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# ALIEN PROPERTY CUSTODIAN

## PROCESS FOR MAKING ARTIFICIAL TEXTILE FIBRES RESISTANT TO DAMP HEAT AND TO HOT DYEING

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It is common knowledge that the textile fibres obtained by spinning, whipping and other similar methods of treating caseins, gelatines and other materials, artificially insolubilized or hardened (as for example those known as "lanital"), are little able to stand damp heat, so that it is almost impossible to dye and boil them as is done with wool and the like.

Dyeing operations, because of the damp heat involved, greatly alters such fibres so that the weight and tensile strength are diminished with consequent considerable waste in spinning.

Certain of these fibres change at ordinary temperatures when wetted, becoming gelatinous, soft and losing, in a word, their best properties; if subjected to boiling and hot dyeing they undergo profound changes, sometimes even to being rendered completely unserviceable in the bath.

The present invention relates to a treatment for considerably increasing the resistance of these artificial fibres, particularly those known as "lanital," and making them suitable for hot dyeing.

The applicant's studies and researches have led to the discovery that by preliminarily treating these fibres with basified metallic salts (especially salts of chromium); with soluble salts; with synthetic tannins (for example sulphonic derivatives of cresols, xilolo, etc. with formaldehyde, in which the sulphonic groups are combined with aluminium, chromium and other metals); with natural tannins (vegetable) alone or treated with metallic salts; or with mixtures of the aforementioned products, mixed together or with other substances having insolubilizing, tanning or polymerizing properties; the said fibres become considerably stronger and resistant to high damp temperatures and are therefore able to stand hot dyeing even up to boiling point.

Fibres treated in the above described way acquire a high degree of physical, chemical and mechanical resistance, really equal to that of natural wool and this particularly with regard to weight, resistance to tearing and weaving qualities.

Up to now it has been found, in practice, that the best results in increasing the resistance of such fibres are obtained by treating them with with polymerizable substances or having polymerizing properties.

Amongst these substances it has been found that urea gives excellent results, due to the fact that:

1. This substance polymerizes easily under the action of the small quantities of formaldehyde present in the fibre (either free or added) as a consequence of the preliminary production process to which they have been subjected.

2. The products of condensation and polymerization of pure urea are colourless and consequently their presence in and on the fibre treated does not alter the colouring, thus permitting all shades of dyeing, even in the lightest tints.

3. The properties of resistance and elasticity conferred on fibre treated with urea are excellent.

The treatment is made with a cold or warm solution of urea, according to the properties it is desired to confer on the fibre, and to this end other products, such as acids or basics, or acid or basic salts may be added to the urea.

An excellent result is obtained, for instance, by subjecting the "lanital" to protracted boiling for about half an hour in a 1 to 5% solution of urea.

The urea of the bath, in contact with the formic aldehyde contained in the fibre, either in free or added (residue of the manufacturing process or eventually added by a preliminary treatment), condenses on and in the fibre, increasing its resistance and elasticity and also exercising on the fibre a tanning action, i. e. an action similar to that exercised by tannin on gelatine, keratine and similar materials.

Naturally the duration of the urea bath and its strength may vary within wide limits, according to the kind of fibre being treated, or according to the results it is desired to obtain. The temperature of the bath may also vary between cold and ebullition.

In industrial practice the urea treatment may be made at any stage of the manufacturing process.

For instance, it is possible to add urea to the initial product (casein, gelatine, keratine, etc.) before coagulation or drawing, so that the fibre is formed ready impregnated with urea which reacts, together with the basic product, with the formaldehyde of the coagulating bath. Evidently, in the above described process, urea may be replaced by another substance of similar effect; in particular those capable of giving condensation products or of addition to the formaldehyde of the coagulation bath or with the other substances which may be present during the process of manufacture of the artificial fibres.

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