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C. H. HEATHER ET AL

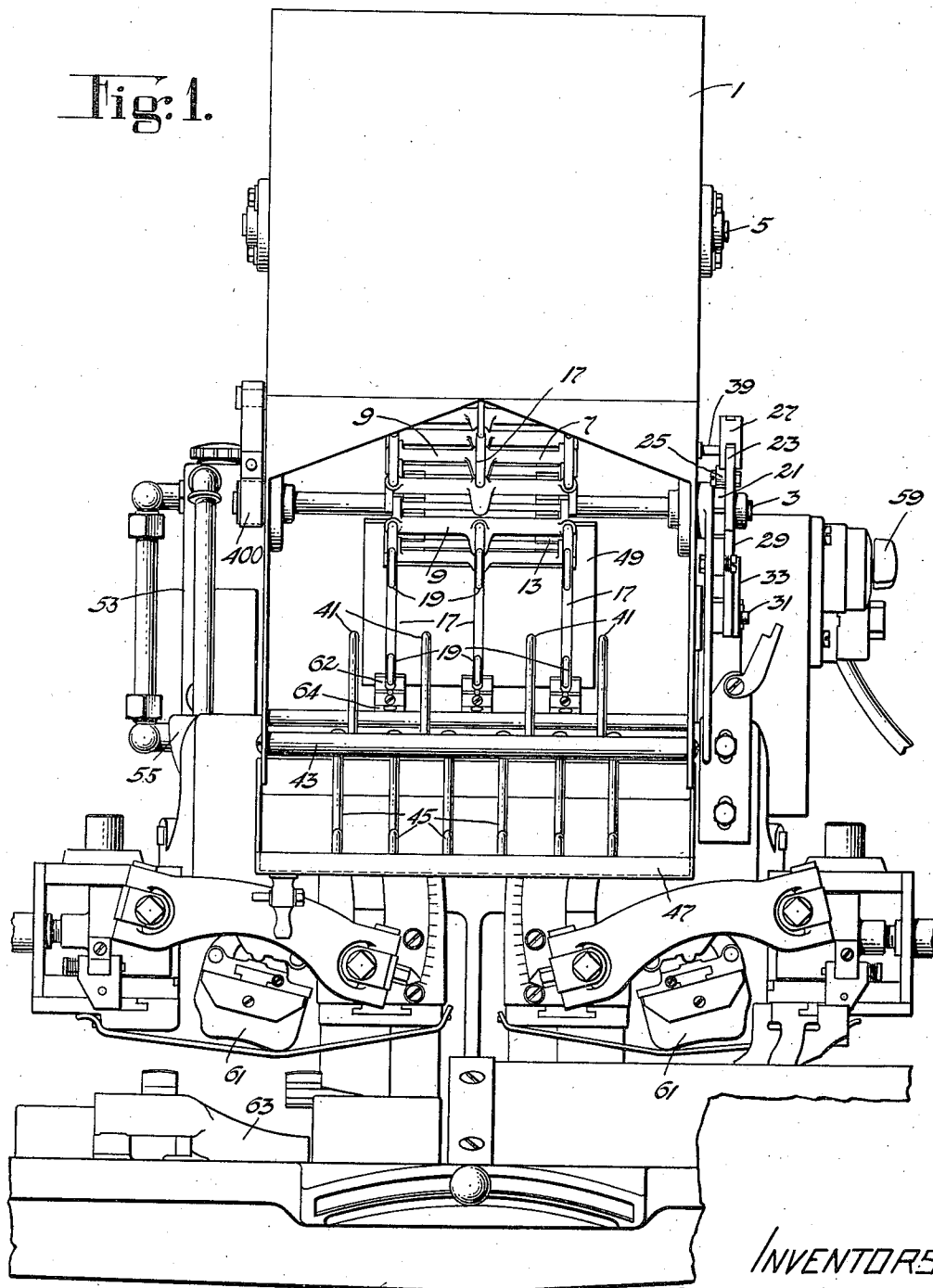
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APPARATUS FOR MOISTENING SOLES

Filed Sept. 17, 1937

2 Sheets-Sheet 1

Fig. 1.



INVENTORS

Charles H. Heather
Charles M. Bagshaw
By their attorney
Victor E. Cobb

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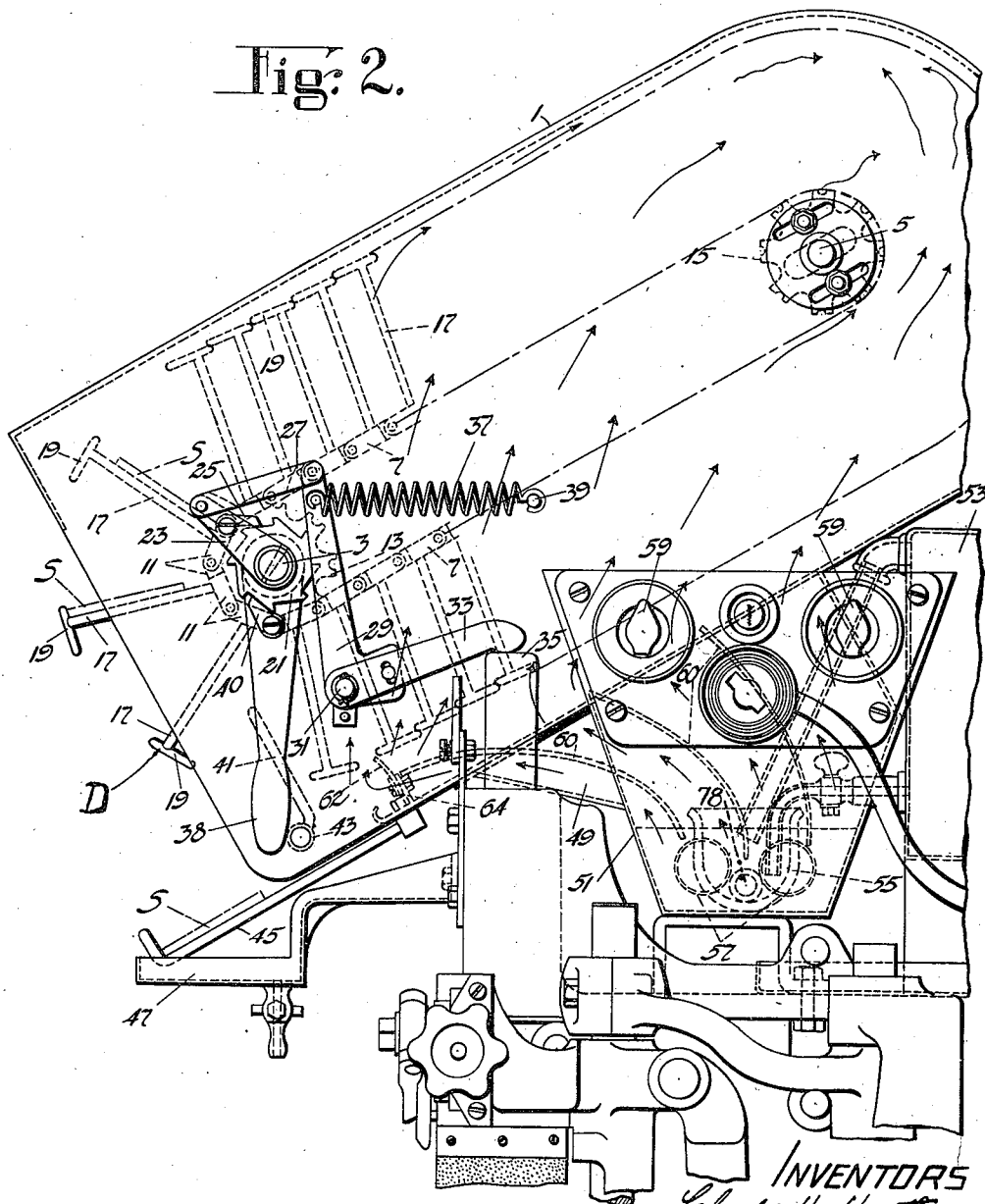
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2 Sheets-Sheet 2

Fig. 2.



INVENTORS

Charles H. Heather
Charles W. Bagshaw
By their attorney
Victor Cobb

UNITED STATES PATENT OFFICE

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APPARATUS FOR MOISTENING SOLES

Charles Harold Heather and Charles Martin Bagshaw, Leicester, England, assignors to United Shoe Machinery Corporation, Borough of Flemington, N. J., a corporation of New Jersey

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In Great Britain November 14, 1936

3 Claims. (Cl. 12—1)

This invention relates to a method of and an apparatus for shaping articles such as soles of boots and shoes.

During the manufacture of shoes it is common to mold or otherwise shape the outsoles, either before or after they are permanently attached to the bottoms of lasted shoes so that they may conform closely to the contours of said bottoms.

Such a sole-shaping operation, if it is to be carried out on the soles before they are permanently attached to their shoe bottoms, may be carried out for example by means of a sole-molding machine, a sole-conforming machine or a sole-laying machine. If the soles are to be so shaped while they are actually being permanently attached to their shoe bottoms, the shaping and permanent attachment of the sole may be carried out at one operation by the use of a cement-sole-attaching machine.

In order to allow the soles to be shaped the more readily prior to their permanent attachment to their shoes it has been a common practice hitherto to reduce the soles to a relatively soft and flexible condition prior to the shaping operation by submerging them in water for an interval sufficient to allow the soles to become wet throughout. When soles are saturated in this manner and then shaped they must frequently be allowed to dry for a considerable interval before certain further operations upon them can be properly carried out. Moreover, there is danger that water remaining in the soles may cause stains in the soles and may be absorbed to an undesirable extent by the uppers of the shoes to which the soles are later permanently attached. As to soles which are to be attached to the bottoms of lasted shoes by cement such as pyroxylin, saturating the soles just before they are attached cannot be practiced since, in addition to the possibility of staining the shoes, the water is likely to find its way between the surfaces which are to be cemented together and prevent their proper adhesion.

In order to obviate difficulties such as the above, there is provided an apparatus for moistening soles and similar articles, comprising a chamber supplied with heated vapor, a conveyor for the soles which is enclosed in the chamber except for a projecting portion from which a treated sole is automatically delivered free of the conveyor and upon which a dry sole may be placed by the operator, and means for operating the conveyor intermittently. The soles are preferably subjected to an atmosphere of proper humidity and temperature for an interval sufficient to wet

their surfaces and to warm their interiors to the desired degree, and are then delivered in a position accessible to the operator of a machine, for example, a sole conforming machine, which performs a succeeding operation upon the moistened soles.

Referring now to the accompanying drawings: Fig. 1 is a front elevation of an apparatus in which the present invention is embodied, and Fig. 2 is a side elevation of the apparatus.

The apparatus includes a sheet metal treating chamber 1, lined with asbestos, located above a sole-conforming machine of the type disclosed in United States Letters Patent No. 1,939,750, granted December 19, 1933, upon an application filed in the name of Erastus E. Winkley, and suitably secured thereto. This machine is provided with two heads each of which carries two molding members 61, 63. The operator places a sole to be shaped between one pair of molding members and depresses a treadle whereupon this pair acts upon the sole to shape it and holds the sole in its shaped state. He then places a sole between the molding members of the second pair and again depresses the treadle whereupon the first sole is released and the second is molded. No further description of the sole-conforming machine will be given, reference being made to the patent. The chamber is about two and a half feet long from front to rear and is somewhat wider than the length of a large size sole. The chamber slopes upwardly away from the operator, and its front end is open while its rear end is closed. Near its opposite ends the chamber has two horizontal parallel shafts 3, 5 rotatably mounted in its side walls, and these shafts support an endless chain conveyor 7 which is located in the chamber. The conveyor runs lengthwise of the chamber and each link of the chain consists of a bar 9 having ears 11. These ears are pivoted to similar ears on the adjacent bars. The chain 7 passes around two sprocket wheels 13, 15 secured to the shafts 3, 5, respectively. The chain has thirty-four links and the bar of each link has extending outwardly from it three sole-supporting arms 17 spaced apart and adapted to support a single sole S. These arms are somewhat longer than the width of a sole of larger size. At their outer ends the arms 17 have relatively short cross-pieces 19 which are substantially perpendicular to the arms and are parallel to the length of the chain. Those cross-pieces 19 on the arms 17 of adjacent links at the top and bottom runs of the chain are held against each other end to end. Consequently, the lower edges

of soles held on the bottom run of the chain between the arms 17 will rest upon the cross-pieces 19.

As has been stated, the chain 7 has thirty-four links and is therefore adapted to carry thirty-four soles. When the sole-conforming machine is equipped with sole-treating apparatus of the kind now being described, the operator will normally present about thirty-four soles to the machine in the space of three minutes. It is desired that each sole shall be submitted to the atmosphere in the treating chamber for about three minutes before it is delivered to the operator to be presented to the machine. To this end means is provided whereby, at each successive operation of the machine the chain 7 is moved clockwise as viewed in Fig. 2, a predetermined distance, and a treated sole is delivered in a position accessible to the operator from one set of arms 17, and this same set of arms is moved into a position to receive an untreated sole. In Fig. 2 the arms 17 which are marked D have just delivered a treated sole S upon the bars 45 and are in position to receive an untreated sole.

For the purpose of driving the chain 7 the shaft 3 has secured on its right hand end (Fig. 1), outside the chamber, a ratchet wheel 21 arranged to be rotated one step in a clockwise direction on each successive operation of the sole-conforming machine. For rotating the ratchet wheel 21 in this manner an arm 23 pivotally mounted on the shaft 3 carries near its upper end a pawl 25 which engages teeth on the wheel 21. At its upper end the arm 23 is pivotally connected with one end of a link 27 which at its other end is pivotally connected to an upwardly extending arm 29 of a bell-crank lever mounted to rock about a fixed horizontal pivot 31. A second arm 33 of this bell-crank lever rests at its rearward end upon the upper end of a rod 35, corresponding to the rod referred to as 212 in the machine of the patent, which is reciprocated once in a vertical direction in each operation of the machine. A tension spring 37 connected at its forward end to the arm 29 and at its rearward end to a stud 39 projecting from the chamber 1 serves to rock the bell-crank lever in a clockwise direction (Fig. 1) and so to maintain the end of the arm 33 in contact with the rod 35.

By reason of this arrangement the arms 17 on all the links of the chain 7 are successively presented in the position marked D in Fig. 2 during thirty-four consecutive operations of the machine, and the soles carried by the chain will each have been subjected to the atmosphere in the treating chamber for about three minutes before they are successively delivered to the operator. In order to prevent overrun of the shaft 5 as it is rotated by the ratchet and pawl device there is provided at the left-hand side (Fig. 1) of the chamber 1 a friction band 400 which engages the periphery of an enlarged portion of the shaft 3. A handle 38 loosely mounted on the shaft 3 carries a pawl 40, which engages the ratchet wheel 21. By swinging this handle the shaft 3 may be rotated, if desired, independently of the operation of the sole-conforming machine.

In order to ensure that a treated sole shall fall from its supporting arms 17 as these arms approach the position marked D in Fig. 2, four stationary pins 41 are located to project upward into the path of the sole so as to cause the sole to be swept from the moving arms and to fall upon the bars 45 which have upturned lower

ends. The operator now puts an untreated sole upon the arms 17 which are marked D, presents the treated sole to the sole-conforming machine, and causes that machine to operate upon it. A flat tray 47 lying below the bars 45 collects any moisture which may condense in the chamber 1 and drip from its open end.

The atmosphere of the chamber 1 is an atmosphere saturated with water vapor at a temperature, preferably of from 110° to 120° F. Under these conditions the surfaces of soles which pass through the chamber in about three minutes become humid to the desired degree, and their interiors remain substantially dry. It should be understood that the figures given above are given by way of example in the case of a particular shaping machine in which thirty-four soles are shaped in about three minutes.

In order to maintain these atmospheric conditions in the chamber 1, the latter has opening into its under side and near its forward end, a relatively large but short duct 49 communicating with a water-containing vessel 51 lying beneath the chamber. The vessel 51 is automatically supplied with water in such manner as to maintain the water at a uniform level. To this end a pipe 78 connects the lower part of the vessel 51 with a reservoir 55 to which water is supplied from a tank 53 by a barometric feed. Two electric immersion heaters 57 of the resistance type are supported in the water in the vessel. Each of the heaters 57 is provided with a regulating switch 59 so that the temperature of the water in the vessel and the temperature of the vapor rising therefrom may be easily controlled. Three baffle plates 60 extending the width of the duct 49 and also extending upwardly from the surface of the water in the vessel 51 serve to conduct the vapor evenly to the soles being treated. Three sheet rubber wipers 62 placed in line with the three rows of arms 17 are supported on brackets 64 fixed inside the lower and forward end of the chamber 1 and are arranged to contact with each arm as the endless chain is moved and thus serve to remove any drops of condensed moisture which may have collected thereon.

Assuming that the atmospheric conditions in the treating chamber have reached those desired, that the chain carries its full complement of thirty-four soles, and that the operator of the sole-conforming machine continues to operate that machine at a normal speed, the method followed involves the following steps. The operator depresses the treadle of the machine whereupon a treated sole which he previously placed between the molding members 61, 63 of one of the two heads of the machine, is operated upon and a second treated sole is delivered in front of the operator upon the bars 45. Immediately the operator places an untreated sole upon the arms 17 from which the second treated sole was delivered, picks up the second treated sole from the bars, places it between the molding members of the other head of the sole-conforming machine and again depresses the treadle. The first treated sole, which has now been shaped, is released, the second treated sole is operated upon and a third treated sole is delivered upon the bars 45. The operator removes from the sole-conforming machine the first treated sole, places another untreated sole upon the proper arms 17, picks up the third treated sole, places it between the molding members which have just released the first treated sole and again depresses the treadle of the sole-conforming machine. The further

operation of the apparatus is merely a repetition of what has just been described.

When the sole is delivered upon the bars 45 in position to be picked up by the operator a very 5 minute quantity of moisture has been distributed over the surface of the sole, and the interior is warm and substantially dry. The sole thus has heat stored up in it and as a whole is relatively dry but has on its surface a very small quantity 10 of moisture which has penetrated the surface very slightly.

A relatively short time (e. g. some five seconds or so) elapses between the presentation of successive soles to the machine, and during this time 15 a sole is being shaped between the molding members of one head of the conforming machine. The very small amount of moisture present in the surfaces of the sole maintains these surfaces sufficiently flexible to eliminate danger of their 20 cracking during the molding operation but evaporates rapidly, owing partly to the heat stored in the sole and partly to the fact that the molding members themselves become warmed by contact with successive soles. Consequently, by the time 25 the sole is released from the molds, its surfaces have become restored substantially to their original dry condition, and further operations may immediately be performed on the sole.

Having described the invention, what we claim 30 as new and desire to secure by Letters Patent of the United States is:

1. An apparatus for moistening soles and delivering them in moist condition, said apparatus 35 comprising a chamber, means for conducting heated vapor into the chamber, a conveyor for soles enclosed in the chamber except for a projecting portion from which a moistened sole is automatically delivered free of the conveyor and

upon which a dry sole may be placed by the operator, and means for operating the conveyor intermittently to deliver the soles one by one in a position convenient to the operator.

2. An apparatus for moistening soles and delivering them in moist condition, said apparatus 5 comprising a chamber, means for conducting heated vapor into the chamber, a conveyor for soles enclosed in the chamber except for a projecting portion from which a moistened sole is 10 automatically delivered free of the conveyor and upon which a dry sole may be placed by the operator, and means for operating the conveyor intermittently to deliver the soles one by one in 15 a position convenient to the operator, the length of the conveyor, the intervals between the intermittent movements, the temperature and the degree of saturation of the atmosphere in the chamber being so controlled that each sole delivered is 20 warm, its surface humid and its interior substantially dry.

3. An apparatus for moistening soles and for delivering them in moist condition, said apparatus 25 comprising a chamber, means for conducting heated vapor into the chamber, an endless conveyor for soles enclosed except for a portion which projects through an opening in the chamber, said conveyor comprising sole supporting arms constructed and arranged to maintain the soles upon 30 the conveyor while the soles are being conveyed from the opening, where the operator may place soles upon them, through the chamber and back to the opening, and means for delivering the 35 soles from the conveyor into a position accessible to the operator after the soles have again reached the opening.

CHARLES HAROLD HEATHER.

CHARLES MARTIN BAGSHAW.