A. BATES.

WORK SUPPORT.

APPLICATION FILED MAY 21, 1915.

1,340,143.

Patented May 18, 1920.

2 SHEETS—SHEET 1.

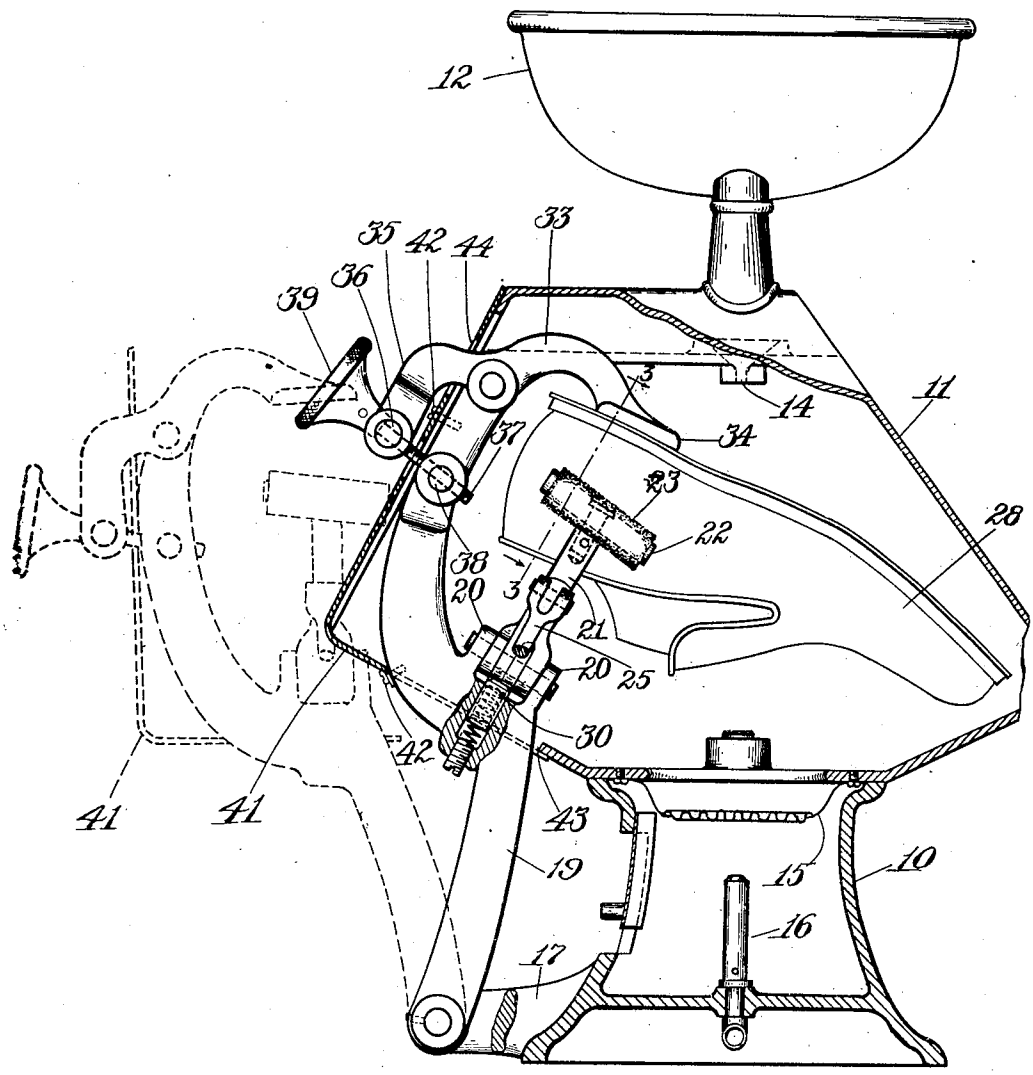


Fig. 1.

INVENTOR.

Arthur Bates

By his Attorney

Nelson Richmond

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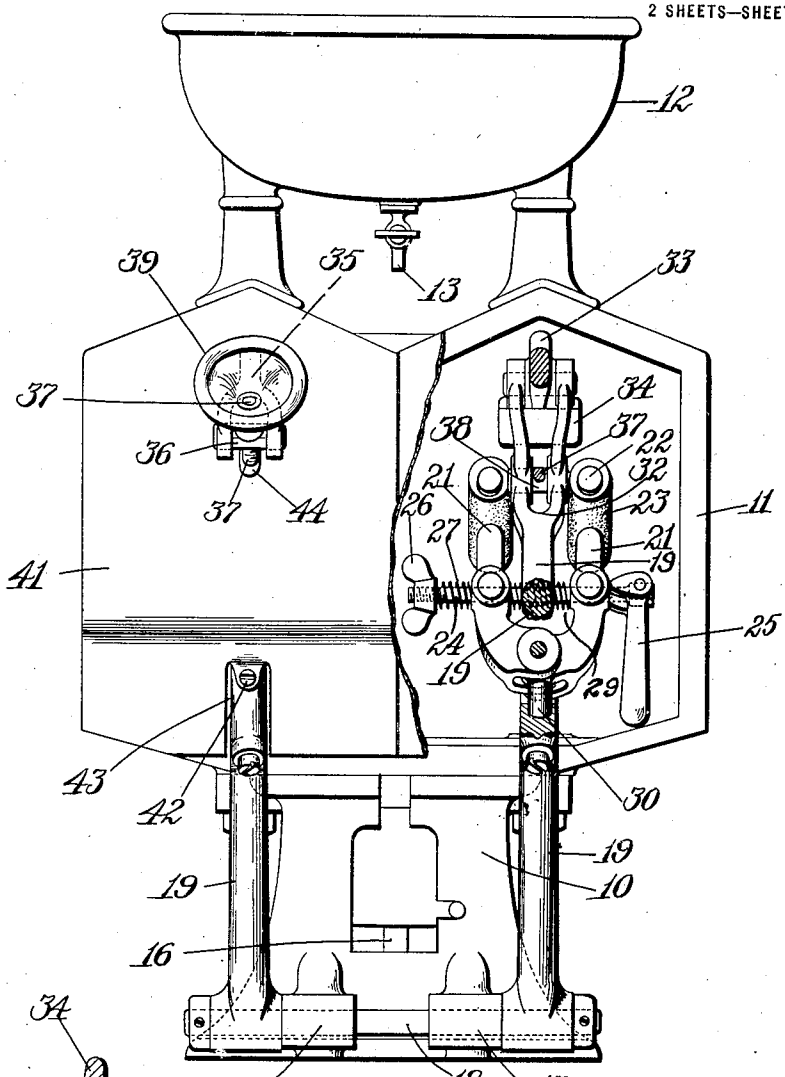


Fig. 2.

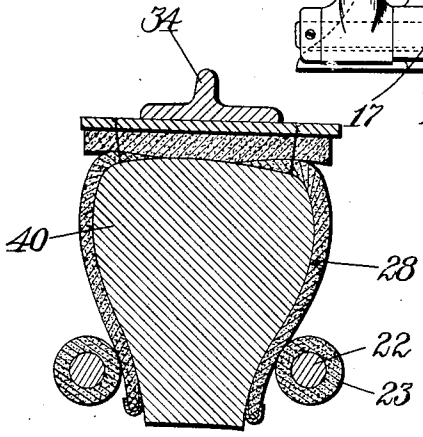


Fig. 3.

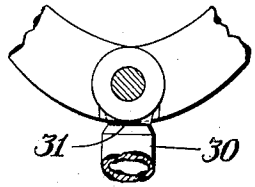


Fig. 4.

INVENTOR.

Nathan Bates

By his Attorney

Nelson Howard

UNITED STATES PATENT OFFICE.

ARTHUR BATES, OF LEICESTER, ENGLAND, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

WORK-SUPPORT.

1,340,143. Specification of Letters Patent. Patented May 18, 1920.

Application filed May 21, 1915. Serial No. 29,602.

To all whom it may concern:

Be it known that I, ARTHUR BATES, a subject of the King of England, residing at Leicester, Leicestershire, England, have invented certain Improvements in Work-Supports, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to the manufacture of shoes, and in particular to the manufacture of shoes made of fabric such as felt. It comprises an improved method of manufacturing such shoes, as well as novel apparatus for practicing the method.

In the manufacture of shoes of felt or other fabric it is desirable to shrink the materials of the shoe over the last in order to cause the shoe to conform more closely to the shape of the last and thus to improve the appearance and fit of the completed shoe. It is evident that the portions of the shoe surrounding the cone of the last will not be treated as efficiently as the forepart portions, since they are unsupported at the upper end of the cone, and the shrinking operation tends to draw them down so as to injure the shape of the rear part of the shoe.

My invention in one aspect obviates this difficulty by engaging those parts of the upper which lie on the cone of the last and holding them against slipping or drawing down over the cone while subjecting the shoe to the action of moisture. In another aspect the invention consists in subjecting the shoe while on the last to the action of moisture and simultaneously stretching the shoe over the last. The apparatus preferred for the practice of the process which is shown in the drawings not only holds the rear portions of the upper on the last, but actually stretches this part of the shoe during the moistening operation. A good appearance, as well as correct shape and fit of the shoe are therefore assured.

An important feature of the invention, therefore, comprises an apparatus for effecting the shrinkage of a shoe on a last, in combination with means for holding the rear part of the upper in position on the last whereby the shape of the rear part of the shoe is not affected by the shrinkage. The apparatus shown in the drawings embodies the further advantage of positively stretching the upper over the rear part of the last.

Another feature of my invention consists in the combination of means for effecting shrinkage of a shoe upper with a support constructed and arranged to act upon the upper and the last so as to stretch the upper over the last during the shrinking operation.

Another feature of the invention comprises a compartment adapted to receive a shoe for treatment through an aperture, a work support arranged to carry the shoe into and out of the compartment, and means for closing the aperture after the insertion of the shoe.

These and other aspects and features of the invention including details of construction and combinations of parts will now be described in connection with an apparatus for shrinking the parts of shoes made of felt or other fabric. It will be understood, however, that the invention is not limited to the particular construction described nor to its application to the type of apparatus referred to, as it could be embodied in other constructions or applied to other types of apparatus or machines without departing from its scope. For example, a work support having the characteristics of the present invention is capable of general use in the manufacture of boots and shoes.

In the drawings:—

Figure 1 is a sectional side elevation of the apparatus, showing an open position thereof in dotted lines;

Fig. 2 is a rear view with one cover plate broken away;

Fig. 3 is a section on the line 3—3 of Fig. 1; and

Fig. 4 is a detail.

The apparatus comprises a base 10 upon which is secured a casing 11 of sufficient size to accommodate two shoes placed side by side. Water contained in a tank 12 above the casing, drips from a tap 13 in the tank, through an orifice 14 in the casing on to a diaphragm 15 located in the bottom of the casing, which diaphragm is heated by a Bunsen burner 16 placed in the base of the apparatus.

Projecting from the base of the casing is a pair of brackets 17 that support a rod 18 upon which the work supports for the two shoes are mounted. As both of these

work supports are the same in construction and arrangement, one only will be described. Each work support comprises a main arm 19 pivoted on the rod 18 and about midway between its ends provided with ears 20 between which are pivoted a pair of work-clamping levers 21. A head 22 is pivotally arranged at right angles to each work-clamping lever and forms the work-engaging portion thereof. Each head is covered with felt 23 or other non-abrasive material. To cause the levers to be moved toward one another to grip the shoe between them a rod 24 extends through a hole formed in each lever and has pivoted upon one end of it a cam lever 25, the cam on which is adapted to bear against one of the work-clamping levers. The other end of the rod has screwed upon it a winged nut 26 between which and the other work-clamping lever a coiled spring 27 is interposed. When the cam lever is turned to bring the cam into action the two levers are pressed against the shoe 28 with a force which is determined by the strength of the spring 27, the winged nut enabling the strength of the spring to be varied as required. A second spring 29 also surrounds the rod and is located between the two work-clamping levers and tends to hold them apart in readiness to receive a shoe. To maintain the levers in an upright position when no work is in the work support, the main arm 19 is provided with a spring-pressed plunger 30 which bears upon flattened portions 31 formed on each of the work-clamping levers near their point of connection with the main arm.

The upper end of the main arm 19 is forked at 32 and between the ends of the forks is pivoted a lever 33 one end of which, 34, constitutes a rest for engaging the heel seat of the shoe. The other end of the bent lever is forked at 35 and journaled in the forks is a stud 36 through which a screw 37 passes loosely and screws into another stud 38 journaled in the forks of the main arm 19 below the pivot of the bent lever. The screw is provided with a handle 39 by which it may be turned to bring the heel seat rest 34 nearer to or farther from the work-engaging portions 22 of the work-clamping levers to accommodate shoes of different sizes or to alter the pressure the work-clamping levers exert against the sides of the last 40.

The cover plates 41 which close the casing when the apparatus is in use are secured to the two main arms 19 by screws 42, and the arrangement is such that when the work supports are moved into position to hold the shoes within the casing, the casing is closed by means of the cover plates. In order that the casing may not be larger than is necessary for the treating of the shoes, the lower part of each of the main arms 19 and the rear end of each bent lever 33 and its adjusting screw extend through apertures 43 and 44 respectively formed in the cover plates.

In the use of the apparatus in practising my novel process the work supports are swung outwardly to remove their clamping members from the inside of the casing. Each shoe is then placed with its heel seat against the heel seat rest 34 and the cam lever 25 is turned to cause the cam thereon to press the work-clamping levers toward one another so as to clamp the sides of the heel or counter portion of the last between them. As the sides of this portion of the last taper from the heel seat toward the top of the last, the pressure of the work-clamping levers 21 against the last will cause the last to be forced upwardly in the upper so as to force the heel seat of the shoe against the heel seat rest 34, stretch the upper over the sides of the last, and cause it to conform closely thereto. This operation is materially assisted by the friction between the felt 23 and the material of the shoe. The shoe is confined to the last only at the points where it is engaged by the members 20, being free to "draw" and shape itself to the last at other places. The action of the steam will cause some portions to shrink and others to stretch, depending upon the initial local discrepancies in shape between the shoe and the last. This will continue until a condition of equilibrium is reached. The clamping action of the members 22, in crowding the last up into the bottom of the shoe, will, in effect, produce a downward creeping action of the shoe upper relatively to the last. Conveniently in use the shoes are clamped in the work supports alternately, one shoe being steamed while a change is made on the other support, each work support being moved inwardly when ready to bring its shoe within the casing. When a felt shoe provided with a leather sole is being steamed in the apparatus, the sole may be protected from the action of the steam by means of a suitable cover which may be clipped in between the shoe sole and the heel seat rest 34 or otherwise secured to the rest, the lever 33 that supports the said rest or some other suitable part of the apparatus.

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

1. That improvement in processes of manufacturing shoes which consists in subjecting the entire shoe, while on the last, to the action of moisture while simultaneously holding the rear portions of the shoe in proper position on the last.

2. That improvement in processes of man-

ufacturing shoes which consists in subjecting the shoe, including the entire sole portion, while on the last, to the action of moisture and simultaneously stretching the shoe over the last.

3. That improvement in processes of manufacturing shoes which consists in engaging the upper of a shoe containing a last and drawing the upper over the cone of the last, and subjecting the entire shoe to the action of moisture.

4. That improvement in processes of manufacturing shoes which consists in fastening the rear part of the upper in position on a last and carrying the entire shoe with the last in it into a chamber arranged for moisture treatment of the shoe.

5. In combination with a chamber adapted to receive and surround a shoe for vapor treatment and having an opening for the entrance and egress of the shoe, a shoe support permanently appurtenant to the chamber arranged to move with a shoe into and out of said opening.

6. An apparatus of the character described comprising means forming a treating chamber having an opening for ingress and egress of a shoe, a pivotally mounted shoe-holder arranged to swing so as to carry a shoe through said opening into and out of said chamber, and a closure for said opening carried by said shoe-holder so as to inclose the shoe in the chamber.

7. An apparatus of the character described comprising means forming a treating chamber having an opening for ingress and egress of a shoe, a pivotally mounted shoe-holder arranged to swing so as to carry a shoe through said opening into and out of said chamber, the pivotal axis of said holder being so arranged that the latter will cross over the center of gravity, whereby the shoe-holder will swing automatically from the center-of-gravity position to treating position and to a relatively remote position, and a closure for said opening carried by said shoe-holder so as to inclose the shoe in the chamber.

8. An apparatus of the character described comprising means forming a treating chamber having an opening for ingress and egress of a shoe, a pivotally mounted shoe-holder arranged to swing so as to carry a shoe through said opening into and out of said chamber, and a closure for said opening carried by said shoe-holder so as to inclose the shoe in the chamber, the pivotal axis of said holder being so arranged that the latter will gravitate to carry the shoe to treating position in the chamber and to carry the closure to chamber-closing position.

9. An apparatus adapted to apply moisture to a shoe containing a last, in combination with a work support constructed and arranged to stretch said shoe over said last.

10. In combination with an apparatus for effecting shrinkage of a shoe upper on a last, a support constructed and arranged to confine the shoe to the last only at the ankle opening and to act upon the upper and the last to stretch the upper over the last during the shrinking operation.

11. That improvement in the art of manufacturing shoes which consists in placing a shoe on a last, placing the shoe and last in a moisture treating chamber, and treating the entire shoe while holding it under tension in the chamber.

12. That improvement in the art of manufacturing shoes which consists in confining to a last the rear part only of a shoe having an attached sole portion, and subjecting the shoe to the action of moisture to shrink it to the last.

13. That improvement in the art of manufacturing shoes which consists in confining to a last the rear part only of a shoe having an attached sole portion, placing it in a vapor treating chamber, and subjecting the shoe to the action of moisture to shrink it to the last.

14. That improvement in processes of manufacturing shoes which consists in stretching a shoe over a last, confining the upper rear portion only of the shoe to the last, and subjecting the shoe while on the last to the action of moisture.

15. That improvement in processes of manufacturing shoes which consists in placing a shoe on a last, confining the rear portions only of the shoe to the last, leaving the fore portions free to adjust themselves on the last, and subjecting the shoe to the action of moisture.

16. That improvement in processes of manufacturing shoes which consists in confining locally the rear upper part only of the shoe to a last, leaving the remainder free to adjust itself to the last, subjecting the shoe to the action of moisture and permitting the unconfined portions to shrink or stretch in adjusting themselves closely to the last.

17. In combination with an apparatus for effecting shrinkage of a shoe upper on a last, a support, constructed and arranged to confine the shoe to the last only at the ankle opening and to act upon the upper and the last to stretch the upper over the last during the shrinking operation.

18. In combination with a compartment adapted to receive a shoe for treatment and having an opening for inserting the shoe, a pivoted shoe support constructed and ar-

ranged to swing the shoe into and out of the opening.

19. In an apparatus of the class described, means for applying moisture to a shoe and means for stretching one part of the shoe relatively to another part, and maintaining the stretched condition during the moisture applying operation.

20. That improvement in processes of manufacturing shoes which consists in sliding a portion of the upper of a shoe containing a last along the last in a direction other than that caused by shrinkage of the upper, and applying moisture to all parts of the shoe while maintaining the stretched condition engendered by the sliding movement.

21. An apparatus of the character described comprising means forming a vapor treating chamber having an opening for ingress and egress of a shoe, movable means constructed and arranged to clamp and support a shoe, and means arranged to guide said clamping means through said opening to transfer the shoe to and from treating position in the chamber.

22. An apparatus of the character described comprising means forming a treating chamber having an opening for ingress and egress of a shoe, a movable support, means constructed and arranged to clamp the sole and two sides of a shoe, said means being carried by said support, and means arranged to guide said support so as to move the shoe through said opening.

23. An apparatus of the character described comprising means forming a treating chamber having an opening for ingress and egress of a shoe, and means for supporting a shoe in the chamber, said means including coöperative shoe-engaging members arranged to clamp the sole and two sides of the shoe-upper.

24. An apparatus of the character described comprising means forming a treating chamber having an opening for ingress and egress of a shoe, and clamping means for supporting a shoe in the chamber, said means including three coöperative clamping elements arranged to engage the heel end of the shoe and to bear on the sole and the two sides of the upper.

25. An apparatus of the character described comprising means forming a treating chamber having an opening for ingress and egress of a shoe, an oscillatory arm, and three coöperative clamping members carried by said arm and arranged to clamp and support a shoe, said arm being arranged to swing so as to carry said clamping members through said opening.

26. An apparatus of the character described comprising means forming a treating chamber, and means arranged to support a shoe in said chamber for treatment, said supporting means comprising coöperative clamping members one of which is arranged to bear on the tread surface of the sole of an inverted shoe, and two other clamping members being arranged to bear on opposite sides of the inverted shoe.

27. An apparatus of the character described comprising means forming a vapor treating chamber, and means arranged to support a shoe in said chamber for treatment, said supporting means comprising cooperative clamping members constructed and arranged to bear on three separate points of the shoe to maintain the latter in a predetermined position.

28. An apparatus of the character described comprising means forming a treating chamber, means arranged to support a shoe in said chamber for treatment, said supporting means comprising three coöperative clamping members each arranged to bear on the shoe, and a spring arranged to cause said three members to function conjointly with each other to clamp the shoe.

29. An apparatus of the character described comprising means forming a treating chamber, and means arranged to support a shoe in said chamber for treatment, said supporting means comprising three cooperative clamping members two of which are spring-stressed and one of which is adjustable to accommodate shoes of different sizes.

30. An apparatus of the character described comprising means forming a treating chamber, and means arranged to support a shoe in said chamber for treatment, said supporting means comprising three cooperative clamping members arranged to engage one end of a shoe to keep the latter in a predetermined position.

In testimony whereof I have signed my name to this specification.

ARTHUR BATES.