UNITED STATES PATENT OFFICE.

WILLIAM PUGH, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN PROCESSES OF WATERPROOFING FABRICS.

Specification forming part of Letters Patent No. **184,984**, dated December 5, 1876; application filed April 1, 1876.

To all whom it may concern:

Be it known that I, WILLIAM PUGH, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and improved process for rendering water-proof and water-repellent, and mildew and moth proof, all kinds of textile and vegetable fibers and fabrics, felt and felted manufactures, cotton, linen, woolen, and hempen goods, leather, and leather manufactures, ropes, cordage, twine, paper, and paper manufactures, and whereby and by the use of certain new compounds, hereinafter fully described and set forth, such goods, fibers, and fabrics are not impaired in color, texture, or porousness, but on the contrary are improved, and rendered more resistive to decay; and I do hereby declare that the following is a full description of my invention, sufficient to enable others to use it.

The principle of chemistry on which my invention is founded is that certain metallic bases in solution combine with and render insoluble such substances as gelatine and certain kinds of saponaceous matter; consequently, when such goods, fabrics, and fibers as are hereinbefore enumerated have had their filaments thoroughly imbued with said substances, and are thereafter properly subjected to the action of certain metallic solutions, they are rendered and become incapable of capillary attraction, and permanently repellent to the action of water, dampness, and mildew.

I am aware that metallic bases or salts in solution have been used in various combinations in waterproofing fabrics; but I believe that my invention differs from any heretofore known in the addition of new ingredients in the compound constituting the bath in which the goods are immersed before being immersed in the metallic solution; also in the manner of mixing and preparing said compound; and also in the manner of preparing the metallic solution.

My invention consists in waterproofing fabrics, as aforesaid, by means of two compositions or compounds, the first of which I prepare as follows:

A. I dissolve sixteen (16) parts of carbonate of soda, or crystals of soda, and eight (8) parts of lime in thirty-two (32) parts of water, by boiling for half an hour, letting the solution settle, and then pour off the clear lye into a separate vessel.

B. I saturate three (3) parts of glue or other gelatine in cold water, letting it swell for twelve hours, and then add to the glue or gelatine three (3) parts of linseed-oil.

C. I melt sixteen (16) parts of tallow or other animal fat, and eight (8) parts of resin, in a suitable kettle, being careful not to allow the mixture to boil.

The mixtures A, B, and C being so prepared, I proceed to finish my first compound, D, by heating the lye A to boiling-heat, and pouring into it the hot fat C, stirring well for half an hour, and then pour into this mixture, while hot, the glue mixture B, stirring well for another half hour.

To prepare my second compound, I dissolve one (1) pound of sulphate of alumina and a half ($\frac{1}{2}$) pound of acetate of lead in eight (8) gallons of boiling water, allowing time for the solution to cool, and time for the sulphate of lead to precipitate; then draw off the clear liquor ready for use.

My mode of treatment of materials and fabrics to be rendered water, mildew, and moth proof, is as follows: I immerse the goods in a bath while hot, prepared by adding to each gallon of boiling water one-half ounce of my compound D, in which bath goods of cotton or other vegetable fiber must remain for twenty-four hours or more, time of immersion dependent on weight or thickness of goods; but in the treatment of goods of silk, wool, or other animal fiber, I prepare the bath by adding to each gallon of water but one-quarter of an ounce of my compound D, in which bath, after it has become cold, the goods should be immersed, and remain therein for twenty-four hours or more, time of immersion, as before, dependent on weight and thickness of goods.

After removal of the goods from the bath prepared with my compound D, they should be thoroughly drained, and then immersed for six or more hours, time, as before, dependent on weight and thickness of goods, in a bath of my second compound, and when removed from this second bath, should be drained and thoroughly dried by artificial heat, or by ex-

posure to sunshine, or in the open air, when they will have become absolutely resistant to water, mildew, and the action of moths.

For some goods and meaterials I combine the two compounds, making one compound thereof, filter the combined solution, and immerse the goods therein for twelve hours, more or less, and afterward drain and dry them, as before described.

I claim—

The process of waterproofing fabrics, by first treating them with a compound of caustic soda, gelatine, linseed-oil, tallow, and resin, and after draining the goods, as described, treating them with the salt of alumina, as set forth, all in the manner and in the proportions of the ingredients substantially as hereinbefore described.

WILLIAM PUGH.

Witnesses:

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