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SIZING OF PAPER

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3 Claims. (Cl. 92—21)

This invention relates to an improvement in the sizing of paper. It relates to a method of sizing paper with resin or wax whereby the amount of resin or wax can be considerably reduced without affecting the sizing effect.

It has been found that the sizing effect of resin or wax can be greatly increased by adding to the sizing material an alkali metal or ammonium salt of polymethacrylic acid or of a copolymer of methacrylic acid and another polymerizable material. In the latter case the proportion of methacrylic acid in the polymer must be sufficient to render the alkali metal or ammonium salt soluble in water.

In carrying out the invention the water-soluble salt of polymethacrylic acid is added to the pulp in the beater before or after the addition of the sizing material, for example a rosin soap solution. The polymethacrylate may also be mixed directly with the sizing material before this is added to the pulp. After the size and polymethacrylate are thoroughly distributed in the pulp, a solution of an aluminum salt is added as is customary in order to precipitate the rosin in the form of its aluminum salt. The aluminum polymethacrylate is also insoluble and precipitates at the same time but this salt alone has no sizing action. In spite of this lack of sizing action the polymethacrylate can be used to replace many times its own weight of rosin. In conjunction with the rosin it increases the sizing effect thereof to such an extent that the amount of rosin necessary to give the desired effect can be reduced to about one-half of that required when no polymethacrylate is present. An addition of 0.3 to 0.5% of the soluble salt of polymethacrylic acid, calculated on the dry solids content of the pulp, is sufficient to replace about 50% of the rosin ordinarily used for sizing. When 0.5% of a salt of polymethacrylic acid, calculated on the cellulose content of the pulp, is employed in conjunction with a rosin size, the mechanical properties of the paper made from the pulp are better than when rosin alone is used.

The invention may be illustrated by the following example:

1.5 parts by weight of rosin dispersed in 150 parts of water is added to 2500 parts of a 4% cellulose pulp in a beater and thoroughly beaten. Then 5 parts of a 10% solution of sodium polymethacrylate is added and thoroughly mixed in whereupon sufficient aluminum sulfate solution is added to precipitate the rosin and polymethacrylate as aluminum salts. Paper made from pulp so treated corresponds in sizing effect to one made with about three percent. of rosin.

In place of the solution of sodium polymethacrylate used in the foregoing example, the sodium salt of a copolymer made from 65 parts of methacrylic acid and 35 parts of methyl methacrylate may be employed. Other copolymers in which methacrylic acid predominates may also be employed in the form of their soluble salts. The salts of polyacrylic acid do not have the same effect except to a very limited extent.

I claim:

1. In the process of beater-sizing with resins and waxes, a paper made from cellulose pulp, the improvement which comprises adding to the pulp, prior to the formation of a web therefrom, about 0.3% to about 0.5% of a water-soluble salt of polymethacrylic acid, the amount of said salt being calculated on the weight of the cellulose content of said pulp.

2. In the process of beater-sizing with resins and waxes, a paper made from cellulose pulp, the improvement which comprises adding to the pulp, prior to the formation of a web therefrom, about 0.3% to about 0.5% of a water-soluble salt of a copolymer of which methacrylic acid is the predominating component, the amount of said salt being calculated on the weight of the cellulose content of said pulp.

3. In the process of beater-sizing with resins and waxes, a paper made from cellulose pulp, the improvement which comprises adding to the pulp, prior to the formation of a web therefrom, approximately 0.5% of a water-soluble salt of polymethacrylic acid, said acid being calculated on the weight of the cellulose content of said pulp.

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