S. M. ALLEN.
Grinding-Wood.

No. 221,993. Patented Nov. 25, 1879.

Fig. 1.

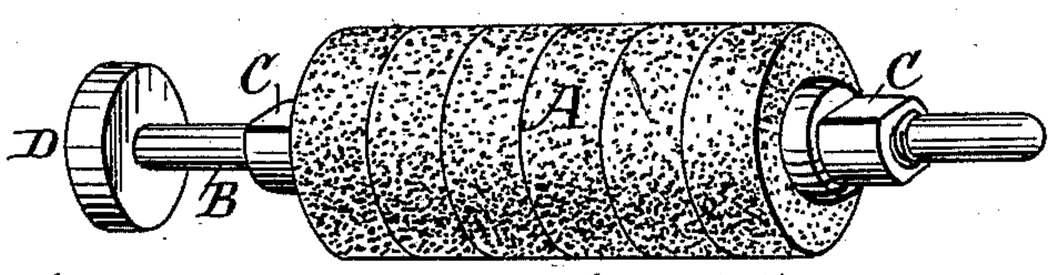
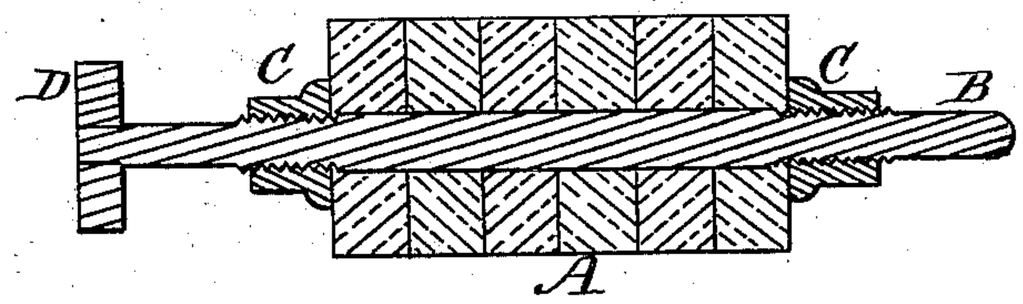


Fig. 2.



Witnesses:

E. E. Masson

Philip Mauro

Inventor:

Stephen M. Allen

by A. Pollok

his atty.

UNITED STATES PATENT OFFICE

STEPHEN M. ALLEN, OF DUXBURY, MASSACHUSETTS.

IMPROVEMENT IN GRINDING WOOD.

Specification forming part of Letters Patent No. **221,993**, dated November 25, 1879; application filed October 16, 1879.

To all whom it may concern:

Be it known that I, STEPHEN M. ALLEN, of Duxbury, Massachusetts, United States, have invented a new and useful Improvement in Grinding Wood, which improvement is fully set forth in the following specification.

This invention relates to a new and improved grinder.

This invention may be employed in carrying out the improvement secured to me by Letters Patent dated March 12, 1878; but it is also adapted for use in other machines and processes.

I have found by experience that emery and other artificial-stone rollers or grinders, when properly made for the purpose, are in many respects better for grinding wood than rollers made from ordinary stone or metal, on account of the facility for changing the grade of the pulp from coarse to fine, as well as in the greater speed with which disintegration can be effected, and in the great saving of power.

I have found, however, that it was very difficult to make such artificial-stone rollers of the size required for practical use. The difficulty is mainly encountered in consolidating so large a body of granulated stone, flint, or emery by pressure or tamping when mixed with the proper cement, so that it will be water-proof, and at the same time stand the wear and tear of constant use without giving away in some parts of the cylinder when subject to the great strain often put upon the grinders. In fact, in my own experience I have found it impossible to make such rollers of practical size in one body without finding, when in use, that they were unequally united by the cement on account of the granular character of the emery, and its tendency to bridge in tamping or pressing the same into the mold in which it was consolidated. This defect causes unequal wear in the wheel when in use and spoils the grinder.

To overcome the difficulties heretofore experienced I have resorted to a combination wheel or cylinder, which, though simple in itself, answers a purpose which all other grinders, so far as I am aware, have failed to accomplish. It is not liable to the danger of bursting or breaking away when revolving through the pressure against the wood in process of grinding or by centrifugal force.

I obtain a cylinder solid to the center by making the wheels in thin sections separately, and then uniting them on a spindle or arbor to obtain a grinder of the desired size. The sections can be tamped and set together very firmly, and the wheel can be run with no danger to life or limb, and will make satisfactory wood pulp.

The following description will enable those skilled in the art to which it appertains to make and use my invention.

I take crushed and granulated emery, corundum, quartz, flint, or any hard stone, and form the same into a paste or mortar by the use of the proper cementing liquid or pastes, which, being well known, need not be described, and to the proper consistency for molding and tamping. The paste or mortar is then cast and compressed in a proper mold for the purpose, of different size and thickness, but usually from four to six inches in thickness. It is consolidated under great pressure, which is readily done. When thus formed I dry the rollers partially, and usually soak them in some waterproofing liquid. Then I fully dry them and turn them off fit for use.

The finished rollers are placed upon a central shaft or arbor to form a cylinder of such length as needed, usually not less than twenty-four inches. They are carefully perforated through the center, and are confined side by side on the shaft or arbor either by clamps, bolts, or screws and nuts.

In the accompanying drawings, which form a part of this specification, is represented a cylinder or grinder made in accordance with this invention, Figure 1 being a perspective view, and Fig. 2 a longitudinal section.

A is the cylinder or grinder, formed of the sections, rollers, or disks, made in the manner before described, and secured upon the shaft or arbor B by means of the nuts C. D is a belt-pulley for revolving the shaft.

In order to grind wood by means of the cylinder shown, the latter may be used as described in my former patent already referred to, or it can be used in other machines and modes of operation. For example, two cylin-

ders, such as represented by A, being revolved by suitable means, the wood is presented thereto endwise, sidewise, diagonally, or in any desired way. The two rollers may revolve both toward the wood as it is presented between them, or both may revolve away from it, or one toward it and the other away. They may revolve in the same direction or in opposite directions.

I do not intend to limit myself to the particular ways described of using my invention, for it is capable of general application in the art. It is not essential that the several sections of the grinder have plane peripheries, or that they be of the same thickness or diameter. For particular purposes variations may be made in these and similar respects.

Having thus fully described my invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

1. A cylinder or grinder of artificial stone or emery, for grinding and disintegrating wood and other fiber, composed of distinct sections or disks, in number to form a cylinder of the desired length, confined upon a shaft, substantially as described.

2. The combination of a number of disks of artificial stone or emery with a shaft or arbor passing through perforations in said disks and nuts, for confining the latter on said shaft or arbor, substantially as described.

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

STEPHEN M. ALLEN.

Witnesses:
THOMAS M. GRIDLEY,
GEO. A. SAVAGE.