UNITED STATES PATENT OFFICE.

SAMUEL W. DAVIS, OF CINCINNATI, OHIO.

IMPROVEMENT IN IMITATIONS OF MARBLE.

Specification forming part of Letters Patent No. **6,471**, dated May 22, 1849.

To all whom it may concern:

Be it known that I, SAMUEL WALTER DAVIS, of the city of Cincinnati, in the county of Hamilton and State of Ohio, have discovered a new and useful process for imparting to all kinds of wood, stone, and other substances the appearance of marble in endless variety of figure and hue of color, which is described as follows:

This process is intended to be applied to the finer operation of inside work in buildings, for furniture, and for other purposes.

Manner of preparing the colors.—Colors of a mineral character must be reduced to solution, and every part of the coloring-matter that can be held in a state of suspension must be so held by the application of heat, acids, alkalies, spirits, the salts, and distillation, according to the several compositions of the colors. The vegetable colors are obtained by infusion, distillation, and evaporation. Permanency is to be given to the colors by the application of mordants, such as acids, nitrate of tin, muriate of tin, nitro-muriate of tin, muriate of zinc, nitrate of zinc, and mineral salts. The stones, woods, and other substances to be operated on are to be prepared according to the several compositions, by the application of receiving-mordants adapted to the colors to be produced and the different hues required, such as lime, alum, niter, &c., and sometimes a combination, according to the nature of the object to be effected.

Manner of applying the colors to the wood or stone or other substances to be marbled or variegated.—The colors, having been prepared as above described, are together thrown broadcast on any matter that will readily yield them up again, (say paper or canvas coated with paste or any other article adapted to that object,) according to the nature or composition of the colors. The colors thus spread upon the paper or canvas or other article are to be applied to the wood or stone or substance prepared for their reception. The surface of the stone, wood, or other article thus coated is to be immediately washed with water or other liquid for the purpose of removing any objectionable matter, such as grit, paste, and any other substances. The stone, wood, or other substance, being colored and washed, as above described, is ready to be polished. The polishing operation is to be performed according to the adaptation of the article to be polished. For instance, when porous the pores must be filled before a polish can be obtained. Some substances will require to be polished by friction, others by the application of matter. A surface of one hundred square feet can be marbled in the space of twenty minutes by this process by a single operator.

When I wish to produce veins on marbles (limestones) no preparation is necessary beyond reducing the stones to a fine level surface and the application of a gentle heat to the side opposite the one intended to be marbled. The heat attracts the colors and draws them into the body of the marble. When thus prepared I throw on the stone or marble, from a brush, oil, melted wax, or any other article that will produce the same result as wax, and allow it to run in the direction I wish to produce the veins. Having completed this operation to suit my fancy or taste, I then throw on the colors prepared in strong acid, by means of a brush or brushes, if more than one color is required, which run in the intermediate spaces between the oil, wax, &c. As soon as the colors have run sufficiently I then lay it aside until it is cold, or for any convenient time, after which the surface is cleansed by means of a brush and alkali, say pearlash in water. After it is perfectly dry it is then ready for the polish. This kind of marble is polished in the usual way of polishing marble by friction. It must be borne in mind that marbles (limestones) are soluble in muriatic acid. Therefore the operator must be exceedingly cautious how he employs this acid in the preparation of his colors. The following process or operation is varied according to the nature of the case, which is shown below. The wood, minerals, or other substances to be marbled are first prepared with a coat of lime and alum, which fills the pores or inequalities of the articles to be marbled, and at the same time it forms an important base for vegetable colors. I sometimes use white lead, resin, oil, and sand to fill the pores, as necessity may require. When the article to be marbled is free from pores or inequalities these preparations are unnecessary. This operation being completed, I then

take a piece of canvas of suitable fabric, paper, gum-elastic, or any other article that will answer the purposes and lay it on the top of a vat containing a mucilagenous paste. The canvas by this process takes up a portion of the mucilagenous paste equally distributed over its surface. I then take as many brushes as I wish colors to be produced, dipping them in their respective color, and then elevating them at a suitable distance above or over the canvas I throw off the colors and oil from the brushes broadcast on the surface covered with the paste. The colors thus thrown on the mucilagenous paste spread themselves over its surface, the one driving the other into veins. (The colors require some active agent to lead them, and for this may be employed spirits of turpentine, alcohol, or any other article having sufficient penetrating and active properties.) I then apply the canvas to the article to be marbled, which article takes up the colors immediately. The canvas is then removed, and if any objectionable matter is found on the surface it is removed by washing it off with water, or otherwise.

I sometimes, as necessity or convenience may require, coat the article itself to be marbled with the mucilagenous paste, and throw the colors on its surface, which remain until it (the paste) is evaporated to dryness. A solution of diluted acid will destroy the gluten in the paste and fit it for the polishing process. Sometimes it is most convenient to apply the colors to the paste and then the article to be marbled to the colors, as the operator finds most convenient to the accomplishment of the object before him—as, for instance, if he should wish to marble a mantel-piece or any other article which is a fixture or of intricate structure, he must employ the canvas coated with paste and the colors, as above described.

The polishing operation is performed according to the object required. For instance, if a clean, transparent, sparkling polish is desired, I take flint-glass and reduce it to a powder as fine as I desire it for the object in question. I then add a sufficient quantity of this powder to a solution of alcohol and shellac with a small quantity of nitro-muriate of zinc and tin or aqua regia. Having thus mixed the preparation, I then spread it on the surface of the article to be polished with a brush or otherwise, and when this is perfectly dry it is rubbed to a smooth surface by means of machinery constructed for that purpose or otherwise, as most convenient to the operator. The surface thus prepared becomes very hard and of a beautiful sparkling appearance. If a blue sparkling surface is desired, I take blue smalt and reduce it to a powder in like manner, and thus the surface may be varied by the change of the glass to any color desired. When plain colors are required the surfaces are coated, as above, with the admixture of the coloring-matter, the polishing operation the same as the above, with the admixture of the coloring-matter necessary to produce the desired line of color.

The mucilagenous paste may be made of any article that does not contain much glutinous matter—the less the better—such as corn-meal, slippery-elm bark, the castor-plant, &c.

What I claim as my discovery, and desire to secure by Letters Patent in the before-described process of marbling minerals, woods, and other substances, is—

1. The employment of strong acids, as herein described, in the preparation and application of colors for producing appearances of marble on woods and minerals.

2. The application of lime and niter as receiving-mordants, adapted to minerals and wood where veins or variations are to be produced imitating marble, as herein set forth.

3. The use of mucilagenous pastes composed of corn-meal, slippery-elm bark, or rice-water, applied to canvas, paper, gum-elastic, &c., for purposes stated in the specification.

4. The process of preparing and of transferring the colors from a temporary to a permanent ground, in the manner and for the purposes described.

5. The composition of glass, lime, shellac, nitro-muriate of zinc or aqua regia, and alcohol, as a compound hard polish for marbling wood and porous mineral surfaces, as before described.

In testimony whereof I have hereunto signed my name, before two subscribing witnesses, this 9th day of August, 1848.

SAMUEL W. DAVIS.

Witnesses:
WM. P. ELLIOT,
A. E. H. JOHNSON.