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**Datasheet for the decision  
of 23 January 2018**

**Case Number:** T 1414/13 - 3.4.03

**Application Number:** 07805455.8

**Publication Number:** 2076898

**IPC:** G09G5/06, H04N9/67

**Language of the proceedings:** EN

**Title of invention:**  
A COLOR MAPPING METHOD

**Applicant:**  
TP Vision Holding B.V.

**Headword:**

**Relevant legal provisions:**

EPC 1973 Art. 84, 111(1)  
EPC Art. 123(2)  
RPBA Art. 13(1), 15(1)

**Keyword:**

Late-filed request - admitted (no) - procedural economy  
Late-filed auxiliary requests - admitted (yes)  
Claims - clarity - auxiliary request (yes)  
Amendments - added subject-matter (no)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**

**Boards of Appeal**

**Chambres de recours**

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Case Number: T 1414/13 - 3.4.03

**D E C I S I O N**  
**of Technical Board of Appeal 3.4.03**  
**of 23 January 2018**

**Appellant:** TP Vision Holding B.V.  
(Applicant) Prins Bernhardplein 200  
1097 JB Amsterdam (NL)

**Representative:** DREISS Patentanwälte PartG mbB  
Friedrichstrasse 6  
70174 Stuttgart (DE)

**Decision under appeal:** Decision of the Examining Division of the  
European Patent Office posted on 22 January 2013  
refusing European patent application No.  
07805455.8 pursuant to Article 97(2) EPC.

**Composition of the Board:**

**Chairman** G. Eliasson  
**Members:** S. Ward  
W. Van der Eijk

## Summary of Facts and Submissions

I. The appeal is against the decision of the Examining Division refusing European patent application No. 07 805 455 on the grounds that the claimed subject-matter did not meet the requirements of Articles 123(2) and 84 EPC.

II. At the end of the oral proceedings held before the Board the appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request filed with letter of 20 December 2017 or on the basis of new auxiliary request 1 filed during the oral proceedings or on the basis of auxiliary request 2 filed with letter of 20 December 2017.

III. The following document which is cited in the description (page 4, lines 5-8) is referred to:

D5: Maximum Visual Efficiency of Colored Materials, David L. MacAdam, J.O.S.A, volume 25, 1935, pages 361 to 367.

IV. Claim 1 of the main request reads as follows:

*"A color mapping method of mapping an input image signal (IS) into an output image signal (OS) for a display (DD) comprising display pixels (Pi) having three or more sub-pixels (RP, GP, BP, YP) with primary colors (RW, GW, BW, YW) defining a display color gamut (WG), the method comprises:*

*gamut mapping (2) the input image signal (IS) having input pixel colors defined by an input luminance (Y) and an input chromaticity (x, y) to obtain a mapped image signal (MS) having corresponding mapped pixel*

colors defined by a mapped luminance ( $Y_m; Y$ ) and a mapped chromaticity ( $x_m, y_m$ ), the input pixel colors lying within an input color gamut different from the display color gamut ( $WG$ );  
retrieving (3) a first looked-up luminance ( $Y_1$ ) by looking up a stored luminance ( $LU$ ) in a look-up table (1) at the mapped chromaticity ( $x_m, y_m$ ) of the mapped image signal ( $MS$ );  
retrieving (6) a second looked-up luminance ( $Y_2$ ) by looking up the stored luminance ( $LU$ ) in the look-up table (1) at the input chromaticity ( $x, y$ ) of the input signal ( $IS$ ); and  
adapting (5) the mapped luminance ( $Y_m; Y$ ) by using a factor ( $G$ ) to obtain an output luminance ( $Y_s$ ), wherein an image output signal ( $OS$ ) is defined by the mapped chromaticity ( $x_m, y_m$ ) and the output luminance ( $Y_s$ ), and  
wherein the adapting (5) the mapped luminance ( $Y$ ) comprises scaling the mapped luminance ( $Y$ ) by the factor ( $G$ ) being substantially equal to a ratio of the first looked-up luminance ( $Y_1$ ) at the mapped chromaticity ( $x_m, y_m$ ) and the second looked-up luminance ( $Y_2$ ) at the input chromaticity ( $x, y$ )."

Claim 1 of auxiliary request 1 reads as follows:

"A color mapping method of mapping an input image signal ( $IS$ ) into an output image signal ( $OS$ ) for a display ( $DD$ ) comprising display pixels ( $P_i$ ) having three or more sub-pixels ( $RP, GP, BP, YP$ ) with primary colors ( $RW, GW, BW, YW$ ) defining a display color gamut ( $WG$ ), the method comprises:

gamut mapping (2) the input image signal ( $IS$ ) having input pixel colors defined by an input luminance ( $Y$ ) and an input chromaticity ( $x, y$ ) to obtain a mapped image signal ( $MS$ ) having corresponding mapped pixel

colors defined by a mapped luminance ( $Y_m$ ) and a mapped chromaticity ( $x_m, y_m$ ), the input pixel colors lying within an input color gamut different from the display color gamut ( $WG$ );

retrieving (3) a first looked-up luminance  $Y_1$  by looking up a stored luminance ( $LU$ ) in a look-up table (1) at the mapped chromaticity ( $x_m, y_m$ ) of the mapped image signal ( $MS$ ), wherein the first looked-up luminance  $Y_1$  is a maximum luminance ( $LU$ ) of a reflective object ( $RO$ ) which has a color corresponding to the mapped chromaticity ( $x_m, y_m$ );

retrieving (6) a second looked-up luminance  $Y_2$  by looking up the stored luminance ( $LU$ ) in the look-up table (1) at the input chromaticity ( $x, y$ ) of the input signal ( $IS$ ), wherein the second looked-up luminance  $Y_2$  is a maximum luminance ( $LU$ ) of a reflective object ( $RO$ ) which has a color corresponding to the input chromaticity ( $x, y$ ); and

adapting (5) the mapped luminance ( $Y_m$ ) by using a factor  $G$  to obtain an output luminance ( $Y_s$ ), wherein an image output signal ( $OS$ ) is defined by the mapped chromaticity ( $x_m, y_m$ ) and the output luminance ( $Y_s$ ), and

wherein the adapting (5) the mapped luminance ( $Y_m$ ) comprises scaling the mapped luminance ( $Y_m$ ) by the factor  $G$  being equal to  $Y_2/Y_1$ ."

Independent claim 6 of auxiliary request 1 reads as follows:

"A color mapping circuit for mapping an input image signal into an output image signal for a display ( $DD$ ) comprising display pixels ( $P_i$ ) having sub-pixels ( $RP, GP, BP, YP$ ) with primary colors ( $RW, GW, BW, YW$ ) defining a display color gamut ( $WG$ ), the color mapping circuit comprising:

a gamut mapper (2) for gamut mapping the input image signal (IS) having input pixel colors defined by an input luminance (Y) and an input chromaticity (x, y) to obtain a mapped image signal (MS) having corresponding mapped pixel colors defined by a mapped luminance (Ym) and a mapped chromaticity (xm, ym), the input pixel colors lying within an input color gamut different than the display color gamut (WG);

a look-up circuit (3) for retrieving a first looked-up luminance Y1 by looking up a stored luminance (LU) in a look-up table (1) at the mapped chromaticity (xm, ym) of the mapped image signal (MS), wherein the first looked-up luminance Y1 is a maximum luminance (LU) of a reflective object (RO) which has a color corresponding to the mapped chromaticity (xm, ym);

a look-up circuit (6) for retrieving a second looked-up luminance Y2 by looking up the stored luminance (LU) in the look-up table (1) at the input chromaticity (x, y) of the input signal (IS), wherein the second looked-up luminance Y2 is a maximum luminance (LU) of a reflective object (RO) which has a color corresponding to the input chromaticity (x, y) ; and

an adapting circuit (5) for using a factor G to obtain an output luminance (Ys), wherein an image output signal (OS) is defined by the mapped chromaticity (xm, ym) and the output luminance (Ys), and wherein the adapting (5) the mapped luminance (Ym) comprises scaling the mapped luminance (Ym) by the factor G being equal to  $Y2/Y1$ ."

V. In a communication pursuant to Article 15(1) RPBA the Board expressed its provisional views as follows:

Claim 1 as originally filed referred to "desirable luminances" and included a definition of this term (albeit one which the Examining Division correctly

found to be unclear). Claim 1 of the main request filed with the statement of grounds of appeal included the term "desirable luminance" but provided no definition. This amendment failed to comply with the requirements of Article 123(2) EPC, since the terms "desirable luminance" or "desired luminance" only occurred in the application as originally filed within a context in which the meaning of this term was defined (even if not always clearly), whereas in claim 1 of the main request filed with the statement of grounds of appeal the criterion rendering a luminance "desirable" was left entirely open. The Board could find no support for this in the application as filed.

In fact, the "desirable luminances" were consistently presented as being a set of maximum luminances of reflective objects having particular chromaticities. These maximum luminances might be objectively determined and tabulated (for a given illuminant), for example by the method described in document D3, cited in the description.

VI. The appellant's arguments, insofar as they are relevant to the present decision, may be summarised as follows:

Claim 1 of the main request was an attempt to overcome the objections under Articles 123(2) and 84 EPC raised by the Examining Division and re-stated in the communication from the Board.

## **Reasons for the Decision**

1. The appeal is admissible.



2. *Admissibility of the Requests*

2.1 Article 13(1) RPBA states the following:

*"Any amendment to a party's case after it has filed its grounds of appeal or reply may be admitted and considered at the Board's discretion. The discretion shall be exercised in view of inter alia the complexity of the new subject matter submitted, the current state of the proceedings and the need for procedural economy."*

The current main request was filed just over a month before the oral proceedings in response to the communication from the Board, hence after the filing of the grounds of appeal. It may therefore only be admitted at the Board's discretion.

2.2 The admission of new requests at a late procedural stage is only in keeping with the principle of procedural economy set out in Article 13(1) RPBA if the requests are clearly suitable *prima facie* to overcome the doubts as to the allowability of the claims (*Case Law of the Boards of Appeal, 8th edition 2016, IV.E.4.2.2 and IV.E.4.4.2*).

In the present case, the objection of the Board to the previous version of claim 1 of the main request was that it failed to comply with the requirements of Article 123(2) EPC, as it comprised the term "desirable luminances" without any restriction on what was meant by "desirable". This was broader than claim 1 as originally filed which restricted the term "desirable luminance" to a particular definition (albeit an unclear one), and there was no support for such broadening in the rest of the application as filed.

In response, the word "desirable" has been omitted entirely from claim 1 of the current main request, thereby broadening the subject-matter even further. In the Board's judgement, such an amendment is *prima facie* incapable of overcoming the objection raised.

- 2.3 A further principle regularly applied by the Boards is that unsubstantiated requests cannot be considered in appeal proceedings (*Case Law of the Boards of Appeal, 8th edition 2016, IV.E.4.2.4*). An appellant filing a new request should explain why that request is considered to overcome the objections raised by the Examining Division or the Board, unless this is self-evident.

In the present case, although a basis for the new features added to claim 1 was given in the letter of 20 December 2017, no reasons were given why the term "desirable" - which was present in original claim 1 - could be omitted, or why the new formulation was considered to overcome the Board's objections.

- 2.4 Since it is not apparent *prima facie* how claim 1 of the main request could overcome the objections previously raised by the Board, and since this request was not accompanied by any substantiation in this respect, the Board exercises its discretion under Article 13(1) RPBA not to admit the main request into the proceedings.

- 2.5 Concerning auxiliary request 1, in the communication pursuant to Article 15(1) RPBA the Board indicated what it considered to be the only clear definition of "desirable luminances" disclosed in the application as originally filed. The independent claims of auxiliary request 1 incorporate this definition. In this case the

omission of the word "desirable" is acceptable, as it has been replaced by a more concrete definition.

Auxiliary request 1 represents a clear attempt to address the concerns raised by the Board and is therefore admitted into the proceedings.

3. *Auxiliary Request 1: Article 123(2) EPC*

3.1 Claim 1 of auxiliary request 1 is based chiefly on claims 1, 2 and 8 as originally filed, and on the embodiment of Fig. 5 (and the corresponding text in lines 18-29 on page 14).

In claim 1 the mapped image signal comprises a mapped luminance  $Y_m$  which is then multiplied by the factor  $G$ , exactly according to original claim 8 (Fig. 5 actually shows the special case where the mapped luminance is just the same as the input luminance, which corresponds to the embodiment defined in claim 9 as originally filed).

In lines 25-27 of page 14 the factor determining circuit 4 is said to determine the ratio of the luminances  $Y_2$  and  $Y_1$  "to obtain the factor  $G = Y_2/Y_1$ ", thus providing an explicit basis for the formula now incorporated into claims 1 and 6.

As correctly pointed out by Examining Division, in original claim 8 this ratio appears to be defined differently (as  $Y_1/Y_2$ ). This does not lead to any inconsistency in auxiliary request 1, since the appellant has now incorporated the correct formula ( $G = Y_2/Y_1$ ) into claim 1 (this formula having a clear basis in the application as filed, as set out in the previous

paragraph), and has excised the apparently incorrect formula from the claims.

The definition of the looked-up luminances being the maximum luminances of reflective objects having colours corresponding to the respective chromaticities can be found throughout the description, for example at page 4, lines 11-15; page 8, lines 31-32; page 9, lines 7-11; page 13, lines 22-26 (describing Fig. 3) and page 14, lines 21-24 (describing Fig. 5).

- 3.2 Claim 6 of auxiliary request 1 is based on claim 13 as originally filed, amended in the manner described above for claim 1, *mutatis mutandis*.

Claims 2-5 and 7 of auxiliary request 1 are based on claims 9-12 and 14 as originally filed.

- 3.3 The claims of auxiliary request 1 therefore meet the requirements of Article 123(2) EPC.

#### 4. *Auxiliary Request 1: Clarity*

- 4.1 In claims 1 and 6 of auxiliary request 1, the "desirable" (now specified as "looked-up") luminances are defined in terms of the maximum luminances of reflective objects which have colours corresponding to respective chromaticities. These maximum luminances may be objectively determined and tabulated, for example by the method described in document D3 (they are represented as contour lines (10-100) in Fig. 1). This definition is considered clear.

- 4.2 No other objections arise in this respect, and hence the claims of the first auxiliary request are judged to meet the clarity requirement of Article 84 EPC 1973.

5. *Further Procedure*

5.1 The application was refused on the grounds that the claimed subject-matter did not meet the requirements of Article 123(2) EPC and was not clear (Article 84 EPC). Other requirements for the grant of a patent including *inter alia* novelty and inventive step were only briefly considered in the contested decision under the heading "Additional Comments".

In the statement of grounds of appeal the appellant did not address the questions of novelty and inventive step generally, but only responded to these "Additional Comments".

In the communication pursuant to Article 15(1) RPBA the Board indicated that if it became necessary to discuss novelty and inventive step, it was likely that the Board would exercise its discretion under Article 111(1) EPC 1973 to remit the case to the department of first instance for further prosecution.

In the appellant's response of 20 December 2017 no objection was raised against this proposal, nor were the issues of novelty and inventive step discussed.

At oral proceedings the appellant suggested that all outstanding issues might be discussed and a decision reached on the case. However, under the circumstances, the Board did not believe that there had been sufficient prior discussion on the questions of novelty and inventive step for it to be appropriate to issue a final decision on these matters. The case is therefore remitted to the department of first instance for further prosecution (Article 111(1) EPC).

5.2 For the avoidance of any doubt, the Board has decided that the claims of auxiliary request 1 filed at oral proceedings before the Board meet the requirements of Article 123(2) EPC, and are clear within the meaning of Article 84 EPC 1973. All other matters remain to be decided by the Examining Division in the remitted procedure.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance for further prosecution.

The Registrar:

The Chairman:



S. Sánchez Chiquero

G. Eliasson

Decision electronically authenticated