UNITED STATES PATENT OFFICE.

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PROCESS OF IMPREGNATING LEATHER.

SPECIFICATION forming part of Letters Patent No. 458,132, dated August 18, 1891.

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To all whom it may concern:

Be it known that I, GEORG CASPAR SEEBERGER, chemist, a subject of the King of Bavaria, residing at Münchberg, in the Kingdom of Bavaria and German Empire, have invented certain new and useful Improvements in a Process for the Impregnation of Leather; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention has for its object a process for the impregnation of leather of any kind, and especially for rendering soles of boots or shoes not only water-proof, but also more durable. The durability becomes at once evident by the fact that boots or shoes made from leather impregnated by the process described hereinafter do not shrink, nor do the seams rip when the goods stand in dry air. The process is based on the principle that the small holes which are formed in the leather by the tacks or the pitched thread are filled up with a resinous mass which is insoluble in water and proof against the weather, so that no moisture can enter the interior of the leather. This filling up of the holes prevents the leather of the soles from drying up, and in this way and also by making the leather very pliable the durability of the leather is indirectly increased. Besides, another and very essential advantage is attained. In consequence of the uniform saturation both of the leather and the wooden tacks and the pitched thread with the resinous mass an intimate cementing of the tacks and thread with the leather is brought about which allows of a long-continued keeping of the ready-made goods in dry air.

In carrying out the process in practice the following method is pursued, whereby more especially the impregnation of soles of shoes or boots is kept in view. One hundred parts of linseed-oil are intimately mixed with about one and one-half parts of manganese borate and one-half part of burnt alum and the mixture is gently boiled for several hours. The soles are then coated several times with the mass thus obtained and afterward exposed to the action of atmospheric air, whereby linseed-oil is subjected to the well-known chemical change. The liquid substance which permeates the leather of the soles in all its pores is gradually changed by the oxygen of the air into a solid resinous mass, which is elastic still and possesses the properties described. A continued boiling of the linseed-oil is of a special importance, inasmuch as by such a proceeding noxious organic matter is destroyed and all the moisture driven off, whereby a purer and more suitable product is obtained. The addition of manganese borate and burnt alum causes a rapid drying of the linseed-oil, whereby the mass becomes harder and more able to resist the influence of the weather. By the addition of the said chemicals and a long-continued boiling the mass acquires the further property of not solidifying even at low temperatures, so that the impregnation of leather can take place at common temperatures. After the soles have been prepared in the manner described above they are treated once more in a manner to be described directly. Whereas the resin in the first stage of the impregnation is, as it were, formed in the material to be treated by exposure to the air, the resin, which is also employed in this second stage, need not be formed by the chemical action of the air; but resinous substances are directly employed for the purpose. I have found that this is best done by using solutions of resin dissolved in suitable agents. The soles are saturated with this solution and then exposed to the air, whereby the dissolving agent is evaporated, while the resinous mass is deposited in the interior of the leather.

The resins to be used can be chosen at pleasure, as also the liquid for dissolving; but it has proved best to employ the following substances in quantities, as stated: One kilo of shellac, one-fourth kilo of sandarac, sixty grams of mastic, fifteen grams of camphor, and two hundred grams of Venetian turpentine are digested with four liters of methylated spirit and heated to the boiling-point in a water bath. After the substances have been dissolved the mass is allowed to cool and the soles are then coated with it several times. After the perfect drying they are ready to be used.

There is an important object in the consecutive treatment of the soles with an oil which turns resinous on exposure to the air and with

a solution of resin ready formed, as will be shown at once. In order to give the leather a permanent elasticity it is very essential that only a certain portion of the linseed-oil turns into resin, while the rest is not changed by the oxygen of the air, but keeps its thick "half-liquid" state. Now the complete conversion of the linseed-oil can only be arrested by covering the first layer of linseed-oil after the partial change has taken place by a second layer of resin, so that no oxygen can get admission to the first layer. This is most aptly effected by the application of alcoholic solutions. The alcohol quickly evaporates and leaves behind a coating of resin which perfectly protects the linseed-oil from oxidation. The leather is therefore saturated with a semi-fluid liquid mass, which, on the other hand, is, as it were, incased in a hard and elastic material, whereby the leather offers the double advantage of posessing both great elasticity and hardness and a powerful resistance against moisture.

The treatment of leather goods with an oil which is transformed into resin by air or the treatment with a solution of resin—that is to say, neither treatment by itself—is not sufficient to produce a lasting effect; but both treatments must be combined in the manner as above described.

Having thus fully described this invention, I claim—

1. The method of treating leather, which consists in first impregnating the leather with an oil—such as boiled linseed-oil—then partially oxidizing the oil, and finally coating the leather with a resinous varnish, substantially as set forth.

2. The method of treating leather, which consists in first impregnating the leather with a mixture of boiled linseed-oil, manganese borate, and alum, then exposing the leather to the air to partially oxidize the oil, and finally coating the leather with a resinous varnish, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GEORG CASP. SEEBERGER.

Witnesses:
ADOLF KUMECK,
CARL LINHARDT.