

# ALIEN PROPERTY CUSTODIAN

## EMBODIMENT IN THE PROCESS FOR MANUFACTURING ARTIFICIAL TEXTILE FIBRES FROM ANIMAL CASEIN

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The present invention has for its object an embodiment in the process for manufacturing artificial textile fibres from animal casein.

The process according to the invention includes (1) spinning filaments from a solution of animal casein and coagulating the same, in acid baths (2) collecting the coagulated filaments in a continuous strip and passing the same, under tension, through baths containing soluble salts, the hardened filaments being then cut to the desired length and dropped into a bath of formaldehyde, to which soluble salts have been added.

The invention includes also (1) spinning filaments from a solution of animal casein and coagulating the same in acid baths (2) collecting the coagulated filaments in a continuous strip and passing them, under tension, firstly through a bath of sodium chloride and then through a bath of aluminium salts and sodium chloride and eventually formaldehyde, the hardened filaments, being then cut to the desired length and dropped into a bath of formaldehyde, to which aluminium salts and sodium chloride have been added.

A further characteristic of the invention consists in the provision that the filaments, when issued from the coagulating bath are stretched and passed under tension through the successive hardening baths until they are cut to the desired length.

The invention will be now explained with reference to the example of carrying out into practice.

The casein fibre bundles which emerge from the spinning nozzles are conveyed to the top of the spinning machine, thus forming a continuous band of fibres (for instance one hundred spinning nozzles having one thousand holes each are equal to a band of one hundred thousand continuous fibres). This band is conveyed, under tension, first through a sodium chloride bath preferably in opposite direction to remove from the fibres, when desired all or part of the acid and the salts which are carried from the preceding coagulation bath; then the continuous band of fibres is conveyed, still under tension, through the preparatory bath for rendering the fibres insoluble, which is composed of sodium chloride and aluminium salts, together with or without the addition of formaldehyde, and when the fibres are sufficiently washed and subsequently hardened, the band is passed through an automatic cutter, which cuts the fibres to the desired length. The cut fibres, as

stated above, must be collected in a bath of sodium chloride or of other salts of alkaline metals or of alkaline earth metals, together with or without the addition of the aluminium salts and formaldehyde, but preferably in a bath for rendering them insoluble which is composed of an aqueous solution of sodium chloride, aluminium salts and formaldehyde.

The sodium chloride in the initial immersion bath may be replaced by other soluble salts of alkaline metals or of alkaline earth metals, but, in addition to the increased cost, the resultant product is not so good. Moreover by the use of a sodium chloride bath, this salt is conveyed by the fibre whose presence in the subsequent bath for rendering the fibres insoluble, is very useful and indeed almost indispensable.

The first immersion bath, for eliminating the acid and the sodium sulphate or other salts conveyed with the fibres from the coagulating bath, could also be omitted, when the said is immediately immersed in the preparatory bath for rendering the fibres insoluble composed of aluminium salts and sodium chloride or even directly into the complete bath for rendering the fibres insoluble composed of formaldehyde, aluminium salts and sodium chloride or of other soluble salts.

The band, which passes through the bath at the same speed as it is spun (60 to 80 metres per minute) may be continuously immersed in the above described baths, but it is also possible to immerse the said band intermittently, for example, at points located one metre apart, making it move upwards and downwards and vice versa so as to enter the bath even over a distance of 10 to 15 centimetres only of its travel, with a distance of one metre between successive immersion.

In this passage of the band of fibres through the above described baths it is important that the band be under tension when passing through the bath, namely that it cannot shrink for the action of the baths.

It is also important that the temperatures of the baths conveniently chosen.

The continuous or the intermittent immersing operation of the band is effected in less than five minutes (in conformity with the spinning velocity); the fibres are sufficiently hard to prevent adhering together (even when coagulation baths of low concentration are employed). The fibres could be cut to the desired lengths immediately and only shrink in so far as the best twist is to be obtained. If, however, a greater

twist is required, to the detriment of the fineness of the fibres, the passage of the band through the baths may be effected without maintaining it under tension.

By the above described treatment short fibres can also be derived from the casein which are finer than those which can be obtained during spinning. For instance, when the spinning operation is regulated so as to obtain a fibre the count of which is three denier and it is not possible to spin a finer number, the band of fibres should be drawn in one or more times with a speed which is 50% higher than that of the spinning velocity, and the count which during the spinning was three denier will be reduced to two denier. But when the band is then immediately cut, the fibres will shrink to a point at which the count has returned to three denier; instead, when the said band is made to pass through the above described baths, under tension and at the prescribed temperature the fibres will maintain the count of two denier.

In view of the fact that the price of wool increases as the count increases it will readily be appreciated that it is of considerable importance to be able to obtain a higher count without any increase in cost.

In order to avoid deterioration of the casein fibres when they are just coagulated, they should not be rendered insoluble in aqueous solutions which contain more or less high percentages of formaldehyde alone, but other salts such as sodium chloride and aluminium salts should be added to the aqueous solutions of formaldehyde.

The further particulars of the manufacture process of the textile fibres of casein may be modified in various ways without departing from the spirit of the invention.

The invention can also be applied to the manufacture of mixed fibres of casein and cellulose.

Of course the invention also covers the textile fibres of casein obtained by the indicated process.

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