No. 645,617. Patented Mar. 20, 1900.

G. BOXLEY.

ABRASIVE TOOL.

(Application filed May 6, 1899.)

(No Model.)

Fig. 1.

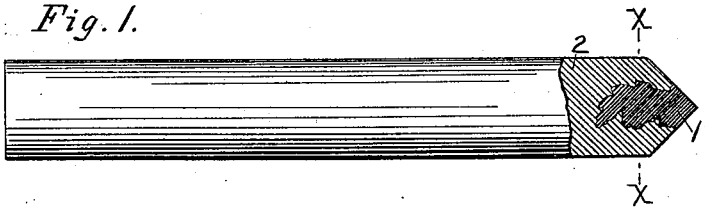


Fig. 2.

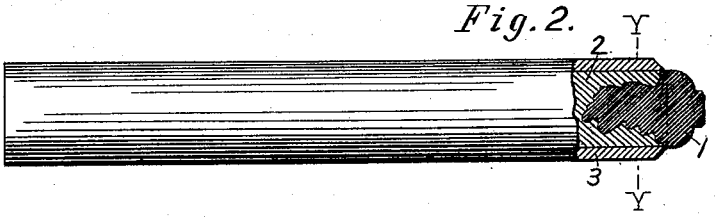


Fig. 3.

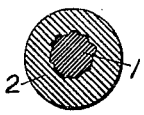
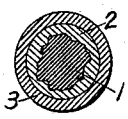


Fig. 4.



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ABRASIVE TOOL.

SPECIFICATION forming part of Letters Patent No. 645,617, dated March 20, 1900.

Application filed May 6, 1899. Serial No. 715,771. (No model.)

To all whom it may concern:

Be it known that I, GEORGE BOXLEY, a citizen of the United States, and a resident of Troy, county of Rensselaer, and State of New York, have invented certain new and useful Improvements in Abrasive Tools, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof, in which similar numerals of reference indicate corresponding parts.

This invention relates to an improvement in abrasive tools, its object being to provide a tool of this character in which the abrasive is held more securely in its backing.

The present way of making abrasive tools—such as grinding-wheels, cones, hones, &c., where emery and carborundum are used—is to mix the abrasive in some kind of cement and when the proper consistency is obtained to press said mixture into a mold and then subject the form thus obtained to a proper degree of heat to dry out all moisture, while diamonds are usually held in a clamping device operated by a screw. It is well known that grinding-wheels of this description when run at high speed are liable to flake off or burst.

This invention, which will be hereinafter fully described, and specifically set forth in the annexed claim, is designed to prevent this action.

In the accompanying drawings, Figure 1 is a side view of one form of the device, partly sectional. Fig. 2 is a side view, partly sectional, of a modified form of the device. Fig. 3 is a cross-section on the line *x x* of Fig. 1, and Fig. 4 is a cross-section on the line *y y* of Fig. 2.

In the practice of my invention in the construction of tools to be used for facing grindstones or for analogous purposes I employ a piece of carborundum 1 or other abrasive. The abrasive is placed at the bottom of a suitable mold, and the metallic holder 2, constituting the main body of the tool, is poured into said mold in a molten state and when it cools will hold the abrasive securely in position. The abrasive may be pointed, as shown in Fig. 1, or that portion of it protruding from the metallic backing 2 may be finished in any desired form, one form being shown in Fig. 2.

In some instances I use a tubular mold 3, in one end of which the abrasive is placed, and the main body of the tool poured into the mold while in a molten state. In this case the mold becomes a part of the finished tool.

In constructing grinding-wheels, cones, hones, &c., where it is desired that the whole tool shall embody more or less of the abrasive I usually pour the abrasive and the molten metal into the mold or form at the same time, the abrasive having been previously reduced to particles of a greater or less degree of fineness, as required for the particular work the wheel is expected to accomplish, and when a tool requires a much larger percentage of abrasive than can be poured in the mold at the same time as the molten metal I fill the mold or form with the abrasive and then subject said mold containing the abrasive to a degree of heat sufficient to allow molten metal to run freely through all the interstices, so that permeation is accurately obtained before the form is allowed to cool.

The metal in which the abrasive is incorporated is preferably such as to wear away as fast as the abrasive, and the tool will always present a firm, true, and sharp cutting-face.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

In a grinding-tool the combination of an elongated cylindrical outer jacket or casing 3, a core 2 contained within said jacket, and an abrasive element 1, embedded in said core upon its outer end; substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 29th day of April, 1899.

GEORGE BOXLEY.

Witnesses:
JAMES CAVEN,
GEORGE W. GEER.