BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Internal distribution code:
(A) [ ] Publication in OJ
(B) [ ] To Chairmen and Members
(C) [X] To Chairmen

D E C I S I O N
of 15 December 1998

Case Number: T 0752/97 - 3.5.1

Application Number: 90309597.4

Publication Number: 0416833

IPC: H04N 1/46

Language of the proceedings: EN

Title of invention:
Color image encoding

Applicant:
CANON KABUSHIKI KAISHA

Opponent:
-

Headword:
Color image encoding/CANON

Relevant legal provisions:
EPC Art. 111(1)

Keyword:
"Remittal to first instance"

Decisions cited:
-

Catchword:

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0752/97 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 15 December 1998

Appellant: CANON KABUSHIKI KAISHA
30-2, 3-chome, Shimomaruko
Ohta-ku
Tokyo (JP)

Representative: Beresford, Keith Denis Lewis
BERESFORD & Co.
2-5 Warwick Court
High Holborn
London WC1R 5DJ (GB)

Decision under appeal: Decision of the Examining Division of the European Patent Office posted 24 February 1997 refusing European patent application No. 90 309 597.4 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: P. K. J. van den Berg
Members: R. Randes
V. Di Cerbo

Summary of Facts and Submissions

I. This appeal is against the decision of the examining division to refuse European patent application No. 90 309 597.4 on the grounds that the subject-matter of claims 1 and 11 lacked an inventive step (Articles 52(1) and 56 EPC) and that the amendments to the description and drawings filed with the letter of 21 January 1997 added subject-matter (Article 123(2) EPC). Inter alia the following document was cited in the decision:

D1: IEEE Transactions on Communications, COM-32, no. 11, Nov 1984, pp 1201 - 1209; YAMAGUCHI: 'Efficient encoding of colored pictures in R, G, B components'.

II. On 28 April 1997, the appellant (applicant) lodged an appeal against the decision and paid the prescribed fee. On 27 June 1997 a statement of grounds of appeal was filed, with a new set of claims 1 to 16. An auxiliary request for oral proceedings was also filed.

III. Following a communication from the Board, the appellant on 22 September 1998 filed a new set of 14 claims numbered 1 to 12, 14 and 15 in which independent claims 1 and 8 had been amended. The appellant also withdrew the amendment that the examining division considered to add subject-matter. The appellant requested that the decision under appeal be set aside and a patent be granted on the basis of these claims, a description including page 32 as originally filed and Figure 15 of the drawings as filed on 20 March 1996. In addition to the above mentioned claims, the application on file comprises the following documents:

Description: pages 2, 3, 30, 32, 36, and 41 to 44, as originally filed;
pages 4, 21, 22, 25, 33, and 34, filed with letter of 12 April 1995;
pages 1, 6 to 20, 23, 28, 29, 35, 39, and 40, filed with letter of 20 March 1996;
pages 5, 24, 26, 27, 31, 37, and 38, filed with letter of 21 January 1997;

Drawings: sheets 1 to 8, and 10, as originally filed;
sheets 12 to 15 (Figures 15 to 19), filed with letter of 20 March 1996 (original Figure 17 deleted and Figures 18 to 20 renumbered as Figures 17 to 19);
sheets 9 (Figures 11 and 12), and 11 (Figure 14), filed with letter of 21 January 1997.

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

"1. A method of encoding a color image signal comprising a plurality of color component data for color components of each pixel of a color image, the method comprising the steps of:
inputting color component data color sequentially;
for a first input color component of a pixel of interest, selecting the first color component of pixels neighboring the pixel of interest as first reference color component data;
for each further sequentially input color component of the pixel of interest, selecting the further color component of pixels neighboring the pixel of interest and each previously input color component data of at least the pixel of interest as further reference color component data, wherein the number of color components used as reference color component data increases

sequentially in accordance with the color sequential input of color component data; and
prediction encoding the color component data for each of the first and further input color components of the pixel of interest using the first and further reference color component data respectively."

Independent claim 8 is an apparatus claim whose features essentially correspond to those of independent method claim 1.

V. The appellant argued as follows:

The invention concerned sequential encoding of colour component data; either pixel sequentially (first embodiment) or colour plane sequentially (second embodiment). D1, on the other hand, was concerned with encoding colour components which were received simultaneously. Moreover, D1 did not increase the number of reference colour components used with each new component to be encoded. A further difference was that in D1, the red and green components were encoded using the decoded green component.

Reasons for the Decision

1. The appeal complies with Article 106 to 108 and Rule 64 EPC and is, therefore, admissible.

2. *Amendments*

2.1 The appellant's withdrawal of the amendment to Figure 15 and the corresponding amendment to the description (see I and III above) has overcome the objection under Article 123(2) given in the decision under appeal.

2.2 Claim 1 of the appellant's request is essentially a combination of refused claims 1, 2 and 6. Independent apparatus claim 8 corresponds to method claim 1. The Board is accordingly satisfied that these amended claims do not contravene Article 123 EPC.

3. *Background*

3.1 The application concerns the problem of improving the prediction encoding of RGB component signals. Prediction encoding uses the values of previous pixels to predict the value of the current pixel to be encoded on the assumption that they will be similar. Thus the difference between the current pixel value and the predicted pixel value is smaller than the current pixel value itself. The difference can therefore be encoded with shorter codes than the original values. The application improves conventional prediction encoding of individual RGB components by predicting the pixels of a given colour additionally using pixels from another colour, thereby exploiting the correlation between colours.

3.2 D1 also discloses a solution of this type, at page 1202, column 2, lines 17 to 34 and Figure 2. D1 discloses determining a predictor for a pixel at a given position X for one colour (G) based on data from neighbouring pixels. For the other colours (R and B), D1 first derives values of R-G and B-G difference signals for the same neighbouring pixels, thereby using pixels of another colour (G), and then combines the result with the decoded value of G to eliminate the G component and derive the required predictors.

3.3 In the decision under appeal the inventive step argument was essentially a question of interpretation of the expressions "status of the reference color

component data" and "encoding parameter". Since these expressions have now been deleted from claim 1, the arguments do not apply any more. Moreover, the refused claims did not define the currently claimed position of the pixel of the other reference colour components, or the sequential nature of the components.

3.4 In the Board's opinion, claim 1 (and claim 8) of the present request now differs from D1 in that the colour component data is input and encoded colour sequentially, which covers either pixel sequentially (first embodiment), in which all colour components of a given pixel are coded before the next pixel is coded, or colour plane sequentially (second embodiment), in which a given colour component of all the pixels is coded before the next colour. In both cases at the time of coding only the previously coded colour components of a pixel are available to the coder. In D1, on the other hand, the colour components of each pixel are presented to the coder in parallel as shown in Figure 4 and are thus all available at the same time. A further difference is that, according to the invention, for encoding a pixel at a given position, the reference data for the further colour components includes at least the pixel at the same position in the previous colour components. A third difference, which follows as a consequence of the first two, is that the encoding of the further sequentially input colour components uses an increasing number of reference colour components. Thus for the third colour, one pixel from both of the previous colours at the position of the current pixel is used.

4. Thus, the Board is of the opinion that the amendments to claims 1 and 8 have overcome the objections in the decision under appeal.

5. It is noted however that the claims in their present form have not been examined in detail by the examining division, although a comment to the effect that similar subject-matter (without the limitation of using each previous colour component) might be inventive appears at page 5 of the communication of 21 June 1994, offset somewhat however by the subsequent statement that the "serial" processing is a matter of design procedure at page 2 of the communication of 22 May 1995. The Board therefore deems it appropriate to make use of its power under Article 111(1) EPC and remit the case to the first instance for further prosecution to preserve two instances.

6. Since the case is remitted to the first instance, oral proceedings before the Board, as requested by the appellant, are not necessary.

7. Finally, the Board notes that the numbering of claims 14 and 15 is incorrect and that claim 4, line 5 is missing the word "of".

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 for further procecution.

The Registrar: The Chairman:

M. Kiehl P. K. J. van den Berg