

UNITED STATES PATENT OFFICE.

PETER TOWNSEND AUSTEN, OF NEW BRUNSWICK, NEW JERSEY.

OBTAINING FRIABLE COLORING-MATTER FROM DYE-WOOD EXTRACTS.

SPECIFICATION forming part of Letters Patent No. 508,592, dated November 14, 1893.

Application filed September 9, 1893. Serial No. 485,188. (No specimens.)

To all whom it may concern:

Be it known that I, PETER TOWNSEND AUSTEN, a citizen of the United States, and a resident of New Brunswick, in the county of Middlesex and State of New Jersey, have invented a certain new and useful Process of Producing a Solid Coloring-Matter from Logwood and Fustic, of which the following is a specification.

In my Patent No. 491,972, dated February 14, 1893, and entitled "Coloring-matter from logwood and mode of preparing same," I have described at length the objections to the various extracts of logwood usually met on the market as well as the advantages of the product produced by the process of that patent.

The product produced by the process of the patent hereinbefore mentioned requires the use of a small amount of acetic acid, or other weak acid, when the dye is used for dyeing on chromed wool, but in certain cases, particularly when the fabric to be dyed contains cotton fibers previously dyed with dyes easily affected by acids, the subsequent use of an acid in the dye bath is objectionable.

By continued experimenting I have now found that it is possible to produce a dry, friable coloring matter from logwood extract, by heating it with ammonium carbonate, which possesses the same properties as the product produced by heating logwood extract with an alkali nitrite, but which does not require the addition of an acid when dyed on chromed wool, and which is of still greater tinctorial strength than the former product. I have found that by mixing hot extract of logwood of high gravity with ammonium carbonate, which is also known as sesqui carbonate of ammonia, or with bicarbonate of ammonia, and allowing the mixture to stand several hours, whereby the mass rises owing to the development of gaseous bubbles, and their entanglement in the viscous mass, the phenomenon being analogous to the rising of dough by the action of yeast or baking powder, and finally heating the porous, spongy mass thus formed until dry, a product is obtained which has the properties hereinbefore mentioned. The gas which causes the mass to rise consists largely of carbon dioxide.

I am aware that aqua ammonia has been used

in conjunction with air to oxidize thin logwood liquors, and that Cocchenhausen in particular has suggested a method of oxidizing thin logwood liquors by making them alkaline with aqua ammonia and forcing air through them. This method, however, aims only at the oxidation of the haematoxylin dissolved in the thin liquor to haematein and has nothing to do with my process which has not the oxidation of the coloring matter of the extract as its main object, but aims to convert the viscous or pitchy extracts into a dry, friable and permanent solid. It has also been urged against the suggested method of Cocchenhausen that its application on a large scale would be impractical, as the action of the oxygen of the air on a hot ammoniacal thin logwood liquor, does not stop at the oxidation of the haematoxylin into haematin, but continues, whereby the haematin is also oxidized and passes into substances of a different nature, which are inferior or worthless as dyes. Hence it would be very difficult, and practically impossible to stop the oxidizing action of air on a large bulk of hot thin logwood liquor at the point where oxidation had proceeded far enough, and before it had attacked and injured the valuable coloring matters.

In the use of ammonium carbonate to effect the conversion of the viscous or pitchy logwood extracts, oxidation of the coloring matter is not the main object sought. The object is to so alter or destroy the viscous and resinous matters by chemical action that it may become possible to convert the extract by heating into a permanent and friable solid, which shall be practically soluble in cold water and easily in hot water, and which shall be free from the objectionable properties of the ordinary logwood extracts, and which shall possess the tinctorial properties of chip logwood in an intensified degree; and also to aid and accelerate the drying of the extract chemically altered, as above explained, by causing it to become filled with bubbles of gas, which render it porous, spongy and light, and allow of a rapid escape of moisture at the elevated temperature to which it is exposed.

My process for making a solid, brittle or friable coloring matter from logwood is substantially as follows: Logwood extract of about 70° Twaddle is heated to about 150°

Fahrenheit and mixed thoroughly with about seven percentum of ammonium carbonate, previously dissolved in as small an amount of water as possible. The mixture is then poured
5 or ladled into shallow trays or pans, or other suitable receptacles, and allowed to stand for several hours at room temperature, about 70° Fahrenheit, in order to rise and set. An hour
10 is usually sufficient for the crust to form, but it is advisable to let the trays stand several hours, so that the mass may rise as much as possible, and become light, porous and spongy,
15 while the crust becomes hard and set. The receptacle and its contents are placed in a suitable drying apparatus and the mass is allowed to dry at a temperature of 150° to 180° Fahrenheit. Increased temperature hastens
20 the drying, but I have obtained the most satisfactory results in color, brittleness and evenness of product by drying at the temperature above stated. After the drying has
25 taken place, the mass which is obtained is brittle, and can be easily ground to powder, is not affected by atmospheric moisture and dyes chromed wool in the same way as cured
chip logwood. It is practically soluble in cold water and easily in hot water.
The above method of procedure is the best
30 to me known, but as heat and time are frequently convertible conditions in chemical reactions, and the amounts of the substances taken may vary depending on their strength
I do not limit myself to the temperatures, nor to the exact gravities or proportions
35 above set forth, the essence of my discovery and invention being that when extract of logwood is mixed with an ammonium compound under such conditions as to bring

about a chemical reaction between them, resulting in the alteration or destruction of the
40 resinous and viscous matters, and attended with the evolution of a gas which shall cause the extract under the proper conditions of gravity and temperature to puff up and become porous and spongy, a new product may
45 be produced which is easily dried and which has the characteristics hereinbefore set forth.

Having thus described my invention, what I claim as new, and desire to patent, is—

1. In the art of making logwood extract, the
50 improvement which consists in adding to logwood extract ammonium carbonate in the presence of water, and causing a reaction between the carbonate and the extract substantially as described.

2. In the art of making logwood extract, the
55 improvement which consists in adding to logwood extract ammonium carbonate in the presence of water, causing a reaction between the extract and the carbonate, and evaporating
60 the product to dryness, substantially as described.

3. As a new article of manufacture a coloring matter derived from logwood extract by the incorporation therewith of ammonium
65 carbonate, and characterized by the fact of its being a friable solid; soluble in cold and rapidly soluble in hot water, substantially as described.

Signed at New York, in the county of New
70 York and State of New York, this 8th day of September, A. D. 1893.

PETER TOWNSEND AUSTEN.

Witnesses:

BENJ. D. BACON,
E. SCHLEGEL.