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MANUFACTURE OF CASEIN PRODUCTS

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4 Claims. (Cl. 18—54)

This invention relates generally to the manufacture of casein products, and more particularly to the manufacture of artificial fibers or filaments of casein which may be spun into threads from which textiles may be woven. It also relates to the manufacture of molded casein products.

The invention will be described particularly with reference to the production of casein fibers which may be spun into threads from which textiles may be woven. Such filaments may be made by dissolving casein containing more or less ash, or no ash at all, in an alkaline solution, for example caustic soda, and passing the dissolved casein through a spinnerette whose discharge orifices are immersed in a solution containing metaphosphoric acid, preferably maintained at pH 2.5. The metaphosphoric acid solution causes the filaments or strings to coagulate. This coagulation is the result of a combination of the metaphosphoric acid and casein resulting in the formation of casein metaphosphate.

The casein concentration in the alkaline casein solution is preferably about 25%, but this may be varied to suit conditions and in any case should be such that the filaments discharged from the spinnerette are homogeneous. That is, the casein solution should not be on the fluid side, but should be of sufficient viscosity so as to insure the formation of a continuous homogeneous filament. The rate of penetration of the metaphosphoric acid depends largely upon the concentration of the acid, and in carrying out the invention a concentration of about 10% metaphosphoric acid is preferably employed. This may, however, be varied so as to give the best rate of penetration under the particular conditions employed. The time of immersion of the filaments in the metaphosphoric acid solution depends upon the diameter of such filaments and the strength of the acid solution. In any event, the time of immersion should be long enough to allow complete penetration by the metaphosphoric acid.

Although the concentration of the metaphosphoric acid solution is preferably in the neighborhood of about 10%, it may vary widely from this value. The preferred metaphosphoric acid solution may be made by acidifying a 10% aqueous solution of sodium metaphosphate, preferably sodium hexametaphosphate, with sulphuric or hydrochloric or other suitable acid until the

desired pH of approximately 2.5 is reached. Thus, the preferred metaphosphoric acid solution contains some sodium hexametaphosphate or sodium acid hexametaphosphate.

When the filaments have been penetrated by the metaphosphoric acid solution, they are dried in any suitable known manner, for example in accordance with known methods of drying artificial silk.

The invention is also applicable to the production of molded casein products. The alkaline casein solution may be coagulated as previously described, i. e. in the form of filaments or strings, in a metaphosphoric acid solution and is then transferred while still wet and pliable to molds of the desired shape, where it is dried under heat and pressure. Desired coloring material may be added to the coagulated casein prior to or during the shaping process in order to make it suitable for different purposes.

The invention covers the use as coagulating solutions of either metaphosphoric acid solutions or acid solutions of alkali-metal metaphosphates such, for example, as acid solutions of sodium hexametaphosphate.

The invention is not limited to the preferred materials referred to, nor to the preferred proportions or concentrations of the casein solution or the coagulating bath, but may be otherwise embodied or practiced within the scope of the following claims.

I claim:

1. A process of making casein products, comprising extruding an alkaline casein solution into an aqueous bath containing metaphosphoric acid to coagulate the casein.

2. A process of making casein products, comprising extruding an alkaline casein solution into an aqueous bath containing acid alkali-metal metaphosphate.

3. A process of making casein products, comprising extruding an alkaline casein solution into an aqueous bath containing acid sodium hexametaphosphate.

4. A process of making casein products, comprising extruding an alkaline casein solution into an aqueous acid bath containing metaphosphoric acid and an alkali-metal metaphosphate.

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