

N° 20,880



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Date of Application, 21st Sept., 1911

Complete Specification Left, 18th Oct., 1911—Accepted, 23rd Sept., 1912

PROVISIONAL SPECIFICATION.

Improvements in and relating to Colour Photography.

I, ARON HAMBURGER, of Dover Street Studios, Dover Street, in the County of London, Managing Director, do hereby declare the nature of this invention to be as follows:—

This invention relates to the obtaining of colour prints of photographs.

5 This invention has for its object to provide improved solutions for the production of a yellow tone in prints of photographs and to provide a method of producing colour photographs which will substantially simplify the methods heretofore proposed.

10 This invention consists in a process for obtaining a yellow tone in prints of photographs consisting in bleaching an image obtained on a silver chlorobromide or other suitable light sensitive medium to any desired extent and toning the bleached image by the action of a suitable mercuric iodide solution.

15 This invention also consists in a process of obtaining colour photographs in which a print is obtained on a silver chlorobromide or other suitable light sensitive medium from the negative corresponding to the yellow colour, is then bleached to any desired extent and then toned by the action of potassium mercuric iodide or alkali mercuric iodide *e.g.* by the action of a solution obtained by mixing solutions of mercuric chloride and potassium iodide, whereby a yellow colour print is obtained having a key or foundation of practically panchromatic grey.

20 This invention further consists in a yellow colour print the yellow tone of which is due to a mercury-silver iodide.

This invention further consists in a colour print of a colour photograph having a key or foundation of practically panchromatic grey.

25 This invention further consists in the improved solutions and processes for the production of colour prints hereinafter indicated.

I have observed that if a silver print be bleached by a suitable bleaching solution such as potassium bromide and potassium ferricyanide and then developed or toned with a solution obtained by mixing mercuric chloride and potassium iodide solutions in suitable proportions a yellow print of good quality is obtained.

30 I have further observed that if the print so treated be one obtained from the negative corresponding to the yellow of a three colour photograph the resultant photograph is of particular brilliance and accuracy in colour reproduction. This is apparently due to the fact that the print obtained from the negative corresponding to the yellow colour is more or less panchromatic and that the yellow toning method above described produces the yellow tone irrespective of the faint practically panchromatic grey image which remains as a key or foundation to the print: When red and blue prints obtained by any suitable method, from red and blue printing negatives are superposed upon this yellow grey key, the resultant colour photograph is therefore apparently a four colour photograph obtained without the necessity of specially producing a panchromatic grey and by utilising this feature the production of colour prints is considerably simplified. Although even if the print be quite bleached out the

45 more or less panchromatic grey is to some extent redeveloped on toning it is

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preferable only to carry the bleaching sufficiently far to leave a faint grey image the extent of bleaching varying of course with each particular subject.

In carrying out the process in obtaining colour prints for colour photographs in one form a bromide or chlorobromide print is first obtained from the negative corresponding to the yellow. It is desirable that the paper of the print should be parchmentised or have been otherwise suitably treated to prevent shrinkage. This print is then bleached in either of the following solutions according to whether a pure yellow or a reddish yellow is desired.

1 part of 5% potassium ferricyanide solution.	
1 " " " bromide " "	10
or	
30 parts of 5% lead nitrate solution.	
10 " 10% potassium ferricyanide solution.	
10 " 10% aluminium nitrate "	
1 part of nitric acid.	15
15 parts of acetic "	
50 " water.	

The bleaching is carried out until a faint grey image only remains when after washing as usual the print is immersed in the following toning solution:—

40 parts of 6% mercuric chloride solution.	20
60 " 8% potassium iodide "	

When the desired tone is attained the prints are removed and washed in the usual way. It is to be observed that the tone continues to develop after completion of the immersion in the toning bath and allowance must be made for this in determining the time of withdrawal. The formation of yellow can be arrested by immersing the print in an acid bath at any time during the toning. In this way a print is obtained in a fine yellow colour which corresponds to the yellow portion of the picture being produced and which possesses a key or foundation of practically panchromatic grey. This has been obtained in one operation without any special skill and avoids the need of registration or fixing necessary where a separately produced panchromatic key or foundation is employed as has been proposed. The print so obtained can now in any suitable way be combined with the remaining colour prints which may be of any suitable kind.

It will be understood that the present invention may be applied to prints on transparent or translucent media as well as to prints on an opaque base.

The print which is treated may be one obtained on a bromide, chloro-bromide or other silver or suitable salt containing light sensitive medium and the bleaching solution may be of any suitable kind *e.g.*, it may be a chromic acid or bichromate bleaching solution.

The same result although with a lesser degree of success may be obtained by treating an ordinary panchromatic positive of the object photographed by the method above described.

It is to be understood that the methods of obtaining the mercury silver iodide image and of obtaining the print with the grey key or foundation above described are referred to by way of example only and may be considerably varied without departing from the spirit of the present invention.

Dated this 21st day of September, 1911.

MARKS & CLERK,
57 & 58, Lincoln's Inn Fields, London, W.C.,
13, Temple Street, Birmingham, and
25, Market Street, Manchester,
Agents.

Hambürger's Improvements in and relating to Colour Photography.

COMPLETE SPECIFICATION.

Improvements in and relating to Colour Photography.

I, ARON HAMBURGER, of Dover Street Studios, Dover Street, in the County of London, Managing Director, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

5 This invention relates to the obtaining of colour prints of photographs.

This invention has for its object to provide improved processes for the production of a yellow tone in prints of photographs and to provide a method of producing colour photographs which will substantially simplify the methods heretofore proposed.

10 The conversion of a silver bromide or like image into a mercuric iodide or a combined mercury and silver salt has been previously proposed in photography for the purpose of intensifying the image.

The present invention consists in a process for obtaining a yellow tone in prints of photographs consisting in bleaching an image obtained on a silver chloro-

15 bromide or other suitable light sensitive medium to any desired extent and toning the bleached image by the action of a suitable mercuric iodide solution. This invention also consists in a process of obtaining colour photographs in which a print is obtained on a silver chlorobromide or other suitable light sensitive medium from the negative corresponding to the yellow colour, is then

20 bleached to any desired extent and then toned by the action of potassium mercuric iodide or alkali mercuric iodide *e.g.* by the action of a solution obtained by mixing solutions of mercuric chloride and potassium iodide, whereby a yellow colour print can be obtained having a key or foundation of practically

25 panchromatic grey. This invention further consists in a yellow colour print the yellow tone of which is due to a mercury-silver iodide.

This invention further consists in a colour print of a colour photograph having a key or foundation of practically panchromatic grey.

30 This invention further consists in the improved solutions and processes for the production of colour prints hereinafter indicated.

I have observed that if a silver print be bleached by a suitable bleaching solution such as potassium bromide and potassium ferricyanide and then developed or toned with a solution obtained by mixing mercuric chloride and potassium iodide solutions in suitable proportions a yellow print of good quality

35 is obtained. I have further observed that if the print so treated be one obtained from the negative corresponding to the yellow of a three colour photograph the resultant photograph is of particular brilliance and accuracy in colour reproduction. This is apparently due to the fact that the print obtained from the

40 negative corresponding to the yellow colour is more or less panchromatic and that the yellow toning method above described produces the yellow tone irrespective of the faint practically panchromatic grey image which remains as a key or foundation to the print. When red and blue prints obtained by any

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preferable only to carry the bleaching sufficiently far to leave a faint grey image the extent of bleaching varying of course with each particular subject.

In carrying out the process in obtaining colour prints for colour photographs in one form a bromide or chlorobromide print is first obtained from the negative corresponding to the yellow. It is desirable that the paper of the print should be parchmentised or have been otherwise suitably treated to prevent shrinkage. This print is then bleached in either of the following solutions according to whether a pure yellow or a reddish yellow is desired. 5

1 part of 5% potassium ferricyanide solution.	
1 " " " " bromide "	10
or	
30 parts of 5% lead nitrate solution.	
10 " 10% potassium ferricyanide solution.	
10 " 10% aluminium nitrate.	
1 part of nitric acid.	15
15 parts of acetic acid.	
50 " water.	

The bleaching is carried out until a faint grey image only remains when after washing as usual the print is immersed in the following toning solution:—

40 parts of 6% mercuric chloride solution.	20
60 " 8% potassium iodide "	

When the desired tone is attained the prints are removed and washed in the usual way. It is to be observed that the tone continues to develop after completion of the immersion in the toning bath and allowance must be made for this in determining the time of withdrawal. The formation of yellow can be arrested by immersing the print in an acid bath at any time during the toning. In this way a print is obtained in a fine yellow colour which corresponds to the yellow portion of the picture being produced and which possesses a key or foundation of practically panchromatic grey. This has been obtained in one operation without any special skill and avoids the need of registration or fixing necessary where a separately produced panchromatic key or foundation is employed as has been proposed. The print so obtained can now in any suitable way be combined with the remaining colour prints which may be of any suitable kind. 25 30

It will be understood that the present invention may be applied to prints on transparent or translucent media as well as to prints on an opaque base. 35

The print which is treated may be one obtained on a bromide, chloro-bromide or other silver or suitable salt containing light sensitive medium and the bleaching solution may be of any suitable kind *e.g.*, it may be a chromic acid or bichromate bleaching solution. 40

The same result although with a lesser degree of success may be obtained by treating an ordinary panchromatic positive of the object photographed by the method above described.

It is to be understood that the methods of obtaining the mercury silver iodide image and of obtaining the print with the grey key or foundation above described are referred to by way of example only and may be considerably varied without departing from the spirit of the present invention. 45

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:— 50

1. A process for obtaining a yellow tone in prints of photographs consisting in bleaching an image obtained on a silver chloro-bromide or other suitable light sensitive medium to any desired extent and toning the bleached image by the action of a suitable mercuric iodide solution; substantially as described.

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2. A process for obtaining colour photographs in which a print is obtained on a silver chloro-bromide or other suitable light sensitive medium from the negative corresponding to the yellow colour is then bleached to any desired extent and then toned by the action of alkaline mercuric iodide solution *e.g.* by the action of a solution obtained by mixing solutions of mercuric chloride and potassium iodide; substantially as and for the purposes described.

3. A yellow colour print, the yellow tone of which is due to a mercury-silver iodide; substantially as described.

4. A colour print of a colour photograph having a key or foundation of practically panchromatic grey; substantially as described.

5. The improved processes for production of colour prints and the prints produced thereby herein described.

Dated this 18th day of October, 1911.

MARKS & CLERK,

57 & 58, Lincoln's Inn Fields, London, W.C.,

13, Temple Street, Birmingham, and

25, Market Street, Manchester,

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