PREPARATION OF SHEET MATERIALS CONTAINING FIBERS, CORK PARTICLES, AND A RUBBERLIKE BINDER

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7 Claims. (Cl. 260—17.4)

1. This application is a continuation-in-part of my copending application Serial No. 168,445, filed June 16, 1950.

This invention relates to the preparation of rubber bonded cork and fiber materials. More particularly, the invention relates to a process of preparing such products in which the cork particles are picked up by the binder and are evenly deposited upon the fibers while in suspension, such as in a conventional paper-making beater and thereafter forming the resulting slurry into a sheet.

Cork and fibrous sheets have been prepared in a number of ways, many of which are basically comprised of the steps of passing the sheet of cork and fiber particles through a binder. There have been some instances wherein cork particles and organic fibers such as Kraft fibers have been subjected to the action of a beater, and while in the beater the beaten mixture has been treated to coagulate a rubberlike binder on the fibers. However, generally speaking, extreme difficulties have been experienced in the beater saturation method of producing a cork and organic fiber sheet material bonded with rubber. The chief difficulty in beater saturation by this technique appears to be due to the tendency of the cork particles to float out during the formation of a wet slurry into a sheet. There may be a rather high concentration of cork particles at the top surface of the resulting sheet. Obviously this is undesirable as it results in the production of a very nonuniform sheet material.

Since one of the more important uses of a fibrous material containing cork particles is in the manufacture of low cost gasket material, it is highly desirable that the sheet from which the gasket cut be substantially uniform throughout.

I have found that cork particles may be uniformly distributed throughout a fibrous sheet material in a beater saturation process provided the cork particles are of very fine particle size. In accordance with my invention I have found that the polyvalent metal ions are inactive by combining them to a compound of very limited water solubility by the addition of a suitable hydroxide such as ammonium hydroxide.

The addition of the ammonium hydroxide converts the aluminum chloride, for example, to aluminum hydroxide. This is an important step in the preferred embodiment of my invention inasmuch as the inactivated ions do not prematurely coagulate the synthetic rubber which is to be added in the form of a latex. Following inactivation, as indicated above, the synthetic rubber latex containing any of the synthetic rubbers mentioned hereinabove is then added to the slurry. Thereafter, the solids content of the latex is coagulated or precipitated. This may be accomplished by the addition of an acid. The slow addition of acid, for example acetic acid, releases Al+++ ions by reacting with the...
aluminum hydroxide and at the same time coagulates the rubber which carries the cork onto the fibrous material suspended in the slurry. This reaction occurs until all of the rubber is exhausted onto the fibers giving a uniformly distributed and uniformly bonded mass of suspended material. After completion of the coagulation, the resulting slurry is then transferred by any conventional means to conventional papermaking equipment such as a wire, and a sheet containing the rubberlike binder and uniformly distributed fibers and cork particles is formed. The following examples are typical of the process of my invention:

Example I

35½ lbs. of hardwood sulfite pulp and 31½ lbs. of finely divided cork, the preponderant portion of which passed through a 200 mesh screen, were dispersed in 900 gallons of water. 16 lbs. of alum were then added to the batch and stirred in thoroughly. Sufficient 28% ammonia solution was then added to the slurry to bring the pH to about 8. Normally this requires about 4500 cc. of 1360 cc. of a 10% solution of "Tamol N" (the sodium salt of polymerized alkyl sulfonic acid) were then mixed with 75 lbs. of a butadiene-acrylonitrile synthetic rubber latex (40% solids). The resulting mixture was then added to the slurry with vigorous agitation. As a result of agitation, the solids content of the latex is coagulated upon the fiber and cork particles.

Example II

27 lbs. of hardwood sulfite pulp and 31 lbs. of finely divided cork particles, the preponderant portion of which passed through a 200 mesh screen, were agitated in water to form a slurry. 174 grams of Erie brown dye, 273 grams of 50% dispersion of Agerite white antioxidant were added to the slurry. Thereafter, sufficient ammonia, normally 3750 cc. of a 28% solution, is added to bring the pH of the mixture to about 8.0. 680 cc. of a 10% solution of "Tamol N" are added to 79 lbs. of a 38% solids GR-S No. 3 latex, with vigorous agitation. The resulting mixture of latex and Tamol solution is then added to the slurry with agitation. Thereafter, about 2 lbs. of acetic acid are added to accelerate the coagulation of the solids content of the latex onto the fibers and cork particles.

Sheets produced in accordance with my invention may be used in a number of ways. For example, cork and fibrous sheet, beater saturated with rubberlike binder, may be employed as an undercovering for rugs to prevent slippage on highly polished floors. They may be used to form gaskets which are very suitable as sealing materials because of the compressible nature of the sheet due to the cork particles therein. The sheets may be used in the manufacture of window panel material, particularly for use in the assembly of automobiles, and another use may be to line the production of anti-squeak materials for use in the assembly of automobiles. Probably the outstanding use of the material is as a low-cost gasket material.

I claim:

1. A method of making sheet material containing fibers, cork particles, and a rubberlike binder, which comprises forming an aqueous slurry containing papermaking fibers and 200 mesh to dust cork particles; adding to said slurry a water-soluble aluminum salt; adding a hydroxide to convert said aluminum salt to an aqueous slurry containing papermaking fibers and 200 mesh to dust cork particles; adding to said slurry a binder, which comprises forming an aqueous slurry containing papermaking fibers and 200 mesh to dust cork particles; adding to said slurry a water-soluble aluminum salt to said slurry; adding a hydroxide to convert said aluminum salt to an aqueous slurry containing papermaking fibers and 200 mesh to dust cork particles; and forming the resulting suspension into a sheet.

2. The product of the process of claim 1.

3. A method of making sheet material containing organic papermaking fibers, cork particles, and a rubberlike binder, which comprises forming an aqueous slurry containing organic papermaking fibers and 200 mesh to dust cork particles; adding to said slurry 200 mesh to dust cork particles; adding to the slurry a water-soluble aluminum salt; adding a hydroxide to convert said aluminum salt to said slurry; adding a binder, which comprises forming an aqueous slurry containing organic papermaking fibers and 200 mesh to dust cork particles; adding to the resulting slurry a liquid latex to form a latex slurry; and forming the resulting suspension into a sheet.

4. A method of making sheet material containing organic papermaking fibers, cork particles, and a rubberlike binder, which comprises forming an aqueous slurry containing organic papermaking fibers and 200 mesh to dust cork particles; adding to the slurry a water-soluble aluminum salt; adding a hydroxide to convert said aluminum salt to said slurry; adding the resulting slurry to said slurry; and forming the resulting suspension into a sheet.

5. A method of making a sheet material containing organic papermaking fibers, cork particles, and a rubberlike binder, which comprises forming an aqueous slurry containing organic papermaking fibers and 200 mesh to dust cork particles; adding to said slurry a water-soluble aluminum salt; adding a hydroxide to convert said aluminum salt to said slurry; adding a binder, which comprises forming an aqueous slurry containing organic papermaking fibers and 200 mesh to dust cork particles; adding to the slurry a liquid latex to form a latex slurry; and forming the resulting suspension into a sheet.
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5 aluminum hydroxide; adding a synthetic rubber latex containing a synthetic rubber of the group consisting of rubberlike polymers of butadiene, rubberlike polymers of isoprene, rubberlike polymers of chloroprene, rubberlike copolymers of butadiene with copolymerizable vinyl compounds, and rubberlike copolymers of isoprene with copolymerizable vinyl compounds; agitating the resulting slurry until substantially all of the solids content of said latex has carried said cork particles onto said fibers; and forming the resulting suspension into a sheet.

7. A method of making sheet material containing organic papermaking fibers, cork particles, and a rubberlike binder, which comprises forming a slurry containing organic papermaking fibers and 200 mesh to dust cork particles; adding a dilute solution of an aluminum salt to said slurry; converting said added aluminum salt to aluminum hydroxide by the addition to said slurry of ammonium hydroxide; adding a latex of a synthetic rubber of the group consisting of rubberlike polymers of butadiene, rubberlike polymers of isoprene, rubberlike polymers of chloroprene, rubberlike copolymers of butadiene with copolymerizable vinyl compounds, and rubberlike copolymers of isoprene with copolymerizable vinyl compounds; agitating said slurry while adding a coagulating acid thereto, thereby causing the solids content of said latex to carry said cord particles onto said fibers; and forming the resulting suspension into a sheet.

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No references cited.