

June 28, 1932.

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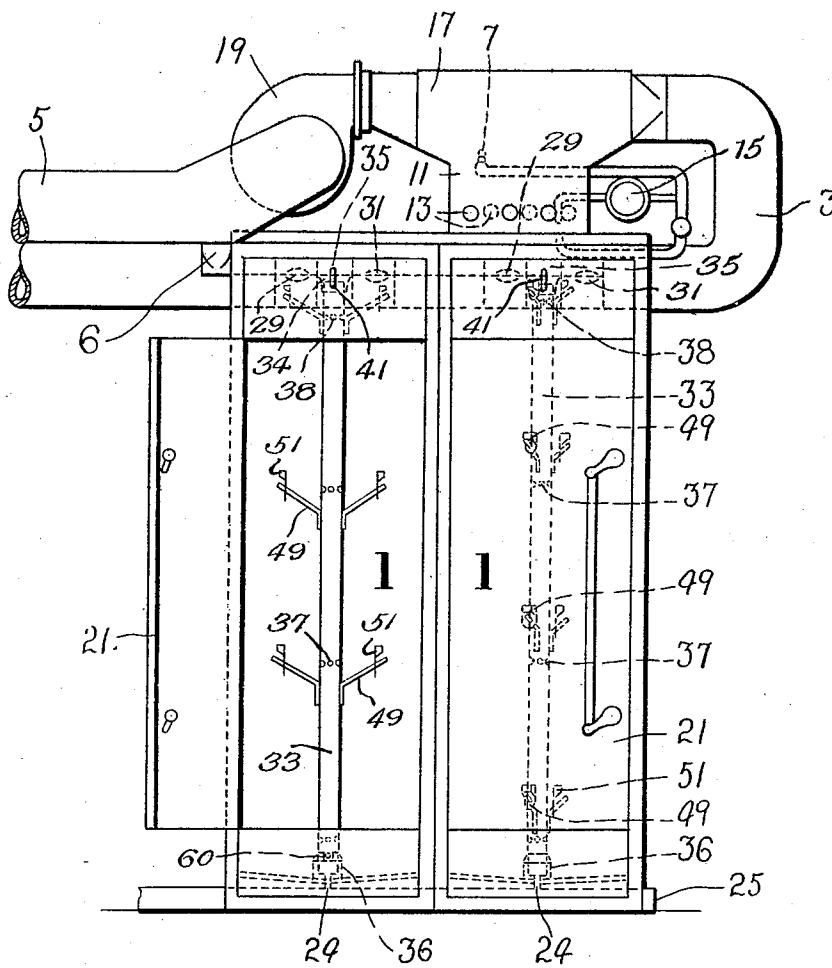
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APPARATUS FOR TREATING SHOE PORTIONS

Filed April 22, 1929

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Fig. 1.



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Fig. 2.

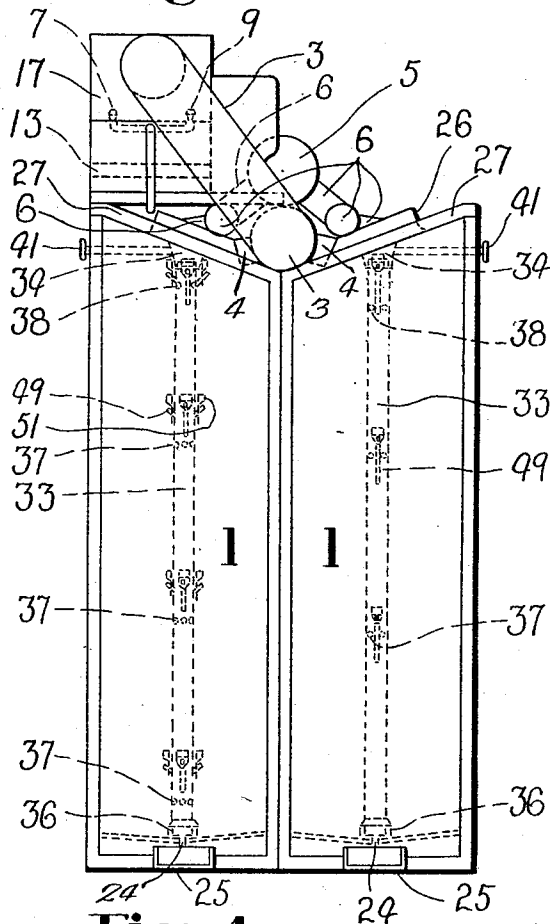


Fig. 5.

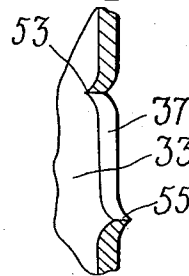


Fig. 3.

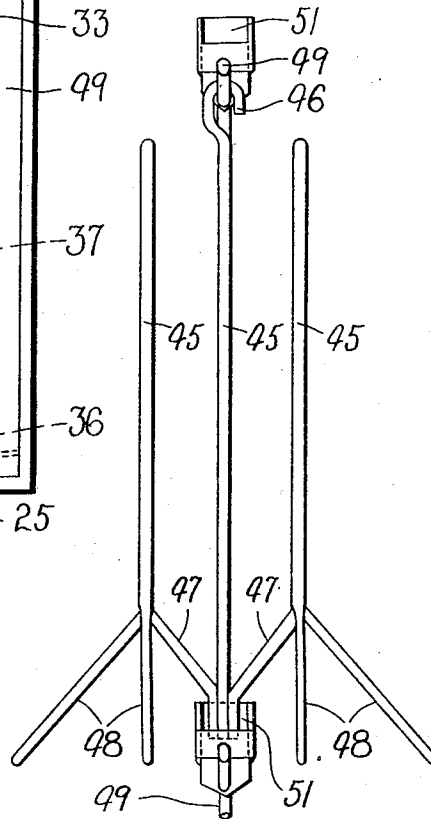
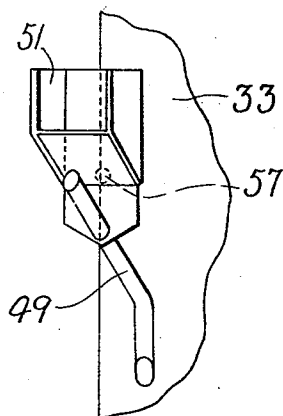


Fig. 4.



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APPARATUS FOR TREATING SHOE PORTIONS

Application filed April 22, 1929, Serial No. 357,119, and in Great Britain May 8, 1928.

This invention relates to the treatment of such articles as shoe-uppers by a tempering or other treating medium, to prepare them for a making operation, such as pulling-over and lasting, and is particularly, though by no means exclusively, concerned with improvements in moistening apparatus, such as is described in British Letters Patent No. 303,211, dated September 3, 1927.

An important object of the present invention is to provide improved constructions of apparatus for tempering shoe-uppers, characterized by being to a very high degree efficient, free from likelihood to injure the work by water of condensation, and which will be relatively compact. This object we attain by means within a chamber, which may be lined with heat-insulating material, this means supporting, in a novel manner, the uppers or other articles in vertical series, together with means for directing a tempering medium longitudinally of and about the columns of articles, preferably introducing it at the lower end of the series and withdrawing it at the upper end. The treating medium, for example warm, moist air, may be supplied to the treating chamber through, and out of groups of openings in, an upright duct near the center of said chamber, around which duct the uppers, nested on hangers, may be closely arranged, they being also in close proximity to the walls of the chambers. The treating atmosphere thus passes from the duct up and about the columns of uppers, completely enveloping these, with little waste space either inside or outside the work. Preferably the central member or duct itself carries arms, on which the uppers may be supported upon hangers, and it is best rotatable to facilitate the loading and unloading of the hangers. The arms are shown as arranged in groups along the duct adjacent to the groups of openings, being inclined downwardly toward said duct. Water of condensation passing down the arms is thus directed to the duct, at

the bottom of which may be a drain-opening.

The above and other objects and the several features of the invention will become fully evident from the following description with reference to the accompanying drawings of one form of apparatus according to this invention, which will now be described by way of example.

In the drawings,

Fig. 1 is a front elevation showing the apparatus sufficiently to enable its construction and arrangement to be understood;

Fig. 2 is a side elevation looking from the right of Fig. 1;

Fig. 3 is a view on an enlarged scale illustrating, in elevation, the construction of a hanger or work-carrier and suspension means therefor;

Fig. 4 is a perspective view on a still larger scale showing the suspension means for the hanger; and

Fig. 5 is a sectional detail showing one of the outlet-passages in a circulating duct.

It will be assumed that the apparatus is generally of the kind and for the purpose of that described in the above-identified patent, save that such drying apparatus as is or may be used in conjunction with the novel moistening or tempering apparatus now to be described will preferably form a quite separate structure, possibly located at some substantial distance from it in a shoe-factory.

The apparatus is made up a number of separate units or chambers 1, there being as many employed as may be necessary to treat the desired number of uppers. These chambers are arranged in two groups, in contact back to back, as shown in Fig. 2, and each in contact with its neighbor or neighbors in its row. That unit shown at the right in Fig. 1 is particularly adapted for shoe-uppers, and that shown at the left in the same figure, for longer articles, as boot-uppers. All the units are supplied with warm, moist air from a common air-circulating and humidifying

equipment of the general kind described in the previously mentioned patent, and situated on the top of the present apparatus, the air being led into the upper portions of the chambers by branch-connections 4 from a supply-trunk 3 leading from the outlet of a fan 19. The air is returned from the top of the chambers by branch-pipes 6 to a common trunk 5 leading to the eye of the fan.

There are provided two water-spraying nozzles 7 and 9 (Fig. 2), which are arranged in parallel and are fed with hot water from a water-bath 11 heated by a series of electric immersion devices 13. From the bath, hot water is delivered to the nozzles by a pump 15 indicated diagrammatically in Fig. 1. The nozzles 7 and 9 are arranged side by side in a chamber 17 across the circulating path, so the air, which may be driven through said chamber 17 by the fan 19, will be effectively warmed and moistened by passing through the water from the nozzles, this water falling back into the bath 11 after having impinged against the roof of the chamber.

Each chamber 1 is preferably square in horizontal section, and is closed by a door 21 extending for its full width and from near the top to about one foot from the floor on which the units stand. The bottoms of the chambers may be located some four or five inches up from the lower ends of the side walls, so there is a space between the bottom and floor. The bottom is shown as inclined downwardly from all sides toward the center, and is there formed with a drain-opening 24, and a gutter 25 rests on the floor and runs beneath the units through notches in the side walls thereof beneath the drain-openings. The roof 27 of the chamber is plane and inclined downwardly from front to rear. The roof, walls and door are lined with asbestos, or similar heat-insulating material, so that contact of the tempering medium with metallic parts is prevented, as far as may be. The lining is applied as far as possible in such a manner as to avoid all ridges or other formations favoring accumulation of any condensate, and consequent objectionable dripping. The air-outputs from each chamber are shown as two circular orifices 29, 31 in the roof 27, which open into a chest 26 (Fig. 2) secured on the roof and from which the branch-pipes 6 lead to the trunk 5 that supplies the fan. These orifices 29, 31 are spaced on opposite sides of a central opening, surrounding which is a depending flange or bearing 34. Into this bearing extends the upper end of a vertical duct 33 situated substantially at the central vertical axis of the chamber. The last-mentioned opening in the roof delivers into another chest 35 (Fig. 1) connected by one of the branches 4 with the air-supply trunk 3 leading from the humidifying chamber 17. Each of the orifices may be surrounded by an

upwardly projecting rim, which prevents condensate from dripping out of the chest into the chamber through the orifice. As illustrated, the depending flange 34, surrounding the central orifice in the roof of each chamber, forms the upper bearing for the corresponding vertical duct 33, the lower end of which is mounted in a step-bearing 36 over the drain-opening 24 in the bottom of the chamber. The bearing 36 is provided with a vertical hole communicating with the drain-opening, so that any water which may condense in the duct may escape through the drain-opening. The step-bearing closes the lower end of the duct, except for the vertical hole just mentioned. Any water which may condense in the chamber outside the duct may find its way to the sloping floor, and down this to the drain-opening, which it may reach by passing through gaps between the step-bearing and the bottom of the chamber. At intervals down the length of the duct are openings 37, through which the treating medium is discharged into the chamber from the chest 35. A valve or damper (not shown) is located in the bearing 34 at the upper end of each duct 33, and this valve may be controlled by a handle 41 (Fig. 2) on the end of its stem, to enable the operator to vary the supply of treating medium to the duct.

If shoe-uppers are to be treated in the apparatus, they are preferably supported on hangers of the kind shown in Fig. 3. These each comprise three parallel uprights 45 extending from the opposite ends of inclined arms 47 connecting their lower ends. These ends of the outer uprights 45 carry outwardly and downwardly extending fingers 48, and each of these outer bars may be adapted to have threaded on it a supply of uppers. The uppers are nested upon each other in columns with the bottom edges downward, the fingers 48 supporting the foreparts, and the arms 47 the heel-ends. The middle bar 45 of each hanger is somewhat longer than the others, and has an eye or hook 46 at its upper end, by which it may be suspended from one of a plurality of hanger-carrying arms 49 projecting from each duct 33. The arms 49 are arranged around and along the duct as closely to one another as convenient, having regard to the size of the uppers, without resulting in packing the uppers so as to interfere with the circulation of the tempering medium, or causing interference in loading and unloading the arms. The hanger-carrying arms preferably are inclined downwardly to the duct, so that any condensate forming thereon may drain back along said arms on to and down the outer surface of said duct.

In the arrangement particularly adapted for the treatment of shoe-uppers, which is shown in the right-hand chamber in Fig. 1, twelve arms 49 may be arranged on each duct

33, there being a group of three of such arms arranged circumferentially about said duct 120 degrees from one another, and there being four of such groups spaced along the duct, as indicated. The spacing of the groups of arms along the duct is such that a hanger suspended from any one of the three upper groups of arms will reach downwardly to the arms 49 below; and each of these arms of the lower groups is provided with a socket 51 (Fig. 3), in which the lower end of such hanger may be received. Thus the hanger will be held in a substantially fixed position with relation to the duct, both at its upper and lower ends. Six of the openings 37 are arranged near each of the three lower groups of arms 49 in a position indicated in the right-hand chamber in Fig. 1, so the air issuing from the duct through these openings may pass upwardly through and around a column of nested uppers suspended from an arm above it, and closely envelop said column. The lower end of such a column of uppers will terminate on a level just a little higher than the top of the openings, and the upper edge of each opening is turned into the duct, as shown at 53 in Fig. 5, while the lower end is turned outwardly, as shown at 55, to direct the issuing air more or less in a horizontal path lying close below the lower end of the column of uppers. The air will begin to rise as it passes beneath the column, and will therefore travel upwardly through and about them. Although, as stated, there are twelve arms 49 arranged on each duct 33, only nine of these—the three upper groups—are adapted to support the upper ends of hangers, the lowest group being provided only to furnish sockets 51 to receive the lower extremities of the hangers carried by the next higher group of arms. Each of the sockets 51 is provided with a drain-opening 57 extending through its rear wall, so that water of condensation forming on the hanger and running down into the socket can escape through the drain-opening to the hanger-carrying arm, and thence to the outside of the duct 33. The diameter of the openings 37 in each group is slightly smaller the nearer the group is to the lower end of the duct, to give a more uniform distribution of the air issuing from the duct. For example, the openings beneath the group of arms second from the upper end of the duct may be one inch in diameter, the openings beneath the next lower group of arms may be thirteen-sixteenths of an inch in diameter, while those below the lowest group of arms may be five-eighths of an inch in diameter. Six openings 38, each three-quarters of an inch in diameter, are preferably arranged in the duct near the uppermost group of hanger-carrying arms to allow the air issuing therefrom to maintain the atmosphere more or less uniform throughout the height of the chamber, and preventing the creation of a

partial vacuum near the exhaust-openings 29 and 31. Rotation of the ducts 33 in their bearings permits the operator easily to apply hangers and remove them from any of the arms 49.

In the unit shown at the left of Fig. 1, which is particularly intended for treating the uppers of leg-boots, an arrangement similar to that already described may be used. In this case, however, owing to the increased size of boot-uppers, the duct is arranged to carry only six hanger-supporting arms, preferably disposed in pairs at opposite sides of the duct, in three groups at different heights. It is more convenient in such a case if the duct is not rotatable, since part of the uppers might brush against the sides of the chamber if the duct were to be turned while boot-uppers are carried thereon. Therefore, the step-bearing 36 may be provided with a pair of stationary upstanding ears 60, between which a radial pin on the central duct may project, to prevent rotation of said duct. The arrangement of the step-bearing 36 at the lower end of the duct, and the bearing 34 at its upper end, is such that the duct may be removed from the chamber and another substituted therefor, by lifting it a little in its bearings until its lower end may move away from the step-bearing, and then withdrawing it lower end foremost from the chamber. By the employment of the described organization, any unit may readily be provided with either of the duct constructions shown, respectively, in the two chambers in Fig. 1.

In such an apparatus as has been described, there is a minimum liability for condensate to form, and when formed to reach the work. The walls and door of each unit present unbroken plane, vertical surfaces, and any condensate on the hangers supported on the central duct will eventually drain away down the central upright of the hanger to the outside of the duct, and down the latter to the opening 24. The supplying of the warm, moist air from perforations in the central duct insures efficient treatment of the uppers arranged close about the duct, this resulting in a relatively large output of treated uppers from a chamber of given volume. There is thus secured a compactness of the apparatus which is an important consideration in the usually rather crowded shoe-factories. While our improved apparatus is especially adapted for tempering treatment, it is to be understood that certain phases may be applicable to drying as well.

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

1. In a tempering apparatus, a chamber, a member extending vertically through the chamber near its center, means for supporting articles to be tempered at different heights upon the member and located about

it in vertical columns along and in close proximity to the chamber-walls, and means for circulating a tempering medium through the chamber.

5 2. In a tempering apparatus, a chamber, a lining of heat-insulating material for the chamber, a member extending vertically through the chamber near its center, means for supporting articles to be tempered at different heights upon the member and located
10 about it in close proximity to the chamber-walls, means for circulating a tempering medium through the chamber, and means for supplying moisture to said medium.

15 3. In an apparatus for treating shoe-portions, a chamber, a duct extending through the chamber and provided with openings, means for creating a circulation through the duct, openings and chamber, projections
20 from the duct, and holders each arranged to carry a series of shoe-portions and being supported by the projections.

4. In a tempering apparatus, a chamber, a duct extending vertically through the chamber and provided with openings, means for
25 creating a circulation through the duct, openings and chamber, and work-supporting arms projecting from and being inclined downwardly toward the duct.

30 5. In a tempering apparatus, a chamber, a duct extending vertically through the chamber and provided with openings, means for creating a circulation through the duct, openings and chamber, and work-supporting
35 arms projecting from and being inclined downwardly toward the duct, there being a drain-opening in the bottom of the chamber at the end of the duct.

40 6. In an apparatus for treating shoe-portions, a chamber, a duct extending through the chamber and provided with groups of outlet-openings spaced from one another, means for supplying a treating medium to
45 the duct, and work-supporting arms projecting from the duct adjacent to the groups of openings.

50 7. In an apparatus for treating shoe-portions, a chamber, means for creating a circulation through the chamber, a member extending vertically through the chamber, groups of arms projecting from the member
55 and spaced from one another vertically, and means carried by adjacent groups of arms to engage opposite extremities of hangers for articles to be treated.

60 8. In an apparatus for treating shoe-portions, a chamber, means for creating a circulation through the chamber, a member extending vertically through the chamber, and groups of arms projecting from the member
65 and spaced from one another vertically, an arm of one group having means to support a hanger for articles to be tempered and an arm of the next lower group being provided

with a socket to receive the lower portion of said hanger.

9. In an apparatus for treating shoe-portions, a chamber, a duct extending through the chamber and being provided with openings, means for creating a circulation
70 through the duct, openings and chamber, groups of arms projecting from the duct and being spaced from one another, and means carried by each arm for supporting hangers
75 for shoe-portions.

80 10. In an apparatus for treating shoe-portions, a chamber, means for circulating air through the chamber, a member extending vertically through the chamber, bearings in which the member may be turned, groups of
85 arms spaced from one another along the member, the arms of each group being arranged circumferentially about said member, and means carried by the arms to engage hangers for shoe-portions.

90 11. In a tempering apparatus, a chamber, a duct extending vertically through the chamber and having openings, means for circulating a tempering medium through the duct, openings and chamber, a step-bearing
95 in which the duct may be turned, said bearing being provided with a drain-opening, and work-supporting arms projecting from the duct.

100 12. In a tempering apparatus, a chamber, a duct extending vertically through the chamber and having openings, means for circulating a tempering medium through the duct, openings and chamber, a step-bearing
105 in which the duct may be turned, said bearing being provided with a drain-opening, and work-supporting arms projecting from the duct, said arms being inclined downwardly toward the duct.

110 13. In a tempering apparatus, a chamber, a duct extending vertically through the chamber and having openings, means for circulating a tempering medium through the duct, openings and chamber, arms projecting
115 from the duct, and hangers supported by the arms and having a central upright, uprights outside the central upright and arms connecting the outer uprights and central upright and being downwardly inclined toward the latter.

120 14. In a tempering apparatus, a chamber, a duct extending vertically through the chamber and having openings, means for circulating a tempering medium through the duct, openings and chamber, arms projecting
125 from the duct, and hangers supported by the arms and having a central upright, uprights outside the central upright and arms connecting the outer uprights and central upright and being downwardly inclined toward the latter, there being other arms extending outwardly from the outer uprights and being downwardly inclined.

130 15. In a tempering apparatus, a chamber,

a duct extending vertically through the chamber and having openings, means for circulating a tempering medium through the duct, openings and chamber, arms projecting
5 from the duct and carrying sockets, and hangers having central uprights extending into sockets on the duct-arms, uprights outside the central upright and arms connecting the outer uprights and central upright
10 and being downwardly inclined toward the latter.

In testimony whereof we have signed our names to this specification.

FRED RICKS.

15 HAROLD ERNEST ELLIOTT.

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