

UNITED STATES PATENT OFFICE

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PROCESS FOR IMPROVING THE DYEINGS
AND PRINTS PREPARED WITH WATER-
SOLUBLE DYESTUFFS

Albert Landolt, Riehen, and Andreas Rupertl,
Arlesheim, Switzerland, assignors, by mesne as-
signments, to the firm Ciba Products Corpora-
tion, Dover, Del.

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5 Claims. (Cl. 8-74)

This application is a division of our application
for Letters Patent Ser. No. 299,390, filed October
13, 1939.

It is known that the wet-fastnesses of dyeings
and prints, which have been prepared with the
help of water-soluble dyestuffs, may be increased
by aftertreatment with high-molecular organic
compounds, if necessary in the form of their salts.
As high-molecular compounds come inter alia in
question those which are prepared by condensa-
tion of formaldehyde with compounds containing
nitrogen. The latter may be capable or incapable
of being hardened.

Among the high-molecular formaldehyde con-
densation products may be mentioned such as
are derived from formaldehyde and nitrogen-
containing compounds such as melamine, guan-
idine, guanyl urea, urea, dicyandiamide, etc. In
this connection, compare U. S. patent specifica-
tions Nos. 2,093,651, 2,169,546 and 2,106,938.

Among the condensation products containing
nitrogen, those are particularly valuable which
are obtained by the condensation of formalde-
hyde with compounds which contain at least once
the group



Such products are, for example, melamine, guan-
idine, guanyl urea, dicyandiamide, already men-
tioned.

This aftertreatment may consist of a simple
wet treatment in baths which contain the prod-
ucts concerned. It may also consist of a wet
treatment combined with a subsequent dry treat-
ment at raised temperature, if formaldehyde-
condensation products which are capable of being
hardened are used as high-molecular organic bas-
ic compounds, whereby the fastness to wet
treatment, in particular the fastness to washing,
as a rule is still further improved. In both cases,
however, the fastness to light may be unfavour-
ably influenced.

It has now been found that this disadvantage
may be eliminated if an aftertreatment with cop-
per salts is combined with the aftertreatment
with the aqueous solution of the high-molecular
condensation products from formaldehyde and
nitrogen-containing compounds. These combin-
ed treatments can be carried out one after
the other in any desired order; it is however,
preferable to unite them, so that the dyeings
and the prints are treated at the same time with
the organic and the copper compounds, for exam-

ple, with baths which contain copper salts in
addition to salts of high-molecular organic basic
compounds: if required, the dry treatment at
raised temperatures may also hereupon take
place.

As suitable copper salts, copper sulphate, cop-
per nitrate, copper chloride, copper acetate, etc.,
may be mentioned.

Example 1

A cotton or linen fabric is dyed on the jig with
3% Direct Sky Blue GS (Schultz, No. 510), rinsed
and squeezed or hydro-extracted. The still moist
material is padded on the mangle at room tem-
perature through a solution containing per litre

30 gms. of a hydrophobic melamine-formaldehyde
condensation product (obtained from 1 mol
melamine and 6 mols formaldehyde), soluble
in water in the ratio of 1:1,

10 ccm. formic acid 85% and
1 to 5 gms. copper chloride, or the equivalent
quantity of another copper salt, such as copper
formate or copper acetate. After drying, the
fabric is subjected to a hardening treatment
over heated cylinders for ½ minute at 130° C.
The treated dyeing possesses very good fastness
to light in addition to exceptional fastness to
water and perspiration. By subsequent wash-
ing with soap and soda, the fastness to light is
not decreased, so that here a permanent im-
provement in this property is concerned.

In place of Direct Sky Blue GS, many other
dyestuffs may be used, giving the same result.
Among these may be mentioned Direct Blue RW
(Schultz No. 507), Direct Brown M (Schultz No.
412), Chlorantine Fast Brown BRLL (Schultz
vol. 2, page 48), Chlorantine Fast Violet 2RLL,
Chlorantine Fast Yellow 4GLL, Chlorantine Fast
Orange T5RLL, Chlorantine Fast Grey 2BLL (all
Schultz, supp. vol. 1, page 79).

Example 2

A material composed of 70% wool and 30%
viscose-rayon staple fibre is dyed by known meth-
ods with 4% Chlorantine Brown BRLL (Schultz,
supp. vol. 1, page 79) rinsed, hydro-extracted,
and impregnated at room temperature with a
solution containing per litre

30 parts by weight of a dicyandiamide-formalde-
hyde condensation product, obtained by con-
densation of 2 mols dicyandiamide with 3 mols
commercial formaldehyde
15 parts by weight of formic acid 85% and
5 parts by weight of copper chloride,

after which it is dried without rinsing and hardened for 1 hour at 90° C. A dyeing possessing good fastness properties is obtained.

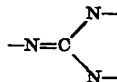
Example 3

A dyeing of Chlorantine Fast Orange TGLL on cotton material is impregnated with a solution containing per 100 parts water, 16 parts dimethylol-urea, 1 part ammonium phosphate, and 1 part copper chloride (the parts being by weight) and is then dried at 110° C., whereby the fastness of the dyeing to wet treatments is increased by the high-molecular compound formed. When the thus aftertreated dyeing is exposed to light, it exhibits a better fastness to light than a dyeing aftertreated in the same manner but with exclusion of the copper salt.

A similar result is obtained when Chlorantine Fast Orange TGLL is replaced by Chlorantine Fast Bordeaux B or by Chlorantine Fast Blue 3RLI.

What we claim is:

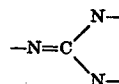
1. Improvement in the process of increasing the fastness properties of dyeings and prints, which have been obtained by means of a water-soluble dyestuff and aftertreatment with a high-molecular organic compound, produced by condensation of formaldehyde with a compound containing at least once the group



consisting in combining the aftertreatment with a simultaneous treatment with a solution of a copper compound in the same bath.

2. Improvement in the process of increasing the fastness properties of dyeings and prints, which have been obtained by means of a water-soluble dyestuff and aftertreatment with a high-molecular organic compound, produced by the condensation of formaldehyde with melamine, consisting in combining the aftertreatment with a simultaneous treatment with a solution of a copper compound in the same bath.

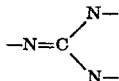
3. Improvement in the process of increasing the fastness properties of dyeings and prints, which have been obtained by means of a water-soluble dyestuff and aftertreatment with a high-molecular organic compound, produced by condensation of formaldehyde with a compound containing at least once the group



consisting in combining the aftertreatment with a simultaneous treatment with a solution of copper compound in the same bath, and then subjecting the material thus treated to a dry treatment at raised temperature.

4. Improvement in the process of increasing the fastness properties of dyeings and prints, which have been obtained by means of a water-soluble dyestuffs and aftertreatment with a high-molecular organic compound, produced by the condensation of formaldehyde with melamine, consisting in combining the aftertreatment with a simultaneous treatment with a solution of a copper compound in the same bath, and then subjecting the material thus treated to a dry treatment at raised temperature.

5. A textile colored with a water-soluble dyestuff and aftertreated simultaneously with a high-molecular organic compound, produced by condensation of formaldehyde with a compound containing at least once the group



and with a solution of a copper compound, the wet-fastness of the aftertreated textile being superior and the light fastness thereof being of a magnitude at least equal to that of the untreated colored textile.

ALBERT LANDOLT.
ANDREAS RUPERTI.