July 13, 1926. 1,592,722

D. G. CARTER

SHOE LAST

Filed March 4, 1924

Fig. 1.

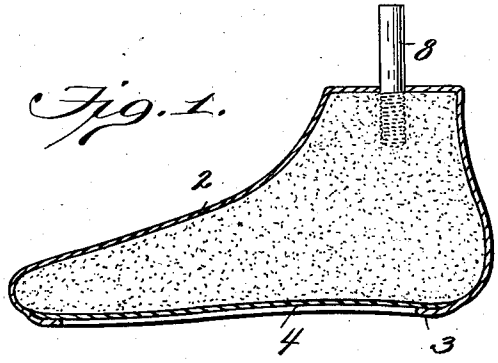


Fig. 2.

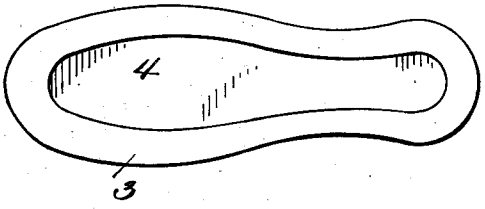
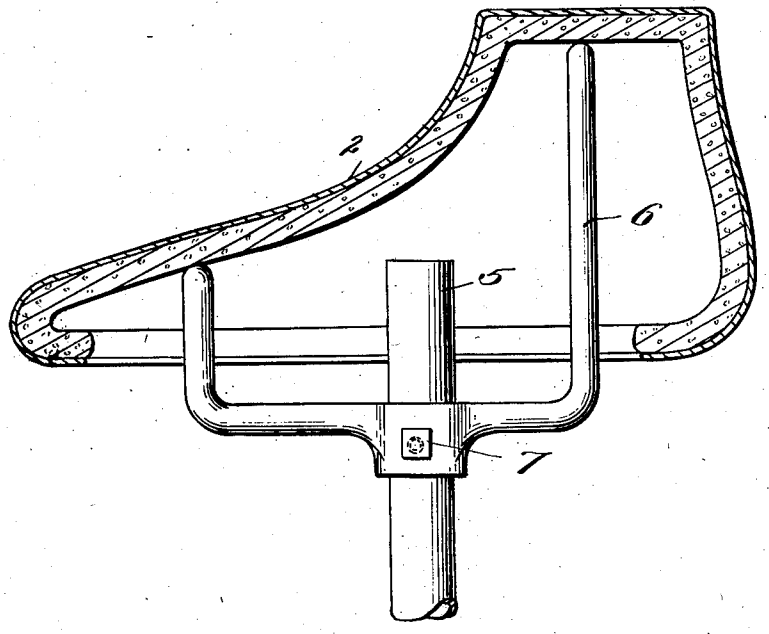


Fig. 3.



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UNITED STATES PATENT OFFICE.

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SHOE LAST.

Application filed March 4, 1924. Serial No. 696,858.

This invention relates to shoe lasts and has for its object the provision of a last having properties that particularly adapt it to use in the carrying out of my process for making seamless uppers from green hides, which process forms the subject matter of my Patent No. 1,463,066, granted July 24, 1923.

A green hide is one which has passed through the steps of soaking, fleshing, liming and dehairing, but has not yet been subjected to the tanning process. At this stage it is a fibrous gelatinous body the essential characteristic of which is that it is substantially plastic or perfectly pliable, having no predominate set or position of repose, so that it may be bent or conformed to any shape, and will remain in that shape when the bending or conforming force is removed without any tendency to revert to or assume another shape.

In the process described in said patent, the green hide is conformed to a last, subjected while so conformed to a tanning process for a sufficient length of time to permit the tanning process to give it a set shape. At this point in the process the last is removed and the tanning of the conformed hide is completed without the supporting assistance of the last.

The most signal advantage of this process over older methods of making seamless uppers from green hides is that but a few lasts are required for a great output, because each last is in service for only a small part of the tanning period and can therefore be used over and over again during the time that a last, under the old method, is used once.

My invention contemplates a last which is an improvement over the ordinary wooden lasts in that it has inherent physical properties which enable it to assist in holding the conformed green hide in place; to accelerate the tanning process as well as render it uniform throughout the extent of area of the green hide in contact with the last; which make it susceptible to special treatment; if desired, so as to produce non-uniform tannage of the conformed hide or other especial effects in parts thereof, and which render it sufficiently heavy to hold the conformed hide beneath the tanning liquor by gravity.

Concrete is an example of substances affording suitable material for the making of such a last, the essential properties being uniform porosity of all surfaces with which the green hide is to make contact, and absence of intra-fibrous absorption which, in a wood last, causes swelling with consequent closing of the pores. Concrete is also heavy enough to hold the green hide submerged.

My invention therefore, in its broadest concept contemplates a shoe last made of concrete or of a material having the essential qualities of concrete.

More specifically, the invention contemplates the construction of a hollow porous last the relatively thin wall of which is readily permeable by the tanning liquor and which lends itself to the transmission of steam heat, which in certain methods of tanning may be introduced into the hollow last.

In the drawings:—

Figure 1 is a side elevation of a concrete last with the conformed green hide in position thereupon, the hide being shown in section.

Figure 2 is a bottom view of the last showing the overlapping edge of the green hide.

Figure 3 is a section showing a hollow last of concrete positioned over a steam pipe.

Referring now in detail to the several figures, the numeral 1 represents a concrete last which is molded in any suitable manner and made of a mixture of cement and sand, and any necessary other ingredients to ensure a uniform porosity of all surfaces of the last with which the green hide is to make contact. I have found that if an ordinary sand and cement concrete is mixed with a suitable soluble substance such as cane sorghum or salt, the soluble ingredient may be soaked out in water after the concrete is set, leaving the latter in a sufficiently porous state to efficiently carry out the tanning process. The preferred manner in which the hide is spread over the last is indicated in Figure 1 in which a piece of hide 2, having a slit or hole to enable it to go over the handle 8, but otherwise imperforate, is pressed into conformation with the upper and lateral surfaces of the last and overlaps a suitable distance upon the bottom surface of the last as indicated at 3 in both figures. The last, covered with the green hide to the extent indicated is then placed in a body of tanning liquid the depth of which should be sufficient to permit the hide to be completely submerged. The weight of the last holds the hide beneath

the tanning liquor resulting in great convenience in handling the material in the tannage bath. Where wood lasts are used it is necessary to place weights upon them to hold them down in the tanning liquor. Some of them frequently escape from the weights and float, exposing part of the hide above the liquid level, causing it to be insufficiently tanned.

But the most important advantage in using the concrete last lines in its effect upon the tanning reaction in the hide itself. The pores in the concrete act as capillary tubes, tending to withdraw moisture from the hide and therefore causing a mild suction which assists in preserving the perfect conformation of the hide with the shape of the last. The thirst for moisture in the concrete last, created by the capillary attraction of the pores, causes the tanning liquor to be drawn through the hide, the tanning principle depositing in the hide structure itself while the water passes through into the pores of the concrete. By this means a quicker tanning action is realized, and the pores being substantially uniformly distributed over the surface of the concrete, the entire hide will be uniformly tanned. This cannot be said of the ordinary wooden last in which all the pores are concentrated at the ends of the grain of the wood, the rate of tanning being thereby rendered non-uniform. Moreover, intra-fibrous absorption takes place in the wood, swelling the fibers and closing the pores so that the capillary action ceases and the entire last becomes substantially inert as an assistant to the tanning process. Moreover in the case of the concrete last a few moments exposure to the air, or to a mild degree of heat is sufficient to relieve the pores from the absorbed moisture, while on the other hand, the wooden last remains wet for a very long time due to the swelling of its fibers, so that it must of necessity remain out of use for a long time, even if it were relied upon to perform some of the functions accomplished by the concrete last.

In the making of the uppers for shoes it is not customary to spread the green hide over all the bottom of the concrete last, therefore, in some tannage processes particularly the dipping method described in my aforesaid patent, the surface of the last which would otherwise be directly exposed to the tanning liquor may be coated with a suitable paint or other coating preparation 4 such as paraffin to prevent the absorption of tanning liquor which would tend to diminish the capilary efficiency of those surfaces of the last which are engaged by the green hide.

In the application of the invention indicated in Figures 1 and 3 it is contemplated that that part of the green hide which covers the top of the last shall be cut off subsequently to the tanning process, in the making of the shoe. However, the invention is not limited to such an adaptation but the top of the upper may be cut away previous to immersion into the tannage bath if desired, in which case the exposed portion of the last should be coated in a manner similar to the bottom.

A green hide subjected to the prelimimary step in the tanning process while supported upon the improved last of my invention, is normally uniformly tanned throughout, but it may be desirable at times to pre-tan the edge of the hide which under-laps the form of last, so as to stiffen said edge immediately for the purpose of holding the hide in place on the last without having to rely upon the capillary attraction of the pores of the last, or without resorting lacing. To this end the edge of the hide may be painted over or dipped into suitable acid or other substance which will set the fibres at once, after which the last with the conformed hide may be subjected to the general tannage bath. Should it be desired to obtain special effects such as stiffening of the heel portion of the upper, to act in place of a separate counter in the built-up shoe, a similar procedure may be followed, it being only necessary to dip that portion of the last which is to come into contact with the heel of the upper into a suitable tanning fluid such as oxalic acid or the like before putting the green hide in place. The tanning of the hide adjacent the dipped portion of the last then proceeds from the inside as well as from the outside producing a more naturally tanned condition in the portion to be stiffened than elsewhere.

Tanning the hide simultaneously from both sides while on the last is best accomplished by making the last hollow as shown in Figure 3, the relatively thin wall permitting the rapid passage of the tanning liquor through said wall and into said contact with the inner surface of the hide. It is also sometimes desirable to dispense with the dipping process of tanning, and to apply a dressing tannage. With this object in view a suitable tannage paste is spread over the outer surface of the last, the raw hide then conformed upon said last over the paste and head in the form of steam from any source, for instance a steam pipe 5, is introduced within the last, said steam passing through the pores of the concrete, warming the latter and producing the proper action between the tannage paste and hide. The last may be held in spaced relation to the orifice of the steam pipe by any suitable means such as the bracket 6 which in the embodiment of the invention illustrated in Figure 3 is fixed to the pipe by means of a set screw 7. Any other suitable means may

be employed for imparting heat to the last without impairing the scope of the invention, the latter covering the last itself whether solid or hollow and without regard to the fact of its being heated at all.

It is obvious that the concrete last may be made of any size or shape to suit the upper that is to be tanned and that its use is not confined to the carrying out of the process described in my hereinbefore mentioned patent but that it may be used with equal advantage in any process of continuous tanning. It is also to be understood that the invention is not necessarily confined to shoe lasts but that it is comprehensive enough to include molds for making from green hide, conformed articles of various shapes.

While I have above described what I have found to be a very practical embodiment of my invention it is nevertheless to be understood that the last may be made of other substances than concrete, it being essential only that the materials possess those characteristics of concrete which will enable the last to react toward the green hide in the manner described in the specification, and I accordingly reserve the right to adopt all such legitimate changes as may be fairly embodied within the spirit and scope of the invention as claimed.

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

1. A shoe last made of concrete including a water soluble ingredient dissolvable out upon subsequent aqueous immersion of the last to increase the pore-capacity thereof.

2. A shoe last for conforming and tanning green hides, formed of a substance having capillary interstices, said interstices in the hide-engaging portions of said last being left open, and means closing the pores in the portions of the last not designed to be engaged by the hide for inhibiting the capillary properties of said pores thereby concentrating the capillarity in the hide-engaging portion of said last.

In testimony whereof I have hereunto set my hand.

DANIEL G. CARTER.