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LYMAN S. BUSHNELL, OF FREEPORT, TEXAS, ASSIGNOR TO THE FREEPORT SULPHUR COMPANY, OF FREEPORT, TEXAS

METHOD FOR TREATING DISCOLORED SULPHUR

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Various methods, treatments and processes have been resorted to in attempts to remove the discoloring substances from the sulphur and to restore its original lustre and brilliancy after it has been over-heated or contaminated with oil. Some of these processes include the treatment of the sulphur with various materials such as carbon and filtering it through mediums such as sand. These treatments, however, have not been proven successful from a commercial standpoint due to the fact that the lustre of the sulphur is not always wholly restored and the fact that the filtration step of the process is very slow. It has been found that the sulphur must be filtered through a very fine medium in order to remove the oil and other contaminating substances. The filtering process heretofore employed is believed to have been largely that of absorption or adsorption and the filtering medium has soon become ineffective so that no commercially successful treatment of the sulphur has been evolved. In the present application, however, a different theory has been followed and a substantial improvement in the color of the sulphur as well as the rate of filtering the sulphur has been developed.

It is one of the objects of the present invention to devise a method of treating the sulphur with certain chemical re-agents or oxidizing agents so that the discoloration is almost entirely removed and the brilliant original color restored.

Another object of the invention is to spray the molten sulphur in the presence of a mist of sulphuric acid and other chemicals so that each particle of the sulphur comes in contact with the treating acid and substantially all of the discoloring material is subjected to a chemical reaction.

The invention relates particularly to an improved method and apparatus for treating discolored sulphur.

Sulphur deposits occur in the United States and particularly along the Gulf Coast States in Louisiana and Texas. These sulphur deposits occur in a porous lime or gypsum formation where the sulphur is deposited in cavities of dome-like structure. The process used in removing this sulphur is somewhat similar to the well known Frasch method which consists of drilling a well and circulating through the sulphur bearing formation fluids heated above the fusion point of sulphur. In this manner the sulphur is reduced to a molten state and may be withdrawn by an air lift or other fluid lifting device. Sulphur melts at a temperature of about 240° F. and remains in a fluid but more or less viscous state above that temperature. It is therefore desirable to handle the sulphur while it is in this state. There is, however, the detrimental feature that if the sulphur is maintained in a heated condition for a prolonged period that it becomes discolored. The sulphur also occurs in a discolored state in some formations due to the presence of contaminating substances such as petroleum, bitumen or other carbonaceous material. These are generally known as "oil" and serve to discolor the sulphur and reduce its commercial appearance and advantages.

It is still another object of the invention to devise a simple and economical apparatus for treating the sulphur so that it may be sprayed with the acid and washed to remove the acid and discoloration from the sulphur.

It is also one of the objects of the invention to add various oxidizing agents to the spraying solution such as sodium nitrate, potassium nitrate and potassium chlorate.

Another object of the invention is to arrange an apparatus where the sulphur may be treated under pressure with super-heated water, so that the sulphur may be washed free of acid and at least partially so of impurities while in a molten condition.

Other and further objects of the invention will be readily apparent when the following description is considered in connection with the accompanying drawings wherein Fig. 1 is a side elevation of a spray tank for treating the sulphur with acid. Fig. 2 is a tank somewhat similar to Fig. 1 but arranged to withstand pressure necessary to prevent the vaporization of super-heated water at the temperature of molten sulphur.

The invention will be best understood by having reference to Fig. 1 where a spray tank