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D E C I S I O N
of 24 January 2001

Case Number: T 0882/95 - 3.3.6

Application Number: 90915650.7

Publication Number: 0450033

IPC: G03C 7/30

Language of the proceedings: EN

Title of invention:
Color imaging process and apparatus

Applicant:
EASTMAN KODAK COMPANY

Opponent:
-

Headword:
Gamma/EASTMAN KODAK

Relevant legal provisions:
EPC Art. 56
EPC R. 27

Keyword:
"Inventive step (yes) - non-obvious use of a known material"
"Content of the description - working example not mandatory for describing in detail how to carry out the invention"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0882/95 - 3.3.6

D E C I S I O N
of the Technical Board of Appeal 3.3.6
of 24 January 2001

Appellant: EASTMAN KODAK COMPANY
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 23 June 1995 refusing European patent application No. 90 915 650.7 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: P. Krasa
Members: G. N. C. Raths
C. Rennie-Smith

Summary of Facts and Submissions

I. This appeal is from the Examining Division's decision refusing the European patent application No. 90 915 650.7 (international publication number WO 91/06038), which related to a colour imaging process and apparatus, on the ground that the subject-matter of the then pending Claims 1 to 22 lacked an inventive step in view of document

(1) US-A-4 770 978.

II. The then pending claims 1 to 22 were those submitted during oral proceedings which took place before the Examining Division on 17 May 1995; claim 1 thereof reads as follows:

"1. A process for recording a positive or negative continuous tone colour copy of a continuous tone original image, comprising the steps of:

providing a photographic element comprising a support having thereon a silver halide emulsion unit capable of forming a yellow image, a silver halide emulsion unit capable of forming a cyan image, and a silver halide emulsion unit capable of forming a magenta image, each image-forming unit having a maximum spectral sensitivity at a different wavelength of radiation, and at least one of the image-forming units having a gamma of greater than 1.5,

receiving image data representing the densities of the yellow, magenta, and cyan records of the original image,

modifying said image data and using it to control three exposure sources, each emitting radiation in the region of maximum spectral sensitivity for a corresponding one of the image-forming units, so that after exposure, the recorded image density range for at least one of the yellow, magenta, and cyan image-forming units is substantially the same as the image density range for the corresponding yellow, magenta, and cyan records, respectively, of said original image, and

exposing said photographic element to said exposure sources".

Independent claim 11 differs from claim 1 in that the passage "at least one of the image forming units having a gamma of greater than 1.5" was replaced by "at least one of the image forming units having a gamma of greater than 1"; and the words "substantially the same as the image density range" were replaced by "0.1 to 0.9 times the image density range".

III. The Examining Division's main line of argument was in essence

- that conversion of gradation was a technical problem underlying each and every photographic copying process the purpose of which is to provide accurate copies of an original,

- that to achieve such a conversion by manipulation of electronic image data was known,

- that document (1) related, at least implicitly, to this problem and offered guidance how to solve it,

- that, consequently, the subject-matter of the application in suit did not involve an inventive step.

IV. The Appellant (Applicant) contested these arguments.

V. In response to a communication issued by the Board of Appeal, which mentioned document

(5) Ullmann, "Photography", vol. 18, 4th edn., Verlag Chemie, 1979, 494

the Appellant pointed to technical details which distinguished the claimed invention from the prior art and helped to define the actual problem to be solved.

VI. During oral proceedings which took place on 24 January 2001, the Appellant submitted a new set of claims 1 to 22. The only difference as compared with the former set of claims was the deletion of "substantially" from claim 1.

VII. The Appellant requested that the decision under appeal be set aside and that the case be remitted to the first instance with the order to grant a patent on the basis of claims 1 to 22 as submitted during oral proceedings before the Board.

VIII. At the end of the oral proceedings the Chairman announced the decision of the Board.

Reasons for the Decision

1. *Articles 84 and 123(2) EPC*

1.1 Claim 11

Claim 11 is directed to a process operating at a gamma value of at least one of the image forming units which can be lower than the respective gamma value addressed in claim 1 (see above point II). Thus the range of gamma values in claim 11 is broader than that in claim 1. Therefore, claim 11 will be analysed before claim 1.

The Board is satisfied that claim 11, which corresponds to claim 12 as originally filed, complies with the requirements of Articles 123(2) and 84 EPC.

1.2 Claim 1

Claim 1 of the set of claims submitted during oral proceedings before the Board differs from claim 1 as originally filed only in that the term "substantially" was deleted.

The deletion of this term amounts only to a clarification of the claim and is based on information already available in the application as filed (see e.g. page 5, lines 35 to 36, the first alternative). Thus, it does not extend beyond the content of the application as originally filed.

Therefore, claim 1 meets the requirements of Articles 84 and 123(2) EPC.

2. *Novelty*

The Board is also satisfied that none of the citations is novelty destroying with respect to the subject-

matter of claims 11 and 1. Since novelty has not been disputed, detailed reasons are not necessary.

3. *Inventive step*

3.1 The application concerns, as already mentioned, a process for producing copies having a lower contrast than the original image by using a photographic element having a gamma greater than 1 (see claim 11). The use of an image forming unit having a gamma greater than 1 will result in a recorded image density range which is 0.1 to 0.9 times the image density range of that of the original image; this is called the "reduced-contrast scenario".

Further, the application concerns a process for producing copies having a contrast that is the same as the original image by using a photographic element having a gamma greater than 1.5 (see claim 1). The use of an image forming unit having a gamma greater than 1.5 will result in a recorded image density range which is the same as that of the original image; this is called the "matched-contrast scenario".

3.2 The starting point for evaluating inventive step must first be determined.

3.3 The problem addressed in the application in suit was to produce colour copies having the same contrast as the original image or lower contrast than the original image. The disadvantage of the state of the art was the necessity to use either multiple silver halide emulsions for each region of spectral sensitivity or highly polydisperse emulsions (application as published, page 5, lines 24 to 30). The objective of

the application in suit is to provide a process avoiding that disadvantage.

3.4 The Examining Division took document (1) as the starting point for assessing inventive step.

3.5 Document (1) concerns an image forming system suitable for use in obtaining high-quality image colour prints, the system producing an output of a colour image which is converted into electric signals or digital signals on a silver halide colour photographic material, in particular photographic colour paper, particularly by using laser beams (column 1, lines 60 to 66).

3.6 The problem defined in document (1) was to find a remedy against the deterioration of the purity of the yellow colour when using a laser instead of the conventional negative-positive process (see column 2, lines 51 to 60).

The system of document (1) was capable of modulating the intensity of the red, green and blue laser beams by image data of an original provided in digitised form, and of making various compensations or conversions of colour images on electric signal levels or digital levels that had been impossible in the conventional negative-positive process, for example, gradation conversion and colour conversion (column 3, lines 2 to 12; column 6, line 47 to column 7, line 6).

3.7 According to the process of the application in suit, it is possible to receive and modify the image data representing the densities of the yellow, magenta and cyan records of the original image, and to control three exposure sources so that the image density range

for at least one of the image-forming units is 0.1 to 0.9 times the image density range of the original image, which is the case with the subject-matter of claim 11; or to control exposure sources so that the image density range for at least one of the image-forming units is the same as that of the original image, which is the case with the subject-matter of claim 1 (see application as published, page 7, lines 12 to 20 and page 6, lines 16 to 29).

Even if document (1) describes the use of laser beam technology and the same method as used in the application, the Board finds that the problem addressed in the application in suit (see above under 3.3) differs from that of document (1) and can not be inferred therefrom, since the main objective of document (1) was the avoidance of colour turbidity in the yellow colour image (column 2, lines 51 to 57; column 4, lines 32 to 33).

The crucial point is that document (1) does not disclose digital conversion of an original image for printing on a high contrast paper in the lower density range (the reduced-contrast scenario range of claim 11) or on a high contrast paper in the same density range (the matched-contrast scenario of claim 1).

3.8 The Board has no reason to doubt that the state of the art is correctly described in the specification of the application in suit. In the absence of other more appropriate citations, it is accepted as the starting point for assessing inventive step. In this case, the technical problem to be solved is as defined in the application as filed, namely to produce onto colour print paper of higher contrast colour copies having

either lower contrasts than the original image (reduced-contrast scenario) or the same contrast as the original image (matched-contrast scenario) thereby avoiding the use of multiple silver halide emulsions for each region of spectral sensitivity or highly polydisperse emulsions (application as filed, page 5, lines 26 to 32; application as published, page 5, lines 24 to 30).

3.9 There is no example illustrating the invention in the application in suit, either for the reduced-contrast scenario or for the matched-contrast scenario. However the figures, and the explanations thereof, regarding the manipulation of image data according to the invention to modify contrast (application as published, page 17, line 11 to page 19, line 20,) are accepted by the Board as the detailed description of how to carry out the invention as required by Rule 27(e) EPC. These suffice to assess whether the problem as defined in the application in suit was solved over the whole range of claim 11 or claim 1.

In the reduced-contrast scenario (see claim 11), represented by figure 6, the density range of the copy is smaller than the density range of the original, the photographic element having a gamma greater than 1. A concrete application regarding the use of a photographic element having a gamma greater than 1 is illustrated by transparency films or paper print materials from which it is often desirable to take a low contrast copy to use as an internegative image to produce further copy prints using conventional optical means (application as published, page 16, lines 18 to 26). Figure 6 is compared with the prior art process represented by figure 3 where the use of a photographic

element having a gamma greater than 1 necessarily resulted in a copy having increased contrast.

In the matched-contrast scenario (see claim 1), represented by figure 5, the density range of the copy is the same as that of the original, the photographic material having a gamma greater than 1.5; further, a concrete application regarding the use of a photographic element having a gamma greater than 1.5 is illustrated by the duplicate copies used in standard printing sequence for motion picture film production (page 16, lines 15 to 18).

Therefore, the Board finds that the problem was credibly solved over the whole scope of claim 11 and claim 1.

3.10 The question is whether the use of an image-forming unit having a gamma greater than 1 (see claim 11), or 1.5 (see claim 1), involves an inventive step.

3.10.1 Claim 11

The use of an image forming unit having a gamma greater than 1 will result in a recorded image density range which is lower than that of the original image. Document (1) offered no incentive to the skilled person to choose a high gamma material. Even if high gamma materials and contrast manipulation were separately known as such, there was no hint in document (1) to use high gamma material and contrast manipulation to obtain an image with a contrast of 0.1 to 0.9 times that of the original image. At the filing date of the application, the practice was to use a photographic element having a gamma with an absolute value of

greater than 1 to produce a photographic copy having greater contrast than the original. When a photographic copy having a lower contrast than the original had to be produced, then a photographic element having a gamma with an absolute value of less than 1 was used (application as filed, page 2, lines 8 to 18).

It follows that the state of the art and, in particular, document (1) did not foreshadow the use of image forming units with a gamma greater than 1 for producing image density ranges which are 0.1 to 0.9 times that of the original's image density range. Consequently, the subject-matter of claim 11 involves an inventive step.

3.10.2 Claim 1

The use of an image forming unit having a gamma greater than 1.5 will result in a recorded image density range which is the same as that of the original image.

The prior art illustrated by document (5) taught the use of a copy having a gamma of 1 with respect to the original if the image contrast had to correspond to the light intensity grades of the real object, which is synonymous with the "matched-contrast scenario"; in other words, the contrast of the copy is the same as that of the original image (document (5), Chapter 9.5, Sensitometry of the copying process; page 494, left-hand column, lines 4 to 9).

According to the process of claim 1 of the application in suit however, at least one of the image-forming units has a gamma greater than 1.5.

As document (5) required a gamma of only 1, and as document (1) did not hint at an image-forming unit having a gamma greater than 1.5 for obtaining the matched-contrast scenario, the Board finds that the subject-matter of claim 1 also involves an inventive step.

3.11 Therefore, the subject-matter of claims 11 and 1 meet the requirements of Article 56 EPC.

4. *Dependent claims 2 to 10 and claims 12 to 22*

There are no objections under Article 123(2) EPC since claims 2 to 10 and 12 to 22 correspond to claims 2 to 10 and 13 to 23, respectively, as originally filed.

These groups of claims relate to particular embodiments of independent claims 1 and 11, respectively, and derive their patentability therefrom.

5. The description will have to be adapted to the new claims before the Examining Division. This will allow a check whether or not corrections of the legends of figures 5 and 6 are appropriate.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to grant a patent with claims 1 to 22 of the

request submitted during the oral proceedings and a description to be adapted thereto and drawings 1 to 7 as filed.

The Registrar: The Chairman:

G. Rauh P. Krasa