UNITED STATES PATENT OFFICE.

STEPHEN M. ALLEN, OF DUXBURY, MASSACHUSETTS.

WOOD-GRINDER FOR MAKING PAPER-PULP.

SPECIFICATION forming part of Letters Patent No. 259,992, dated June 27, 1882.

Application filed May 19, 1882. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN M. ALLEN, of Duxbury, Plymouth county, Massachusetts, have invented a new and useful Improvement in Wood-Grinders for Making Paper-Pulp, which improvement is fully set forth in the following specification.

This invention relates more particularly to wood-grinders (for making paper-pulp) formed of artificial stone, emery, corundum, quartz, flint, or other like substances, in which the fine particles of abrading material are united into a solid mass by means of a suitable water-proof cement; and it has for its object to improve the construction of such grinders and their durability and efficiency in use.

In the present invention the grinding-cylinders, rolls, or plates are made up of a number of small blocks of abrading material of any symmetrical shape, so that they will fit closely together, making a kind of mosaic surface. The blocks are perhaps most conveniently made about the shape and size of a brick, and are laid together as in ordinary brick-laying, so as to break joints. The small blocks or pieces are united to form a grinder by any suitable means, as in the case of a cylinder they may be dovetailed into the core or mandrel around which the grinder is formed, or in case of a plate or disk into the supporting-frame or base. The advantages of this construction are that the small blocks, bars, or pieces can be more easily constructed, more solidly tamped, and less liable to contain imperfections than where the grinder is made in one piece, or in several large pieces, as in the case of the several forms of sectional grinders heretofore patented by me. Moreover, in case of breakage of a single piece it could be easily removed and replaced by a new block. In order to render the surface perfectly water-proof, the blocks are cemented together.

In the accompanying drawings, which form a part of this specification, Figure 1 is a side view, and Fig. 2 an end view, of a grinder embodying my invention.

The grinder shown is made up of a number of small blocks, bars, or plates, *a*, formed independently and assembled together. The blocks *a* may be of any desired abrading material—such as emery, corundum, quartz, flint, metallic crystals, and the like—reduced to the required degree of fineness and united in a solid mass by means of water-proof cement or other suitable composition. A mixture of boiled linseed-oil, japan, marine glue, with or without earthy pigments, and silicates may be used for this purpose; or any of the well-known cementing compounds employed in the manufacture of emery grinders may be used instead. The abrading particles, being thoroughly incorporated with the cement, are tamped and compressed in molds of the shape desired and dried in the air or by artificial heat. Where the mass contains vitrifiable substance the whole may be baked until vitrified. When completed the blocks *a* are laid together in such manner as to break joints, and are held in place on the core or mandrel *b* by means of dovetail joints, as shown, or they may be united by means of cement in any other desired way.

The shape of the blocks or pieces *a* is not material. They may all be square, rectangular, hexagonal, or other symmetrical and uniform shape; or they may be of different shape, provided the adjacent faces are made to correspond, so that they can be laid compactly with tight joints. Greater solidity is insured and the surface of the grinder rendered perfectly water-proof by filling the joints between the several blocks with a suitable water-proof cement.

In a grinder so constructed the wood is worn away evenly, there being no breaks or continuous cracks in the abrading-surface, and the several parts of the grinder, being of small size, can be thoroughly compacted, and are of greater strength and durability and less liable to contain flaws than where the abrading material is compacted in masses of large size. The breakage, moreover, of one of the blocks would not affect the whole grinder, as it can readily be removed and a new piece substituted.

Instead of constructing the grinder in the manner described, alternate rows of blocks may be held between iron bars running lengthwise of the cylinder or roll; or other modifications may be made in the construction of the grinder and other details of the invention.

As the medium for uniting the particles of abrading material, any of the compounds or

mixtures for that purpose described in my application filed December 14, 1881, No. 47,911, may be used; or the compound known as "French cement," composed of metallic oxide with a solution of metallic chloride—such as zinc or magnesium—may be employed; or the particles of abrading material may be compacted by means of rubber vulcanized, as in the substance known as "emery vulcanite;" or "celluloid" may be employed as the binding medium; or to the compound of oil, japan, and marine glue above specified may be added other ingredients, such as metallic oxides, resins, silicates, sulphur, rubber, celluloid, or oily or gummy matters generally, whether vegetable or mineral.

Having now fully described my said invention and the manner of carrying the same into effect, what I claim is—

1. A wood-grinder for making paper-pulp having the grinding-surface composed of blocks with their edges in close contact and with the joints broken, substantially as described.

2. A wood-grinder having a grinding-surface of emery or artificial-stone blocks separately compacted and laid so as to break joints, and cemented, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

STEPHEN M. ALLEN.

Witnesses:

HORACE G. ALLEN,

FLORENCE EMERY.