

UNITED STATES PATENT OFFICE

1,926,982

FIBROUS COMPOSITION

Lester Kirschbraun, Leonia, N. J., assignor, by
mesne assignments, to The Flintkote Corpora-
tion, Boston, Mass., a corporation of Massa-
chusetts

No Drawing. Original application May 6, 1927,
Serial No. 189,460. Divided and this applica-
tion June 9, 1930. Serial No. 460,095

4 Claims. (Cl. 92-21)

This application is a division of my co-pending application, Serial No. 189,460, filed May 6, 1927, issued as Patent No. 1,781,645, dated Nov. 11, 1930.

with water, as desired. The mixture may vary in composition from two parts upwardly of soap to 100 parts of the binder.

This first emulsion, which is a mobile liquid, is gradually added to an aqueous paste of water and material containing colloidal particles, such as clay, and the two thoroughly mixed together to form a second emulsion.

In forming this second emulsion, the result is an emulsified composition of a non-sticky and stable character.

I have above referred to making the first emulsion by the use of a fatty acid and later adding an alkali solution. One advantage of making an emulsion in this way is that it permits of the use of a very high melting point asphalt for a binder. For example, if an asphalt having, say, 300° F. melting point is desired to be used with the binder, it obviously cannot be mixed with an aqueous solution when melted, for the reason that the melting point of the bitumen will be much above the boiling point of water. However, by first adding a fatty acid to the high melting point binder, the latter is so softened or cut back by the fatty acid that it is a liquid at a temperature below the boiling point of water. The hot aqueous alkali solution can then be added and the alkali and fatty acid combined to form soap. This first emulsion can then be mixed with a second emulsifying agent, as before stated. It will thus be seen that a very high melting point binder can be used. The utilization of a high melting point binder permits of the formation of a very hard and rubbery product.

After this double emulsion is formed, as above stated, it may, if desired, be combined with various kinds of fillers or fibrous materials and then molded or sheeted as desired. As the water dries out of the mixture, the binder will coalesce, become adhesive and form a very tough and strong product.

While it may not be true in all cases, I have found that it is most desirable, in forming the first or primary emulsion, that the aqueous solution containing the emulsifying agent be added to the binder rather than the binder to the aqueous solution, while in forming the second emulsion, the first emulsion is added to the second emulsifying agent rather than the reverse. With reference to the binders, a wide variety of binders may be employed, either asphalts, natural or artificial coal tars, water, gas tars, animal and vegetable pitches, hydrocarbon oils, drying oils, such as linseed oil, Chinawood oil, wax tailings, paraffin, resin and the like. In some cases the binder

In my Patent No. 1,302,810, I described a process of making an emulsified composition suitable for use with certain fibrous material. I have since discovered that in certain cases it may be advantageous to make a double emulsion. Heretofore, attempts to make waterproof sheets, particularly as a continuous operation, on paper machines and the like, have experienced much difficulty in making a composition which would not stick to the machine. In said patent, I obviated this difficulty by making a non-sticky emulsified matrix composed of water and an emulsifying agent, such as clay of a colloidal character and a binder such as bitumen. In this matrix, the finely divided particles of the binder were in effect surrounded by a non-adhesive colloidal emulsifying agent, so that the material would pass readily over the paper machine without sticking.

I have discovered that in certain cases, it may be desirable to form what in effect may be called a double emulsion. This double emulsion seems to permit of a more minute dispersion of the asphalt particles in the water vehicle. Just exactly the action that takes place I am not at this time prepared to state.

I have ascertained, however, that certain kinds of binders, as for example, some tars and pitches do not as readily emulsify with a clay paste as do others. Moreover, while a certain percentage of such tars or pitches might readily emulsify with the clay paste, there seemed to be a point at which no more tar or oil could be added and get a satisfactory emulsion. I have discovered, however, that by making a double emulsion, I can overcome this objection.

The process of the present invention may be described as follows:

An adhesive waterproof binder, preferably in a hot liquid condition, is placed in a suitable receptacle. To this liquid binder is gradually added an aqueous paste or solution. This aqueous paste or solution may consist of water and soap; cheap resin soap has been found satisfactory. This emulsified matrix is of a rather sticky character and unstable to electrolytes. Another way in which this emulsion may be formed will be to dissolve a fatty acid, such as oleic acid in a liquid binder and then add to this mixture a solution of suitable alkali, such as common lye. This emulsion can be thinned

may consist of rubber dissolved in a suitable vehicle such as naphtha or benzol, which, of course, will ultimately evaporate. By the work bituminous, as used in this specification and in the claims, is meant to include the various forms of binders referred to in the two preceding sentences.

Instead of carrying out the process in the manner above described, a saponifiable fluxing agent such as oleic acid, sulphonic acid, and, in general, substances which upon combination with soluble alkalies act as emulsifying agents, or protective colloids, may be fluxed with the bitumen and the mixture emulsified by the addition of an emulsifying agent, as for example colloidal clay, bentonite or analogous emulsifying agents. To this emulsion may be added an alkali such as sodium hydroxide or ammonium hydroxide. The result is to produce an emulsion which, in certain instances, has increased stability, and is less susceptible to disturbing elements which may tend to break down the emulsion in case it is used as a paint, or applied on a paper machine.

Another advantage of this modified type of operation is that the soluble substances formed may, in certain instances, act as a stabilizing agent, tending to hold the hydrogen ion concentration fairly stable within predetermined limits.

In a paint, this treatment results in stabilizing the paint while it is in an aqueous condition. Where a stabilized product is formed, such as ammonium oleate, and the dry paint film exposed to the weather, the ammonium soaps tend to break down, losing the ammonium and regenerating the saponifiable substances, which being oil soluble tends to facilitate coalescence and engulfing of the mineral particles (clay and pigment) inasmuch as these become wet with the oil soluble saponifiable agent.

The invention may be carried out, substituting metallic soaps for saponifiable acids, these soaps being fused with the pitchy binder, and then the combination emulsified as described, with clay and treated with alkali. The addition of metal soaps appears to change the interfacial tension between pitch and argilliferous emulsifying agent so as to present an optimum relationship with

certain clays, and tends to produce the effect of better dispersion.

I claim as my invention:

1. A stock capable of being felted on a paper machine comprising fibrous pulp in an aqueous vehicle intimately mixed with a waterproofing material dispersed in the aqueous vehicle, an emulsifying agent for the waterproofing material and a protective agent to render the stock non-adhesive, said agent being present in quantity less than would substantially impair the waterproofing properties of the waterproofing material.

2. A stock capable of being felted on a paper machine comprising fibrous pulp in an aqueous vehicle intimately mixed with a bituminous waterproofing material dispersed in the aqueous vehicle, a water soluble emulsifying agent for the waterproofing material and a protective colloid to render the stock non-adhesive, said colloid being present in quantity less than would substantially impair the waterproofing properties of the bituminous waterproofing material.

3. A stock capable of being felted or otherwise formed into a fibrous product, comprising fibrous pulp in an aqueous vehicle intimately mixed with a normally adhesive bituminous waterproofing material dispersed in the aqueous vehicle, a soap-like emulsifying agent for the bituminous waterproofing material, a protective colloid to render the stock non-adhesive, said colloid being present in quantity less than would substantially impair the waterproofing properties of the bituminous waterproofing material.

4. A stock capable of being felted or otherwise formed into a fibrous product, comprising fibrous pulp in an aqueous vehicle, intimately mixed with a normally adhesive bituminous waterproofing material dispersed in the aqueous vehicle, soap, and a clay-like protective colloid to render the stock non-adhesive, said colloid being present in quantity less than would substantially impair the waterproofing properties of the bituminous waterproofing material.

LESTER KIRSCHBRAUN.