

United States Patent Office.

WENDELL P. VAN KLEECK, OF CHARLESTOWN, MASSACHUSETTS.

Letters Patent No. 104,231, dated June 14, 1870.

IMPROVEMENT IN EMERY POLISHING-WHEELS, &c.

The Schedule referred to in these Letters Patent and making part of the same.

To all to whom it may concern:

Be it known that I, WENDELL P. VAN KLEECK, of Charlestown, in the county of Middlesex and State of Massachusetts, have invented a new and improved Article for Grinding and Polishing Purposes, consisting of a Concrete Emery-Wheel; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying specimens and to the letters of reference marked thereon.

Emery-wheels for grinding and polishing purposes have heretofore been made of clay and emery, with a flux such as borax and litharge. These fusing materials are costly, which render the wheels composed thereof expensive; and, from the action of these substances when in the fused state upon the clay and emery, the wheels composed thereof are liable to be reduced to a fused mass and wholly destroyed, which renders it a very unreliable mixture for the production of wheels of large dimensions with safety, therefore cannot be made universally practical.

The nature of my invention consists in manufacturing concrete emery-wheels for grinding and polishing purposes of a concretion or vitrescent earth, called granite, and a refractory or pyrous earth called kaolin or mica, and a polishing powder, such as emery, by combining these ingredient in the manner as herein-after described, and subjecting the wheels composed thereof to an intense heat. By the action of this violent heat upon them they undergo in the fire a perfect petrification, which renders them of the density and hardness required for grinding and polishing purposes.

By the employment of granite and kaolin or mica as the basis of a composition for the production of emery-wheels, I form a mixture that is susceptible of petrification, by subjecting to a strong heat, without injury to the emery or the danger of destroying or in any way altering the form of the wheels, which enables me to produce emery-wheels of large dimensions with perfect safety; and, from the nature of these materials, the wheels are rendered of a density and hardness that cannot be attained by the use of the composition heretofore made of clay with borax and litharge, preventing them from wearing away as fast in use, therefore a larger amount of work can be accomplished with them than with the wheels formerly employed.

A high degree of heat does not injure the cutting quality of the emery (as formerly supposed) when combined with materials that are not of so fusible a nature as borax and litharge, but have found that a high degree of heat improves its cutting quality; for, by this heat, it is rendered much harder than it is found in

its natural state, which hardness prevents the cutting-edge of the fine particles from dulling as easily; hence a more durable and sharper cutting-surface is imparted to these wheels than can be produced by the use of the composition formerly employed in their production, enabling the grinding and polishing operation to be performed in a more expeditious and thorough manner; and, from the nominal expense of the materials comprising the basis of this composition, it is rendered the most economical mixture ever employed in the production of solid emery-wheels, enabling me to produce emery-wheels of superior quality at a reduction of about one-half in the expense of the manufactured article, which is thrown in favor of the consumer.

To enable others skilled in the art to compound and use my invention, I will now proceed to describe the process thereof.

I take the granite stone and reduce it to a fine powder, after which I mix it in equal parts, by weight, with kaolin or mica, by adding water in sufficient quantity to render the ingredients about the consistence of soft paste, and thoroughly incorporate and blend them in one mass. When this compound mass is formed I place it in cases of wood or stone, which must be placed in a moist situation, where I let it remain for two or three months, during which time a kind of putrid ferment enters into the mixture, by which the parts of the different matter combine and form a substance with new qualities, unknown while separate. This change shows itself by the whole mass changing to a dark brown or black color, with a fetid smell, and a tenacity like that of clay or any argillaceous moistened earths.

When the described qualities are found in the matter, I add the polishing powder, (emery,) of any desired number or grade, in equal parts, by weight, adding water, if necessary, to render the materials of the proper consistence, and thoroughly mix them in a mass, after which I form this mass in the form of wheels, and, when thoroughly dry, subject them to a heat of sufficient intensity to produce a perfect petrification.

What I claim as my invention, and desire to secure by Letters Patent, is—

The production of concrete emery-wheels for grinding and polishing purposes, using for that purpose the within-named concretion of earth or any other substantially the same, in the manner set forth and described.

WENDELL P. VAN KLEECK.

Witnesses:

GEO. W. BALLARD,
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