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# ALIEN PROPERTY CUSTODIAN

## PROCESSES FOR THE 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.

In co-pending U. S. Patent Application Serial N. 96470 of 1936, processes are described and claimed by which a casein and a colloidal solution thereof may be produced from milk and by which the colloidal solution can be spun and coagulated in a manner which is suitable for use in the manufacture of artificial textile fibres. Coagulated fibres produced by these processes must be rendered insoluble and the present invention provides in a process for the manufacture of artificial textile fibres the step of rendering casein fibres insoluble by subjecting them to treatment in a solution of which formaldehyde forms the basic substance together with sodium chloride.

It is to be understood that, as described in the co-pending Patent Application, the term "casein fibres" refers to fibres made from casein solution alone or of a mixture thereof with cellulosic viscose.

It is known that casein is hardened by formaldehyde but the coagulated fibres contain a considerable percentage of water and other impurities which when immersed in solution of formaldehyde would cause the fibres to swell so that the fibres would partially dissolve before the formaldehyde could have rendered them insoluble. For this reason it has not been possible to obtain pliable and successful artificial textile fibres by known means. According to the present invention, however, the coagulated fibres are hardened in an aqueous solution of which formaldehyde forms the basic substance together with the addition of sodium chloride, which prevents further swelling of the fibres.

The fibres may be treated with solutions, of which formaldehyde forms the basic substance, with the addition of sodium chloride, and also aluminium salts, or an acid.

An aqueous solution of sodium chloride of less

than 10% exercises a swelling action on the casein fibres whilst a solution with more than 10% exercises an astringent action. It is therefore very useful to regulate the behaviour of the fibres in the bath which renders them insoluble by employing a convenient quantity of sodium chloride.

It is possible to operate with a solution having but one concentration only, for instance, with 90 parts of a 12% aqueous solution of sodium chloride and 10 parts of 40% formaldehyde, to which aluminium salts may be added or not. Examples of suitable aluminium salts are potassium alum, aluminium chloride and aluminium sulphate. It is preferable, however, and even very important, to operate with various solutions having progressively increasing concentrations, and to begin the treatment of the filaments with weak concentrations, for instance with 99 parts of 12% aqueous solution of sodium chloride and 1 part of 40% formaldehyde, gradually passing to higher concentrations. The procedure is the same when aluminium salts are added, but it is preferable not to reduce the sodium chloride concentration below 10% in order to avoid an excessive and undesirable swelling of the fibres.

The solution for rendering the filaments insoluble which are prepared in the manner described above may be slightly acidified, preferably with sulphuric acid.

According to a preferred embodiment of the present invention the fibres are rendered partially insoluble and are maintained under tension in an initial low concentration bath, in order to prevent shrinkage thereof, and subjected to further treatment in baths of higher concentration after being cut to a desired length in order to obtain a twisting thereof.

The fibres may also be rendered insoluble by treatment in an initial low concentration bath and by subsequent treatment in a series of baths of gradually increasing concentration.

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