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A. J. WELLS

2,363,715

METHOD OF TEMPERING LEATHER

Original Filed Jan. 25, 1941

Fig. 2.

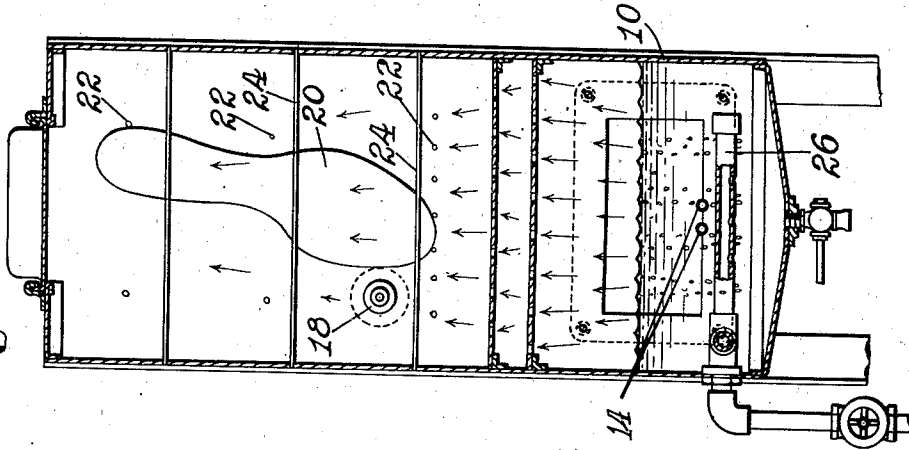


Fig. 1. — II — 28

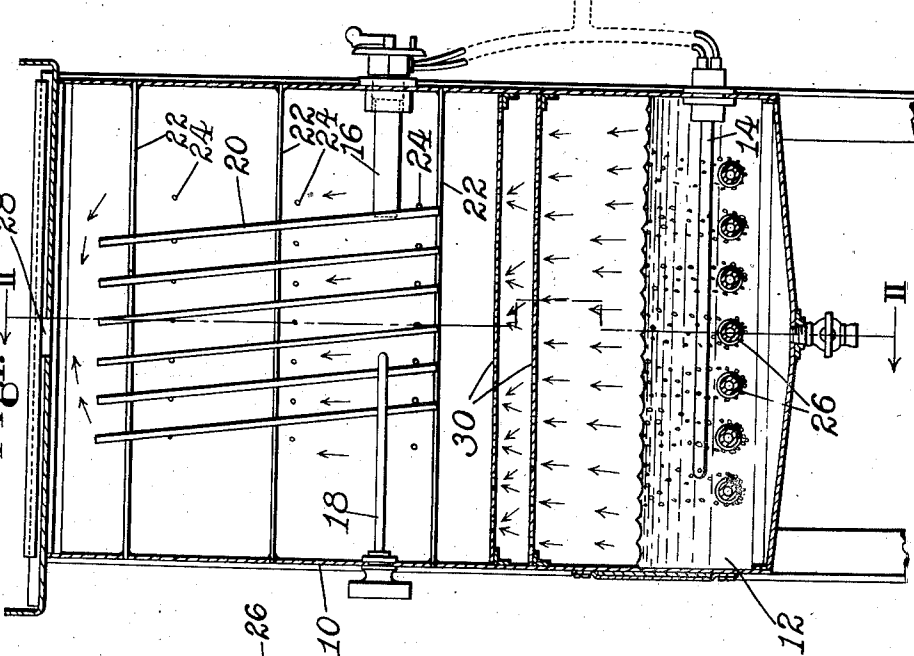
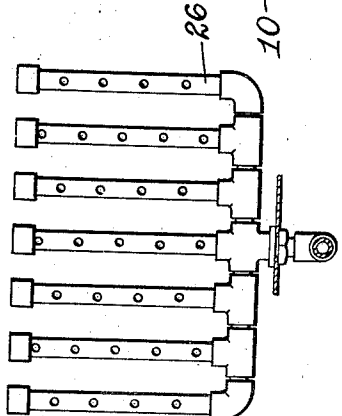


Fig. 3.



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UNITED STATES PATENT OFFICE

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METHOD OF TEMPERING LEATHER

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375,951. Divided and this application February
11, 1942, Serial No. 430,350

3 Claims. (Cl. 12-146)

This invention consists in a method of tempering leather without staining the grain surface thereof or removing any of the tanning substances therefrom. It is known that some solid tanning substances with which leather is loaded are soluble in water and that immersion of leather in water results in washing away some of them. Even if water comes into contact with the grain surface of leather otherwise than by immersing the latter, the water-soluble substances are reduced to a migratory condition and in consequence thereof staining of the grain surface is likely to result, particularly if that surface is spattered without being entirely wet with water.

Again, it is known that leather can be tempered with warm water-vapor without water in the liquid state, and that such treatment will not produce stains. Nevertheless, if convection alone is the only force by which water-vapor is transferred from its source to the leather, the speed of transfer is so slow that much time is required to accomplish a useful degree of temper.

With these considerations in view, an object of the method herein set forth is to utilize the advantages of tempering with water-vapor and at the same time speed the tempering process. This may be accomplished with an apparatus of the type set forth in my application for Letters Patent of the United States, Serial No. 375,951, filed January 25, 1941. The present application is a division of that identified above. In describing the method to which the present application is directed, it will be assumed that unattached leather soles are the articles of work to be tempered, although it is to be understood that the utility and advantages of the method are not limited to the treatment of soles.

In the drawing,

Fig. 1 is a sectional elevation of apparatus adapted for use in practicing the method of the present invention;

Fig. 2 is a section on the line II-II of Fig. 1; and

Fig. 3 is a bottom plan view of the air pipe shown in Figs. 1 and 2.

The soles to be tempered are placed in a chamber 10 that also contains a body of water 12. The water is heated by an immersion heater 14 controlled by a thermostat 16 to furnish a supply of vapor at a temperature of about 140° F. indicated by a thermometer 18 and the soles 20 are supported above and out of contact with the water and out of contact with each other on wires 22 and wires 24 extending at right angles

to the wires 22 to expose their surfaces to the vapor. If nothing more were done a long period of treatment would be required produce a useful state of temper because the quantity of vapor supplied to the soles by convection alone would be small and the circulation of vapor between and around the soles would be slow.

To accelerate the tempering process the quantity of vapor is increased without increasing its temperature, and its circulation around the soles is accelerated by emitting a forced draft of air at high velocity through perforated pipes 26 located in the body of water below its surface and releasing the used air and surplus vapor to the atmosphere through a restricted vent 28 above the soles. The restriction of the vent is to prevent the chilling effect of atmospheric air that might otherwise enter the chamber above the soles.

The air forced into the body of heated water is divided into many small jets by the perforated pipes 26 to insure a large number of small bubbles and a high degree of absorption of heat and vapor by the air. Moreover, the boiling action of the water thus produced increases the vapor output thereof. At the same time the bubbles of air absorb heat from the water and become substantially saturated with vapor. Then, since a large volume of vapor-charged air flows under forced draft from the water below the soles to the restricted vent above them it causes a large quantity of vapor to flow on the surfaces of the soles located in its path.

The boiling produced by emitting air under pressure in the water also produces many globules of water so small as to be carried along in the stream of vapor-charged air which flows at considerable velocity. If these globules of water were spattered on the grain sides of the soles they would produce stains. Therefore, to guard against that result, the method includes the step of filtering the stream of vapor and air to arrest the globules at points between the body of water and the soles without appreciably diminishing the vapor content of the stream. This filtering may be accomplished by arranging a series of non-absorbent baffles in the path of the stream to divide the latter into smaller streams and to deflect these. The baffles may comprise a pair of perforated plates 30, the holes in one plate being in staggered relation to those of the other. All globules of water precipitated against the baffles will cling to the latter while the air and vapor continue to flow, albeit in crooked paths,

and since the temperature of the baffles will be about the same as that of the vapor little, if any, of the latter will be condensed by them.

A specific example of the utility of the method herein set forth is that of conditioning soles about to be subjected to operation in a sole-conforming machine. For this operation it is not necessary to temper soles throughout their thickness, but it is desirable to temper their grain surfaces. This may be done in about thirty seconds of treatment of each sole, according to the method herein set forth, and at this rate of treatment a treatment chamber designed to receive five or six soles at once will be capable of keeping pace with the output of a commercial sole-conforming machine.

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

1. That improvement in methods of producing and maintaining a tempering atmosphere for leather which consists in heating a body of water to a suitable predetermined temperature substantially below the boiling point, forcing air at room temperature through said body of water to cause the air to be heated and laden with water-vapor, removing water in liquid form from the vapor-laden air to provide a water-free tempering atmosphere, passing said atmosphere through a work-treating chamber and maintaining it against condensation by continuously supplying the chamber with further quantities of atmosphere at a rate sufficient to maintain a continuous current thereof through the chamber.

2. That improvement in methods of producing

and maintaining a tempering atmosphere for leather which consists in heating a body of water to a suitable predetermined temperature substantially below the boiling point, forcing air at room temperature through said body to cause the air to be heated and laden with water-vapor, filtering the vapor-laden air to remove water in liquid form to provide a water-free tempering atmosphere, maintaining its temperature constant to prevent condensation of vapor, passing said atmosphere into a leather-treating chamber and permitting a restricted escape of said atmosphere therefrom, and maintaining said atmosphere against condensation by continuously supplying the chamber with further quantities of said atmosphere at a rate at least equal to the rate of escape therefrom.

3. That improvement in methods of producing and maintaining a tempering atmosphere for soles which consists in heating a body of water to a predetermined temperature sufficient to heat air passed therethrough to approximately 140° F., forcing air at the normal temperature through said body of water to cause the air to be heated and laden with water-vapor, removing from the vapor-laden air water in liquid form to provide a water-free tempering atmosphere, passing the said atmosphere through a sole-treating chamber having an opening to the outer air, and maintaining said atmosphere against condensation by continuously supplying the chamber with further quantities of said atmosphere at a rate sufficient to maintain a continuous current thereof through the chamber.

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