

UNITED STATES PATENT OFFICE.

DANIEL M. LAMB, OF NEW YORK, N. Y.

COMPOUND FOR TREATING GOODS TO RENDER THEM WATER-REPELLENT

SPECIFICATION forming part of Letters Patent No. 256,108, dated April 4, 1882.

Application filed December 29, 1880. Renewed March 7, 1882. (No specimens.)

To all whom it may concern:

Be it known that I, DANIEL MARTAIN LAMB, of the city, county, and State of New York, have invented a new and useful Compound for
5 Treating Goods or other Articles to Render them Water-Repellent; and I hereby declare the following specification to be a full and clear description of the same.

This invention is an improvement on a similar invention granted to me in Patent No. 10 224,295, dated February 10, 1880.

The object of this invention is to prepare a compound adapted to be applied to various kinds and qualities of goods or other articles,
15 for the purpose of rendering them impervious to moisture or repellent to water or moisture.

The articles intended to be treated by this compound embrace every variety of textile fabrics, from the heaviest goods to the most
20 delicate—such as sails of vessels, carpets, tents, cordage rope, yarn, thread, clothing, &c., as well as feathers, flowers, furs, paper, wood, stone, or metal—and, in short, the compound is intended to be applied to any article
25 whatever the preservation of which from the humidity of the atmosphere or from a more complete saturation is a desirable object, and the compound used is such that it may be applied to the most delicate shades or tints of
30 any textile goods, or ostrich-feathers, or any other feathers or furs that claim the attention of the taxidermist, or any beautiful specimens, either in color or texture, that are intended to adorn the museum of the entomologist, and
35 for all of these uses, or any others where moisture is to be excluded, the compound herein-after more fully described is equally as well adapted as to the textile fabrics.

The nature and constituents of this compound are such that no delicacy of shade or coloring will be injured by the treatment therewith, but, on the contrary, the colors to which the compound shall be applied will become and remain more fixed and unfading, for the
45 reason that the humidity of the atmosphere will be excluded from every pore and fiber of the article treated, and hence all incipient decay or fermentation will be prohibited, and consequent decomposition or fading will there-
50 by be prevented. The materials used for this purpose are so compounded and manipulated

and the elements of the compound are such that goods treated therewith will retain all their ordinary beauty and style of finish, remain as entirely pliable and soft as in the
55 natural or untreated state, be as perfectly inodorous as before the treatment, and no injury whatever will result from the treatment. The materials used for this purpose, the manner of compounding them, and the process of
60 treating the goods are as follows:

In the first place, I take solidified paraffine and dissolve it in any of the lighter hydrocarbons—such as naphtha, benzine, benzole, gasoline, &c.; but I take only such hydrocarbons
65 as are 0.72 Baumé, (more or less,) using for this mixture, say, from one-quarter of an ounce to two ounces, (more or less,) or for ordinary cases, say, about one ounce of the paraffine to one gallon of the solvent. The proportions in
70 which these ingredients are mixed will vary of course with the kind and quality of the goods to which the mixture is to be applied and the purpose for which the goods are to be employed.

The mixture may be made in any suitable quantities, and will preferably be compounded in such a vessel as is usually employed as and called an "agitator" in coal-oil-refining operations.
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To facilitate the solution of the paraffine, it should be cut up into small pieces before it is put in the solvent, and the mixture should be allowed to stand until the paraffine is fully dissolved, and then the mixture or solution will
85 be treated with a gas or gases in substantially the following manner: I take about one pound (more or less) of common salt, or chloride of sodium, for each gallon of the solution above described, and put it directly into the solution,
90 preferably distributing the salt pretty evenly over the bottom of the vessel containing the solution, and immediately thereafter I add to the mixture for each gallon thereof about one pound (more or less) of sulphuric acid, which
95 will settle down directly upon the salt and decompose it, thereby setting free a gas or gases, which will rise up through the solution or compound under treatment and attack the mucilaginous and sedimentary portions thereof, and
100 precipitate them to the bottom of the vessel, the whole operation of the gaseous treatment

upon the solution being to whiten or bleach it, as well as to remove all foreign substances or impurities, and also to effect a complete chemical change in the compound. The compound
 5 or solution will be allowed to remain standing quietly, subject to the gaseous treatment above described, for from three to ten days, (more or less,) and the sediment will be drawn off from the bottom of the vessel, or the purified com-
 10 pound from the top of the vessel. After the sediment shall have been drawn off or removed from the purified solution, the remaining gas will be eliminated from the compound by any suitable means. This may be accomplished by
 15 allowing the mixture to stand a sufficient length of time to discharge the gas; or the mixture may be agitated by any suitable mechanical appliance; or it could best be done by a powerful current of air driven through the
 20 compound from the bottom to the top, using for this purpose some suitable air compressor or blower conveniently located with reference to the fabricating-vessel and connected there-
 25 with by means of suitable piping, so arranged within the fabricating-vessel as to deliver the air-current at or near the bottom of the same, in order that the air-current may be driven up
 30 through the mass of the compound, so as to carry off any gases, impurities, or other foreign substances that may be held in suspension in the solution. This agitation will be continued
 35 for from five to thirty minutes, or until the gas is removed from the compound, along with all foreign substances or impurities that may be carried with it.

A process of treatment somewhat similar to that above described has been employed heretofore by me in the treatment of crude or distilled oils, such oils having been subject to the
 40 gaseous treatment, and afterward agitated with air; but the application of the gaseous treatment and air-agitation in the present instance is to a compound, as hereinbefore described, of an essentially different character to the oils to
 45 which I have heretofore applied it, and for which I obtained Letters Patent No. 183,401 in 1876. After the air-agitation of the compound, as above described, a small quantity of caustic soda or ammonia, or both, or any other
 50 suitable alkaline, will be added to it, and the agitation continued, as hereinafter described, so as to remove any trace of gas or acid; and this washing or purifying is accompanied by water, and it must be accompanied by a me-
 55 chanical agitation, so as to throw the alkaline solution up into and through the mass of the compound, so as to act upon the particles thereof.

As has been described, the gas for the puri-
 60 fication and bleaching of the solution under treatment may be generated within the mass of the compound under treatment, and it will be best to so generate it, and from the materials hereinbefore described, as by doing so a
 65 cheap and efficient gas may be produced and used in its nascent form, which will be most

efficacious; but it will be equally within the scope of this invention to generate the gas within a contiguous vessel and conduct it into the fabricating-vessel by means of suitable
 70 piping, so arranged as to deliver the gas at or near the bottom of the solution, so that it may rise up through and permeate the entire mass under treatment. This form of applying the gas, however, would take more time than would
 75 the application of the nascent gas fabricated in the vessel in which the compound was made. The gas or gases may also be generated from other chlorides and other acids than those
 80 mentioned above, or an efficient gas or gases may be generated by mixing the black oxide of manganese with the chloride of sodium and then causing the mixture to be acted upon by sulphuric acid, muriatic acid, or any other
 85 suitable acid, and all of these forms of generating the gas or gases and the elements for fabricating the same are clearly within the scope of this invention, as I find them to pro-
 90 duce equivalent results; but I prefer the use of the chloride of sodium and sulphuric acid, and the application of the same, substantially as first hereinbefore described.

After the purification of the compound shall have been fully completed, as above described, the solution will be retained in a tightly-closed
 95 vessel, if it is desired to retain it in the form of a solution, and to do this, if left in the agitator or fabricating-vessel, a cover should be provided therefor, which said cover will set
 100 into a water-chamber, or arranged in any similar manner so as to tightly seal it and prevent the evaporation of the solvent, which is exceedingly volatile; but if it is desired to re-
 105 store the solids contained in the solution to a solidified form, the compound should be placed in shallow tanks, and the vaporization of the solvent be accelerated by raising the temperature of the apartment in which it is placed to, say, 150° Fahrenheit. The usual manner, how-
 110 ever, of storing the purified material will be in the solution, as it will be principally adapted to application to textile or other goods or materials for the purpose of rendering them water-
 115 repellent or proof against oxidization in any form. The class of goods which may be so treated and preserved embraces an exceedingly wide range of subjects, among which are wood, stone, metal, textile goods, leather, furs, feathers, artificial flowers, human-hair goods, &c.
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The application of the compound to the goods or articles to be treated may be by means of a brush or sponge; but I prefer in ordinary cases for all articles where it is practicable to immerse the goods to be treated in a bath; but
 125 in either case the articles treated (if they be textile or other light and portable goods) will have all adhering moisture drained off from or pressed out of them, and then gently dried in a closed room kept at a temperature of about
 130 60° Fahrenheit, and after the goods shall have been so dried the compound will be fixed into

and upon the goods by heat, (preferably in the same room in which they were dried;) but during the fixing or curing process the temperature must be kept at about 180° Fahrenheit (more or less) by means of steam pipes or radiators.

I have discovered that gas generated as described (from common salt and sulphuric acid) under hydrocarbon oils and paraffine acts directly upon the oils and paraffine, bleaching, deodorizing, and curing the oils and paraffine; and it also combines with the hydrogen of the oil and paraffine and forms solids to the amount of three-quarters of an ounce per gallon, or more.

Having described my invention, I claim—

1. The process of preparing a waterproofing compound, consisting in first dissolving paraffine in naphtha or other light hydrocarbon solvent, then subjecting the solution so formed for a period of from three to ten days to the action of a gas formed by the union of sulphuric acid and chloride of sodium, in the proportion of about one pound of each ingredient

to each gallon of the solution, then subjecting the solution to a powerful agitation of a current of air, and then washing said solution with water and an alkaline solution, substantially as described.

2. A waterproofing solution formed by dissolving paraffine in any suitable light hydrocarbon solvent, then subjecting the solution so formed for a period of from three to ten days to the action of gas formed by the union of sulphuric acid and chloride of sodium in the proportions mentioned, and then subjecting the solution to the action of air and a washing process, substantially as described.

3. As a new article of manufacture, a fabric having an invisible water-proof coating composed of the solution of paraffine treated as herein described, fixed thereto by heat, substantially as described.

DANIEL M. LAMB.

Witnesses:

J. B. THURSTON,
M. RANDOLPH.