

UNITED STATES PATENT OFFICE

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DYEING

No Drawing. Application filed June 21, 1928, Serial No. 287,351, and in Great Britain June 24, 1927.

This invention relates to an improvement in the art of dyeing. The invention consists in the various improvements hereafter described and claimed. According to the present invention in its preferred form, I first impregnate textile yarns or fabrics or other materials such as furs, wool or leather with a soluble condensation product of urea or preferably thio-urea with formaldehyde, hereafter termed semi-condensate, and I then treat the impregnated material by dyeing or printing.

dyes from a bath containing a plurality of dyes.

Its affinity for various dyestuffs and colours, etc., furnishes an aid to securing level dyeing, and of reducing the time required for dyeing processes.

The following are illustrative examples:—

(a) Of two pieces of plain cotton cloth in the grey, one is uniformly impregnated with semi-condensate and dried out, the other is left untreated; both are simultaneously immersed in a dye-bath of a suitable direct violet dyestuff and dyed; on simultaneous withdrawal of the cloths, the impregnated cloth will be found to have abstracted much more of the dye than the untreated cloth and to be of a deeper shade of heliotrope.

(b) A plain cotton cloth in the grey is pattern printed with semi-condensate, dried out and dyed in the same bath as in (a); on withdrawal, the pattern will be presented in a deeper shade of heliotrope than the ground.

(c) A similar cotton cloth is similarly pattern printed, dried out and dyed in a bath of direct brown M (colour index No. 420); on withdrawal, the pattern will be presented faintly tinged with colour on a deeper coloured ground.

(d) A similar cotton cloth is similarly pattern printed, dried out and dyed in a bath of a suitable basic blue dyestuff; on withdrawal, the pattern will be presented faintly tinged with colour on a deeper coloured ground.

The colours of the dyed fabric may be varied by substituting coloured condensate for clear and semi-condensate, when, in consequence of the semi-condensate abstracting additional colour from the dye-bath, the final colour of the semi-condensate may be altered.

Impregnated material may also be printed with suitable dyes either in self-colour, or single and multi-colour patterns.

After dyeing or printing, the fabric may be treated in accustomed manner.

I am aware that it has been proposed to dye or print fabrics with mixtures of phenol formaldehyde condensation product and

The semi-condensate may be prepared by known processes, such as those for the manufacture of condensation products to the stage preceding gelatinization described in British Patents (Pollak) #157,416, #171,094, #181,014, #187,605, #193,420, #201,906, #206,512, #213,567 and #248,729.

The semi-condensate is employed in the state of dilution suitable for the particular purposes intended, as for example where a slight effect is required, 2½% by weight of condensate in water.

The semi-condensate may be employed either coloured (by means of dyes, etc.) or clear.

The material to be dyed may be impregnated with the semi-condensate uniformly or superficially to produce ingrain and all-over effects, or may be impregnated to produce pattern effects.

The impregnated material may be dyed before or after drying out the semi-condensate, but preferably drying precedes dyeing and/or printing so as to cause further condensation of the semi-condensate and thus to convert it into an insoluble condensate in known manner.

It is found that according to the dyestuffs and colours, mordants and the like used, and the nature of the fibres of the impregnated material, such material exhibits various affinities and resistances and degrees of affinity and resistance for the dyestuffs, colours, etc., e. g. the semi-condensate may act as an activator of absorption, as a resist, or it may selectively absorb this or that element of a dye or mordant, or one or more

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I declare that what I claim is:—

1. The process of colouring material which consists in applying thereto in selected areas a soluble semi-condensate of thio-urea with
5 formaldehyde and then applying a dyestuff thereto.

2. The process of colouring material which consists in applying thereto a soluble semi-condensate of thio-urea and formaldehyde,
10 rendering said condensate insoluble and applying a dyestuff to the material.

3. The process of colouring material which consists in applying thereto in selected areas a soluble semi-condensate produced by reacting one of the group consisting of urea and
15 thio-urea with formaldehyde and then applying a dyestuff thereto.

4. The process of colouring material which consists in applying thereto a soluble semi-condensate produced by reacting one of the
20 group consisting of urea and thio-urea and formaldehyde, making said condensate insoluble and applying a dyestuff to the material.

25 In witness whereof, I have hereunto signed my name this 11th day of June, 1928.

GEORGE SPENCER.

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