METHOD OF TEMPERING LEATHER

Fig. 2

Fig. 1

Fig. 3

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METHOD OF TEMPERING LEATHER

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3 Claims.

This invention consists in a method of tem-
pering leather without staining the grain sur-
face thereof or removing any of the tanning sub-
stances thereof. 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 sub-
stances are reduced to a migratory condition and
in consequence thereof staining of the grain sur-
facing is likely to result, particularly if that sur-
face is splattered without being entirely wet with
water.

Again, it is known that leather can be tempered
with warm water-vapor without water in the liq-
uid state, and that such treatment will not pro-
duce stains. Nevertheless, if convection alone is
the only force by which water-vapor is trans-
ferred 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. 375,551,
filed January 25, 1941. The present application
is a division of that identified above. In de-
scribing the method to which the present appli-
cation is directed, it will be assumed that unat-
tached 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 practising 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 cham-
ber 10 that also contains a body of water 12. The
water is heated by an immersion heater 14 con-
trolled by a thermostat 16 to furnish a supply
of vapor at a temperature of about 140° F. in-
dicated 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 quan-
tity 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 lo-
cated 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 pre-
vent 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 substan-
tially saturated with vapor. Then, since a large
volume of vapor-charged air flows under forced
draft from the water below the soles to the re-
stricted vent above them it causes a large quanti-
ty 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 con-
siderable velocity. If these globules of water were
splattered 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-conforming 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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