste to hold it in place and to prevent contact of portions of the inserted shoes therewith. The layer of waste 17 acts as a pervious partition between the upper chamber 12 and the lower portion 13 of the casing 10. The steam generated in the chamber 13 passes readily through the layer of waste and partially condenses therein, the remainder passing into the chamber 12 to maintain the atmosphere therein completely saturated at a temperature several degrees below the boiling point. This hot saturated vapor is for convenience herein referred to as steam. A cover member 19 is provided for the casing 10, this cover being preferably removable to permit access to the interior of the casing 10. This cover member is preferably composed of two spaced layers or plates, the upper plate 20 being in contact with the atmosphere, the lower plate 21 being within the chamber 12 and preferably sloping downwardly toward the rear of the chamber 12 as shown in Figure 2. The space or hollow 22 between the plates 20 and 21 communicates at the ends thereof with the chamber 12 so that during the operation of the apparatus, the chamber 22 is filled with steam. The purpose of the construction of the cover member 19 as thus described is to prevent the formation of condensate on the layer 21, which condensate is liable to drop on the toes of the shoes and to spot them. After the apparatus has been started in operation and steam has come up from the lower chamber in sufficient quantity to fill the up-

per chamber and the hollow 22, the layer 21 is thereafter maintained at the temperature of the steam by the presence of steam both above and below it. In case any condensate forms on the layer 21 during the initial operation of the machine and before the layer 21 has become thoroughly heated, such condensate will tend to follow the slope of the layer and trickle along the surface thereof to the rear of the chamber before dropping therefrom where it cannot reach the shoe. During the operation of the machine, the cooling of the plate 20 by the atmosphere will cause a certain amount of condensation on the under side thereof, but this will be caught in the hollow 22 and led to the ends of the chamber 12 before dropping to the screen 18. To prevent dripping from the portion of the front wall 23 which is above the opening 11 through which the shoes are inserted, I may provide a trough 24 to catch such condensate and lead it to the ends of the chamber 12.

The cover member 19 may be provided with a pair of upstanding ears 25 upon which is hinged a cradle 26 having downwardly depending ears 27. Pins 28 are passed through these ears forming a pivotal mounting for the cradle 26. The cradle 26 is adapted to receive a suitable tank or reservoir 29 which may be filled with water as through an opening 30. A discharge pipe 31 is attached to the reservoir 29, this discharge pipe leading downwardly to a receptacle 32 secured to the lower portion 13 of the casing 10 and communicating therewith as by a nipple 321. It will be apparent from Figure 1 that if after filling the reservoir 29 and closing the supply opening 30, the reservoir be placed in the cradle 26 as shown with the discharge pipe 31 depending downwardly into the extension 32, water will flow from the reservoir 29 until the level in the extension 32 and the lower chamber of the casing 10 rises to seal the lower end of the pipe 31. Thus as long as there is water in the reservoir 29, a substantially constant level will be maintained in the lower chamber of the casing 10. In order to prevent injury to the apparatus through an exhaustion of the water supply while the heat is turned on, I provide automatic means for shutting off the heat when the water supply is nearly exhausted. To this end, the pins 28 by which the cradle 26 is pivotally mounted are offset from the midline of the reservoir 29 when the latter is in place in the cradle, this offset being to the right as viewed in Figure 1. The cradle 26 is furthermore constructed so that the weight thereof to the right of the pins 28 is sufficiently greater than the weight of the portion to the left of the pivot axis to tilt the cradle to the right when an empty reservoir 29 is in place thereon. The disposition of weight in the portions of the tilting cradle and reservoir is such that when there is any appreciable amount of water in the reservoir 29, the weight of the water to the left of the rocking axis being greater than that of the water to the right of the axis will prevent a tilting of the cradle to the right. Thus while there is water in the reservoir 29, the cradle is maintained in the position shown in Figure 1, but when the supply of water in the reservoir is exhausted, the cradle will tilt to the right. On the right hand end of the cradle may be mounted a suitable bracket 33 provided with a contacting face 34 which is adapted to engage and operate suitable heat-controlling means, the construction of which will vary according to the kind of heating means employed. I do not limit myself to any particular type of heating means, but for illustration an electric heating unit and a switch for controlling it will be described, though it will be understood that the bracket 33 could for example engage and operate a valve controlling the supply of steam or other hot fluid to a coil in the lower portion 13 of the casing 10. As shown on the drawing, a sensitive, snap-acting switch is provided to shut off the heating current when the tank tilts. This switch may be actuated by a plunger 35 which is engaged by the bracket 33 when the tank tilts. The plunger as shown in Figure 3 is adapted to extend through the top of the casing 36 and to contact with a rockably mounted tube holder 37 which is supported by a suitable bracket 38 from the casing 36. The tube holder 37 is constructed to contain a suitable tube 39 through the wall of which adjacent to one end thereof extend a pair of electrical contact members 40, 41. These, as shown in Figure 3, may comprise a pair of small rods or similar elements which project through the wall of the tube and extend downwardly so that their lower ends are near to each other and to the bottom of the tube. Within the tube is a globule of mercury 42. When the tube is tilted so that the globule rests at the end of the tube containing the contact points, the globule is in contact with both the members 40, 41 and thus acts as an electric switch to close the circuit of which the members 40, 41 are a part. The tube holder 37 is preferably supported in such a way that the rocking axis 43 is offset from the midpoint of the holder, the greater portion of the holder being on the side of the axis toward the end having the contact points therein. As a result of this mounting, the end of the tube having the contact points therein will normally be lower than the other and consequently the mercury globule will be in contact with the points 40, 41. This position may further be insured as by a light spring 44 which may be employed to press this end portion of the tube and tube holder downwardly. When the plunger 35 is depressed, this plunger pushes against the end portion of the tube holder opposite to that having the contact

members. The throw of the plunger is such that when it is fully depressed, the tube and tube holder are rocked to tilt in the opposite direction so that the globule 42 thereupon flows to the other end of the tube, opening the circuit containing the members 40, 41. The tube and holder may be so balanced that a relatively light touch will reverse the tilt and move the globule, but the breaking of the circuit is positive and sudden so that arcing is avoided. These members as indicated in Figures 6 are connected in series with the heating unit 14, a fuse 45 being also connected in series with the heating element and the tilting switch. A low voltage tell-tale lamp 46 may be shunted around the fuse. This tell-tale lamp glows as long as the heating element is functioning. If, however, the water in the tank 29 becomes exhausted, and the tank tilts on its pivotal support 28, the tube 39 will be rocked by the plunger 35 so as to tilt in the opposite direction, thus breaking the circuit through the heating unit, and extinguishing the tell-tale light. A suitable operating switch 55 may also be provided.

It will be noted that the opening 11 through which the toe portions of shoes are inserted into the chamber 12 does not fit tightly around the shoes thus inserted. There is therefore a constant escape of steam through the opening 11 around the portions of the shoes projecting therethrough. It is desirable to lead off such escaping steam to prevent condensation thereof on cooler portions of the shoes adjacent to the opening 11. For this purpose, I provide a hood 47 which may consist essentially of a narrow box having substantially the same length as the opening 11 and a relatively small width so as not to interfere with the operator. This box may extend upwardly to any convenient height and its upper portion may have end openings as at 48, these end openings being screened to prevent plugging with waste or other material by the operators. In order to prevent condensate which forms within the box 47 from dripping upon the shoes inserted through the opening 11, the lower edges of the side walls of the box 47 may be turned up as at 49, 50 to provide gutters to catch the condensate running down the sides of the box and to lead it off to the ends of the opening 11 out of the way of the shoes.

The location of the water tank 29 above the casing 10 which is normally hot during the operation of the apparatus, is advantageous not only because the tank may easily be removed or replaced, but also because the water therein during the operation of the apparatus is continually heated by the heat arising from the steam chamber 12 so that less current is required in the heating unit 14 to bring the water which is fed into the compartment 13 up to steam.

Suitable brackets for holding the work may be supplied as shown particularly in Figure 2, a small fixed bracket 51 being mounted on the forward side of the casing 10, and an adjustable bracket 52 being supported from the lower end of the casing to carry the heel portions of the shoes being treated.

Having thus described certain embodiments of my invention, it should be evident to those skilled in the art that various changes and modifications may be made therein without departing from its spirit or scope as defined by the appended claims.

I claim:—

1. Apparatus of the class described, comprising a casing having a steaming chamber and an aperture for inserting work, means for supplying hot vapor to said chamber, and a cover on said casing having spaced upper and lower portions having a hollow space between them communicating with said steaming chamber, said lower portion having a sloping lower face.

2. Apparatus of the class described, comprising a casing having a steaming chamber and an aperture for inserting work, means for supplying hot vapor to the chamber, means for supplying water to said vapor-supplying means including a tank, a cover member on said casing, said cover member comprising a pair of spaced plates, the lower plate being sloped, and a cradle mounted on said cover member to receive and support said tank.

3. Apparatus of the class described, comprising a casing, a pervious partition in said casing defining an upper and a lower chamber, a heating element in said lower chamber, means for supplying water to said lower chamber comprising a tank and a feed pipe from said tank, a cradle supporting said tank and rockably mounted on a transverse axis above said casing, one end portion of said cradle being heavier than the opposite end portion, said rocking axis being offset from the median plane of the cradle toward the heavier end, and means for controlling said heating unit according to the direction of tilt of said cradle.

4. Apparatus of the class described, comprising a casing enclosing a steaming chamber, means for supplying hot vapor to said chamber including a heater in the lower portion of said casing, a water tank rockably mounted above said casing, said tank being arranged to rock in one direction when containing liquid and in another direction when substantially empty, and means automatically acting to shut off said heater when the tank rocks in said other direction.

5. Apparatus of the class described, comprising a casing having an aperture in the side thereof for inserting work, means in the lower portion of said casing for heating water to generate vapor, a hood extending upwardly from said aperture and comprising a box

closed at the upper end thereof and provided with lateral openings adjacent said upper end, and gutters along the lower edges of the side walls of said box.

6. Apparatus of the class described, comprising a casing having a lower and an upper chamber, a pervious partition separating and defining said chambers, an electric heater in said lower chamber, means for supplying water to said lower chamber comprising a tank positioned above said casing and a supply pipe extending from said tank, means for automatically shutting off the heating means when the water supply in said tank is substantially exhausted, said automatic means comprising a rockably supported cradle for said tank, said cradle having a rocking axis offset from the transverse median thereof whereby the cradle comprises lever arms of unequal length, the weight of the cradle and an empty tank therein being arranged so that the shorter arm overbalances the longer when the tank is substantially empty, but is overbalanced by the longer arm when liquid is in the tank, a switch in series with said heater, and means operating to open said switch when the shorter arm of the cradle overbalances the longer arm.

In testimony whereof I have affixed my signature.

MELVIN O. JENNINGS.