Feb. 7, 1961 J. H. GAQUIN 2,970,331

SHOE HEATER

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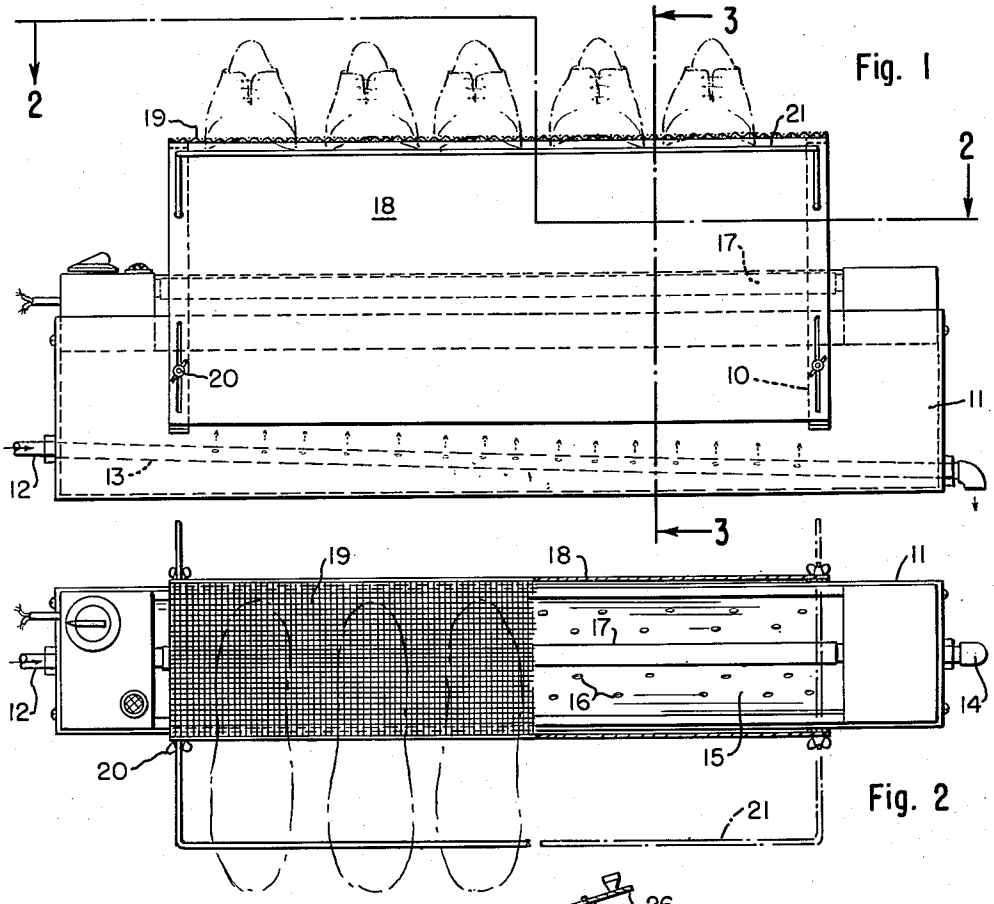


Fig. 1

Fig. 2

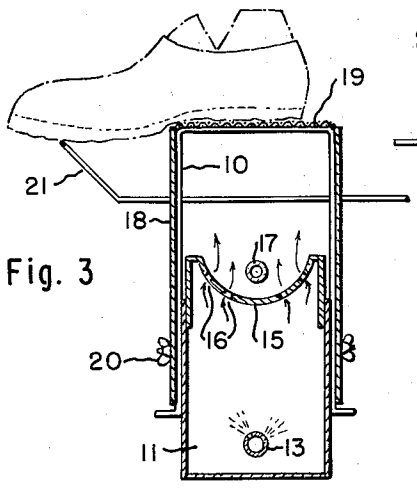


Fig. 3

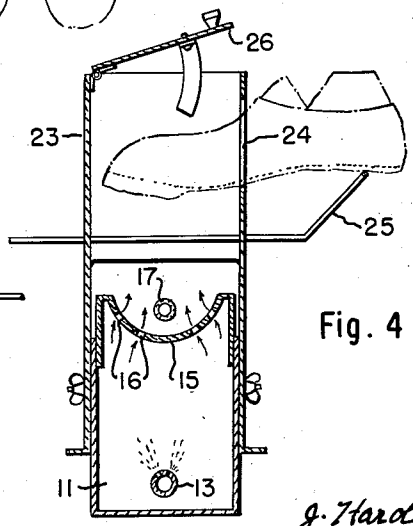


Fig. 4

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SHOE HEATER

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2 Claims. (Cl. 12—59.7)

This invention comprises a new and improved shoe heater for conditioning partly finished shoes for box toe and counter molding and stiffening by the application of steam.

Shoe heaters of this type include a steam chamber from which moist steam is directed into contact with the toe or heel ends of shoe uppers preliminarily assembled on a last in order to soften and condition the upper material which it is desired to mold and stiffen in the contour of the last. Factory conditions generally require the steam to be generated and applied at approximately atmospheric pressure and this gives rise to several problems caused by partial condensation of the steam in its passage to contact the shoe upper. The present invention supplies a solution for these problems as will be pointed out hereinafter.

Steam conditioning of the unfinished shoe usually takes place when the upper is presented as preliminarily assembled on a last to the bottom of which the inso.e has been tacked and to which the lasted margin of the upper has been or is to be secured by cement. If the steam reaching the insole carries with it condensation in the shape of drops of water, adhesion between the lasting margin of the upper and the insole is seriously impaired. In dealing with patent leather the presence of condensed drops in the steam is very objectionable because the leather absorbs the moisture and is rendered so flexible that it stretches in the lasting operation causing the enamel to crack. Further, in dealing with leather of pastel shades, a very objectionable discoloration of the leather is caused by contact with wet steam, and in dealing with suede upper leather, treatment with wet steam often causes the suede to mat down in the bed lasting machine under pressure occurring in the lasting operation. Still another difficulty that has been encountered in the use of automatic machinery wherever the insole is permitted to absorb moisture in steam treatment is that the positioning post or abutment is likely to sink into a moisture-saturated insole making it impossible accurately to wipe in the upper.

All of these difficulties are avoided in accordance with the process of the present invention which is characterized by directing moist steam toward the shoe bottom and superheating the steam in its passage toward the shoe so that it reaches the insole and upper in dry condition and incidental condensation is eliminated.

Apparatus for carrying out this process includes a frame superposed upon a steam chamber, a support for holding an unfinished shoe in position above the chamber which is provided with ports directed toward the shoe, and means located above the ports for superheating steam issuing from them in its passage toward the shoe.

An important feature of the invention resides in the employment of a tubular infrared lamp as the superheating medium. Under most favorable conditions the steam chamber is provided with a perforated top wall which is concave in cross section and the tubular lamp is located within the concavity of this top wall where it is most efficiently located for superheating and drying the steam before the latter reaches the shoe parts to be conditioned.

These and other features of the invention will be best understood and appreciated from the following description of preferred apparatus for carrying out the invention, selected for purposes of illustration and shown in the accompanying drawings in which:

Fig. 1 is a view in front elevation,

Fig. 2 is a corresponding plan view with portions broken away on the line 2—2 of Fig. 1,

Fig. 3 is a view in cross section on the line 3—3 of Fig. 1, and

Fig. 4 is a corresponding view in cross section illustrating a modification of the invention.

The apparatus herein shown comprises a rectangular strip steel frame 10 open at its bottom and adjustably secured to an underlying steam chamber 11. This is provided with steam connections including an inlet fitting 12, a downwardly inclined steam pipe 13 located in the bottom of the chamber, and an outlet fitting 14. In the illustrated apparatus steam at substantially atmospheric pressure is supplied to the pipe 13 and discharged upwardly through its perforations as indicated in Fig. 1. The pipe is inclined so that condensation will drain from the right hand end of the chamber through the outlet fitting 14. It will be understood that if desired, water may be supplied to the steam chamber 11 and steam generated therein by an electric heating unit or other convenient means.

The steam chamber 11 is provided with an upwardly concave top wall 15 defining a trough provided with a plurality of spaced ports 16 which it will be seen are directed upwardly and generally toward the axis of curvature of the top wall 15. Within the concavity of the top wall 15 is located a tubular quartz infrared lamp. Such lamps 17 are readily procurable in diameter from ⅜" up. The quartz from which they are formed has a softening point of 3000° F. They are designed to operate in a horizontal position and are available in 500 watt capacity on 115–125 volt circuit.

It will thus be seen that the tube 17 supplies a high concentration of heat energy in the area occupied by the steam as it emerges from the ports 16 and passes upwardly in reaching the shoe.

The frame 10 carries a rectangular shoe support having a top wall in the shape of an open mesh panel 19 and side walls 18 which embrace the frame 10 and are adjustably secured thereto by wing nuts 20 threaded into the frame and passing through vertical slots in the support. The support as shown in Fig. 3 includes also a wire loop 21 designed to support the forepart of an unfinished shoe while the heel seat and shank portions of the shoe rest upon the mesh panel 19 directly in the path of the rising superheated steam.

In Fig. 4 the apparatus is illustrated as modified for conditioning the toe end of a shoe preparatory to molding and stiffening its box toe portion. In this case the upper portion of the casing 23 is provided with a series of openings 24 into which the forepart of the shoe projects while it is supported at the heel seat by a wire loop 25. The top of the casing 23 is provided with an adjustable damper 26 for regulating the escape of superheated steam supplied from the chamber 11 through the ports 16 which surround the tubular lamp 17. The side walls 18 of the shoe support in Figs. 1–3 and the side walls 23 of the casing in Fig. 4 are of sheet metal and form an enclosed steam chamber for dry steam after it passes the tubular lamp 17 and directs the steam to those portions of the shoe to be conditioned.

Having thus disclosed my invention and described in detail an illustrative embodiment thereof, I claim as new and desire to secure by Letters Patent:

1. A shoe heater comprising a frame containing a steam chamber, supporting means for positioning an unfinished shoe above the steam chamber, said chamber having a top wall with ports formed therein, said top wall being upwardly concave in cross section whereby steam passing through said ports is generally directed towards the axis of curvature of said wall, and a heating element mounted above said wall in the general vicinity of said axis.

2. A shoe heater comprising a frame containing a steam chamber, supporting means for positionng an unfinshed shoe above the steam chamber, said chamber having an oblong top wall with ports formed therein, said top wall being upwardly concave in cross section and defining an arcuate trough on the upper portion of said wall whereby steam passing through said ports on the way to said shoe is generally directed towards the axis of curvature of said trough, and an elongated heating element mounted above said wall longitudinally within said trough and in the vicinity of said axis for superheating said steam in its passage towards said shoe.

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