UNITED STATES PATENT OFFICE.

FRITZ RASCHIG, OF LUDWIGSHAFEN, GERMANY.

PROCESS OF CLEANING WOOL AND PRODUCT THEREFOR.

SPECIFICATION forming part of Letters Patent No. 567,412, dated September 8, 1896.

Application filed July 13, 1895. Serial No. 555,898. (No specimens.)

To all whom it may concern:

Be it known that I, FRITZ RASCHIG, a citizen of the German Empire, and a resident of Ludwigshafen-on-the-Rhine, Germany, have invented certain new and useful Improvements in Processes of Washing Crude Wool, of which the following is a specification.

As is well known, sheep's wool contains, besides woolly fibers, a mass of organic or inorganic substances from which it must be freed by a thorough washing operation before it can be used for spinning purposes. Washing by means of clean water does not answer the purpose, and hence putrefying urine was first used and replaced later on by ammonia, but nowadays soap and soda are most generally used. The soapy solutions should, in order not to weaken the wool, be sufficiently cold and have a temperature of about 40° centigrade. They should, moreover, be sufficiently concentrated, one hundred parts containing about five parts of soap. With sodaic soap such five per cent. solutions cannot be made at a temperature of 40° centigrade, as a five per cent. solution of sodaic soap prepared by the aid of heat soon becomes gelatinized when cooled down to 40°, and, moreover, it is absolutely impossible to add soda to a five per cent. solution of sodaic soap, as so soon as a very small quantity of soda solution is added the sodaic soap separates immediately in flakes. Hence potash soap has been generally used in wool-washing, although it is much more costly than sodaic soap, the best potash soap containing only about forty-four per cent. of fatty acids and having only two-thirds of the cleaning power of a good sodaic soap containing about sixty-six per cent. of fatty acids, although it costs about as much as the latter.

Although a great economy would be realized by replacing potassic by sodaic soap, considering the extent of the wool-washing industry, all efforts in this direction have hitherto failed, for when trying to use for wool-washing purposes sodaic soap in a sufficient degree of concentration the soap solution becomes gelatinized as soon as soda is introduced. The wool receives the separating soap-flakes and remains unctuous without the wool fat or sweat being dissolved.

The substitution above mentioned is only possible by adding to the sodaic soap a substance which increases its solubility in water and imparts thereto the nature of a potash soap. This substance, which is a by-product of the manufacture of carbolic acid, is cresylic acid. About one thousand parts of water are necessary to dissolve twenty parts of sodaic soap. When five parts of cresylic acid are added to twenty parts of sodaic soap, the mixture may be dissolved in one hundred parts of water at 40° centigrade, and this solution, which is possessed of great washing power, will bear, moreover, the addition of one hundred and twenty-five parts of a ten per cent. solution of soda without separation of soap and is still fairly thin. By adding lesser quantities of soda, or by diluting with water, thoroughly thin and fluid soap-lyes are obtained in a very concentrated state. If the contents in fatty acids were merely considered with reference to the washing power of this solution, then twenty parts of sodaic soap containing sixty-six per cent. of fatty acids and five parts of cresylic acid would replace thirty parts of potassic soap containing forty-four per cent. of fatty acids, and as cresylic acid does not cost more than soap a considerable reduction in the cost of the washing process would be realized, but experience proves that these expectations are much exceeded, as in reality twenty parts of sodaic soap and five parts of cresylic acid replace forty parts of potassic soap. The reason therefore is that cresylic acid possesses cleaning properties similar to those of sodaic soap which are added thereto. It has been found that the washing power of these solutions can be still further increased by saturating the cresylic acid with caustic soda either entirely or partially. So long as the necessary quantity of caustic soda is added that will half saturate the cresylic-acid mass in use the latter has the same favorable influence upon the solubility of the sodaic soap as if added in a free state, but if all the cresylic acid is saturated with caustic soda its property of rendering the soap soluble is diminished, notwithstanding the reaction is clearly remarkable. The proportion of four parts of sodaic soap to one part of cresylic acid, (partly, entirely, or not at all saturated by caustic soda,) such as is indicated in the above example,

has been found most useful; but more cresylic acid could be used, the soap being rendered more readily soluble than above stated, although when too large quantities of cresylic acid are used the smell becomes objectionable in the washing-houses. When less cresylic acid, the solubility of the soap is not so considerably increased and yet it retains considerable advantages as compared with former processes.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, I declare that what I claim is—

1. The process for rendering ordinary soap, for example sodaic soap, very easily soluble in small quantities of cold water without subsequent gelatinization, by mixing sodaic soap, water and cresylic acid, which may be partly or fully saturated with caustic soda, in the proportions substantially as described.

2. A soap for washing crude wool consisting of a concentrated solution of sodaic soap, water and cresylic acid partly or fully saturated with caustic soda, said solution remaining thin and fluid without subsequent gelatinizing owing to the presence of the cresylic acid, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

FRITZ RASCHIG.

Witnesses:
GERLACH,
FR. JOSEF DÖRFELS.