

UNITED STATES PATENT OFFICE

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PROCESS FOR THE PRODUCTION OF COLORED DISCHARGE EFFECTS

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Many dyestuffs which are used in hydrosulphite discharge printing for colored effects show the drawback that after steaming their original dye tone only comes back slowly and not sufficiently deep.

This may be due to the fact that the dyestuff, which is reduced by the hydrosulphite during the steaming, is only incompletely reformed on the fibre, perhaps owing to its not being absolutely fast to hydrosulphite and its being partially destroyed.

With a view to completely develop a dyestuff which is not completely developed, i. e. to oxide any available leuco compound on the fibre, it is often suggested to submit the material, after the steaming, to an after-treatment in an oxidizing bath containing bichromate of soda or hydrogen peroxide, etc.

Such an aftertreatment is not sufficient in every case and is not applicable to all fibres. Many tones suffer for instance from a treatment with bichromate. Such a treatment is also complicated and costly.

It has now been found that deep effects can be obtained in the direct way by adding to the discharge color a suitable oxidizing agent, such as for instance chlorate (chlorate of soda, chlorate of potash etc.).

It is surprising that a reducing agent like hydrosulphite and an oxidizing agent like chlorate, which are both contained in the printing color at the same time, have no disturbing effect on each other.

The presence of chlorate in the printing paste does not adversely affect the stability of the same. The discharge effect of the ground color is normal and the colored discharges obtained are deeper than those obtained without chlorate.

The present process is applicable to the most different textile fibers. It is explained by the following examples:

(A) Cotton

The following printing colors are prepared:

		Parts
(1)	Chromorhodine BR (Colour Index No. 762)-----	20
	Hot water-----	180
	Gum dragon thickening-----	600
	Heat up to dissolve, let cool down and add:	55
	Sodium - sulfoxylate - formaldehyde-----	100
	Chromium acetate 32° Tw-----	60
	Sodium chlorate solution 1:3-----	40
		1000
		Parts
(2)	Thiopyronine (Colour Index No. 739)-----	20
	Monoethylglycol-----	50
	Hot water-----	170
	Arabic gum 1:1-----	500
	Heat up to dissolve, let cool down and add:	70
	Sodium - sulfoxylate - formaldehyde-----	100
	Tannin and water 1:1-----	120
	Sodium chlorate solution 1:3-----	40
		75
		1000
		Parts
(3)	Rhodamine B extra (Colour Index No. 749)-----	20
	Monoethylglycol-----	50
	Hot water-----	170
	Arabic gum 1:1-----	500
	Heat up to dissolve, let cool down and add:	85
	Sodium - sulfoxylate - formaldehyde-----	100
	Tannin and water 1:1-----	120
	Sodium chlorate solution 1:3-----	40
		90
		1000

Cotton which is dyed with a dischargeable dyestuff, is printed with one of these discharge colors, dried, aged for 5 minutes in the rapid ager, and afterwards steamed for 40 minutes.

In the case of Example 1, there is washed straight away, whereas in the case of Examples 2 and 3 a treatment in a tartar emetic bath takes place before washing. In all three

cases brighter and deeper discharge effects are obtained than with discharge colors which do not contain any chlorate of soda.

(B) *Wool*

The following printing pastes are prepared:

	Parts
(4) Rhodamine B extra (Colour Index No. 749)-----	20
Monoethylglycol-----	50
Hot water-----	40
British gum 1:1-----	650

Heat up to dissolve, let cool down and add:

Sodium - sulfoxylate - formaldehyde-----	200
Sodium chlorate solution 1:3-----	40
	1000

	Parts
(5) Fast acid violet A2R (Colour Index No. 758)-----	20
Hot water-----	90
British gum 1:1-----	650

Heat up to dissolve, let cool down and add:

Sodium - sulfoxylate - formaldehyde-----	200
Sodium chlorate solution 1:3-----	40
	1000

	Parts
(6) Eosine (blue shade) No. 55 (Colour Index No. 778)-----	20
Hot water-----	90
British gum 1:1-----	650

Heat up to dissolve, let cool down and add:

Sodium - sulfoxylate - formaldehyde-----	200
Sodium chlorate solution 1:3-----	40
	1000

Wool which has previously been dyed with a dischargeable dyestuff is printed with one of these discharge colors, dried, aged in the damp state for 5 minutes in the rapid ager, and steamed afterwards for 40 minutes, then washed. One obtains colored discharge effects which are considerably deeper than those obtained with a printing color which does not contain any chlorate.

(C) *Silk*

The following printing colors are made up:

	Parts
(7) Thiopyronine (Colour Index No. 739)-----	20
Monoethylglycol-----	50
Hot water-----	140
Arabic gum 1:1-----	600

Heat up to dissolve, let cool down and add:

Sodium - sulfoxylate - formaldehyde containing zinc oxide-----	150
Sodium chlorate solution 1:3-----	40
	1000

	Parts
(8) Rhodamine B extra (Colour Index No. 749)-----	20
Monoethylglycol-----	50
Hot water-----	140
Arabic gum 1:1-----	600

Heat up to dissolve, let cool down and add:

Sodium - sulfoxylate - formaldehyde containing zinc oxide-----	150
Sodium chlorate solution 1:3-----	40
	1000

	Parts
(9) Acridine red brown (German Patent No. 495,115)-----	20
Monoethylglycol-----	50
Hot water-----	140
Arabic gum 1:1-----	600

Heat up to dissolve, let cool down and add:

Sodium - sulfoxylate - formaldehyde containing zinc oxide-----	150
Sodium chlorate solution 1:3-----	40
	1000

	Parts
(10) Thionine blue GO (Colour Index No. 926)-----	20
Hot water-----	190
Arabic gum 1:1-----	600

Heat up to dissolve, let cool down and add:

Sodium - sulfoxylate - formaldehyde containing zinc oxide-----	150
Sodium chlorate solution 1:3-----	40
	1000

	Parts
(11) Eosine (blue shade) No. 55 (Colour Index No. 778)-----	20
Hot water-----	190
Arabic gum 1:1-----	600

Heat up to dissolve, let cool down and add:

Sodium - sulfoxylate - formaldehyde containing zinc oxide-----	150
Sodium chlorate solution 1:3-----	40
	1000

Silk which has previously been dyed with a dischargeable dyestuff is printed with one of these discharge colors, dried, aged for 5 minutes in the rapid ager, afterwards steamed for 40 minutes and washed. One obtains brighter and deeper discharge effects than when using discharge colors which do not contain any chlorate of soda.

(D) Acetate silk

The following printing paste is prepared:

Parts

(12) Thiopyronine (Colour Index No.

5	739)-----	30
	Monoethylglycol-----	50
	Hot water-----	90
	Arabic gum 1:1-----	600

Heat up to dissolve, let cool down and add:

10	Sodium - sulfoxylate - formalde-	
	hyde containing basic zinc oxide.	150
	Sodium chlorate solution 1:3-----	80

15 1000

Acetate silk which has previously been dyed with a dischargeable dyestuff, is printed with the above discharge color, dried, aged for 5 minutes in the rapid ager, and steamed afterwards for 40 minutes, then washed. One obtains a considerably deeper shade than when using a discharge color which does not contain any chlorate of soda.

What I claim is:—

25 1. A process for obtaining color discharge effects according to the principle of reduction, consisting in adding to the usual discharge printing color with the view of obtaining color discharge effects of increased
30 intensity together with the reducing agent a chlorate as oxidizing agent.

2. A process for obtaining color discharge effects according to the principle of reduction, consisting in adding to the usual discharge printing color with the view of obtaining colored discharge effects of increased
35 intensity together with the reducing agent sodium chlorate as oxidizing agent.

In witness whereof I have hereunto signed
40 my name this 6th day of December, 1930.

HEINRICH WERDENBERG.

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