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TREATMENT OF CASEIN FIBERS

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1 Claim. (Cl. 18—54)

Casein fibers even when they have been hardened with an aldehyde have a certain tendency to stick together and felt owing to their great softness; this tendency creates difficulty in the wet treatment processes which come between the hardening operation and the drying.

This invention is based on the observation that when the fibers which have left the hardening bath still feebly acid with mineral acid easily float apart during washing with a dilute solution of ammonium carbonate or bicarbonate or caustic soda or even a dilute solution of an organic base of alkaline reaction, for instance methylamine. This characteristic tendency to float apart is decidedly noticeable already at a pH-value between 4.5 to 6.3 of the washing liquor. The separation occurs when the liquid is already alkaline to methyl-red. The preparation of alkali used naturally depends on the quantity of acid still adhering to the casein fibers. In order to avoid any damage of the fibers the alkali concentration of the washing liquor should not exceed 0.05 to 0.1 per cent of ammonia. Depending upon the tendency of the fibers to stick together and the efficiency of the mechanical isolation, the washing liquor used in practice should have a hydrogen ion concentration (pH) in presence of the casein fiber of between 4.5 and 11.5.

Before the treatment with the dilute alkali the fibers adhere strongly to one another or indeed are in part strongly felted together. After the flotation process which may occur in vats or flotation troughs there follows a short washing with water and the usual soaping. After the washing the fibers may be subjected to a short acid treatment with dilute acetic acid or lactic acid.

By the treatment of the casein fiber with dilute alkali last traces of the mineral acid (H_2SO_4) are neutralized at the time of the flotation, this acid having been introduced from the spinning or hardening bath and resisting removal by washing with water. In this manner a minimum of washing water is required which is of great importance, in view of the chemical constitution of the casein fiber which has a tendency to take up considerable proportions of salt from the washing water even in hardened condition.

The following examples illustrate the invention:

Example 1.—5–7 kilos of casein fiber are separated by centrifuging from the main quantity of the hardening bath, then washed with about 200 liters of permutite-water, again centrifuged and finally floated with 200 liters of water to which 700–800 cc. of ammonia of 22 per cent strength have been added. The proportion of ammonia is determined by the residual acidity of the washed fiber. The pH-value is 6.5–11.0. After the flotation the liquor should contain as far as possible not more than 0.05–0.8 per cent of ammonia. 0.05–0.1 per cent of formaldehyde is added, to avoid any damage to the fibers. The floated fiber is then washed in about 100 liters of permutite-water and treated as usual with dilute acetic acid, soaped and dried.

Example 2.—A hardened casein fiber sliver still impregnated with a formaldehyde bath containing salt is washed in the form of a sliver by conducting it through a trough in which permutite-water is flowing; it is then squeezed between rollers and cut. The staple fiber falls from the cutting machine into a flotation trough containing dilute ammonia solution of pH-value=10–11. The further treatment is like that described in Example 1.

Example 3.—5.7 kilos of casein fiber are washed as described in Example 1 and floated with 200 liters of dilute caustic soda lye. The addition of sodium hydroxide amounts to about 250 cc. of caustic soda lye of 14.5 per cent strength. After the flotation the liquid has a pH-value=8.3. The further treatment resembles that described in Example 1.

I claim:

An improvement in the after-treatment of the wet formaldehyde-hardened, mineral acid-reacting fibers produced from casein which comprises floating the wet fibers in an aqueous liquid containing ammonia and the concentration of ammonia not exceeding 0.1%.

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