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TEXTILE PRINTING PROCESS

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This invention relates to a resist printing process and more particularly to an improved process for producing resist styles under vat ground colors.

It is an object of this invention to produce clear white illumination designs on a vat color ground, which white illuminations are further distinguished by their excellent "handle" and freedom from the harshness usually associated with the production of resist effects. It is a further object of this invention to produce vat color illuminations on vat color grounds that are distinguished by their purity of tone, clarity of outline and excellent "handle." Other objects will appear hereinafter.

These objects are accomplished by printing a design on a textile fabric with an emulsion containing wax and a hydrolyzable aluminum salt, and drying the printed fabric on hot cans as rapidly as possible. The maximum resist action is attained only by a sharp drying of the printed design. This treatment endows the printed design with a temporary water repellency which enables the fabric to be safely dyed with a vat color either by the normal reduction vat with sodium hydrosulfite and caustic or with a water soluble leuco sulfuric ester of a vat color to give a clear white illumination on a vat color ground. If a colored illumination design is desired, the emulsion containing wax and an aluminum salt is mixed with a vat color to be applied by the usual potash-sulfoxylate method, printed, dried sharply as before, aged for 5 to 10 minutes in a vat color ager, dyed with a water soluble leuco sulfuric ester of a vat color using the standard nitrite process, the excess dye liquor squeezed out, and the illumination and ground color oxidized in a solution of sodium bichromate just acid with sulfuric acid, giving an unstained vat color illumination on a vat color ground.

The above described processes give illumination designs which are superior to the usual resists since cleaner and more complete resist action is attained and any harsh feel of the printed fabric or tendering of the cloth is avoided.

Other auxiliary agents commonly used in resist printing such as glue, casein and albumen may be used in conjunction with the emulsion containing wax and an aluminum salt. These

auxiliary agents serve chiefly to give additional body to the printing pastes used.

The following examples illustrate but do not limit the invention. All parts are given by weight.

Example I

An emulsion containing wax and an aluminum salt is prepared containing the following materials:

	Parts
Asiatic wax	12.5
White paraffin oil	12.5
Glue (10%)	10.0
Aluminum acetate	4.8
Water	60.2

Asiatic wax is a hard paraffin wax melting at 142–145° F.

The above emulsion is printed on a textile fabric by means of a suitably engraved printing roll, and the printed on design fixed by drying the cloth over hot dry cans for 2 minutes. The printed cloth is then dyed in a 2% solution of the water-soluble leuco sulfuric ester of dimethoxydibenzanthrone (Colour Index No. 1101) containing 2% of sodium nitrite; the excess dye liquor is removed by passing the fabric through a wringer or "squeeze" roll, and the color developed in a bath containing ½% of sulfuric acid at 160–180° F. The fabric is then rinsed and soaked in the usual manner giving a sharp white illumination on a bright green ground. This illumination is free from the objectionable harsh feel or stiffening ordinarily met with in resist prints.

Example II

25 parts of the emulsion containing wax and an aluminum salt which is described in Example I is mixed with 15 parts of water and 60 parts of gum tragacanth (6%) thickener. The paste thus prepared is printed on a textile fabric, and the printed fabric is dried over hot cans, and dyed with a 0.5% solution of 5:7:5':7'-tetrabromindigotin (Colour Index No. 1184) vatted in the usual manner with sodium hydrosulfite and sodium hydroxide. The excess dye liquor is removed by passing the fabric through a "squeeze" roll, and the color developed by oxidation in cold running water. The printed and dyed fabric is then soaped in the usual manner giving a sharp white illumination design on a bright blue ground.

Example III

When aluminum formate is substituted for aluminum acetate in the formulation of the wax emulsion described in Example I and the directions given in Example I are otherwise followed, it is found that a sharp, white illumination on a bright green ground is also obtained.

Example IV

An emulsion containing wax and aluminum acetate is prepared as follows: 33.4 parts of Asiatic wax is melted with 0.18 part of the diethylcyclohexylamine salt of technical lauryl sulfate. This molten mixture at 80-90° C. is poured slowly into an aqueous phase, also at 80-90° C., which contains 152.2 parts of water, 2.6 parts of deacetylated chitin, 6 parts of glacial acetic acid and 6 parts of aluminum triacetate. This aqueous phase is prepared by mixing a solution containing 2.6 parts of deacetylated chitin and 0.8 part of glacial acetic acid in 96.6 parts of water with 37 parts of water and 30 parts of an aluminum acetate solution containing 20% of aluminum triacetate and 17.5% of free acetic acid. The resulting emulsion is passed thru a colloid mill or homogenizer.

A printing paste is prepared by mixing 10 parts of a 10% paste of 6:6'-diethoxy-2:2'-bis-thio-naphthen-indigo (Colour Index No. 1217), 8 parts of sodium formaldehyde sulfoxylate, 13 parts of potassium carbonate, 45 parts of textile printing gum thickener, 15 parts of the emulsion containing wax and aluminum acetate which is described in the preceding paragraph, and 9 parts of water.

The above printing paste is printed on a textile fabric, the printed fabric dried sharply over hot dry cans, then aged for 5 minutes in a vat color ager and dyed in a 0.5% solution of the water-soluble leuco sulfuric ester of dimethoxy-dibenzanthrone (Colour Index No. 1101) containing 1% of sodium nitrite. After the excess dye liquor is removed by a "squeeze" roll the printed and dyed fabric is oxidized in a bath at 140-150° F. containing ½% of sodium bichromate and ¼% of sulfuric acid to give a sharp, bright, unstained orange design on a green background.

Example V

An emulsion is prepared as in Example I using paraffin wax in place of Asiatic wax. A fabric is printed with this emulsion and then dried and dyed as in Example I. A sharp white illumination on a bright green ground is thus obtained.

Example VI

An emulsion is prepared from the following materials:

	Parts
Paraffin wax.....	12.5
White paraffin oil.....	12.5
Aluminum formate.....	4.5
5 Water.....	70.5
	100.0

A textile fabric is printed with this emulsion and then dried and dyed as in Example I giving a sharp white illumination on a green ground.

Resort may be had to such modifications and variations as fall within the spirit and scope of the appended claims.

I claim:

1. A process for the production of resist designs under vat color dyeings which comprises printing a textile fabric with an emulsion containing wax and a hydrolyzable aluminum salt, drying the printed fabric to obtain a temporary water repellency in the printed portions of the fabric, and then dyeing the printed fabric with a vat dyestuff to provide a ground color.

2. A process for the production of resist designs under vat color dyeings which comprises printing a textile fabric with an emulsion containing wax and a hydrolyzable aluminum salt of a monocarboxylic fatty acid containing not more than two carbon atoms, drying the printed fabric to obtain a temporary water repellency in the printed portions of the fabric, and then dyeing the printed fabric with a vat dyestuff to provide a ground color.

3. A process of printing textile fabrics in resist styles to produce colored patterns on a differently colored ground which comprises applying to the textile fabric a resist printing paste containing a vat dyestuff, wax and a hydrolyzable aluminum salt, drying the printed fabric to obtain a temporary water repellency in the printed portions of the fabric, dyeing the printed fabric with another vat dyestuff to provide a ground color, and then developing the design and ground colors.

4. A process for the production of resist effects illuminated with vat dyestuffs on textile fabrics which comprises applying to the fabric a vat dyestuff printing paste containing wax and a hydrolyzable aluminum salt of a monocarboxylic fatty acid containing not more than two carbon atoms, drying the printed fabric to obtain a temporary water repellency in the printed portions of the fabric, dyeing the printed fabric with a soluble leuco sulfuric ester of a vat dyestuff to provide the ground color, and then developing the ground and illumination colors.

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