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SIZING FIBERS.

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My invention relates to the treatment of fibers, especially paper stock, preliminary to their being compacted into board, such as pasteboard and pulp board, but is applicable to any process which involves the treatment of fiber with a metallic soap and a precipitating agent. It is of particular advantage in connection with the manufacture of articles in sheet or other form made of compressed fiber, such as paper pulp, wood pulp, asbestos fiber, straw or the like. It has been the practice to size or waterproof such fibers by adding to the beater a colloidal sollution of a soluble metallic soap and after such soap has been mixed as thoroughly as possible with the fiber to treat the same with a metallic salt, such as aluminum sulfate, in order to precipitate upon the fiber an insoluble soap. The object of my invention is to bring about a more even distribution of the insoluble soap so that the fibers will more uniformly be covered by the insoluble soap.

My invention is of particular advantage in connection with the manufacture of pulp board made by running a mixture of pulp and water, to which a binder may have been added, into a mold, removing the majority of the water by pressure, removing the remainder of the water by the application of heat, preferably in a suitably constructed drier, and then subjecting the resulting board to heat or to heat and pressure. (See United States Letters Patent No. 971,936, dated October 4, 1910, and No. 1,272,566, dated July 16, 1918). A board made by this method will, when treated in accordance with my invention, have greater strength, higher water resisting power and better tooling qualities.

In carrying out my invention I add to the water, fiber and soluble metallic soap, preferably in the beater, tannic acid either pure or crude. I have found that tannic acid acts as a dispersing agent, that is to say, causes the soluble soap, as it precipitates, to assume the form of very fine particles which settle very evenly upon the fibers. The proportion of tannic acid may vary within wide limits, depending on prevailing conditions, and may very readily be determined by simple experiment in each case. Generally speaking, an amount of tannic acid about 20% by weight of the weight of the insoluble soap used, is sufficient for all practical purposes, but, of course, a less amount should be used if the desired dispersion can thereby be obtained.

A further, incidental advantage of the use of tannic acid is that it forms an ink with iron so that, if iron sulfate is employed as the precipitating agent, or if iron is present as an impurity in the precipitating agent, the finished board will receive a desirable dark color. With other metals, other colors may be produced.

Example.—1000 pounds of waste paper are beaten up in the beater, or other suitable mixing engine, with from 110 to 130 pounds of a soap prepared from drying oils, such as linseed oil or China wood oil, or from rosin, to which soap has been added from 10 to 20% of its weight of tannic acid, preferably in the form of a commercial tanning extract. When the beating operation has been completed, the soap is precipitated by the addition, for instance 45 to 55 pounds, of commercial sulfate of aluminum. I prefer to use a sodium soap of linseed oil, that is to say a sodium linoleate which, when treated with aluminum sulfate is converted into an insoluble aluminum soap, that is to say aluminum linoleate.

I claim:

The process of treating fibers as a preliminary step to shaping the same which comprises adding water, tannic acid and a soluble metallic soap to the fiber, beating the fiber and then precipitating the soap onto the fiber by means of a metallic salt.

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