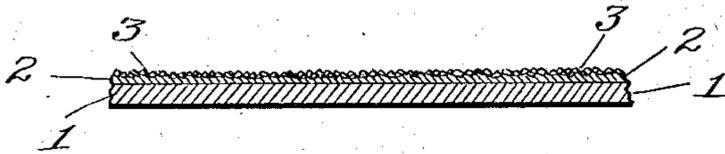


No. 842,993.

PATENTED FEB. 5, 1907.

S. B. ARCHER.  
PROCESS OF ATTACHING AN ABRADING SURFACE TO METAL.  
APPLICATION FILED JUNE 9, 1905.



Inventor

Witnesses  
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# UNITED STATES PATENT OFFICE.

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## PROCESS OF ATTACHING AN ABRADING-SURFACE TO METAL.

No. 842,993.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed June 9, 1905. Serial No. 264,403.

*To all whom it may concern:*

Be it known that I, SAMUEL B. ARCHER, a citizen of the United States, residing at Saratoga Springs, in the county of Saratoga and State of New York, have invented certain new and useful Improvements in Processes for Attaching an Abrading-Surface to Metal, of which the following is a specification.

This invention relates to improvements in abrading material; and it consists in an improved process of coating iron, steel, or other metallic substances with flint, emery, corundum, carborundum, or other like substances.

The principal object of my invention is to obtain an abrading-surface firmly attached to iron, steel, or other metallic surfaces for grinding, polishing, grating, delinting cotton-seed, peeling potatoes, and other similar purposes.

Heretofore abrading-surfaces have been applied to metal by means of oil, japan, shellac, gum, sulfur, and other similar substances, but with such substances as these the adhesion of the abrading material to the metal is very weak, and in certain machines, such as those used for grinding, polishing, or delinting cotton-seed, which run at a high speed, the frictional heat is so very high that the material holding the abrading material decomposes, which causes a disintegration of the whole abrading-surface. Then in another class of machines used for peeling potatoes, grating horse-radish, or other wet substances the water soon penetrates between the abradant and the metal and causes the abradant to fall off. In order to obviate these disadvantages and to produce an abrading-surface on a metal base that will be equally efficient for either a high temperature or a wet substance, I use the means illustrated in the accompanying drawing and described in the following specification.

In the drawing is illustrated a section of my abrading-surface applied to a metal plate.

1 designates a plate of metal having applied to it an enamel 2, having embedded therein grains or particles of abrading material 3, such as flint, emery, or other like substances.

To more fully describe what I mean by "enamel" and to show more clearly wherein my process differs from those in common use, I will state that the enamel herein described is made of clay, feldspar, florspar, flint, glass,

boracic acid, oxids, &c., such as is used by manufacturers of enameled iron hollowware, bath-tubs, and such articles, and one of the formulas used for such purpose is given in Patent No. 222,422, but any similar formula may be used for the purpose.

In applying the abradant the metal base is first thoroughly cleaned by any of the well-known processes. A coat of liquid enamel is then applied and allowed to dry, after which the metal is heated to a cherry red. At this temperature the enamel fuses with the metal. While in this highly-heated condition a coating of dry powdered enamel is applied to the surface, and the whole is again heated to a high temperature, which fuses the powdered enamel, causing it to assume a plastic state, and while in this condition a thick coating of abrading material is applied to the face of the enamel and the whole is kept at a high temperature until the abradant becomes firmly embedded in the enamel, when it is allowed to cool.

The temperature used in heating the metal and fusing the enamel ranges from 800° to 1,500° Fahrenheit, and as the frictional heat attained in grinding, polishing, or delinting cotton-seed seldom attains above 400° Fahrenheit it can be plainly seen that abrading material attached in this way will not be affected by frictional heat.

Having thus described my invention, what I claim is—

1. Abrading-tools consisting of metal having a coating of enamel with an abradant embedded therein united to the metal by fusion.

2. The process of attaching an abrading-surface to metal for the purposes specified, consisting in applying a coating of liquid enamel to a metal plate and allowing it to dry, then heating the metal and applying to its coated surface a coating of dry powdered enamel, then heating the whole to a temperature that fuses the powdered enamel and reduces it to a plastic state and while in this condition applying a coating of abrading material and keeping the whole at a high temperature until the enamel sets and holds the abradant firmly to the metal.

In testimony whereof I affix my signature in presence of two witnesses.

SAMUEL B. ARCHER.

Witnesses:

FRANCIS S. MAGUIRE,  
JOHN A. MURPHY.