UNITED STATES PATENT OFFICE.

WARREN TANNER, OF CHICAGO, ISAIAH S. HYATT, OF ROCKFORD, ILLINOIS, AND JOHN W. HYATT, JR., OF ALBANY, NEW YORK, ASSIGNORS TO WARREN TANNER.

IMPROVEMENT IN FORMING ARTIFICIAL STONES FOR GRINDING AND POLISHING.

Specification forming part of Letters Patent No. **53,056**, dated March 6, 1866.

To all whom it may concern:

Be it known that we, WARREN TANNER, of Chicago, in the county of Cook and State of Illinois, ISAIAH S. HYATT, of Rockford, in the county of Winnebago, in the said State of Illinois, and JOHN W. HYATT, Jr., of Albany, in the county of Albany, in the State of New York, have invented a certain new and useful Improvement in Composition for Artificial Stones or Wheels for Grinding; and we do hereby declare that the following is a full and exact description thereof.

Our invention is intended more particularly for small rotating devices for grinding knives, but may be used for all the general purposes of grinding and polishing. It is superior to any other known to us of equal cost.

The invention consists in a certain mixture of materials—to wit, of coarse silicious matter, very fine silicious matter, and a binding material, adapted to each other in the manner and in about the proportions herein set forth.

We will proceed to describe what we consider the best mode of working out our invention. We take emery of the proper grade to produce the desired effect on the steel—say, for example, No. 46—and mix it very thoroughly with the very-finely-pulverized emery known in the trade as "flour-emery." We mingle with these pure roll-brimstone and expose the mass to a heat sufficient to melt the brimstone, and then work the whole together a considerable period, so as to thoroughly incorporate the brimstone with the emery and cover all the particles of the latter with the melted brimstone. The best proportions are as follows: twelve pounds of brimstone, twenty-four pounds of sharp emery, six pounds of flour-emery. While the mass is warm, and consequently plastic, we shape it by pouring or pressing into suitable molds, which shape the rollers, wheels, or whatever may be the forms required for the grinding device. When the composition has sufficiently chilled we remove it, using the same means of molding and manipulating in that respect as has been heretofore commonly practiced to produce the desired forms.

We deem it important that the flour-emery shall be such as is properly so called, as we have found a very marked diminution of the strength of the grinding-wheel in consequence of using a very fine grade of emery not quite so fine as flour.

We believe it unnecessary to demonstrate the truth of or to advocate any particular theory in regard to the action of the flour in our invention. It may be that a very thin lamina of the sulphur unites chemically with the surface of the emery, forming a union of the metal and the acids which exist in too thin a layer to be recognized by any test except by its effect when made available in our invention.

We have determined by experiment that our invention produces a very strong grinding-wheel at a very low cost, and enables us to obtain exactly the quality desired with regard to coarseness of the grain.

Coarser or finer emery may be used by varying the proportions of flour and brimstone, as also by a greater or less degree of heat. The degree of steam-heat required to make the composition here described is 292° Fahrenheit, or a pressure, as indicated by the common steam-gage, at sixty pounds. The brimstone will melt and mix with the emery at a lower heat—say 210° Fahrenheit; but at that low heat fails to cement the flour properly with the coarse emery. When extra-hard wheels are desired, a little addition of flour and brimstone only is required.

We believe that our invention applies to other gritty material than emery, and to other cementing material than brimstone. We propose to employ it in mixing sand of proper quality with rosin and many other kinds of binding material, using always an absolutely pulverized grade of the silicious matter to intermix with the other elements in the manner above described, and anticipate a portion of the benefits of our invention from any such admixture if properly treated.

Having now fully described our invention, what we claim as new, and desire to secure by Letters Patent, is as follows:

The combination of coarse grit with flour-grit and a binding material, substantially as and for the purposes herein set forth.

WARREN TANNER.
ISAIAH S. HYATT.
JOHN W. HYATT, JR.

Witnesses to the signature of Warren Tanner:

P. A. HOYNE,
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Witnesses to the signature of Isaiah S. Hyatt:

EDWARD H. GRIGGS,
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Witnesses to the signature of John W. Hyatt, Jr.:

MARTIN DELEHANTY,
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