UNITED STATES PATENT OFFICE.

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BITUMINOUS PITCH AND SULFUR COMPOSITION AND METHOD OF MAKING THE SAME.

1,353,003. Specification of Letters Patent. **Patented Sept. 14, 1920.**

No Drawing. Application filed April 26, 1919. Serial No. 292,925.

To all whom it may concern:

Be it known that I, JOSEPH JOHNSTON WHITE, Jr., a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented new and useful Improvements in Bituminous Pitch and Sulfur Composition and Methods of Making the Same, of which the following is a specification.

The composition is particularly designed to resist the actions of acids and alkalis and is utilized for coating vessels or passages which are exposed to acids and alkalis but may be otherwise used as desired. In providing such a composition it is desirable to have a comparatively low melting point so that it may be readily handled and spread at a comparatively low temperature. At the same time it is desirable that the material when it cools have as high a viscosity as possible so that it may retain its position and shape and have under ordinary temperatures a requisite degree of hardness.

Different kinds of pitch, such as asphalt pitch and coal tar pitch have been used but these materials are not entirely satisfactory because they do not sufficiently resist the action of acids and alkalis. Further it is desirable that the melting point of the pitch may be less than is ordinary with such pitch and it is also desirable that it have a higher viscosity than the natural pitch.

I have discovered that such a composition may be formed by adding sulfur to the pitch. In forming my composition I melt the pitch keeping the temperature a little above the melting point at a temperature that the pitch will be in a fluid state. The pitch should have and ordinarily has a melting point above the melting point of sulfur, namely 114°–120° centrigrade so that with a pitch in fluid state the sulfur readily melts and can be thoroughly mixed with the pitch. By keeping the temperature of the pitch down to near the melting point very little, if any, chemical reaction takes place. I prefer to use coal tar pitch as it has a more definite melting point than the other bituminous pitches and my composition is preferably formed from coal tar and sulfur.

The effect of the addition of the sulfur to the pitch is to reduce its melting point, that is to say, after the substance has been compounded it will melt at quite an appreciably lower temperature than would occur when the ingredients were melted together in the first instance.

It is also found that the composition has a very much higher viscosity at the ordinary atmospheric temperatures than the untreated pitch and that its acid-resisting qualities are very much improved. The effect of the sulfur depends on the proportions of sulfur to the pitch. A greater amount of sulfur gives a higher viscosity and a lower melting point than a smaller amount. It retains its stiffness very nearly up to the melting point. I prefer to use about twenty per cent. of the sulfur. With such a percentage of sulfur a pitch originally melting at 150° centrigrade will melt to a brush consistency of 139° C. and will flow at 80 degrees centigrade only one-half as fast as the pitch without the sulfur. Different theories might be advanced as to the reason for this action but it is believed to arise from the peculiar manner that sulfur has in crystallizing, particularly the delay in crystallization of sulfur after it is melted. It is believed that these crystals impede the flow of the pitch in the same manner that suspended matter commonly impedes the flow of a viscous liquid.

The composition may be made to adhere more certainly to the coated surface by the interposition of a binder coat preferably having as a base the same pitch used in the main composition. I have found that where coal tar is used that this pitch treated with a solvent of carbontetrachlorid or chloroform will give the most satisfactory results. In coating a substance such as wood a solution of pitch and carbontetrachlorid or chloroform is first applied to the wood as a binder, allowed to dry thoroughly and then the composition of pitch and sulfur applied to this.

What I claim as new is:—

1. A bituminous pitch and sulfur composition in which the major portion of the ingredients are not chemically combined.

2. A bituminous pitch and sulfur composition in which the sulfur is less than 25% of the mixture and in which the major por-

tion of the ingredients are not chemically combined.

3. A bituminous pitch and sulfur composition of coal tar pitch and sulfur in which the major portion of the ingredients are not chemically combined.

4. The method of forming a coating which consists in mixing molten pitch and sulfur while maintaining the temperature at approximately the melting point of the pitch.

In testimony whereof I have hereunto set my hand.

JOSEPH JOHNSTON WHITE, JR.