

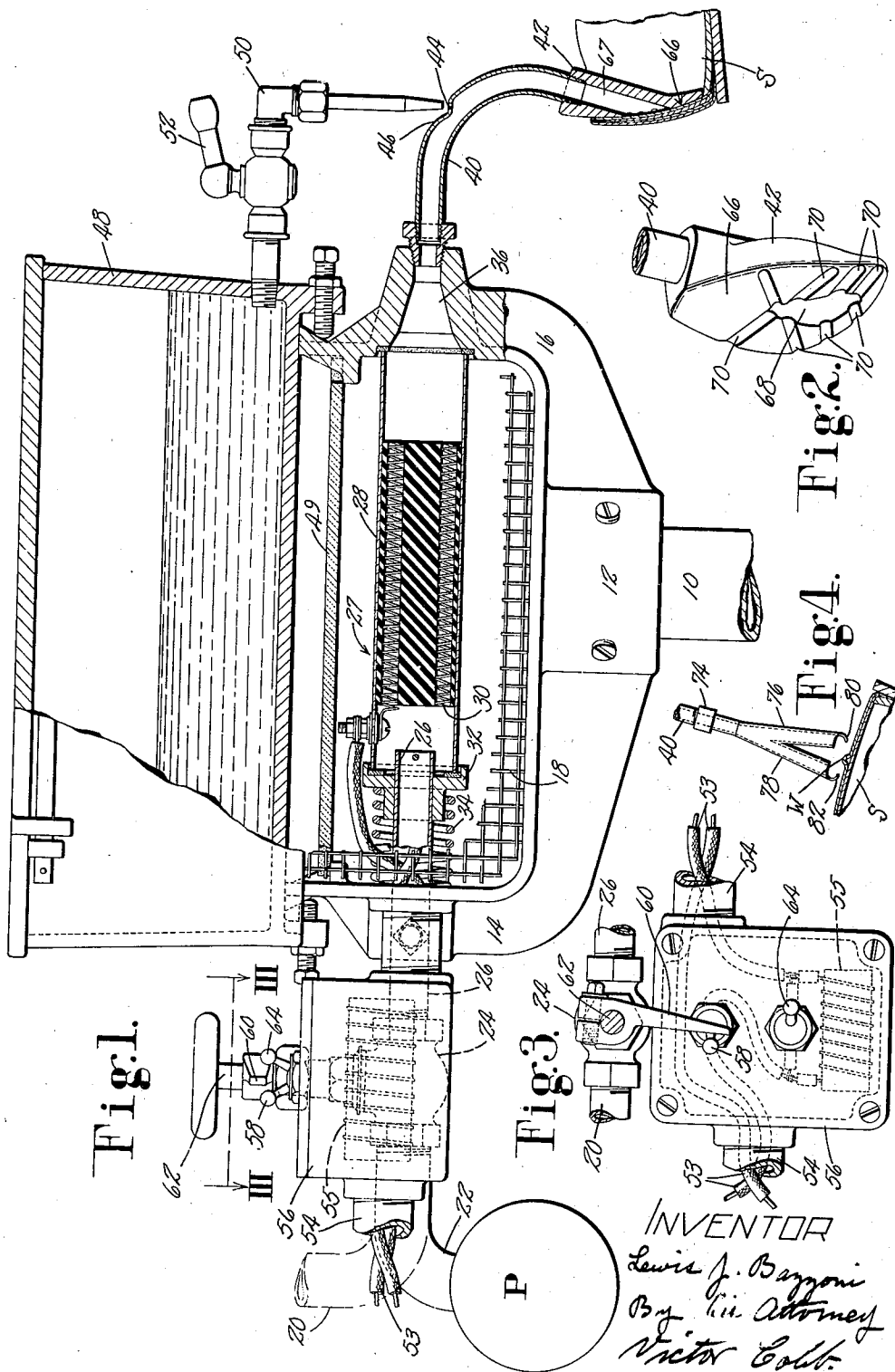
March 11, 1941.

L. J. BAZZONI

2,234,547

METHOD OF AND APPARATUS FOR SMOOTHING SHOE UPPERS

Filed April 12, 1939



INVENTOR
 Lewis J. Bazzoni
 By *Attorney*
 Victor Colby

UNITED STATES PATENT OFFICE

2,234,547

METHOD OF AND APPARATUS FOR
SMOOTHING SHOE UPPERS

Lewis J. Bazzoni, Swampscott, Mass., assignor to
United Shoe Machinery Corporation, Borough
of Flemington, N. J., a corporation of New
Jersey

Application April 12, 1939, Serial No. 267,469

18 Claims. (Cl. 12—51)

This invention relates to a method of and apparatus for treating parts of shoe uppers and linings to remove therefrom wrinkles, folds, and the like to give the uppers and linings a smooth, pleasing appearance.

In the construction of shoes, the lasting operation, even when carefully performed, is liable to leave wrinkles in various localities in the uppers and linings and this wrinkled condition is usually further aggravated by the stretching to which they are subjected when the shoes are removed from the lasts. The wrinkling is especially bad in the cheaper grades of shoes where less care is used in lasting and cheaper materials are used.

In one aspect, my invention relates to an improved method for rapidly removing wrinkles, folds, and the like from uppers and linings of completed shoes to impart to them the desired smooth, finished appearance. This method consists in shrinking the wrinkles out of the upper materials by applying a blast of moist heated air to the wrinkled surfaces and in some cases ironing the wrinkled surface concomitantly with the application thereto of heated air. In practicing this method, air is heated to a desired temperature which is usually between 250° and 400° F., at which temperature water is vaporized, moisture is added to the heated air, and a blast of the moist heated air is discharged against the upper surface to be treated, the moisture in the air facilitating the shrinking effect of the heated air and reducing the danger of scorching the upper material, especially so in the case of materials such as cloth linings. While 250° to 400° F. is the usual operating range for machines of this type, temperatures both above and below those limits may be used. In cases where ironing is desirable the air is discharged against the surface of the material where the ironing operation is being carried out so that the wrinkles are removed by the combined action of the heated air and the iron.

It is a further object of this invention to provide an improved apparatus for the practice of the above method. To this end, and as illustrated, the invention provides an apparatus having an air conduit, means arranged to heat the air as it passes through the conduit, and a device for adding moisture to the air before it is discharged from the conduit. Preferably, and as shown, the device for adding moisture to the heated air consists of an arrangement for forming an obstruction to the passage of air through the conduit so that a partial vacuum will be

formed on the discharge side of the obstruction and an inlet for admitting moisture into the conduit on the low-pressure side of the obstruction so that the suction will pull the moisture into the conduit.

Upper linings are frequently badly wrinkled and in some cases the shrinking action of the heated air may advantageously be supplemented by ironing to remove the deep wrinkles. With this in view, a further feature of this invention relates to a nozzle for the discharge end of the conduit. As illustrated, my improved nozzle has one of its surfaces constructed and arranged for ironing engagement with the upper lining and has an opening therein communicating with the conduit to permit the heated air passing through the conduit to be blown directly against the surface of the upper material in the area in which the ironing operation is being carried out. To permit the heated air to be applied to as much of the surface as is possible in the immediate vicinity of the ironing operation and thus to facilitate the removal of the wrinkles by increasing the area in which the shrinking takes place, grooves are provided in the ironing surface of the nozzle to permit the hot air to escape around the nozzle and to heat the upper surface in its immediate vicinity.

It is impracticable to use a hot iron on some upper materials because of the danger of damaging those materials. To facilitate the removal of deep wrinkles from materials of this type, there is disclosed, in accordance with a further feature of my invention, a nozzle which is especially adapted for use on these materials. As illustrated, this nozzle is provided with a pair of spaced openings arranged to discharge converging streams of heated air onto opposite sides of a wrinkle containing portion, thereby tending more effectively to draw out the wrinkle.

With the above and other objects in view, the invention will now be described with reference to the accompanying drawing and will be pointed out in the appended claims.

In the drawing—

Fig. 1 is a side elevation partly in section of an apparatus illustrating my invention;

Fig. 2 is a perspective view of the nozzle shown on the apparatus illustrated in Fig. 1;

Fig. 3 is a view taken along lines III—III in Fig. 1 looking in the direction of the arrows, and

Fig. 4 is a perspective view of a modified nozzle for use in the apparatus shown in Fig. 1.

My novel method may be advantageously carried out by the use of apparatus which, as illus-

trated, comprises a standard 10 upon which is mounted a U-shaped head 12 having spaced up-standing arms 14, 16 that support a heating unit for raising the temperature of a blast of air prior to its application to a wrinkled surface. The air passes through a section of pipe 26 which is mounted on the arm 14 and extends a short distance into the opening formed by the arms 14, 16. Interposed between the end of the pipe 26 and the arm 16 is a heating unit 27 which consists of a sleeve 28 of a larger diameter than the pipe 26 and a heating element 30 having an opening therethrough for the passage of the blast of air discharged by the pipe 26. One end of the sleeve 28 is seated against a shoulder formed around an opening 36 in the arm 16 and is held in that position by the pressure exerted by a coupling member 32 which is slidably mounted on the pipe 26 and is forced against the opposite end of the sleeve 28 by a spring 34. The construction just described allows for the expansion and contraction of the heating unit 27 and also provides for the ready interchange of heating units as all that is necessary to effect this change is to disconnect the wires leading to the heating unit, move the coupling member 32 to the left, as viewed in Fig. 1, against the pressure of the spring 34 and then lift out the heating unit in the machine and insert another one. In the illustrated apparatus, the heated air passes out through the opening 36 in the upstanding arm 16 and thence through a section of pipe 40 to a nozzle 42 whence it is discharged against the wrinkled surface to be treated.

The flow of air through the pipe 26 is controlled by a valve 24 which may be connected either to a factory source of compressed air by a pipe such as 20 or to a fan or a compressor unit P by a pipe 22. If desired, the compressor unit P may be mounted on the standard 10 so as to provide a self-contained unit. The temperature to which the air is heated by the unit 30 may readily be controlled by adjusting the valve 24, as the temperature of the air will vary with the rate of flow of the air through the heating unit.

As the wrinkled upper surfaces are dry when they are operated upon in the packing room to prepare them for shipment, it is desirable to add moisture to the heated air to facilitate its wrinkle removing action on the wrinkled surfaces and also to reduce the danger of drying upper leathers to such an extent as to cause them to crack and present a roughened appearance, giving what is known as a sharkskin effect. In the illustrated apparatus, moisture is added to the heated air through an opening 44 in the pipe 40. The opening 44 is located on the discharge side of a depression 46 in the pipe 40 so that the moisture will be pulled into the pipe by the partial vacuum which is created by the obstruction to the flow of air caused by the depression 46. Water is supplied from a tank 48 mounted on the head of the apparatus and is led to the opening 44 by a conduit 50 which includes a valve 52 that regulates the flow of the water. As the tank 48 is mounted over the heating unit 27 there is a possibility that the heat given off by the heating unit will cause the water in the tank to boil off; therefore, to avoid this situation a strip of asbestos 49 is mounted on the arms 14, 16 between the heating unit 27 and the tank 48.

Current for the heating unit 27 is supplied by leads 53 which pass through a conduit 54 and a junction box 56 in which is located a line switch

58. The line switch 58 is turned on and off by an arm 60 mounted on the stem 62 of the valve 24, the arrangement being such that when the valve is open to permit the flow of air through the apparatus the arm 60 will throw the line switch 58 to an "on" position to cause the heating of the unit 30 and when the flow of air is shut off the arm will throw the switch to an "off" position thus disconnecting the heating unit 30 and avoiding the waste of electricity. To cut down the flow of current through the heating coil 30 when shoes are not being presented to the apparatus, a resistance unit 55 is provided which is also located in the junction box 56 and is connected in circuit with the heating unit 30 so that it can be put in series with that unit by a manually operable switch 64. The operator is protected from accidental contact with the heating unit 27 by an open mesh wire screen 18 which, while acting as a guard, also permits the free access of air to the heating unit and thus prevents overheating of that unit.

The upper linings of shoes are sometimes so badly wrinkled that the action of the moist, heated air has to be supplemented by an ironing operation. To meet this condition, the nozzle 42 on the pipe 40 has a curved surface 66 shaped for ironing engagement with the upper lining of a shoe S in the manner indicated, by way of example, in Fig. 1. The nozzle 42 has a passage 67 extending therethrough which communicates with the pipe 40 and which opens through an opening 68 onto the ironing surface 66 of the nozzle so that the moist heated air passing through the pipe 40 will be discharged through the opening 68 against the wrinkled surface in the area in which the ironing operation is being carried out. When treating a wrinkled surface with heated air, the larger the area to which heat is applied, the greater will be the shrinking effect. With this in mind the ironing surface 66 of the nozzle 42 is provided with a plurality of grooves 70 which permit the heated air issuing from the opening 68 to escape past the nozzle. In this manner, the surface of the work in the vicinity of the iron will be heated by the air concomitantly with the ironing operation and will thus facilitate the removal of wrinkles.

In the treatment of some upper materials it is impracticable to apply a heated iron to the surface of the material in which case wrinkles are removed by blowing the heated air issuing from the nozzle against the surface of the upper material. Often deep wrinkles are encountered which call for special treatment, as for example, along the back seam. The nozzle shown in Fig. 4 is especially adapted to meet this condition as the nozzle has a pair of forked ends 76, 78 which are provided with deflecting lips 80, 82 that are arranged to direct the streams of air issuing from the forked ends inwardly toward each other so that when a wrinkled surface is brought into close relation with the nozzle the two converging blasts of air will contact the work at spaced points along opposite sides of a wrinkle (Fig. 4) thus causing a shrinking action on both sides thereof which tends more effectively to draw out the wrinkle.

In the operation of my apparatus it is customary to apply the nozzle 42 directly to the shoe lining as indicated in Fig. 1. However, when treating the upper material it is the general practice to hold the surface of the upper quite close to, but not in contact with, the nozzle so that it can be treated by the hot moist air issuing

therefrom. Due to the fact that many upper materials are very easily injured, the hot ironing surface of the nozzle is not customarily applied to the surface of the upper.

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

1. The method of removing wrinkles from uppers and linings of substantially completed shoes which comprises heating air to a temperature high enough to smooth the material to be operated upon, adding a predetermined amount of moisture to the heated air sufficient in quantity to materially enhance the wrinkle removing quality of the air but insufficient to moisten the material to a point where the shoe need be re-lasted to permit the material to dry, and blowing the moist heated air on the wrinkled material.

2. The method of removing wrinkles from shoe uppers, linings and like materials which comprises heating air to a temperature high enough to smooth the material to be operated upon, adding sufficient moisture to the heated air to materially enhance its wrinkle removing quality but not enough substantially to moisten the material, and blowing the moist heated air against the material to be operated upon.

3. The method as defined in claim 2 in which an ironing action is concomitantly applied to the area subjected to the action of moist heated air.

4. The method of removing wrinkles from shoe uppers, linings and the like which comprises heating air to a temperature high enough to smooth the materials to be operated upon, adding a predetermined amount of moisture to the heated air sufficient in quantity to materially enhance the wrinkle removing quality of the air but insufficient substantially to moisten the material, and blowing the moist heated air on the wrinkled material.

5. The method of removing wrinkles from shoe upper material which consists of ironing the wrinkled surface and blowing heated air directly on the wrinkled surface as it is being ironed.

6. An apparatus for removing wrinkles from shoe uppers, linings and like materials comprising an air conduit, a heating device for heating the air passing through said air conduit, and means for adding moisture to the air passing through the air conduit.

7. An apparatus as defined in claim 6 in which the moisture adding means is arranged to introduce the moisture into the air after it has been heated.

8. An apparatus as defined in claim 6 in which means are provided for regulating the flow of air through the air conduit thereby to regulate the temperature of the heated air.

9. A shoe upper smoothing apparatus comprising an air conduit, an obstruction in the air passage of said conduit arranged to interfere with the flow of air therethrough and cause an area of reduced pressure on the discharge side thereof upon the flow of air through the conduit, and an opening in the conduit for admitting moisture into the conduit on the low pressure side of the obstruction.

10. A shoe upper smoothing apparatus comprising an air conduit, an obstruction in the air passage of said conduit arranged to interfere with the flow of air therethrough and cause an area of reduced pressure on the discharge side

of the obstruction upon the flow of air through the conduit, an opening in the conduit arranged to admit moisture into the conduit on the low pressure side of the obstruction, and means arranged to heat the air passing through the conduit before it reaches said moisture-admitting opening.

11. A shoe upper smoothing apparatus comprising a head having spaced upstanding portions, an air conduit extending between the upstanding portions, said conduit comprising a first section extending inwardly from one portion part way to the other portion, a second section having one of its ends disposed adjacent to the end of said first section and its other end in engagement with the other upstanding portion, and a coupling for said sections arranged to hold the second section of the conduit in engagement with the upstanding portion.

12. A shoe upper smoothing apparatus as defined in claim 11 in which the coupling is slidably mounted on one of said sections and is spring urged into engagement with the other section, and in which means are provided for heating the air as it passes through the sections of the conduit.

13. A shoe upper smoothing apparatus comprising an air conduit, means for heating air as it passes through the conduit, means for adding moisture to the air in the conduit, and a nozzle on the end of said conduit for directing the hot moist air against a wrinkled surface to be treated.

14. A shoe upper smoothing apparatus as defined in claim 13 in which the nozzle has a surface shaped for ironing engagement with the surface to be operated upon.

15. A shoe upper smoothing apparatus comprising a support, an air conduit mounted on said support, and a heating unit for heating the air passing through the conduit, said conduit having a portion thereof extending outwardly from the support, the extending portion having an opening therein for the admission of moisture to the heated air passing therethrough and a nozzle on its free end.

16. A shoe upper smoothing apparatus comprising an air conduit, means for heating air as it passes through the conduit, and a nozzle on the end of the conduit shaped for ironing engagement with the work, said nozzle having an opening therein communicating with the conduit whereby the heated air passing through the conduit is blown against the work in the area in which the ironing operation is being carried out.

17. A shoe upper smoothing apparatus as defined in claim 16 in which the ironing surface of the nozzle is provided with a plurality of grooves communicating with the opening therein to permit the passage of heated air outwardly from the iron while the iron is in contact with the work whereby a substantial area of the work surface will be heated and thus facilitate the removal of wrinkles.

18. A nozzle for use in a wrinkle removing apparatus comprising a body portion forked at its discharge end, openings in the forked portions, and deflecting flanges adjacent said openings arranged to direct the stream of air issuing from the openings into converging paths for application to spaced points on either side of a wrinkle-containing portion of a work piece.

LEWIS J. BAZZONI.