

UNITED STATES PATENT OFFICE.

WILLI LISSAUER, OF BERLIN, GERMANY, ASSIGNOR TO LEONHARD FRIEDLÄNDER, OF SAME PLACE.

PROCESS OF WORKING LEATHER.

SPECIFICATION forming part of Letters Patent No. 680,604, dated August 13, 1901.

Application filed June 10, 1899. Serial No. 720,071. (Specimens.)

To all whom it may concern:

Be it known that I, WILLI LISSAUER, a subject of the King of Prussia, German Emperor, residing at the city of Berlin, Germany, have
5 invented a new and useful Process of Working Leather, of which the following is a specification.

My invention has relation to the treatment of leather with the object of improving its
10 quality, in that it is rendered more elastic and flexible and more durable.

Leather tanned by the more modern processes, especially the rapid processes, is, as is well known, much inferior in quality, in so far
15 as flexibility and durability are concerned, to leather which has been tanned by the older processes, requiring longer periods of time in their completion.

The elasticity or flexibility of hides and
20 skins is due to certain peculiar microscopic filaments, chiefly tubular tissues, the elastin composed of an albuminous substance free from sulfur. These elastin tissues are not as readily affected by the tanning agent as the
25 other tissues of the hide or skin and in the so-called "rapid" processes are but imperfectly tanned and become filled with the tanning solution, which when the leather is exposed to moisture is dissolved out, thus destroying
30 the flexibility and elasticity of the said elastin tissues. I have discovered that leather, and particularly leather of inferior quality, can be so treated as to effectually protect the elastin tissues against the action of moisture
35 by reacting upon them with bisulfid of carbon or with a hydrocarbon capable of dissolving a resin, as of the group C_nH_{2n+2} , and holding the resin in solution in suitable proportions, the solvent acting upon these tissues
40 and preparing the same for the reception of an infinitely thin coating of resin, whereby these fibers or filaments are practically waterproofed, and practice has shown that this treatment does not in the least diminish, but,
45 in fact, rather enhances, the elasticity and flexibility of the elastin tissues. Practice has also shown that the tissues or fibrous constituents of the leather other than the elastin are not affected by the resin solvent, and
50 hence not prepared to receive a deposit of

resin, whereby the leather would otherwise become more or less hard and brittle.

By "resin" I mean not only the common resin obtained in the manufacture of turpentine, but also those organic compounds of the
55 turpenes which possess the property of becoming resinified by oxidation in the air or under the influence of chemical reagents—i. e., of being converted into substances very similar to the resins which occur in nature. These
60 natural resins are solid, amorphous, and generally vitreous brittle masses of conchoidal fracture, insoluble in water, but soluble in alcohol and other solvents, and are formed
65 naturally and in abundance partly as balsams, the latter being known as the "resins of the balsam series," and these also can be used in my process.

It is of course not possible to give a fixed proportion of resin relatively to a given pro-
70 portion of solvent for general use, as these necessarily depend upon the weight of the leather. In the treatment of heavy leather—as sole-leather, for instance—a solution of a resin in bisulfid of carbon or in a hydrocarbon
75 capable of dissolving resin and containing from about thirty per cent. to thirty-five per cent. of the latter will answer the purpose, the percentage of resin being reduced in proportion to the reduction in the weight of the
80 leather.

The resin solvent being highly volatile, the process is carried out in a closed vessel or tank provided with suitable racks, from which the leather is suspended, the resin solution
85 being used cold. The leather is completely immersed in the solution and is exposed to its action for a period of time which likewise varies with the weight of the leather treated, the heavier leather requiring about thirty
90 minutes exposure, after which time it is removed and the solvent evaporated. This can be done either in the open air or in a suitably-heated drying-room.

In my copending application for patent, 95 Serial No. 720,070, I have described a process of treating hides after being prepared for tanning in the usual manner and before being tanned substantially similar to the process
100 herein described. The action of the resin

solvent in the two processes differs, however, very materially by reason of the vast differences in the chemical as well as physical character of the materials treated. In the
5 treatment of hides as described the resin solvent acts chemically upon the albuminous tissue of the hide and prepares the tissue for the reception of the resin, which forms thereon a protective coating imperceptible to the
10 naked eye, yet sufficient to protect said tissue against the action of the tanning agent without thereby impairing the flexibility of such tissue. The action of the resin solvent and the resin upon leather is, however, radically
15 different. It is a well-known fact that certain parts of leather, and particularly the albuminous tissues above referred to, remain unaffected or are only imperfectly acted upon by the tanning agent. It is these tissues
20 which are reacted upon by the resin solvent. By exhaustive examinations and tests I believe I succeeded in determining the action of the solvent and resin upon these tissues, and my conclusions have been supported by
25 eminent chemists. When leather is treated as described and withdrawn from the solution, it has a decidedly-pronounced rubber smell, and inasmuch as the resin solution itself does not smell like rubber nor does the leather
30 itself previous to its exposure to the action

of said solution I have come to the conclusion that a chemical reaction takes place, which I likened to a species of vulcanization in the cold, whereby the untanned or partly-tanned albuminous tissues referred to are
35 rendered more elastic or flexible and are at the same time practically waterproofed, and these conclusions, as hereinabove stated, have been corroborated by eminent chemists. It will therefore be seen that the chemical
40 processes which take place in the processes described in this application and in my said copending application are radically different.

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

The method of treating leather, which consists in immersing the same for a suitable length of time in a solution of resin in a bisulfid of carbon or in a solution of resin in a
50 hydrocarbon capable of dissolving the resin, for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

WILLI LISSAUER.

Witnesses:

SALLY FRIEDLAENDER,
WOLDEMAR HAUPT.