UNITED STATES PATENT OFFICE.

WILLIAM McCAINE, OF ST. PAUL, MINNESOTA, ASSIGNOR TO HELEN J. McCAINE, OF SAME PLACE.

PROCESS OF TREATING PYROXYLINE COMPOUNDS.

SPECIFICATION forming part of Letters Patent No. 276,443, dated April 24, 1883.

Application filed September 11, 1882. (Specimens.)

To all whom it may concern:

Be it known that I, WILLIAM McCAINE, of St. Paul, in the county of Ramsey and State of Minnesota, have invented a new and Improved Process of Treating Pyroxyline Compounds; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention is an improved process or method of treating compounds containing pyroxyline for the purpose of removing the atmospheric air contained in cells or spaces thereof, and also for effecting the rapid evaporation of the pyroxyline solvents.

It is well known that compounds of which pyroxyline forms an element, after being dissolved, harden by evaporation of their liquid solvents, and, as the outer portion necessarily hardens first, it shrinks upon the inner portion, thus applying a pressure which tends to close the pores, so that the expulsion of the volatile solvents from the interior requires a comparatively long time. In fact, as a rule, the substance requires to be kept in a kiln or drying-room, heated to about 120° Fahrenheit, for a space of ten or twelve weeks, before it becomes sufficiently dry to prevent further shrinkage, or hard enough to adapt it to be manufactured into the various articles it is used for. Pyroxyline compounds are also liable, owing to the volatile nature of their solvents, to contain numerous air-bubbles, or spaces filled with air, which remain therein after the substance becomes hard, and hence render it unfit for many uses. To overcome the difficulty and remove the defect above specified, I have conceived and successfully employed the process hereinafter described.

In carrying out my invention in detail I proceed as follows: The pyroxyline is dissolved in any suitable solvent—such as sulphuric ether and alcohol—to which is added a small quantity of oil of cassia, gum-camphor, or such other substance as will remain in the compound and act as a latent solvent when exposed to heat, and such pigments are also added as are required to give it the desired color, elasticity, and weight, the whole being mixed together, either by hand or some suitable machinery, until the ingredients have become perfectly commingled into a homogeneous mass. The latter is then cast in molds of any desired pattern, and allowed to remain therein from twenty-four to forty-eight hours, when it will be sufficiently hard to admit of being cut into strips from one-fourth to one-half inch in thickness. The strips are placed in a kiln or drying-chamber heated to about 120° Fahrenheit, where they are allowed to remain about twenty-four hours, when they will have become sufficiently hard for the further treatment required. The said strips are placed in a mold of any desired form and heated to about 150° Fahrenheit, and while thus heated subjected to a pressure of about four hundred pounds to the square inch. The material is thus compacted into a solid mass in a semi-dry state, having comparatively few air bubbles or spaces. It is to the material in this condition that my process is preferably applied, although it is applicable to the material in any form if it contains a latent solvent such as I have indicated.

The process is as follows: The blocks formed in the molds, as above described, are converted into fine shavings, which may be conveniently done by a hand-plane, or by turning in a lathe, and these shavings are rubbed through a sieve to reduce the material to a finely-comminuted state—that is to say, the material is thus reduced practically to powder and for this purpose I propose to employ any other suitable method or means than the one above described. When in this pulverulent state the volatile solvents may be entirely evaporated, and hence the fine particles composing it will all harden alike when exposed to the heat of a drying-kiln. In fact, the finer the particles the more perfect will be the result and product obtained by the drying process. The powder is placed in a kiln heated to 120° Fahrenheit and kept therein for about twenty-four hours, when it will be sufficiently hard for practical purposes. The dried powder is then placed in a mold of the form it is desired to produce, and the mold is subjected to a heat of about 200° Fahrenheit, and while thus heated a pressure of about one ton to the square inch is applied to compact the powder into a solid homogeneous mass.

I am aware that pyroxyline has been reduced to fine particles by a cutting or grinding process, and in that form subjected to pressure in molds; but saturation of the compound is first necessary, in order to render it sufficiently adhesive to form a solid homogeneous mass; and after pressing in molds the forms thus produced require to be dried for a long time in order to evaporate such solvents to a sufficient degree to adapt the material for use. The evaporation will, however, be greater from the outer than the inside, and hence the material will be hard on the outside, but less so interiorly, and the outer portion will shrink on the inner. In other words, a defect will remain, which is impossible in the application of my process.

What I claim is—

The process of treating pyroxyline compounds which contain a latent solvent, the same consisting in reducing the material to powder, then thoroughly drying the latter, and subjecting it, when dry, to heat and pressure, substantially as described.

WILLIAM McCAINE.

Witnesses:
WARREN H. MEAD,
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