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FELTING PROPERTY OF DYED SHODDY

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My invention relates to a process for an improvement in the felting property of dyed shoddy by subjecting the shoddy to a treatment with acid and at the same time oxidising carrots, particularly carrots containing nitric acid and oxidising agents such as cerium nitrate, alkali tungstenate, ferric nitrate or hydrogen peroxide in aqueous solutions.

Dyed shoddy, especially when dyed with acid or substantive dyestuffs, show a bad, sometimes even very bad felting property. Thorough investigations have shown that the felting property of such shoddy may be improved considerably by subjecting it to a carroting treatment with acid and at the same time oxidising substances.

In carrying out my invention carrots have proved suitable which contain nitric acid and oxidising agents acting also as oxidation catalysts such as cerium nitrate, alkali tungstenate, ferric nitrate or, if desired or necessary, also other oxidising agents, for instance, hydrogen peroxide in aqueous solutions.

The acid concentration of the carrots is rated in such manner that the pH value of the carroted shoddy lies between about 2.1 and 2.7, preferably between about 2.1 and 2.5.

It was already known to carot crude wool with acid solutions containing oxidising substances to attain a proteolytic splitting up which improves the felting property of the wool. It was impossible to foresee that the treatment of dyed shoddy with such carrots would yield to an improvement with respect to the felting property of such material since the shoddy has formerly already been subjected to a proteolytic splitting up, for instance, by dyeing, wet dyeing or the like. Moreover, considerable competent objections have been raised against the carroting of dyed shoddy as this material has been subjected to a heavy damage caused by the dyeing, use and tearing and would therefore not be able to stand also a further carroting process.

Now it was surprisingly found that dyed shoddy which according to my invention has been treated with acid oxidising carrots has a substantially improved felting property and results in thicker felts with remarkably improved qualities, especially increased mechanical strength, particularly tensile strength. The surprising effect of the carroting is obviously due to the fact

that the peptide groups—CO—NH—contained in the wool fibres are split up by the carroting action and liberate basic amino groups which favor the plastic swelling in the felting process. Consequently the carroting has to be carried out in such manner that the peptide groups are split up sufficiently or nearly sufficiently in order to obtain products the pH value of which lies in the above mentioned area. Experiments have shown that ready carroted shoddy with a pH value below or even far below 2.1 undergoes a harmful influence in view to its tensile strength, whilst products with a pH value above 2.7 show an insufficient carroting effect.

Should the thus treated shoddy show a pH value just above 2.7, it may be adjusted to a pH of 2.3 by an after treatment with acid substances, for instance, by spraying with warm sulfuric acid solutions.

The carroting process may be carried out according to the known methods, for instance, in such manner that the shoddy is immersed in the aqueous carrot or sprayed with it whereby the excess of the carroting liquid is removed by centrifuging or squeezing. According to my invention the shoddy may also be treated by spraying with a definite quantity of carrot only without subsequent squeezing or centrifuging. I have found that rinsing decreases or even eliminates the carroting effect and should therefore be strictly avoided.

The carroted material is allowed to stand for about two hours at ordinary temperature. The subsequent drying is carried out expediently at moderately elevated temperatures, for instance, at about 50°–60° C.

The carroted shoddy may be mixed with other fibrous materials, for instance, not carroted undyed wool or with carroted hairs and then felted or fulled. The carroting of the shoddy may be carried out also in mixture with other fibrous materials. This may be done, for instance, by subjecting mixtures of shoddy and coarse undyed wool to a carroting process and working up of the carroted mixtures as usual. The felting and fulling is advantageously carried out in an acid area.

The definition of the pH value of the carroted shoddy may be ascertained as follows:

1 g of an average sample is extracted with 30 cc of distilled water during one hour on the water

bath and the pH value of the clear liquid determined according to the known methods. As a state of equilibrium will be obtained during the extraction process, the pH value of the clear liquid corresponds exactly to that of the carroted shoddy.

Example 1

Dyed shoddy is immersed and homogeneously soaked in an aqueous solution containing 5% hydrogen peroxide (40 Vol. %), 0.5% cerium nitrate and 3% nitric acid (65%) whereafter the excessive liquid is removed by centrifuging. The good is then allowed to stand for a time of about 2 hours at ordinary temperature and is subsequently dried at a temperature of about 50-60° C. The carroted shoddy is mixed with other fibre material, for instance with uncarroted and undyed wool

and felted and fulled in an acid area according to known methods. The thus obtained felts are especially suited in the manufacture of hats.

Example 2

5 Dyed shoddy is sprayed with an aqueous solution consisting of 7% hydrogen peroxide (40 Vol. %), 1.5% ferric nitrate and 5% nitric acid (65%). The excess liquid is eliminated by squeezing and then the good is allowed to stand for nearly two hours at ordinary temperature and afterwards dried at a temperature of about 50-60° C. The thus treated shoddy may be mixed with other fibres and worked up as mixed material. The felting and fulling is preferably carried out in an acid area.

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