

ALIEN PROPERTY CUSTODIAN

PROCESS FOR LAUNDERING WITH HARD WATER AND SOAP OR OTHER LAUNDERING AGENTS, AND MEANS FOR PERFORMING SAID PROCESS

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In laundering with soap or other laundering agents in hard water the difficulty has always been met with that the hardness producers of the water, especially calcium salts, precipitate a portion of the soap as insoluble fatty-acid salts, the result being partly a rather considerable loss of soap and a corresponding reduction of the laundering capacity of the laundering agents, and partly an incrustation in the laundered cloth, impairing its appearance and reducing its wearing quality.

In order to remedy these drawbacks, filtering through base-exchanging substances has been resorted to and, especially in households and smaller laundries, alkaline active substances, for instance soda, have been used, in order to soften the water, the said substances, when added to the laundering water, precipitating gradually the calcium salts.

These reactions, however, take place very slowly at the ordinary temperature (10 to 20° C) of service water. In order to promote the speed of reaction, the water has been passed over crystalline calcium carbonate, especially marble, as a catalyst, but in that case apparatuses are also required which render the use of the process expensive and unpractical, when only smaller quantities of water are concerned. Some alkaline reacting substances, for instance normal sodium phosphate react certainly rather quickly, without the presence of any such catalyst, but the precipitate produced is subject to the drawback that it reacts highly with soap, in such a manner that a considerable quantity of the latter will be wasted, unless the precipitate be removed, before the soap is added.

No satisfactory agent for softening smaller quantities of water, for instance for household use (cloth-laundering, dish-washing) or the like, has heretofore been known.

The present invention having for its object to solve this problem is based on the fact that the softening process of the washing water by means of alkalies and, consequently the entire laundering process, may be accelerated considerably by adding to the water, before the soap or other laundering agents sensitive to the hardness are dissolved in the same, of certain solid finely comminuted insoluble substances accelerating the process, for instance crystalline or micro-crystalline calcium carbonate or, maybe, also magnesium carbonate. A characteristic feature of the present invention is that the precipitate is not removed, since it possesses, as demonstrated by the inventor, the highly important technical property that it does not react with soap. Instead of the pure salts, we may also use minerals containing

the said salts, for instance marble, dolomite, limestone or chalk in powdered state. The soap, or other washing agents sensitive to the hardness, may be added to the washing water simultaneously with, or after, the addition of the alkalies and the said reaction-promoting substances, the said substances being used in a suitable slowly soluble state, if the laundering agents sensitive to the hardness are added simultaneously with the hardness-removing agents.

As appearing from the following examples, the process referred to here renders practicable the removal of hardness from water by means of alkaline reacting substances, with the formation of reaction products that are inactive to soap or other laundering agents, in a small fraction of the otherwise required time, and without this process requiring any special apparatuses.

Examples

In the following experiments, water of 19 German degrees of hardness and a temperature of 12° C was used, with an addition of 1,5 grams of calcined soda per liter. If merely the said quantity of soda is added, no softening will be noticeable after the lapse of ten minutes. If at the same time calcium carbonate in a sufficiently comminuted state is added, the softening will be accelerated considerably.

The below mentioned quantities of calcium carbonate have been found to be able to cause the softening to be finished (viz. to about 3 or 4 degrees of hardness) within the periods mentioned:

Calcium carbonate	Period of hardness removal
	Minutes
0,02 grams per liter.....	12
0,04 grams per liter.....	5
0,08 grams per liter.....	3
0,20 grams per liter.....	1½

This shows that the process according to my invention will render harmless the hardness-producers, within a very short time to the same extent that is attainable by ordinary water softening by means of chemicals. In the examples soap is used, but the invention may also be employed for softening of water used for laundering with other washing agents that might be influenced unfavourably by the hardness in the water.

It should be noted that instead of calcium carbonate or magnesium carbonate, also numerous other solid finely crystalline or micro-crystalline insoluble substances may be useful.

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