May 27, 1947. W. C. CARD, JR 2,421,053

SOLE TREATING APPARATUS

Filed March 7, 1945 2 Sheets-Sheet 1

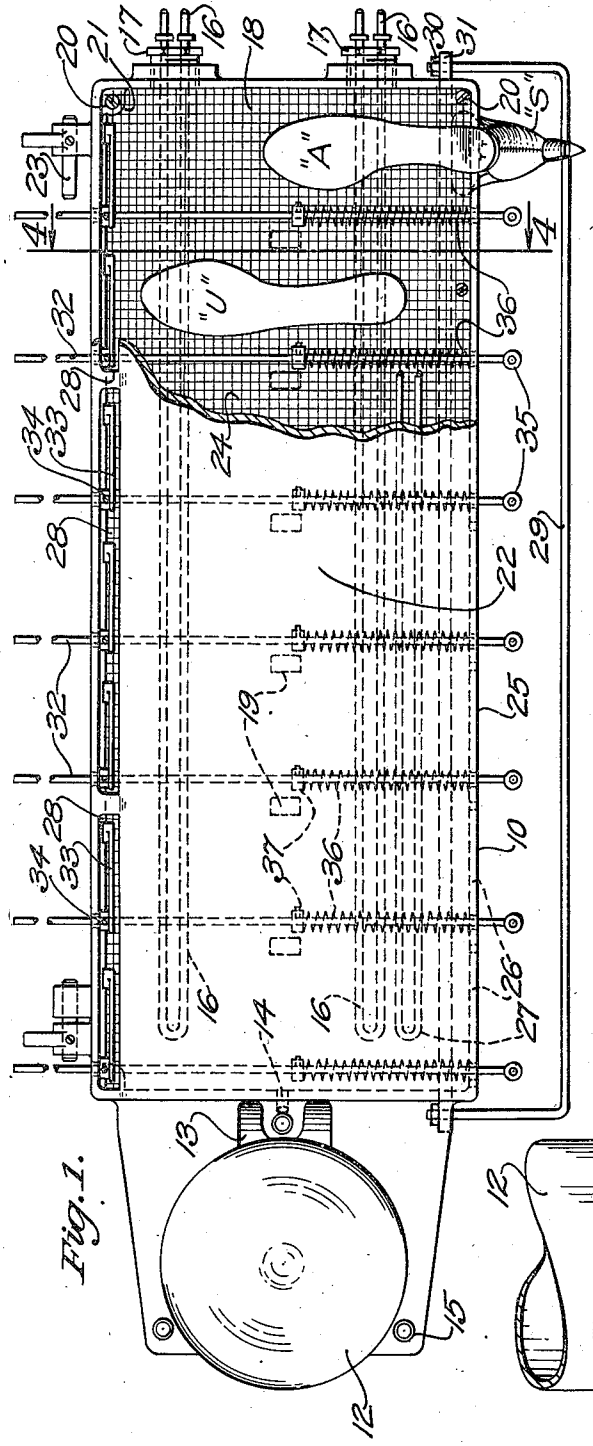


Fig. 1.

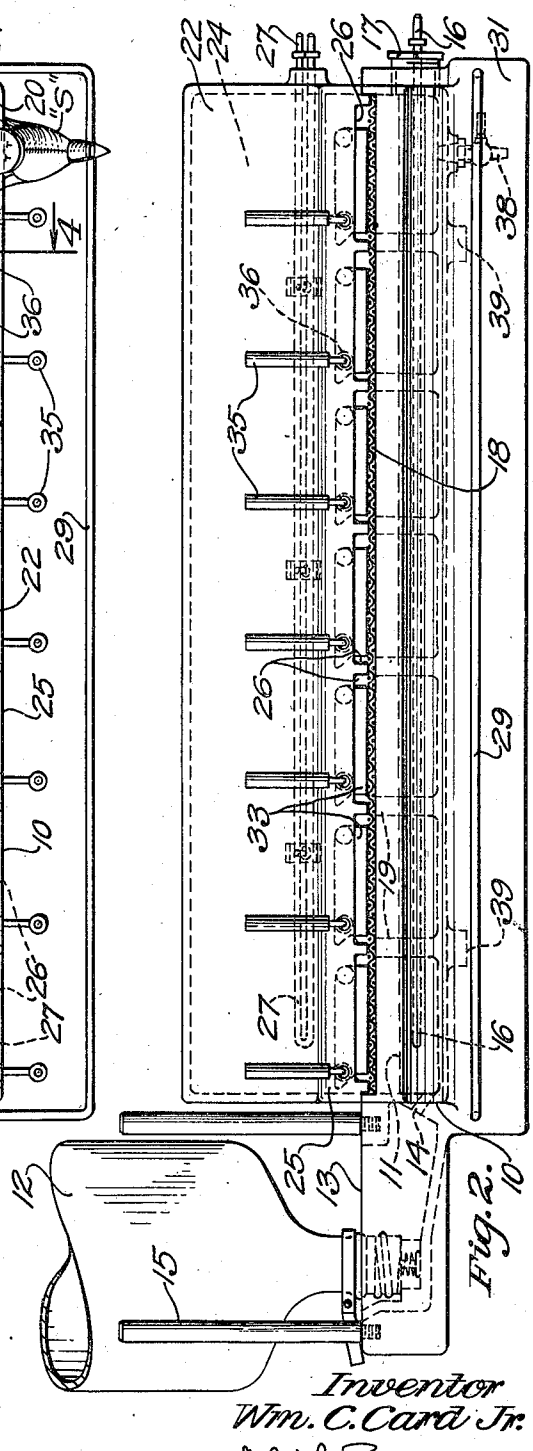


Fig. 2.

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SOLE TREATING APPARATUS

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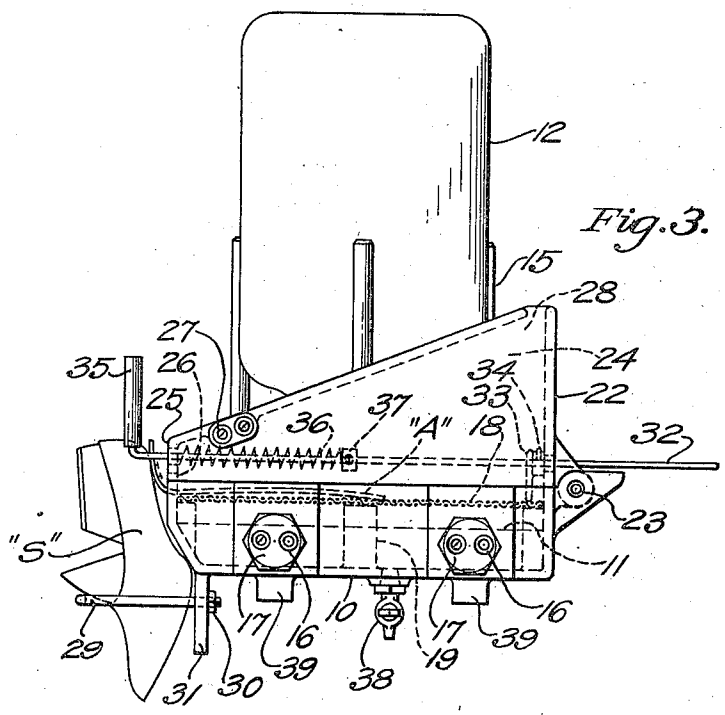


Fig. 3.

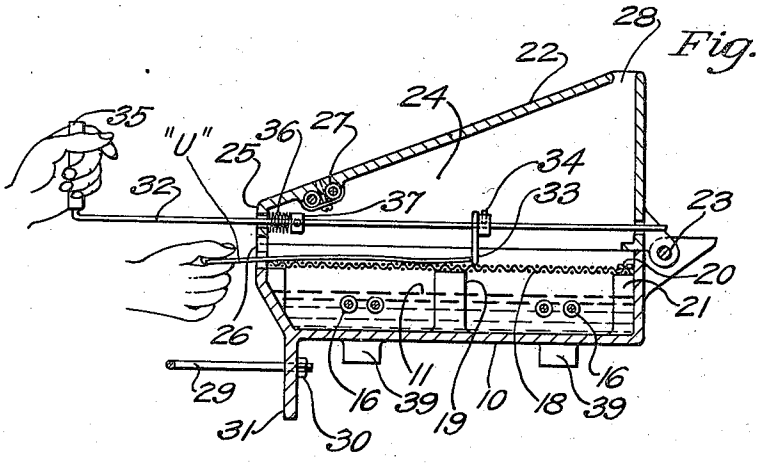


Fig. 4.

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2,421,053

UNITED STATES PATENT OFFICE

2,421,053

SOLE TREATING APPARATUS

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Application March 7, 1945, Serial No. 581,371

4 Claims. (Cl. 12—1)

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This invention relates to apparatus for use in the manufacture of footwear and relates more specifically to apparatus for treating pre-cemented outsoles to prepare them in condition for permanent attachment to shoe bottoms.

As more fully explained in my co-pending application Serial No. 525,911, filed in the United States Patent Office on March 10, 1944, soles may be adhesively attached to shoe bottoms by means of a thermoplastic, i. e., heat-activatable, cement which may be applied in solution to one or both of the mating surfaces and allowed to set or harden. The cemented outsole is then subjected to the action of a heated vapor so as to activate the cement and, preferably, simultaneously to mull the outsole material; and thereafter, the outsole is pressed against the shoe bottom to cause its permanent adhesive attachment thereto.

The soles to be attached to shoes which are to be supplied with conventional heels, e. g., Louis, Cuban, Continental or other types which do not require that the heel end of the sole be cemented to the heel seat of the shoe, may be aligned with respect to the shoe bottom and be secured at their heel ends to the heel seats of the shoes with any suitable means such as tacks, staples, or the like, prior to subjecting the soles to the action of the heated vapor to activate the cement thereon.

Of course, with soles which must be adhesively attached to the entire shoe bottom including the heel end, e. g., those used for wedge heel shoes, it is preferable not to secure them to the heel portion of the shoes prior to activation of the cement in order that the entire sole can be inserted within the vapor treating chamber fully to activate the cement which extends around the entire margin of such a full sole.

When using previous apparatus for vapor treating soles which were secured to the heel seats of shoes, the operator grasped the shoe while inserting and removing the sole from the treating chamber and thus his hands did not come into contact with the heated vapor within the chamber. However, in treating soles which were not secured to shoes and which had to be inserted completely within the treating chamber, removal of the soles caused considerable difficulty, and when the operator inserted his fingers into the treating chamber to grasp the soles his fingers were liable to become burned or scalded by the heated vapor, the temperature of the heated vapor being in the neighborhood of 90° C.

Also, when treating soles with heated vapor, especially water vapor or vapor containing steam, I have found that if the vapor is allowed to condense within the treating chamber it forms droplets which may fall upon the grain or uncemented side of the soles and cause undesirable spot staining of the outsole material.

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I have also found that, when treating soles which are secured to the heel seats of shoes, the weight of the shoe and its last may tend to pull the sole part way out of the treating chamber so that in some instances the cement at the rear shank portion of the sole would not be properly activated and therefore would not be securely attached to the shoe during the pressing operation.

A general object of the present invention is to provide improved apparatus for treating outsoles with heated vapor which overcomes the difficulties remarked above, among others.

Another object of the invention is to provide an apparatus for treating shoe soles with heated vapor in an efficient and rapid manner, regardless of whether the soles being treated are secured or are not secured to the heel seats of the shoes to which they are to be attached.

Another object of the invention is to provide apparatus for treating soles with heated vapor, with simple and effective means for ejecting treated soles therefrom without any danger of the operator's hands being burned or scalded by the hot vapor within the apparatus.

A further object of the invention is to provide an apparatus for treating shoe soles with heated vapor having adequate provisions for retarding the condensation of vapor within its sole treating chamber and for preventing staining of the soles being treated.

A still further object of the invention is to provide apparatus for treating shoe soles with vapor, while the soles are secured to shoes, with a positive support for the shoes to which the soles are secured.

Other objects of the invention will, in part, be obvious and will, in part, appear hereinafter.

The invention accordingly comprises the features of construction, combination of elements, and arrangement of parts, which will be exemplified in the construction hereinafter set forth and the scope of the invention will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention reference should be had to the following detailed description taken in connection with the accompanying drawings in which:

Fig. 1 is a plan view of a sole treating apparatus embodying features of my invention, a por-

tion of the cover being broken away to show soles placed within the treating chamber;

Fig. 2 is a side elevation of the apparatus shown in Fig. 1, with parts broken away;

Fig. 3 is an end elevation of the apparatus of Figs. 1 and 2 showing a sole within the treating chamber and a shoe to which the sole is secured resting upon its support; and,

Fig. 4 is a sectional view taken substantially along lines 4—4 of Fig. 1, and showing a sole being ejected from the treating chamber.

Referring to the drawings, there is shown an improved form of apparatus for treating shoe soles with heated vapor which comprises a receptacle 10 adapted to hold a body 11 of liquid, e. g., water, which is supplied to the receptacle and preferably kept at a constant level therein by a barometric feed tank 12 via a trough 13 and a conduit 14. The tank 12 preferably is supported by upstanding posts 15 which may be screw-threaded into the walls of the trough 13.

Preferably, the body 11 of liquid within the receptacle 10 is heated by means of the electrical resistance heaters 16, which may be of a known direct immersion type terminating in the form of screw plugs 17 threaded into an end wall of the receptacle to form liquid-tight seals.

Disposed above the body of liquid 11 is a sole support 18, which may rest upon lugs 19 and be secured by screws 20 to bosses 21 adjacent to the side walls of the receptacle 10. The sole support 18 may be formed of wire mesh or other suitable material through which vapor rising from the body of heated liquid can pass.

A cover 22 having depending side walls is hinged at 23 to the receptacle 10 and, in its closed position over the receptacle, cooperates with the latter to form a chamber 24 above the sole support 18. The cover 22 has a front depending wall 25 provided with a plurality of notches 26 forming with other structure a plurality of slots through which soles may be inserted to rest upon the sole support 18 while being subjected to the action of the vapor arising from the body of heated liquid.

As soles, which are generally at room temperature, are continually inserted into the chamber 24 for treatment, there is a tendency to cool the vapor therein. Also, the outer atmosphere tends to cool the cover 22 and, as is well known, heated vapor condenses when chilled below its dew point temperature. To prevent condensation of the vapor within the chamber 24, the cover 22 is provided with suitable heating means, such as an electrical resistance heater 27, for maintaining the temperature of the atmosphere within the chamber 24 higher than the dew point temperature of the vapor rising into the chamber. This heating means is especially designed for maintaining the temperature of the cover 22 above said dew point temperature, since it has been observed that condensation of the vapor most frequently occurs through the relatively cool cover chilling the vapor below its dew point resulting in liquid droplets falling as rain, which may fall upon the grain or uncemented side of the soles being treated and stain the same.

The cover 22 is sloped as shown, and at its portion of highest elevation remote from its depending front wall 25 is provided with vents 28. Thus, a draft chimney effect is formed and atmosphere enters the slots 26 where the heat within the chamber causes it to rise and accelerate in motion until it passes out of the vents 28 carrying with it an amount of unwanted vapor to keep

the concentration down below a certain maximum and to prevent a film of condensate forming upon the grain or uncemented side of relatively cool soles inserted for treatment which may result in blushing or slight discoloring of leather soles, especially those which have been grain buffed.

A shoe supporting rail 29 is secured by nuts 30 to a bar 31 depending from the bottom of the receptacle 10, so that when treating a sole A which is attached at its heel end to the heel seat of a lasted shoe S, the sole is bent away from the shoe bottom as it is inserted into one of the slots 26 and rested upon the sole support 18 within the chamber 24, and the shoe is placed between the support rail 29 and the bar 31. This fully supports the weight of the shoe and its last, ensuring that the sole inserted within the treating chamber will be activated entirely up to its heel breast line.

When treating a sole U which is not secured to a shoe, the sole is inserted into one of the slots 26 and is pushed with sufficient force to ensure that it will come to rest upon the sole support 18 with its full length entirely within the chamber 24. To facilitate removal of such a sole without danger of the operator's hands being burned or scalded, ejectors are provided which, in the particular form shown, comprise a rod 32 which is slidably mounted in bores formed in opposite side walls of the cover member 22, and a pusher arm 33 is attached thereto by a set screw 34. The end of the rod 32 adjacent to the sole entering slot 26 is turned upwardly to provide a convenient handle 35 for reciprocating the rod and its pusher arm 33. The latter is thus moved substantially parallel to the sole support 18 to engage the end of the sole U and eject it from the chamber 24 far enough to allow it to be grasped and fully removed for attachment to a shoe. To return the rod 32 and its pusher arm 33 to the rearward position, a helical spring 36 surrounding the rod abuts against the side wall 25 of the cover member 22 and its other end presses against a collar 37 fixed on the rod.

After continued use, the receptacle 10 may become coated with mineral deposits or other impurities contained in the liquid and a drain cock 38 is provided so that the liquid can be drained out. The cover 22 can be opened, the sole support removed and the receptacle cleaned.

In using the apparatus, it may be attached by bosses 39 to or near a sole pressing machine, e. g., as that shown in the patent to Weiss, No. 1,945,762, the heaters 16 and 27 being connected to a suitable electrical source. Preferably the heaters 16 are controlled by a suitable thermostatic control (not shown) to keep the body 11 of liquid in the receptacle 10 at a temperature of from 90°–95° C. which has been found to be adequate to vaporize certain liquids, such as water. The soles may then be inserted through the slots 26 so that they rest upon the sole support 18 in a manner as previously described for the type of sole being treated. The outsoles may be treated by the heated vapor for a period of up to two minutes and as each sole is removed to be placed with its shoe in a shoe press machine for permanent attachment of the sole to the shoe bottom, another untreated sole may be inserted into the vacant slot 26 to replace the one removed. Thus the operation of treating the soles may be carried out in an efficient and continuous production manner.

Since certain changes may be made in the

construction of the apparatus as above described and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

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

1. Apparatus for treating shoe soles with heated vapor, comprising a receptacle for containing a body of liquid, heating means for forming vapor from the liquid, a sole support mounted above the intended level of the surface of the body of liquid, means including a cover cooperating with said receptacle to form a chamber above said sole support, said cover being sloped upwardly to a portion at highest elevation and vented in the latter portion and the structure forming said chamber being provided with an air inlet passage, and means for heating said cover.

2. Apparatus for treating shoe soles with heated vapor, comprising a sole support, means including a cover above said sole support forming a chamber, means for passing heated vapor through said sole support, said first means being so constructed as to permit soles to be inserted into said chamber to rest upon said sole support while receiving the action of vapor passing therethrough, means adjacent said cover for retarding condensation of vapor within said chamber, and means operable from the exterior of said chamber for ejecting soles from within said chamber.

3. Apparatus for treating shoe soles with heated vapor while they are secured at their heel ends to lasted shoes, comprising a sole support, means

including a cover above said support forming a chamber, means for passing heated vapor through said support into said chamber, said first means being so constructed as to permit soles to be inserted into said chamber to rest upon said support while receiving the action of the vapor passing therethrough, and means for supporting exteriorly of the chamber the entire weight of the lasts and shoes to which the soles being treated are secured.

4. Apparatus for treating shoe soles with heated vapor while they are secured at their heel ends to lasted shoes, comprising a sole support, means including a cover above said support forming a chamber, means for passing heated vapor through said support into said chamber, said first means being so constructed as to permit soles to be inserted into said chamber to rest upon said support while receiving the action of the vapor passing therethrough, means adjacent said cover for retarding condensation of vapor within said chamber, and means for supporting exteriorly of the chamber the entire weight of the lasts and shoes to which the soles being treated are secured.

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