

UNITED STATES PATENT OFFICE.

CHARLES MORTIMER, OF PHILADELPHIA, PENNSYLVANIA.

PROCESS OF MAKING PAINT FROM BITUMINOUS COAL.

Specification forming part of Letters Patent No. 7,266, dated April 9, 1850.

To all whom it may concern:

Be it known that I, CHARLES MORTIMER, of the city and county of Philadelphia and State of Pennsylvania, have discovered a new and useful Process of Converting Mineral Coal into a Superior Black Paint, Ink, and Pigments, which is described as follows:

I am aware that lamp-black, ivory-black, and similar materials have been used for black pigments; but the successful application of bituminous coal to the same purpose has presented such difficulties as hitherto to prevent its employment.

My process consists, first, in heating cannel-coal, bituminous coal, or other carbonaceous mineral substance of similar constitution, so as partially to expel the volatilizable matter and to render the coal of a deep black color. I do not find it necessary or desirable to carry the heating far enough to expel the last portions of volatile constituents. I prefer a gradual application of heat and in close vessels to a rapid heating in the open air.

Second. While hot the coal is thrown into cold water for the purpose of allowing the matter in a vaporous state to be condensed and to float off, and also to render the partially-debitumenized coal brittle and pulverulent.

Third. I next grind the coal thus rendered friable in a suitable mill, reducing it to a degree of fineness which may prepare it for the acid process.

Fourth. The powder is dried and then thrown into sulphuric acid (either hot or cold, generally the latter, and the more concentrated in general the better; but this will vary with the particular kind of coal used and the intensity of black intended to be produced) for the purpose of dissolving out such earthy materials of the coal as would be liable to undergo solution in acids, and also of reducing the coal to a greater degree of subdivision, and thereby augmenting the intensity of its color.

Fifth. While mixed with the acid I grind the powder under a muller or equivalent machine not liable to be attacked by acid. Although I prefer sulphuric to all other acids, I do not confine myself to that, but occasionally use other acids capable of producing similar results.

Sixth. Having reduced the pulp to a sufficient degree of fineness, I next wash or elutriate it in repeated copious supplies of cold

water, and as the first washings will contain by far the greater portions of the acid, I make arrangements for saving the water of those washings, to be again employed after due concentration.

Seventh. In order to prepare the finer class of colors, I decant the wash-water of the last washings while the finer particles of coal are yet suspended, and then allow the decanted portions to settle for a sufficient time to render the supernatant liquid clear.

Eighth. The coarser part remaining in the first settling-vat is then reground, as before, or is dried and used for the coarser kinds of painting.

Ninth. To know when the sulphuric acid has been completely removed I test the clear liquid with chloride of barium or other suitable test for that acid, and also with the appropriate tests of the other acids where they are employed. When the washing has been long continued I concentrate a portion of the wash-water before applying the test for acid.

As the powders of highly-bituminous coals are generally more or less brown and not deep black, and as they are gummy and difficult of pulverization, the purpose of the first step, or heating process, is not only to deprive the coal of its bituminous or gummy character and to make it penetrable by water and easily reducible to powder, but also to deepen the color of the powder.

As some classes of coals are in their natural state pulverulent and of a deep black color, containing but little bitumen, and therefore not liable to become gummy or pasty under the pestle, the heating process may with such coals be dispensed with. Thus the semi-bituminous and some cannel coals will admit of pulverizing without the previous process of heating. Even these varieties of coal, however, I sometimes heat sufficiently to cause them to crack and fall to pieces by the sudden and unequal contraction produced on plunging them while hot into cold water.

The purpose of washing the powder with great care after treating with acid is to free it from acid and to prevent the color, whether used as paint, water-color, or ink, from acting on the metallic or other surfaces to which it may be applied.

As in grinding other paints I shall some-

times grind the coal-paint in lime-water, which will have the effect of neutralizing any trace of acid which may have escaped the washing in pure water.

The paint which I make may be converted into printers' ink of superior quality by mixing it with the ordinary materials used in compounding said ink.

Having thus described my process of converting mineral coals into a superior black powder for making black paints, inks, and water-colors, what I claim as new, and desire to secure by Letters Patent, is—

The process of making black paint from bituminous coal by the cleansing in water, grinding, mixing with acid, regrinding in acid, and washing, substantially as herein fully set forth.

In testimony whereof I have hereunto signed my name before two subscribing witnesses.

CHARLES MORTIMER.

Witnesses:

WM. P. ELLIOT,
LUND WASHINGTON.