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WATERPROOF PRODUCT.

No Drawing. Original application filed February 1, 1919, Serial No. 274,498. Divided and this application filed February 19, 1921. Serial No. 446,489.

To all whom it may concern:

Be it known that I, LESTER KIRSCHBRAUN, a citizen of the United States, residing in the city of Evanston, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Waterproof Products, of which the following is a specification.

This application is a divisional on an original application filed by me in the United States Patent Office under date of February 1, 1919, Serial No. 274,498.

Heretofore it has not been commercially practicable to use natural asphalt containing foreign matter as a saturant for fibrous sheets such as the prepared roofing of commerce. I refer more particularly to such asphalts as Trinidad and Cuban. This results from the fact that in the ordinary method of saturating the felted fabric, the foreign nonbituminous or mineral matter clogs up the pores of the felted sheets and prevents saturation under reasonable commercial conditions.

I have discovered, however, that asphalts of the character referred to may be used as a saturating agent by waterproofing the sheet simultaneously with the formation of the felted fabric. To this end I mix the asphalt with the fiber prior to the sheeting operation in the manner now to be described.

I take for example, refined Trinidad asphalt which contains approximately 40% or more of foreign matter, a large portion of which is clay. This asphalt is heated to a fluid condition and fluxed with a petroleum residue. The amount of flux used will depend upon the desired consistency of the saturant and also upon the character of the flux. For example, if a residue resulting from the distillation of Trinidad, Mexican or California petroleum were used, a larger percentage will be necessary to obtain a given consistency than if a lighter flux obtained from the midcontinent oils were used. Residues from the pressure distillation of petroleum oils may also be employed. This mixture forms the adhesive bituminous binder.

I mix water and an emulsifying agent such as clay containing colloidal particles to a predetermined consistency. While this is hot I gradually add to it the above-described binder while the latter is in liquid state and simultaneously thoroughly agitate the mixture. Water is added from time to time if necessary as the mixing proceeds. The water and clay are held during this operation at a temperature below 212 degrees F. The asphalt is added while at a temperature above 212 degrees F. a temperature of 400–450 F. giving satisfactory results. By mixing the above materials in the manner stated, I produce a non-adhesive bituminous matrix in which the bitumen is in the internal phase and the water and emulsifying agent is in the external phase. Accordingly the bitumen is finally dispersed through a continuous medium of water and is in an emulsified condition, and is capable of being thinned to any desired condition by the further addition of water. I have found that where fluxed Trinidad asphalt is used as the binder much less clay is required than where certain other bitumens are used. This may result from the fact that such a large percentage of clay is naturally contained in the Trinidad itself. One part of clay to eight parts of binder makes a satisfactory matrix.

This matrix is thoroughly mixed with pulped fiber, which operation may be conveniently carried out in a beater engine commonly used for beating out paper stocks. This composition or mixture after being diluted with sufficient amount of water may be run over any of the usual types of paper machinery. Because of the non-adhesive character of the emulsion this stock does not stick to the metallic parts or to the fabrics or felts of the paper machine. After the sheet is dried by the removal of the water at a temperature which will not volatilize the bitumen, the binder regains its adhesiveness and intimately unites with fibers.

The finished sheet may then be coated if desired with asphalt or bituminous coating in the usual manner and a granular facing applied to the coating.

I claim as my invention:

A waterproof sheet consisting of a solid bitumen containing its native non-bituminous matter, flux intimately mixed therewith to form a homogeneous mixture, an emulsifying agent and fiber mixed with the bitumen, the whole being formed into a sheet and having the characteristics of having been formed on a paper machine.

LESTER KIRSCHBRAUN.