Patented Aug. 2, 1927. 1,637,487

UNITED STATES PATENT OFFICE.

FRED M. KERN, OF DETROIT, MICHIGAN, ASSIGNOR, BY MESNE ASSIGNMENTS, TO CINCINNATI GRINDERS INCORPORATED, OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

PROCESS OF SIZING AND FINISHING ARTICLES OF FIBER.

No Drawing. Application filed November 5, 1923. Serial No. 673,041.

This invention relates to sizing and finishing articles of fiber, such as articles made from a pulp of ground paper, wood, cloth or other fibrous materials impregnated with a phenol condensation product. More particularly, the invention relates to grinding such articles to finished size.

Heretofore various attempts have been made to grind fibrous articles but have failed so utterly as to convince fiber manufacturers that fiber could not be ground satisfactorily. One difficulty encountered during these prior attempts was that of loading or clogging of the grinding wheel with the ground fiber particles so as to render the active surface of the wheel ineffective. In order to overcome such loading and to prevent heating of the grinding wheel and articles being ground, many well known lubricating and cooling liquids were employed but were found to detrimentally affect the surfaces of the fiber articles and to cause the same to swell, blister, and even disintegrate.

Articles of such material have been machined, sized and finished by means of ordinary cutting tools, but due to the peculiar composition of the fiber article and its other physical properties, the hardest cutting tool soon became dull. The material often has a tendency to tear and become otherwise damaged during such machining.

The economical advantages of sizing and finishing fiber articles by grinding as contrasted with machining are extensive. Particularly when such articles are ground by a centerless grinding machine, the production can be increased enormously and the cost of sizing and finishing such articles greatly reduced. The cutting of such fibrous articles by means of abrasive wheels is very practicable and efficient when properly conducted to preserve the surface finish and shape of the fiber article and maintain the abrasive wheel freely cutting.

It is the object of the present invention to provide certain expedients whereby fiber articles may be ground to finished size so as to preserve the surface finish and shape of the article and maintain the active surface of the abrasive wheel freely cutting.

In accordance with the invention, I grind the fiber article with a grinding wheel, or other abrasive element, and simultaneously supply to the article and grinding wheel a non-aqueous liquid containing a petroleum product. I have discovered that a solution of crude petroleum or its distillates, more particularly kerosene, either alone or in combination with other non-aqueous liquids, may be used as a grinding liquid without any harmful effect on the material being ground; that the temperature of the work and the wheel is kept down thereby; that the active surfaces of the grinding wheels are kept clean and free from particles of fiber; and that the particles of the fiber cut free by the grinding wheels are carried off by the grinding liquid and are thus kept from being carried through between the work and the wheels which is liable to cause scratches in the finished surfaces. The liquid also seems to assist in imparting a smooth and otherwise desirable finished surface to the articles being ground.

Articles of any desired shape may be properly ground and finished by the use of this grinding liquid, but the process is particularly adapted for use in "centerless" grinding machines in the production of cylindrical rods and tubes.

I claim:—

1. The method of sizing and finishing an article of fiber which comprises grinding the article with an abrasive element, and simultaneously supplying to the fiber article and the abrasive element a medium containing a non-aqueous liquid which will preserve the surface finish and shape of the fiber article and maintain the abrasive element freely cutting.

2. The method of sizing and finishing an article of fiber which comprises grinding the article with a grinding wheel, and simultaneously supplying to the article and to the grinding wheel a non-aqueous liquid containing a petroleum product which will preserve the surface finish and shape of the fiber article and maintain the grinding wheel freely cutting.

3. The method of sizing and finishing an article of fiber which comprises grinding the article with a grinding wheel, and simultaneously supplying to the fiber article and the grinding wheel a non-aqueous liquid containing kerosene which will preserve the surface finish and shape of the fiber article and maintain the grinding wheel freely cutting.

FRED M. KERN.