

UNITED STATES PATENT OFFICE.

T. P. SHAFFNER, OF LOUISVILLE, KENTUCKY.

IMPROVED METHOD OF PRESERVING VEGETABLE FIBER.

Specification forming part of Letters Patent No. 55,371, dated June 5, 1866; antedated April 10, 1866.

To all whom it may concern:

Be it known that I, TALIAFERRO P. SHAFFNER, of Louisville, in the county of Jefferson and State of Kentucky, have made new and useful Improvements in Coating Vegetable Fibers to prevent decay, &c.; and I do hereby declare the following to be a full, clear, and exact description of the same, sufficient to enable one skilled in the art to which it appertains to use the same.

My invention consists in coating vegetable fiber with a metallic surface, by which several valuable results are obtained.

First. It tends to prevent decay, however exposed.

Second. It lessens inflammability.

Third. It will enable ropes in suitable positions to serve to some extent as lightning-conductors.

The process is applicable to all descriptions of vegetable material, such as fiber, fabric, rope, wood, &c., which it may be desirable to protect from decay, or with other objects, as above stated.

The material to be treated is placed in a bath or otherwise saturated with water, holding in solution plumbago or other metallic powder, whose fineness or impalpability enables it to be mechanically suspended to a sufficient degree for my purpose.

The water and plumbago, under pressure, if required, penetrate the interstices of the fabric enveloping the fibers, or penetrate the cellular texture of the wood, or, speaking in general terms, saturate mechanically and by capillary attraction the material plunged into the said bath.

Mechanical means may be employed to hasten this, such as a hydraulic press, which may be employed to remove the sap and cause the water and plumbago to follow up and occupy its place; or other means familiar to the expert may be employed to cause the water and plumbago to penetrate the recesses of the material, so as to be in contact with every part to which liquid can be induced to penetrate.

By this means the fibers will become enveloped in a metallic solution, so to speak, though it may only be mechanically suspended. The water of suspension is now withdrawn by evaporation or otherwise. The fabric may be taken out and dripped, or such

other means employed as may suit the nature of the case. These will, of course, vary according to the material, quantity, and other economical considerations.

The material, then, whatever it may be, is plunged into a bath of metallic solution—say sulphate of copper—until the solution penetrates the recesses of the material from which the water has just been expelled or removed, and is there surrounding the fibres, which are themselves immediately enveloped by the coat of plumbago which has adhered to them.

By the aid of the voltaic pile or other generator of electricity, the metal—in the case cited the copper—is precipitated upon the metallic surfaces to which it is exposed—in this case the plumbago—the copper being thereby caused to coat the fiber by a covering outside of the film of plumbago.

As before remarked of the liquid and plumbago, the metallic solution may be caused to penetrate by hydraulic pressure, if found necessary, and the liquid of saturation of the plumbago may be water or otherwise, the invention not being confined to the use of special liquids for holding in suspension or solution the ingredients which are to be placed in contact with the fibers.

The plumbago itself, under these circumstances, acts to fill the pores of wood, for instance, and to some extent tends to preserve the material to which it is attached; but it is mainly intended to be introduced on account of its convenience as to levity and disseminability in water, and its well-known adhesive property, by which it becomes permanently attached to bodies with which it is brought into contact, so as to form a metallic coating upon them, upon which to precipitate a coat of pure metal for purposes of economy, beauty, security, and imperishability.

The value of this invention is evident in preventing decay of cordage, sails, tents, ropes, wagon-covers, and the thousand and one articles made of fiber, spun, woven, or felted, and made of hemp, cotton, flax, jute, or other fiber.

In the production of an unflammable coating for fiber its use is evident, and it would be tedious to attempt to anticipate all its various applications. Sails, awnings, dresses, coverings for bales, goods, and merchandise may be instanced.

As regards ropes which are exposed on masts and flag-staffs, the metallic coating to the fiber gives them such a conducting property that they greatly increase the safety of the spar or other structure to which they are attached, when by signal halyards or stays they connect the summit with the ground, or with conductors on the vessel, which afford ready escape of the electric fluid to the water.

As a means of beautifying dresses, by imparting a coating of silver or gold, it is perhaps without a rival, as a gorgeous and purely metallic luster may be given to the fabric, making a web of elastic gold or silver, as the case may be.

The precipitation of the metal may be facilitated by the application to the fiber of wax in a state of fluidity produced by heat, benzine, or other solvent. The object of the application of wax or similar material is to give to the fiber a surface which shall enable it to be more evenly coated with the plumbago.

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

1. The process of imparting a pure metallic coating to fibrous substances by precipitation by electrical action of a metal upon a metallic surface previously given by saturation with a metallic solution, and subsequent removal or evaporation of the water of suspension or evaporation.

2. Saturating the fiber, fabric, or wood, as described, with a liquid containing plumbago in suspension, for the purpose of imparting a metallic coating to said fibrous substances, upon which a film of metal may be afterward precipitated by electrical action.

TAL. P. SHAFFNER.

Witnesses:

EDWARD H. KNIGHT,
CHARLES D. SMITH.