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PROCESS OF MATTING TEXTILE MATERIALS

Albert Landolt, Riehen, and Hans Benz, Basel, Switzerland, assignors to the firm of Society of Chemical Industry in Basle, Basel, Switzerland

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1 Claim. (Cl. 8—135)

In the specifications of U. S. Patent No. 2,145,-011 and of application Serial No. 271,392, filed May 2, 1939, there is described a process of matting textile materials, especially those consisting of regenerated cellulose or cellulose esters or ethers by treating the material in a matting bath containing urea and formaldehyde or a soluble urea-formaldehyde compound, for instance mono- or dimethylolurea.

The process of the said specifications consists in adding to the matting bath a condensing agent (acid) and by suitable choice of temperature, concentration and liquor ratio, bringing about a precipitation of the condensation product produced by the action of the condensing agent in a pigment-like form on the fibre.

The present invention relates to the performance of the process in a continuously operating or standing bath, that is to say, that the bath is used repeatedly and the fresh reagents are added to keep up the concentration. The urea and formaldehyde or the water-soluble condensation product from urea and formaldehyde is added to the bath with the addition of so much acid that the bath has a feeble but pronounced reaction to Congo. Under such conditions there is immediately formed in the bath a water-soluble urea-formaldehyde compound, for instance mono- or dimethylolurea which under the influence of the acid is gradually transformed further into a water-insoluble pigment-like compound. As to the proportion of acid required the essential factor to be considered is the hydrogen ion concentration. The latter may vary according to the concentration of the soluble urea compound, namely the higher the concentration of the urea-formaldehyde compound, the lower the hydrogen-ion concentration should be.

In baths which are constituted in this manner the material is treated only until it has attained the desired degree of matting. When this has happened the batch is removed and a new batch matted, the matting bath receiving a fresh quantity of urea and formaldehyde or of a soluble urea-formaldehyde compound and if necessary acid.

As regards the liquor ratio, the operation may be conducted with a long or short liquor ratio accordingly as the dimensions of the machine permit. An advantage of the invention however is that a long liquor ratio is commercially possible. Thus for instance the operation may be performed with a liquor ratio of 1:10, but it is of value as stated that the operation can be conducted at liquor ratios of at least 1:15 for example 1:20, 1:30, 1:40 or even 1:80. As to the duration of the matting operation this depends especially on the concentration of the urea-formaldehyde compound. For example the same degree of matting is obtained with a liquor ratio of 1:30 at a concentration of 5.5 grams of monomethylolurea per litre in a period of one hour as is obtained with only 4.3 grams of monomethylolurea during 3 hours of matting operation and at a temperature of 20° C. It is generally advantageous to operate the temperature below 40° C. advantageously at room temperature, that is to say at 10–25° C. However matting proceeds best at about 20° C. and requires a somewhat longer period at a higher or lower temperature than this.

If for any reason the matting process is to be interrupted, the matting bath is brought to neutrality by an addition of alkali. When the matting is to be restarted the bath receives the necessary proportion of acid before the operation begins.

The invention is applicable to both the dyed and undyed materials. The dyeing may follow the matting operation. For producing a given matting effect the duration of the matting process must be adjusted in accordance with the various factors indicated above. Thus the user is able by increasing or diminishing the concentration of the matting agent or the acid or by lengthening or shortening the bath to accelerate or retard the matting operation.

The following examples illustrate the invention:

Example 1

4 kilos of dimethylolurea are dissolved in 50 litres of water at 70° C. The liquor is then cooled to 20° C. and made up to 200 litres by addition of water at the same temperature. 10 kilos of viscose artificial silk in hank form are reeled in this bath for 15 minutes and there are then added 3.2 litres of hydrochloric acid of 36 per cent strength. The artificial silk which has been thus treated for 2 hours has a good matting fast to washing.

There is then added to the bath 1 kilo of dissolved dimethylolurea, 10 kilos of viscose artificial silk are entered and the reeling is repeated for 2 hours. The material then shows a strong matting fast to washing. For further batches of artificial silk to be matted the same addition of dimethylolurea is made and if necessary further acid is added.

Example 2

1 kilo of viscose artificial silk is reeled during 1 hour at 20° C. in 80 litres of liquor containing 0.32 kilo of urea, 0.48 litre of a formaldehyde solution containing 360 grams of formaldehyde per litre and 1.28 litres of hydrochloric acid of 36 per cent strength. The artificial silk thus treated is strongly matted. For further matting in the same bath the liquor receives 0.1 kilo of urea and 0.16 litre of formaldehyde solution, whereupon it is ready for similarly matting a further 1 kilo of the viscose artificial silk.

Example 3

10 kilos of viscose artificial silk tricot are matted at 20° C. in 100 litres of liquor containing per litre 10 grams of monomethylolurea and 10 cc. of hydrochloric acid of 36 per cent strength After reeling for 1 hour the goods are rinsed and dried, whereupon the artificial silk is found to have a strong matting effect. For the next batch of tricot there is added to the liquor per litre 6 grams of monomethylolurea and 2 cc. of hydrochloric acid of 36 per cent strength. If instead of 10 grams of monomethylolurea per litre only 5 grams are used, the matting effect is weaker.

Example 4

10 kilos of viscose artificial silk crepe are reeled at 20° C. in 400 litres of liquor containing per litre 3.5 grams of monomethylolurea and 20 cc. of hydrochloric acid of 36 per cent strength. After matting has continued for 1 hour the goods are rinsed, neutralized and dried, whereupon they are found to have a matting of medium strength. Before starting to mat the next batch of viscose artificial silk crepe there are added to the bath per litre 1.5 grams of monomethylolurea and 1 cc. of hydrochloric acid of 36 per cent strength and the operation is renewed in the manner described above. If instead of 3.5 grams of monomethylolurea per litre there are used 5 grams of monomethylolurea a stronger matting effect is obtained.

What we claim is:

In the process of matting textiles which comprises handling the textiles in a bath containing a member of the group consisting of (*a*) urea and formaldehyde and (*b*) a water-soluble urea-formaldehyde compound under conditions whereby a water-insoluble urea-formaldehyde condensation is formed and is adsorbed by the textiles to be matted, the steps of repeatedly adding fresh reagents to the treating bath as the old reagents are consumed in order to maintain the proper concentration thereof, and repeatedly subjecting fresh textiles to matting in the replenished treating bath, the said bath having a liquor ratio of at least 1:15 and a hydrogen ion concentration corresponding to that of a solution of at least 2 cc. per liter of hydrochloric acid of 36 per cent strength.

ALBERT LANDOLT.
HANS BENZ.