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MANUFACTURE OF ARTIFICIAL TEXTILE FIBRES

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This invention concerns improvements in or relating to processes for the manufacture of artificial textile fibres and constitutes an improvement in or modification of the processes described and claimed in the Specification of the Applicant's U.S. Patent Application Serial N. 191,000 dated Feb. 17, 1938 and in the Applicant's U.S. Patent Application Serial N. 96,470 dated August 17, 1936.

In the U.S. Patent Application Serial N. 96,470 it has been stated that in addition to casein derived from milk, mixtures of such casein with raw material of vegetable and also of mineral origin can be employed. In the Specification of Application Serial N. 191,000, it is stated that any casein can be used. According to the present invention casein derived from any raw materials of vegetable origin or of animal origin can be employed for obtaining fibres similar to the artificial wool obtained by the processes described and claimed in the aforesaid Patent Applications.

Among the raw materials which can satisfactorily be employed are, for example, the caseins derived from vegetables (legumen) of various kinds. A suitable vegetable of which there is a plentiful supply throughout the world is the soya bean (glicyne hyspida) from which casein is derived which is so similar to casein obtained from whey as to be known universally as soya-casein. Soya-casein can be treated without difficulty in the manner set forth in the aforesaid Patent Specifications either by itself or mixed with whey casein, for the steps of dissolving, maturing, spinning and rendering insoluble in the manufacture of artificial textile fibres.

In order that the invention may be readily understood an example of the use of a mixture of soya-casein and whey casein will now be described, the procedure being the same when employing soya-casein alone.

In the first step of the process, 50 kilogrammes of soya-casein and 50 kilogrammes of whey-casein are well mixed together and then diluted with 300 litres of water. After a period of one to three hours 17 litres of water, 23 litres of 35° Be sodium hydrate, and 0.350 kilogrammes of sodium hyposulphite are added and the solution is well mixed, preferably in two stages each of 1½ hours; then another 85 to 100 litres of water are added and the solution is filtered at least once and left to mature. As an alternative to sodium hydrate an equivalent quantity of potassium hydrate can be employed, but when the caseins have been washed before use the quantity of 35° Be sodium hydrate is reduced to 17 to 18 litres or the equivalent quantity of potassium hydrate is reduced in a corresponding manner.

In the second step of the process the matured solution is passed through a spinning nozzle immersed in a coagulating bath containing an aqueous solution of sulphuric acid and other salts, such as sodium sulphate, sodium chloride, aluminium sulphate, zinc sulphate, ammonium sulphate or the like; the bath should have a density greater than 1.180 and a sulphuric acid content greater than 25 grammes per litre of bath. Other salts can be added to the bath either singly or in combination, but the temperature thereof must be maintained between 48° C and 58° C preferably at 52° C to 53° C.

As soon as the fibres have coagulated they are collected in a continuous ribbon and are conveyed, preferably under tension through a sodium chloride bath, to which aluminium salts can be added, preferably at a temperature of between 35° C and 50° C. The ribbon is then passed through a second bath containing aluminium salts and sodium chloride, with or without the addition of formaldehyde, preferably at a temperature of between 55° C and 65° C. When the fibres are hard, that is after a few minutes, they are cut to the desired length and dropped into a bath of aluminium salts and sodium chloride, with or without the addition of formaldehyde, preferably at a temperature of between 30° C and 40° C.

After several hours, the fibres are placed, preferably after treatment in a centrifuge, in a bath for rendering them insoluble consisting of formaldehyde, aluminium salts and sodium-chloride at a temperature exceeding 25° C, and preferably at 70° C. Alternatively the fibres are treated in the same bath at a low temperature and then they are washed in running water and treated, preferably after drying, in an aqueous bath of formaldehyde (in this case the addition of aluminium salts and sodium chloride to the bath is not indispensable) at a temperature exceeding 25° C and preferably at 70° C.

The fibres are finally treated with aqueous solutions of monosodic, bisodic or trisodic phosphate, then they are washed and dried.

In the case of manufacturing fibres of sole soya-casein the process followed is the same as in the example above specified.

The process can be modified in various ways without departing from the spirit of the invention.

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