

UNITED STATES PATENT OFFICE.

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

COMPOUND FOR TREATING GOODS, &c., TO RENDER THEM WATER AND MOTH REPELLENT.

SPECIFICATION forming part of Letters Patent No. 256,107, 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 and Moth Repellent; and I hereby declare the following specification to be a full and clear description of the same.

10 This invention is an improvement on a similar invention patented to me in Patent No. 224,296, 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, and at the same time to render them indestructible by such vermin as moths.

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

45 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 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
50 fermentation will be prohibited, and consequent decomposition or fading will thereby 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 natural or untreated state, be as perfectly inodorous as before the treatment, and no injury whatever will result from the treatment. The materials
55 used for this purpose, the manner of compounding them, and the process of treating the goods are as follows:

In the first place, I take any hydrocarbon gum and dissolve it in any of the lighter hydrocarbon solvents—such as naphtha, benzine, benzole, gasoline, &c.; but I take only such hydrocarbons as are about 72° Baumé gravity, more or less, using for this mixture, say, from one-quarter of an ounce to two ounces
65 (more or less) of india-rubber, gutta-percha, milk-weed, or any other suitable hydrocarbon gum to one gallon of the solvent. The proportions in which these ingredients are mixed will vary of course with the kind and quality
70 of the goods to which the mixture is to be applied and the purposes for which the goods are to be employed.

The mixture may be made in any suitable quantities, and will preferably be compounded
80 in such a vessel as is usually employed as and called an "agitator" in coal-oil-refining operations.

To facilitate the solution of hydrocarbon gum, it should be cut up into small pieces before it is put into the solvent, and the mixture should be allowed to stand until the hydrocarbon gum is fully dissolved, and then the mixture or solution will be treated with a gas or gases in substantially the following manner:
85 The most efficient method of producing the desired gas or gases will be to add to the solution formed as above described, and in the same vessel in which it is contained, about one pound (more or less) of common salt or chloride of sodium to each gallon of the solution, and immediately thereafter also about one pound
90 (more or less) of sulphuric acid to each gallon of the solution in such a manner that the acid will settle down directly upon the salt and act upon it, so as to decompose the salt and generate a gas or gases, which will rise up through the mass of the solution and act in its nascent form upon the mass under treatment.
100

The proportions herein given for the different materials that are used to form the solution, and also the materials that are employed to generate the gas or gases, may of course
5 be varied for different purposes, the proportions herein given being merely intended to serve as a guide for the expert who will conduct the operations.

The gas or gases mentioned above will be introduced into the bottom part of the fabricating-vessel and rise up through the mass of the compound under treatment and attack all of the sedimentary and mucilaginous portions of the compound and precipitate them to the bottom of the fabricating-vessel, whence they may
15 be drawn off, or the purified compound from the top of the vessel. This gaseous treatment will be continued for about from, say, three to ten days, more or less, during which time the solution will be thoroughly bleached and rendered colorless, or nearly so, and a complete chemical change will be effected upon it. After the sediment shall have been drawn off or removed from the purified solution the remaining gas
25 will be eliminated from the compound by any suitable means. This may be accomplished by 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
30 powerful current of air driven through the 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 therewith
35 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
40 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 for from five to thirty minutes, or
45 until the gas is removed from the compound, along with all foreign substances or impurities that may be carried with it. The fabrication and purification of this solution can best be conducted in such a vessel as is ordinarily employed as and termed an "agitator" in coal-oil-refining operations.

After the agitation of the compound or elimination of the gas therefrom, as above described, shall have been completed, the sediment should be again drawn off, and then the solution or compound thoroughly freed from any residual acid or gas by treating it with a small quantity of caustic soda or ammonia, or both; or with any suitable alkaline solution,
60 either with or without the addition of water to facilitate the washing or purifying process. During this process of freeing the compound from residual acid or gas the compound will be agitated by some suitable mechanical appliance, so as to throw up the alkaline solution
65 into the mass of the compound, so as to enable

the said alkaline solution to act upon all parts of the compound, and thereby completely remove all adhering gas or acid.

As has been above described, the gas or gases
70 for the purification 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 probably, and from the materials hereinbefore described,
75 as by doing so a cheap and efficient gas or gases 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
80 and conduct it into the fabricating-vessel by means of suitable 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
85 form of applying the gas, however, would take more time than would the nascent gas generated within the fabricating-vessel.

The gas or gases may also be generated from other chlorides and other acids than those
90 above mentioned, or an efficient gas or gases may be generated by mixing the black oxide of manganese with the chloride of sodium and then causing this mixture to be acted upon by sulphuric acid, muriatic acid, or any other
95 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; but I prefer the use of the chloride of sodium and sulphuric acid and
100 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
105 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 into a water-chamber so as to tightly seal it
110 and prevent the evaporation of the solvent, which is exceedingly volatile; but if it is desired to restore the solids contained in the solution to a solidified form, the compound should be placed in shallow tanks and the vaporization
115 of the solvent accelerated by raising the temperature of the apartment in which it is placed to, say, 150° Fahrenheit. The usual manner, however, of storing the purified material will be in the solution, as it will principally be
120 adapted to application to textile or other goods or materials for the purpose of rendering them water-repellent or proof against oxidization in any form, and it will also be proof against or repellent to moths or other similar insects.
125

This purified solution may be applied to any textile or other goods, or to any article whatever, for the purpose of repelling water or moisture or preventing oxidization in any form. It will also be used as a filling for silk, woolen,
130 and other woven fabrics or felted goods, this application of the material being especially use-

ful, as the goods may be properly weighted and at the same time improved, as the application of this compound to woven or felted goods not only increases the flexibility and durability of the same, but fixes and enhances the brilliancy of the colors, and gives to each and every fiber a coating that will repel the attack of moths and other similar insects. The classes of goods which may be so treated and preserved embrace an exceedingly wide range of subjects, among which are wood, stone, metal, textile goods, leather, furs, feathers, artificial flowers, &c.

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 in either case the articles treated, if they be textile or other light and portable goods, will have all adhering moisture drained off or pressed out, and then the treated articles will be gently dried in a closed room at a temperature preferably kept at about 60° Fahrenheit, and after the goods are so freed from moisture the coating or material remaining on the goods will be thoroughly fixed and vulcanized or cured (preferably in the same room in which they have been dried) by raising the temperature thereof to about 180° Fahrenheit, more or less. This high heat will thoroughly force the applied compound into and upon all of the fibers and give them the coating desired.

I have discovered that gas generated as described (from common salt and sulphuric acid) under hydrocarbon oils and gums acts directly

upon the oils and gums, bleaching, deodorizing, and curing them; and it also combines with the hydrogen of the oils and gums 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 a hydrocarbon gum in a 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 a hydrocarbon gum 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. A fabric having an invisible water-proof coating composed of the solution of hydrocarbon gum treated as herein described, fixed thereto by heat, substantially as described.

DANIEL M. LAMB.

Witnesses:

J. B. THURSTON,
M. RANDOLPH.