

74 106/74

317,387 : 38

UNITED STATES PATENT OFFICE.

CHARLES S. LOCKWOOD, OF ALBANY, NEW YORK, AND JOHN W. HYATT,
OF NEWARK, NEW JERSEY, ASSIGNORS TO THE BONSLATE COMPANY,
(LIMITED,) OF ALBANY, NEW YORK.

PROCESS OF TREATING ALKALINE SILICATES, &c.

SPECIFICATION forming part of Letters Patent No. 317,387, dated May 5, 1885.

Application filed August 13, 1884. (No specimens.)

To all whom it may concern:

Be it known that we, CHARLES S. LOCKWOOD, a citizen of the United States, and a resident of Albany, in the county of Albany and State of New York, and JOHN W. HYATT, a citizen of the United States, and a resident of Newark, Essex county, New Jersey, have invented certain new and useful Improved Processes of Treating Alkaline Silicates and the Resultant Composition and Products, of which the following is a specification.

The invention relates to an improved process of treating alkaline silicates and to the resultant composition and products, and has for its object the production of a material which may be utilized in the manufacture of articles usually made of ivory and its substitutes.

Alkaline silicates combined with other substances have heretofore been pressed in heated molds, and reference is made in this connection to Letters Patent of the United States No. 201,348, granted to John W. Hyatt and Charles M. Hyatt on the 19th day of March, 1878.

The process herein described is based upon the discovery that alkaline silicates, when properly desiccated and comminuted, may be successfully molded to form articles of exceptional durability and value. The silicate, with or without suitable oxides or other inert materials, is subjected to heat and pressure when it is in a particular condition, as hereinafter described, whereby a new result is produced.

In practice we make use of any alkaline silicate, selecting, by preference, one having a minimum percentage of alkali. The silicate being in solution, we add to it a sufficient quantity of water to enable us to effect a thorough filtration and reduce the filtered solution to such an extent that at a temperature of 60° it has a specific gravity of about 26° Baumé. Of the solution, in the condition just stated, we take, say, eight pounds, and add to it, say, two pounds of zinc oxide, (or other metallic oxide or inert substance, many kinds of which may be used, according to the quality of material desired,) and mix the two ingredients together as thoroughly as possible. We then place the mixture preferably on a water bath and evaporate it slowly until the aqueous particles have so far been removed as to permit the material

to be comminuted, which may be effected by grinding or otherwise; or the removal of the aqueous particles to the proper extent and the comminution of the material may be accomplished in other ways. Before the comminution of the material is attempted it will be allowed to become cool, when its reduction to a powder may be readily effected by means of a mill of appropriate construction. The material will be ground to an impalpable powder, and by preference sifted so as to insure the production of a powder composed as far as practicable of particles of relatively equal size. After the powder has been sifted we have been accustomed to put it in an evaporating-pan and stir it continuously until it is in a condition in which it will not adhere to the surface of the die under the degree of heat and pressure required to weld it, as hereinafter stated—say, a temperature of 300° Fahrenheit and a pressure of eight thousand pounds to the square inch—by which test the operator may ascertain whether the proper degree of desiccation has been reached. If the powder does not adhere to the die, it may be concluded that it is in a proper condition.

The next step in the process consists in subjecting the powder formed as hereinbefore described to pressure in heated dies, whereby any desired article may be formed. The dies employed are of usual construction. They will be heated to a temperature of, say, about 250° to 350° Fahrenheit, or thereabout, and the material will be subjected to a pressure of about, say, eight thousand pounds to the square inch, more or less, according to the character of the article, the heat and pressure being continued until the contents of the mold have been completely welded.

After the article is formed it may be polished in any convenient way, when it may be placed in a bath, preferably of chloride of ammonium, consisting of, say, about two parts of water and one part of chloride of ammonium, in which it will be permitted to remain from, say, ten to fifteen hours, or until a test will show no further alkaline reaction. We prefer to use a bath of chloride of ammonium, but other baths may be used with satisfactory results, the object of the treatment in the bath being

to correct the tendency of the material to attract moisture and to effloresce. After the article is taken from the bath it is thoroughly washed, when it will be ready for use.

5 We do not wish to be understood as confining ourselves to any particular oxide or inert material.

It is important that it be borne in mind that unless the material is reduced to the proper degree of dryness without being completely dehydrated the result will not be satisfactory. The means we have described of ascertaining when the material has been brought to the proper condition of dryness is the best and most convenient of which we are aware, and if carefully observed will enable the operator to accomplish the desired result without difficulty.

20 We do not restrict ourselves to the use of any alkaline silicate or any oxide, inert material, or coloring substance; and it is also true that it is not essential that any oxide or inert material be added to the silicate to produce a useful result.

25 If an oxide, inert material, or coloring substance is employed, the proportions which we have given—that is to say, about four parts of the silicate to one part of the inert material—may be used with satisfactory results; but it is not to be understood that there can be no departure from these proportions, nor that other formulas involving a use of other oxides or inert substances cannot be made use of.

35 We do not herein claim, broadly, the use of an ammoniacal bath as described, as the same is made the subject of another application.

What we claim as our invention, and desire to secure by Letters Patent, is—

40 1. The within-described process of forming articles of an alkaline silicate with or without

an inert material, which consists in, first, forming a solution of the silicate and, if preferred, adding the inert material; second, desiccating the solution, and, third, subjecting the desiccated compound to pressure in heated molds, substantially as described. 45

2. The within-described process of forming articles of an alkaline silicate with or without an inert material, which consists in, first, forming a solution of silicate and introducing, if preferred, an inert material; second, removing the aqueous elements in part; third, comminuting the compound; fourth, subjecting the desiccated powder to pressure in heated molds, and, fifth, subjecting the article to the action of a bath, substantially as set forth. 55

3. The within-described process of forming articles of an alkaline silicate with or without an inert material, which consists in, first, forming a solution of the silicate and introducing, if preferred, an inert material; second, removing the aqueous elements in part; third, comminuting the compound, and, fourth, subjecting the desiccated powder to pressure in heated molds, substantially as set forth. 65

Signed at Albany, in the county of Albany and State of New York, this 2d day of August, A. D. 1884, by Charles S. Lockwood.

CHAS. S. LOCKWOOD.

Witnesses to signature of Charles S. Lockwood:

ROBERT C. PRUYN,
E. A. GROESBECK.

Signed at Newark, in the county of Essex and State of New Jersey, this 9th day of August, A. D. 1884, by John W. Hyatt.

JOHN W. HYATT.

Witnesses to signature of John W. Hyatt:

ABRAHAM MANNERS,
CHAS. C. GILL.