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COMPOSITION OF MATTER AND PROCESS OF MAKING THE SAME

No Drawing.

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To all whom it may concern:

Be it known that I, HERBERT S. LEVENSON, a citizen of the United States, and a resident of New York city, borough of Brooklyn, State of New York, have invented new and useful Improvements in Composition of Matter and Processes of Making the Same, of which the following is a specification.

This invention relates to the production of a composition of matter having adhesive properties, and more particularly such a composition which can be used as a binder for granular or pulverulent materials, as for example, in the production of briquets, the treatment of road surfaces, and the like.

The objects of the invention are to secure such a binder which shall be insoluble by water and moisture under usual working conditions, and thus to secure a perfect and complete binding action; to enable an ingredient soluble in water to be used in the production of such a binder and yet have the binder insoluble; to thus enable concentrated sulfite liquor to be advantageously used in the production of such a binder; to produce such a binder from concentrated sulfite liquor and fatty oil pitch; to unite said concentrated sulfite liquor and fatty oil pitch so that they will not separate, as when stored or shipped, but will always be ready for use, and to obtain other advantages and results.

In the manufacture of paper pulp by the sulfite method, wood is heated in a digester with an aqueous solution of bi-sulfite of lime (calcium acid sulfite). Sometimes dolomitic or magnesian lime is used in making the sulfite liquor, in which case it contains acid sulfite of magnesia. In the digester about half of the wood goes into the solution, forming "sulfite waste liquor," the remainder forming paper pulp. In going into solution the organic material of the wood, and particularly what is known as the "lignin complex," forms new combinations with the sulfurous radical and the bases present. For the sake of a name, the new bodies formed are usually called ligno-sulfonates. There are small amounts of sugars and other bodies present, but the characteristic organic substances of the sulfite waste liquor are these ligno-sulfonates. The ligno-sulfonates have the character of salts of sulfonic acids and the salts formed with most or all of the bases are soluble.

Sulfite waste liquor with proper care in manipulation may be evaporated down to thick liquids or dry compositions, sometimes known as sulfite pitches. These concentrated products have found an extensive market in the country for various purposes, but mainly as adhesives, such as making sand cores and briquets. Their adhesive properties are very good indeed; they may be used in agglutinating any pulverulent material. But since the ligno-sulfonates are soluble bodies, in many of these uses, and particularly where the agglutinated material is to be exposed to the weather, the solubility of the binder is an inconvenience. Many efforts have been made to obviate this by incorporating other binders with the sulfite waste liquor preparations without much success.

I have found that these difficulties may be obviated and a binder secured which shall be free from them by mixing fatty oil pitch with the concentrated sulfite liquor. and I use the term fatty oil pitch as opposed to natural pitches and designating the still residue left after free fatty acids are steam distilled from cottonseed oil, palm oil, wool fat, grease, etc. The fatty oil pitches contain olein, palmitin and stearin, and some of them would be covered by the term stearine pitch. The fatty oil pitch known in the trade as "vegetable pitch", containing principally olein and palmitin, is well suited to my purpose, and I use that, though I do not wish to be restricted to it. A smaller quantity of fatty oil pitch than of sulfite liquor is best employed, and the two ingredients must be thoroughly mixed, as by stirring or other agitating; if this is done in the presence of heat it is advantageous, and so it is convenient to first dilute the concentrated sulfite liquor with hot water and then add the fatty oil pitch. Preferably, I take four (4) parts by weight of commercial 30° Bé. concentrated sulfite liquor and re-dilute it with hot water at 160° F.; to this I add one (1) part of commercial "vegetable pitch," stirring it in well. The hot water may however, be at any temperature from 120° F. to boiling point, and the proportions stated may be varied by one skilled in the arts to which this invention relates, without departing from the spirit and scope of the invention, and I do not wish to be understood as limiting myself except as required by the

following claims when construed in the light of the prior art.

The above proportions will give approximately two parts of water-free sulfite pitch to one part of commercial "vegetable pitch," which are the real ingredients of the binder. The water carried by the concentrated sulfite liquor at 30° Bé. is practically all evaporated during the manufacture and treatment of the product. Therefore, if concentrated sulfite liquor of a higher concentration than 30 Bé. is used, only such portion of it is required as would give the results of a binder in a dry state of approximately two to one, that is, if concentrated sulfite liquor of about 65% solids instead of 50% is used, the proportions would be only three of the concentrated sulfite liquor to one of "vegetable pitch" in order to maintain the above proportions. The water in the binder is only used as a vehicle to make it liquid and aid in the distribution in the pulverulent material.

The preparation made as described may be stored, shipped and used without separation of the components, and it may be used as a binder for any granular or pulverulent materials, being capable of making really waterproof briquets and of being used to great advantage in road dressings, core compounds, for waterproofing cements and for all similar uses.

It should be noted that the water with which I dilute the concentrated sulfite liquor, before adding the "vegetable pitch," is a solvent of both said ingredients, or a co-solvent, and this is an important feature in making my binder. Any co-solvent of concentrated sulfite liquor and the fatty oil pitch can be used, for example, carbon tetrachloride, carbon bisulphide or ordinary benzol diluted, for stearin base pitches, and I do not wish to be limited in that respect.

Having thus described the invention, what I claim is:

1. An adhesive composition containing concentrated sulfite liquor and fatty oil pitch.
2. An adhesive composition composed of fatty oil pitch and a solution of concentrated sulfite liquor.
3. An adhesive composition containing one part of fatty oil pitch and a solution of four parts of concentrated sulfite liquor.
4. An adhesive composition containing fatty oil pitch and a substantially larger proportion of concentrated sulfite liquor.
5. An adhesive composition containing concentrated sulfite liquor and fatty oil pitch in substantially the proportions set forth.

6. An adhesive composition containing fatty oil pitch, a substantially larger proportion of concentrated sulfite liquor, and a co-solvent.

7. An adhesive composition containing fatty oil pitch, a substantially larger proportion of concentrated sulfite liquor, and water.

8. An adhesive composition containing concentrated sulfite liquor and a fatty oil pitch containing olein, palmitin and stearine.

9. The process of making a binder, which consists in adding fatty oil pitch to concentrated sulfite liquor of a consistency which is thin relative to said vegetable pitch.

10. The process of making an adhesive composition, which consists in adding fatty oil pitch to concentrated sulfite liquor of a relatively thin consistency under heat.

11. The process of making an adhesive composition, which consists in adding fatty oil pitch to a solution of concentrated sulfite liquor in a solvent of vegetable pitch.

12. The process of making an adhesive composition, which consists in adding fatty oil pitch to a solution of concentrated sulfite liquor under heat.

13. The process of making an adhesive composition, which consists in adding fatty oil pitch to concentrated sulfite liquor, which is hot relative to said vegetable pitch and thin relative to said vegetable pitch.

14. The process of making an adhesive composition, which consists in adding fatty oil pitch to a solution of concentrated sulfite liquor which is hot relative to said vegetable pitch.

15. The process of making an adhesive composition, which consists in adding fatty oil pitch to a solution of concentrated sulfite liquor which is hot relative to said vegetable pitch and thin relative to said vegetable pitch.

16. A process of making an adhesive composition, consisting in adding a quantity of fatty oil pitch to a solution of a larger quantity of concentrated sulfite liquor which is thin relative to said vegetable pitch.

17. A process of making an adhesive composition, consisting in adding fatty oil pitch to a solution of concentrated sulfite liquor in a solvent of vegetable pitch in substantially the proportions set forth.

18. An adhesive composition containing a solution of fatty oil pitch and concentrated sulfite liquor.

19. An adhesive composition containing concentrated sulfite liquor and a fatty oil pitch containing olein and palmitin.

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