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(54) **Aqueous bath for processing photographic materials**

(57) The present invention relates to an aqueous bath for processing photographic materials which have been exposed and developed and a process for treating exposed and developed photographic materials.

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Description**The field of the invention**

5 **[0001]** The present invention relates to an aqueous bath for processing photographic materials which have been exposed and developed and a process for treating exposed and developed photographic materials.

Background of the invention

10 **[0002]** Photographic processing is the chemical means by which photographic materials like photographic film and paper is treated after photographic exposure to produce a negative or positive image. Photographic processing transforms the latent image into a visible image, makes this permanent and renders it insensitive to light. Basic processing steps of light-sensitive materials i.e. basic processing steps of photographic materials based on the gelatin-silver process include the processing steps development, bleach-fix (or bleaching and fixing) and washing or stabilizing. In the color development processing step exposed silver halide is reduced by a color developing agent to form metallic silver and, at the same time, the oxidized color developing agent reacts with a color coupler to form a dye. In the subsequent bleach-fixing step the silver formed by the development is oxidized by a bleaching agent and then converted into a soluble silver complex by the action of a fixing agent. This complex is dissolved into the bleach-fix bath. In order to maintain photographic or physical qualities of an image or improve preservative property of an image, development processing further may include, in addition to the above-described basic steps, various auxiliary steps, such as hardening, stopping, image stabilization, washing, and the like (for more detailed information of processing steps of photographic materials see e.g. Langford, Michael (2000), Basic Photography, Oxford: Focal Press.). Modern colour negative film is normally developed with the C-41 process and colour negative print materials with the RA-4 process. These processes are very similar, with differences in the first chemical developer. C-41 is a chromogenic color print film developing process introduced by Kodak in 1972. C-41, also known as CN-16 by Fuji, CNK-4 by Konica, and AP-70 by AGFA, is the most popular film process in use, with most photofinishing labs devoting at least one machine to this development process. RA-4 is Kodak's proprietary name for the chemical process most commonly used to make color photographic prints. It is used for both digital printers of the types most common today in photo labs and drug stores, and for prints made with older-type optical enlargers and manual processing. More specifically, common color photographic paper is carefully exposed to form a latent image of the picture, and then the paper is run through the series of chemicals that together comprise the RA-4 process to convert the latent image into the final print. RA-4 is a standardized chromogenic process used worldwide to make prints with a variety of equipment, photographic paper, and chemicals. Kodak created the RA-4 process for its color negative photographic papers. Fuji, Agfa, and other present and past photographic supply companies also make or have made both papers that are compatible with the Kodak chemicals, and chemicals that are compatible with the Kodak papers. These other companies typically call their equivalent processes by other names, but to most photographers, RA-4 is used as a generic term. The result of RA-4 processing is a Type C print.

35 **[0003]** Recently photo books on silver halide photographic papers became very popular. Such photo books often are produced using machines such as machines made by the applicant which make books with a "Lay Flat" binding. A usual manufacturing process of photo books comprises the processing steps exposing the image data onto Silver Halide photographic paper; developing this paper in a suitable photographic process; producing book blocks from the prints by glueing back to back of the folded double pages; producing book covers and glueing book block into the cover. Thus the backsides of the folded images are glued together to form the book block. In these books the images lie face to face on each other. If these books are stored in an environment with high humidity, the photographic emulsions may stick to each other. The book can not be opened, without damaging the images. Sticking of the paper is also a problem during production of the book block when folding the pages. Sticking may cause a paper jam in the processor or may cause crinkly prints. Sealing the surface of the photographic paper with a usual water-resistant coating or laminating with a water-resistant film could be solutions. However, these solutions need specialized mechanical equipment and will arise considerable cost. Therefore, a method that reduces or completely prevents sticking of exposed and developed photographic paper would be of great benefit for the photo industry in particular for production of photo books.

Summary of the invention

50 **[0004]** The present invention relates generally to the processing of photographic materials which have been exposed and developed. The present invention provides an aqueous bath for processing photographic materials which have been exposed and developed and a process for treating exposed and developed photographic materials, which allow producing exposed and developed photographic materials which do not stick or do stick at a reduced level to each other when surfaces of this photographic materials are contacted. Thus the aqueous bath for processing photographic materials which have been exposed and developed and the process for treating exposed and developed photographic materials

of the present invention are suitable to produce high quality photo books which when stored, can be opened without damaging the images due to sticking of the images to each other. The treatment with the aqueous bath of the invention does not produce drying marks on the paper and does not impair the surface of glossy paper. Additionally treatment with the aqueous bath of the invention does surprisingly significantly reduce the friction of the image layers to each other

for a trouble-free as possible processing in the subsequent process steps.

[0005] In a first aspect the present invention relates to an aqueous bath for processing photographic materials which have been exposed and developed, which comprises a hardener and a surfactant.

[0006] In a further aspect, the present invention relates to an aqueous bath for processing photographic materials which have been exposed and developed, which comprises water and siloxane-terminated polyalkylene oxide polyether as surfactant.

[0007] In a further aspect, the present invention relates to a pulverulent hardener or a tableted hardener for use in preparing the aqueous bath for processing photographic materials which have been exposed and developed, which comprises a hardener and a surfactant.

[0008] In a further aspect, the present invention relates to an aqueous concentrate which on mixing with water or a water comprising solution in the ratio of 1 : 10 to 1 : 100 gives an aqueous bath as described herein.

[0009] In still a further aspect, the present invention relates to a process for treating exposed and developed photographic materials, which comprise processing said exposed and developed photographic materials in the aqueous bath as described herein.

Detailed description of the invention

[0010] The present invention provides an aqueous bath for processing photographic materials which have been exposed and developed and a process for treating exposed and developed photographic materials.

[0011] For the purposes of interpreting this specification, the following definitions will apply and whenever appropriate, terms used in the singular will also include the plural and vice versa. It is to be understood that the terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting.

[0012] The term "photographic materials" as used herein refers usually to gelatin silver halide photographic materials which include photographic films and photographic paper. Preferably, photographic paper such as photographic paper color paper or photographic paper of the black&white type, more preferably photographic paper of the RA-4 type is used as photographic material in the present invention.. Photographic color paper which can be used is e.g. Fujifilm Crystal Archive + (HD, Supreme, Supreme HD, DP II, Album, Digital Pearl, Writable, Printing, Display); or Kodak+ (Professional Endura Premier, Ektacolor Royal Digital, Ektacolor Edge, Photobook Paper, Profoto plus, Proimage II). In particular photographic paper of the RA-4 type selected from the group consisting of Fujicolor Crystal Archive Paper Glossy (abbreviated: CAP Glossy 0.21) and Fujicolor Crystal Archive Album Paper Lustre (abbreviated: Album Lustre 0.17) is used as photographic material in the present invention.

[0013] The term "photographic paper" or "gelatin silver photographic paper" are used interchangeably herein and refers to photographic paper which contains a gelatin silver halide emulsion.

[0014] The term "silver halide" as used herein refers to known silver halide compositions used in photography such as e.g. silver bromide, silver chloride or silver iodide.

[0015] The term "photographic materials which have been exposed and developed" used herein refers usually to photographic materials which have been exposed image-wise and have been developed by a photographic process i.e. have been processed, which means have been treated in a developer, bleach-fix and wash.

[0016] The term "hardener" as used herein refers to a compound or composition which changes the physical properties of the gelatine to less sensitivity to mechanical impact. The hardener as used herein usually comprise compounds or compositions which are known in the field of photographic processing as hardener such as organic aldehydes e.g. formaldehyde or glutar-dialdehyde, or metal salts e.g. water-soluble aluminium or zirconium salts.

[0017] The term "about" refers to a range of values $\pm 10\%$ of a specified value. For example, the phrase "about 200" includes $\pm 10\%$ of 200, or from 180 to 220.

[0018] The term "comprise" is generally used in the sense of include, that is to say permitting the presence of one or more features or components.

[0019] In one aspect the present invention provides an aqueous bath for processing photographic materials which have been exposed and developed, which comprises a hardener and a surfactant. As stated above usually well known hardening agents can be used. A surfactant should be chosen that does not react with the hardening agent thus reducing either the activity of the surfactant or of the hardening agent. The surfactant used in the present invention is usually a surfactant which reacts with its hydrophilic part with the gelatin, while the hydrophobic part of the surfactant is facing outward. Such an arrangement should reduce the water absorption of gelatin significantly.

[0020] In one embodiment the hardener is selected from the group consisting of organic aldehydes e.g. formaldehyde or glutardialdehyde, or metal salts e.g. water-soluble aluminium or zirconium salts. A preferred hardener are water-

soluble aluminium or zirconium salts, more preferably water-soluble aluminium salts. As water-soluble zirconium salts usually zirconium ammonium sulfate, zirconium sulfate or zirconium chloride, preferably zirconium ammonium sulfate is used. As water-soluble aluminium salt a water-soluble aluminium salt selected from the group consisting of aluminium sulfate, potassium aluminum sulfate, potassium aluminum sulphate dodecahydrate, aluminium nitrate, aluminium citrate and aluminium chloride is usually used. A preferred water-soluble aluminium salt is selected from the group consisting of aluminium sulfate, potassium aluminum sulfate, potassium aluminum sulphate dodecahydrate, and aluminium chloride. A more preferred water-soluble aluminium salt is aluminum sulfate or potassium aluminum sulfate dodecahydrate.

[0021] Usually the aqueous bath of the invention comprises from about 0,001 to about 0,1 mol/l, preferably from about 0,005 to about 0.05 mol/l of the hardener.

[0022] In one embodiment the surfactant is a non-ionic surfactant. Non-ionic surfactants which can be used are usually selected from the group consisting of alkylphenol ethoxylates (APE or APEO), alkyl ethoxylates (AE) also named or referred to as alcohol ethoxylates, alkyl ethoxysulfates (AES) also named or referred to as alcohol ethoxysulfates, alkylphenol polyglycidol ethers, and siloxane-terminated polyalkylene oxide polyethers. Also combinations of these non-ionic surfactants can be used. Preferably the surfactant is selected from the group consisting of alkyl ethoxylates (AE) such as e.g. Trideceth-n wherein n is from 2-20 such as Trideceth-2, Trideceth-3, Trideceth-4, Trideceth-5, Trideceth-6, Trideceth-7, Trideceth-8, Trideceth-9, Trideceth-10, Trideceth-11, Trideceth-12, Trideceth-15, Trideceth-18, Trideceth-20, alkylphenol polyglycidol ethers (APE or APEO) such as e.g. 4-Nonylphenoxypolyglycidol and siloxane-terminated polyalkylene oxide polyether such as e.g. 3-(Polyoxyethylene)propylheptamethyltrisiloxane (commercially available under the name Xiameter OFX-5211®), 3-(3-Hydroxypropyl)-heptamethyltrisiloxane ethoxylate acetate (commercially available under the name Xiameter OFX-0309), dimethylsiloxane, siloxane-terminated ethylene oxide block copolymers (commercially available under the name Silwet such as Silwet L-77). More preferably the surfactant is selected from the group consisting of alkyl ethoxylates (AE) and siloxane-terminated polyalkylene oxide polyethers in particular alkyl ethoxylates (AE) selected from the group consisting of Trideceth-n wherein n is from 2-20 such as Trideceth-2, Trideceth-3, Trideceth-4, Trideceth-5, Trideceth-6, Trideceth-7, Trideceth-8, Trideceth-9, Trideceth-10, Trideceth-11, Trideceth-12, Trideceth-15, Trideceth-18, Trideceth-20, and siloxane-terminated polyalkylene oxide polyethers selected from the group consisting of 3-(Polyoxyethylene)propylheptamethyltrisiloxane and 3-(3-Hydroxypropyl)-heptamethyltrisiloxane ethoxylate acetate. Most preferably alkyl ethoxylates (AE), in particular Trideceth-8 or Trideceth-12 or combinations thereof, most particular Trideceth-12 is used.

[0023] Trideceth refers to an ethoxylated tridecyl group, and the suffix "-n", wherein n is an integer, indicates the number of such ethylene oxide units per group, for example "Trideceth-3" indicates an ethoxylated tridecyl group with 3 ethylene oxide units per tridecyl group.

[0024] Alkyl ethoxysulfates (AES) consists largely of linear primary alcohol ethoxy sulphates with the basic structure $\text{CH}_3(\text{CH}_2)_n(\text{OCH}_2)_m\text{OSO}_4\text{X}$ where n can vary between 11 and 17 and m varies from 0 to 8 with X most often being sodium such as e.g. alkylethoxylate sulphate sodium salts which are included herein.

[0025] Siloxane-terminated polyalkylene oxide polyether can be linear or branched. This type of surfactant to be used according to the invention can by way of example be obtained through the hydrosilylation of an unsaturated compound with a polysiloxane bearing Si-H groups. The unsaturated compound can inter alia be the reaction product of allyl alcohol with ethylene oxide or propylene oxide. The surfactant can also by way of example be obtained through the reaction of polyether alcohols with a polysiloxane bearing Si-Cl groups. All of the end groups in the polyether can be siloxane-terminated groups. It is also possible that mixed end groups are present, i.e. that siloxane end groups and OH end groups or reaction-functionalized OH end groups, such as methoxy groups, are present. The siloxane termination can be a monosiloxane group $\text{R}_3\text{Si-O-}$ or an oligo- or polysiloxane group $\text{R}_3\text{Si-O-[R}_2\text{Si-O]}_n\text{[AO]}$, where by way of example n is from > 1 to < 100. In the case of branched surfactants, the siloxane termination can also have a structure $\text{R}_3\text{Si-O-RSi[AO]-O-[R}_2\text{Si-O]}_m\text{O-SiR}_3$, where by way of example m is from > 0 to 10, or can have a combpolymer structure $\text{R}_3\text{Si-O-[RSi[AO]]}_n\text{O-[R}_2\text{Si-O]}_m\text{O-SiR}_3$, where m+n is from > 0 to < 250. In the instances mentioned it is preferable that the moiety R is an alkyl group, in particular a propyl or methyl group. The group [AO] is a polyalkylene oxide moiety, preferably polyethylene oxide and/or polypropylene oxide. The group [AO] can also have linkage to the siloxane by way of a connecting group, such as C_3H_6 .

[0026] Usually the aqueous bath of the invention comprises from about 0,015 to about 0,75 mol/l, preferably from about 0,02 to about 0,04 mol/l of the surfactant.

[0027] In one embodiment the pH of the aqueous bath is in the range from about 9 to about 2, preferably from about 7,5 to about 2, more preferably from about 6 to about 2, in particular from about 5 to about 2, more particular from about 4 to about 2, most particular from about 3 to about 2.

[0028] In a further aspect the present invention provides a pulverulent hardener or a tableted hardener for use in preparing an aqueous bath as described supra. The composition of the pulverulent and tableted hardener corresponds to that of the aqueous baths or concentrates thereof (with the exception of water). The tableted preparations usually also contain inert binders and swelling agents, which accelerate the rate at which the tablets dissolve in water. Suitable swelling agents are preferably natural and/or synthetic polymers (hydrocolloids), which swell to up to 10 times to 1,000

times their original volume on the absorption of water, for example (crosslinked) copolymers of acrylic acid and methacrylic acid and their alkali metal salts; (crosslinked) polyacrylamides; sulfonated polystyrenes; polyethylene oxides; cellulose ethers (carboxyethylcellulose, methylcellulose, hydroxycellulose, hydroxymethylcellulose, carboxymethylcellulose, hydroxy-ethylcellulose and carboxymethoxyethylcellulose); polysaccharide carboxylates; polyvinyl alcohol and copolymers with styrene or acrylonitrile and acrylates; alkali metal alginates and tragacanth gum. The percentage amounts in which the swelling agents are incorporated in the tablet can vary depending on the nature of the swelling power of the particular agent, the swelling agents being employed in amounts such that they at least double the volume of the tablet consisting of the hardener reagents.

[0029] In a further aspect the present invention provides an aqueous bath for processing photographic materials which have been exposed and developed, which comprises water and a siloxane-terminated polyalkylene oxide polyether as surfactant. It has been surprisingly found that an aqueous bath comprising a siloxane-terminated polyalkylene oxide polyether as surfactant without a hardener also provides for improved properties of the treated photographic materials which have been exposed and developed such as reduced or completely prevented sticking of exposed and developed photographic paper and reduced friction of the image layers to each other for a trouble-free as possible processing in the subsequent process steps. Siloxane-terminated polyalkylene oxide polyether which can be used are the ones as described supra. Preferred siloxane-terminated polyalkylene oxide polyether according to this aspect of the invention are selected from the group consisting of 3-(Polyoxyethylen)propyl-heptamethyltrisiloxan (commercially available under the name Xiameter OFX-5211®) and 3-(3-Hydroxypropyl)-heptamethyltrisiloxaneethoxylate acetate (commercially available under the name Xiameter OFX-0309®).

[0030] In a further aspect the present invention provides an aqueous concentrate which on mixing with water or a water comprising solution in the ratio of 1 : 10 to 1 : 100, preferably in the ratio of 1 : 10 to 1 : 20 gives an aqueous bath as described supra. Thus, the aqueous bath concentrates are, for example, concentrates which contain e.g. a water-soluble aluminium or zirconium salts and surfactant as described supra, and usually also contain substances which regulate the pH value and buffers. The pH value of the concentrate being usually between from about 7 to about 2, preferably from about 6 to about 2, more preferably from about 5 to about 2, in particular from about 4 to about 2, more particular from about 3 to about 2.

[0031] In some embodiments the aqueous baths of the invention as described supra may contain other substances, for example, substances to adjust the pH-value such as e.g. citric acid, sulfuric acid or hydrochloric acid, buffers such as salts of boric acid or acetic acid and/or an alkanolamine and optionally a salt of sulfurous acid or substances to prevent the formation of precipitates or biological growth in the bath such as e.g. sodium dichloroisocyanurate, trichloroisocyanuric acid and/or isothiazolinones.

[0032] The aqueous baths according to the invention are used in particular when processing photographic materials. Thus in a further aspect the present invention provides a process for the preparation of a ready-for-use aqueous bath as described supra, which comprises

- i) mixing a bath containing an aqueous solution with a hardener and a surfactant
- ii) mixing a bath containing an aqueous solution with an aqueous bath concentrate which comprises a hardener and a surfactant
- iii) mixing a bath containing an aqueous solution with a pulverulent hardener and a surfactant
- iv) mixing a bath containing an aqueous solution with a tabletted hardener and a surfactant.

[0033] In even a further aspect the present invention provides a process for treating exposed and developed photographic materials, which comprises processing said exposed and developed photographic materials in the aqueous bath as described supra.

[0034] In one embodiment the process comprises processing said exposed and developed photographic materials according to the following order of process steps:

- i) developer
- ii) bleach fix
- iii) wash
- iv) aqueous bath as described supra.

[0035] In one embodiment the processing time of the exposed and developed photographic materials in the aqueous bath is between about 10 to about 60 seconds, preferably between about 10 to about 40 seconds, more preferably about 20 seconds. Processing is usually carried out at temperatures above 20°C, for example in the range from 20 to 40°C and preferably from 25 to 35°C, so called automatic developing machines preferably being used. In one embodiment the aqueous bath is contained in a tank, wherein the aqueous bath in the tank is continuously exchanged during processing due to consumption of the active ingredients of the bath such as e.g. surfactant and/or hardener. Consumption of the

active ingredients of the bath is related to the surface (m^2) of the photographic paper treated. The replenishment rate, i.e. the rate fresh aqueous bath is supplied to the tank is usually $40 \text{ ml} / \text{m}^2$ to $3000 \text{ ml} / \text{m}^2$, preferably $150 \text{ ml} / \text{m}^2$ to $400 \text{ ml} / \text{m}^2$ of photographic paper treated.

Examples

Example 1:

[0036] A roll of photographic paper of the RA-4 type was exposed by a suitable printing device. Length and width of the paper roll used depend on the processing equipment and the size of the resulting photo book. Then the roll was developed in a photographic developing machine using the suitable RA-4 processing chemicals. The processing steps are

- Developer
- Bleach Fix
- Wash

[0037] Subsequent to the wash the paper was passed through an aqueous bath according this invention comprising the following ingredients (pH: 2,5):

Water 1000 ml
Potassium Aluminum Sulphate dodecahydrate 7.00 g
Citric acid 0.50 g
Trideceth-12 0.02 g

[0038] The processing time of the paper in this bath was 20 sec. Adhering liquid was squeezed off before the paper is moved into the dryer. The dried paper was then cut into prints of the size of a double page of the final photo book. The print was creased in the middle and then folded in a way that the emulsion sides lie on each other. The back sides of the prints were glued together to form a book block. This book block was then stored in a climatic exposure test cabinet at temperatures between 10 to 60°C and a relative humidity of 80 and 90%. The block was pressed with a power of 20 N.

[0039] After remaining 24 hours in the climatic exposure test cabinet the block could be opened on each page. No prints were sticking together with the emulsion sides. A book block produced the same way but without processing in the aqueous bath stucked together with the emulsion sides of the photographic prints.

[0040] A friction test of the print surface was made. The friction coefficient of the prints treated in the aqueous bath according this invention was reduced by about 70 - 80% compared to the untreated prints.

Example 2:

[0041] Exposed photo paper Fujicolor Crystal Archive Paper Glossy (abbreviated: CAP Glossy 0.21) and Fujicolor Crystal Archive Album Paper Lustre (abbreviated: Album Lustre 0.17) was used as photographic paper of the RA-4 type and was processed in the MiniLab FujiFilm LP5500. The processing steps and the aqueous bath are as described in example 1.

[0042] A friction test of the print surface was made. The friction coefficient of the prints treated in the aqueous bath was reduced as shown in Table 1.

Table 1: Friction test of the print surface

Paper:	CAP glossy untreated		CAP glossy treated	
Pressure:	31 N	58 N	31 N	58 N
Friction- : coefficient*	2,18	>1,42	0,48	0,48

*Friction coefficient is defined as quotient of friction power and pressure. Friction coefficients from 0 to 0,6 show lowest, i.e. optimal friction.

[0043] After climatic exposure in test cabinet WK1 180 photo paper pages did not stick together significantly. Photo paper pages produced the same way but without processing in the aqueous bath pages stucked together.

Example 3:

[0044] A roll of photographic paper is processed as described in example 1. The aqueous bath comprising the following ingredients:

1000 ml water

2ml 3-(Polyoxyethylen)propylheptamethyltrisiloxan commercially available under the name Xiameter OFX-5211)

[0045] The processing time of the paper in this bath was 20 sec. The paper was then dried and stored in climatic exposure test cabinet as described in example 1. After climatic exposure in a test cabinet the block could be opened on each page. No prints were sticking together with the emulsion sides.

Claims

1. An aqueous bath for processing photographic materials which have been exposed and developed, which comprises a hardener and a surfactant.
2. The aqueous bath according to claim 1, wherein the hardener is a water-soluble aluminium or zirconium salt.
3. The aqueous bath according to claim 1, wherein the hardener is a water-soluble aluminium salt selected from the group consisting of aluminium sulfate, potassium aluminum sulfate, potassium aluminum sulphate dodecahydrate, aluminium nitrate, aluminium citrate and aluminium chloride.
4. The aqueous bath according to claim 3, wherein the water-soluble aluminium salt is aluminum sulfate or potassium aluminum sulfate dodecahydrate.
5. The aqueous bath according to claim 1, wherein the surfactant is a non-ionic surfactant.
6. The aqueous bath according to claim 1, wherein the surfactant is selected from the group consisting of alkyl ethoxylates (AE), alkylphenol polyglycidol ethers (APE or APEO), and siloxane-terminated polyalkylene oxide polyethers.
7. The aqueous bath according to claim 1, wherein the surfactant is Trideceth-12.
8. The aqueous bath according to any one of claims 2-4, which comprises from about 0,001 to about 0,1 mol/l of the aluminium or zirconium salt.
9. The aqueous bath according to any one of claims 1-8, which comprises from about 0,015 to about 0,75 mol/l of the surfactant.
10. The aqueous bath according to any one of claims 1-9, wherein the pH of the aqueous bath is in the range from about 9 to about 2.
11. A pulverulent hardener or a tabletted hardener for use in preparing an aqueous bath according to any one of claims 1-9.
12. An aqueous bath for processing photographic materials which have been exposed and developed, which comprises water and a siloxane-terminated polyalkylene oxide polyether as surfactant.
13. An aqueous concentrate which on mixing with water or a water comprising solution in the ratio of 1 : 10 to 1 : 100 gives an aqueous bath according to anyone of claims 1-10.
14. A process for treating exposed and developed photographic materials, which comprises processing said exposed and developed photographic materials in the aqueous bath according to anyone of claims 1-12.
15. The process according to claim 14, wherein the process comprises processing said exposed and developed photographic materials according to the following order of process steps:

- i) developer
- ii) bleach fix
- iii) wash
- iv) aqueous bath according to any one of claims 1-12.

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EUROPEAN SEARCH REPORT

Application Number
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Y	* page 3, left-hand column, line 29 - line 36 * * page 3, right-hand column, line 10 - line 15 * * page 3, right-hand column, line 32 - line 39; claim 1 *	2-4,8,13	G03C5/26
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 28 October 2015	Examiner Magrizo, Simeon
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03.82 (P04C01)



EUROPEAN SEARCH REPORT

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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		28 October 2015	Magrizo, Simeon
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/82 (P04C01)



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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-10, 12-15

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

EP 15 18 0028

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-10, 12-15

Aqueous baths and process for photographic treatment
comprising a surfactant

2. claim: 11

A pulverulent or tabletted hardener

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 15 18 0028

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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28-10-2015

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