UNITED STATES PATENT OFFICE.

HOMER HOLLAND, OF WESTFIELD, MASSACHUSETTS.

IMPROVEMENT IN THE MAKING OF CARBONATE AND OTHER PIGMENTS OF LEAD.

Specification forming part of Letters Patent No. **994**, dated November 3, 1838.

To all whom it may concern:

Be it known that I, HOMER HOLLAND, of the town of Westfield, in the county of Hampden and State of Massachusetts, have invented several new improvements in processes for compounding, making, and producing pulpy compounds from metallic lead and the converting of said pulpy leads into sulphate and carbonate of lead for white pigments, and also for making of said pulpy lead into chromate of lead, known as "chromic yellow," which special improvements in compounding have not heretofore been known or used; and I do hereby declare that the following is a full, discriminating, and exact description of said methods, sufficient in detail to distinguish the same from all other processes, and to enable any one skilled in chemistry to apply and use said improvements understandingly.

The special improvements which I would describe and claim consist—

First, in using any alkaline salt or substitute in the moistening solution for the charge and chamber or open-headed cylinders described and mentioned in my patent dated the 18th day of March, 1836, whose elements consist essentially of oxygen, carbon, and hydrogen in any proportions, instead of alkaline carbonates, before recommended and employed, as they augment the electro-chemical action, increase the product, and modify and facilitate the combination of the elements with nascent pulpy leads by their presence or catalytically. Acetates of lead, whether neutral or basic, also sugar, and even alcohol, may be advantageously used in the solution to moisten charge, chamber, and pulp.

Second, in digesting the pulpy plombic compound, produced as described in my said patent for acetate and nitrate of lead or with the catalytic additions with neutral chromate of potash or soda, or by dissolving the alkaline chromates in water and using this chromic solution as the moistening of charge and chamber. The chromic pulp, after subsiding, may have most of the alkali withdrawn by decantation, and the remainder neutralized by working with water made acid by sulphuric or other acids. The commercial bichromates of potash and soda are to be made neutral by the addition of suitable proportions of their respective bases. The economy of the above process in making chromates of lead is in substituting the plombic compound in their nascent state for the expensive plombic salts, acetate, and nitrate now usually employed in the manufacture of chromic yellow.

Third, in my said patent for oxidizing and producing lead pulps, although in the incipient stage of the operation the lead may be an under oxide, the subsequent exposure in the open-headed chambers to the continuous and conjoint action of the elements, which constitute the atmosphere, water, and catalytic additions, together with the friction and the known and established property or capacity which all metals in a minute state of division have of absorbing, dissolving, or combining with all elements with which they are in contact, constrains me to disclaim the opinion that plombic pulp under any circumstances can be considered a definite compound, and much less an oxide, but that it is a compound of lead into which the elements hydrogen, carbon, and nitrogen and their compounds enter as well as oxygen.

By the foregoing explication of the pulpy plombic compound the following rationale of the modifications of the pulp in converting it into a perfect carbonate or sulphate will be apparent: After carbonating the pulp with certain catalytic additions artificially, should there be any basic salt it is to be removed by working in an alkaline solution, boiling; particularly in making the sulphate of lead the pulp must be boiled to modify the plombic hydrate by more highly oxidizing the pulp. The sulphate of lead is made directly from the pulpy lead, modified and oxidized by heat while in its moistened state by digesting it in any quantity with sulphuric acid of commerce, previously diluted with twice its measure of water, (more or less,) and suffering the acid thus diluted to become perfectly cold previous to adding the pulp-lead. It is necessary to boil the dilute sulphuric acid and pulp thoroughly together in a shallow leather vessel with rather an excess of acid, that the product may become a perfect sulphate. In this great caution is requisite, otherwise the product will be more or less a mixture of sulphide, hydrosulphite, or sulphamite of lead, and its color changed by mixing and painting in oil. Besides it will not be as dense, fine, and friable.

All the pigments should be thoroughly washed in several waters, and may be dried by the well-known methods. The cylinders mentioned in said patent I now make about four feet in length and thirty inches in diameter, wholly of lead, either sheet or cast, about one-fifth of an inch in thickness. The ends are entirely open, except an inner rim to retain charge and moistening fluid or solution with forming pulp and allow a free circulation of the atmosphere for its elements. They are mounted on an axis passing through their centers, and the centers are of iron with arms, which are attached to the rims of each end of the cylinders. The rotations may vary from six to nine times in a minute, and are moved by a drum and belt or other gearing. The pulpy lead may be withdrawn every six, eight, or twelve hours. The medium charge is fifty pounds, and the moistening fluid or solution from three pints to three quarts, or more.

I claim—

1. The process and method of using the alkaline salts, carbonates, and other catalytic substitutes, as hereinbefore mentioned, in moistening charge and chambers described and mentioned in said patent in producing pulpy plombic compounds; and I do not intend to restrict their application and use to pulpy leads produced by revolving chambers alone, but to extend application to the compound of lead produced by other methods of friction, whether substituted or adopted to evade my chambers.

2. Making chromate of lead, as above specified and described.

3. Modifying the pulpy plombic compound above described for carbonate of lead, and particularly the processes described for making a definite sulphate of lead by digesting, boiling, and washing, as above discriminated and made plain and distinct.

HOMER HOLLAND.

Witnesses:

E. M. KINGSLEY,

E. HOOKER.