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**Datasheet for the decision  
of 11 September 2019**

**Case Number:** T 0052/14 - 3.5.04

**Application Number:** 10197420.2

**Publication Number:** 2472867

**IPC:** H04N7/26, G06T3/40

**Language of the proceedings:** EN

**Title of invention:**

Coding and decoding of multiview videos

**Applicant:**

Advanced Digital Broadcast S.A.

**Headword:**

**Relevant legal provisions:**

EPC Art. 56

RPBA Art. 12(4)

**Keyword:**

Admission of amended claims into the proceedings - main and first to fourth auxiliary requests (no)  
Inventive step - fifth auxiliary request (no)

**Decisions cited:**

T 0273/11

**Catchword:**



**Beschwerdekammern**  
**Boards of Appeal**  
**Chambres de recours**

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Case Number: T 0052/14 - 3.5.04

**D E C I S I O N**  
**of Technical Board of Appeal 3.5.04**  
**of 11 September 2019**

**Appellant:** Advanced Digital Broadcast S.A.  
(Applicant) Avenue de Tournay 7  
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**Representative:** Borsano, Corrado  
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**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 30 July 2013  
refusing European patent application  
No. 10197420.2 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chairman** C. Kunzelmann  
**Members:** M. Paci  
B. Müller

## Summary of Facts and Submissions

- I. The appeal is against the decision of the examining division refusing European patent application No. 10 197 420.2, published as European patent application EP 2 472 867 A1.
- II. The documents cited in the decision under appeal included the following:
- D1: Ni Qin et al., "On-Demand Sharing of a High-Resolution Panorama video from Networked Robotic Cameras", Proceedings of the 2007 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) held in San Diego, CA, USA, October 29 - November 2, 2007, IEEE, Piscataway (NJ), pages 3113-3118, XP031222254
- D2: King-To Ng et al., "Data Compression and Transmission Aspects of Panoramic Videos", IEEE Transactions on Circuits and Systems for Video Technology, Vol. 15, No. 1, January 2005, IEEE, pages 82-95, DOI:10.1109/TCSVT.2004.839989, XP011124668
- D4: WO 01/99430 A2
- D5: US 2005/0243920 A1
- III. The decision under appeal was based on the grounds that the subject-matter of claim 1 according to the main, first and second auxiliary requests then on file did not involve an inventive step (Article 56 EPC) in view of the following combinations of prior-art documents:
- for the main and first auxiliary requests, when starting from either D1 or D2 in combination with either D4 or D5; and
  - for the second auxiliary request, when starting from D2 in combination with either D4 or D5.

IV. With the statement of grounds of appeal, the appellant filed six sets of amended claims according to a main request and first to fifth auxiliary requests replacing all the claims underlying the decision under appeal.

The appellant requested that the decision under appeal be set aside and that a European patent be granted on the basis of the claims of the main request or, in the alternative, the first, second, third, fourth or fifth auxiliary request, all requests filed with the statement of grounds of appeal. As a precaution, the appellant also requested oral proceedings.

V. The appellant was summoned to oral proceedings to be held on 11 September 2019.

In a communication under Article 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA, OJ EPO 2007, 536) annexed to the summons to oral proceedings, the board gave a preliminary opinion which may be summarised as follows:

- the main request and first to fourth auxiliary requests should not be admitted into the proceedings under Article 12(4) RPBA;
- the claims of the fifth auxiliary request, which appeared to be identical to the claims of the main request underlying the decision under appeal, would be admitted into the proceedings; however, their subject-matter did not involve an inventive step in view of the disclosure of document D2.

VI. By letter dated 5 September 2019, the appellant informed the board that it would not be attending the oral proceedings. It did not comment on the board's preliminary opinion.

VII. The board held oral proceedings on 11 September 2019 in the appellant's absence.

The chairman noted before the end of the oral proceedings that the appellant's requests were that the decision under appeal be set aside and that a European patent be granted on the basis of the claims of the main request or, in the alternative, the first, second, third, fourth or fifth auxiliary request, all requests filed with the statement of grounds of appeal.

At the end of the oral proceedings, the chairman announced the board's decision.

VIII. Claim 1 according to the appellant's **main request** reads as follows:

"Method for coding a multiview video stream (100) comprising a plurality of images (104, 105, 106) corresponding to single views in a fixed time instant, characterized by comprising the steps of:

- a) Dividing said images (104, 105, 106) in a plurality of slices;
- b) Coding (502, 611) each of said slices;
- c) Generating a multiview video stream (100) comprising a plurality of separate images, each of said separate image comprising
  - i. a set of said coded slices (401),
  - ii. first information (107a) adapted to define the position of said slices (401) and
  - iii. second information (107b) adapted to identify at least one image of said multiview video stream (100), said at least one identified image comprising at least one slice (404, 405)."

IX. Claim 1 according to the appellant's **first auxiliary request** reads as follows:

"Method for coding a multiview video stream (100) comprising a plurality of images (104, 105, 106) corresponding to single views in a fixed time instant, characterized by comprising the steps of:

- a) Dividing said images (104, 105, 106) in a plurality of slices;
- b) Coding (502, 611) each of said slices;
- c) Generating a multiview video stream (100) to be broadcast comprising a plurality of separate images, each of said separate image comprising
  - i. a set of said coded slices (401),
  - ii. first information (107a) adapted to define the position of said slices (401) and
  - iii. second information (107b) adapted to identify at least one image of said multiview video stream (100), said at least one identified image comprising at least one slice (404, 405)."

X. Claim 1 according to the appellant's **second auxiliary request** reads as follows:

"Method for coding a multiview video stream (100) comprising a plurality of images (104, 105, 106) corresponding to single views in a fixed time instant, characterized by comprising the steps of:

- a) Dividing said images (104, 105, 106) in a plurality of slices;
- b) Coding (502, 611) each of said slices;
- c) Generating a multiview video stream (100) comprising a plurality of separate images, each of said separate image comprising
  - i. a set of said coded slices (401),

ii. first information (107a) adapted to define the position of said slices (401) and  
iii. second information (107b) adapted to identify at least one image of said multiview video stream (100), said at least one identified image comprising at least one slice (404, 405),  
wherein said first information (107a) comprises a plurality of identification codes (PID), in particular Packet ID codes, assigned respectively to each of said slices."

XI. Claim 1 according to the appellant's **third auxiliary request** reads as follows:

"Method for coding a multiview video stream (100) comprising a plurality of images (104, 105, 106) corresponding to single views in a fixed time instant, characterized by comprising the steps of:  
a) Dividing said images (104, 105, 106) in a plurality of slices;  
b) Coding (502, 611) each of said slices;  
c) Generating a multiview video stream (100) comprising a plurality of separate images, each of said separate image comprising  
i. a set of said coded slices (401),  
ii. first information (107a) adapted to define the position of said slices (401) and  
iii. second information (107b) adapted to identify at least one image of said multiview video stream (100), said at least one identified image comprising at least one slice (404, 405),  
wherein said multiview video stream includes an initial default view (1101) to be displayed to the user."



XII. Claim 1 according to the appellant's **fourth auxiliary request** reads as follows:

"Method for coding a multiview video stream (100) comprising a plurality of images (104, 105, 106) corresponding to single views of a scene (1) in a fixed time instant, characterized by comprising the steps of:  
a) Dividing each of said images (104, 105, 106) in a plurality of slices;  
b) Coding (502, 611) each of said slices;  
c) Generating a multiview video stream (100) comprising a plurality of separate video streams (101, 102, 103), each of said separate video streams (101, 102, 103) comprising  
i. a set of said coded slices (401),  
ii. first information (107a) adapted to define the position of said slices (401) in said images (104, 105, 106) and  
iii. second information (107b) adapted to identify at least one video stream (101, 103) of said multiview video stream (100), said at least one identified video stream (101, 103) comprising at least one slice (404, 405) that, in said scene (100), is adjacent to a slice of said set (401)."

XIII. Claim 1 according to the appellant's **fifth auxiliary request** reads as follows:

"Method for decoding a multiview video stream (100) comprising a plurality of images (104, 105, 106) corresponding to single views of a scene (1) in a fixed time instant, wherein said scene develops over a main horizontal direction (X), wherein said multiview video stream (100) is coded according to a coding method comprising the steps of:

- a) Dividing each of said plurality of images (104, 105, 106) in a plurality of slices obtained by sectioning said plurality of images (104, 105, 106) along a transversal direction (Y) that is orthogonal to said main horizontal direction (X);
- b) Implementing a 90 degrees rotation (501) of each of said slices (104) and Coding (502, 611) each of said rotated slices (104b);
- c) Generating a multiview video stream (100) comprising a plurality of separate video streams (101, 102, 103), each of said separate video streams (101, 102, 103) comprising:
  - i. a set of said coded slices (401);
  - ii. first information (107a) adapted to define the position of said slices (401) in said plurality of images (104, 105, 106), wherein said first information (107a) comprises a plurality of identification codes (PID) assigned respectively to each of said slices (601, 602, 610);
  - iii. second information (107b) adapted to identify at least one video stream (101, 103) of said multiview video stream (100), said at least one identified video stream (101, 103) comprising at least one slice (404, 405) that, in said scene (100), is adjacent to a slice of said set (401); and
  - iv. a third information representative of said rotation (501) of said slices (104);and wherein said decoding method comprises the steps of:
- d) Receiving said plurality of coded video streams (504, 652, 505);
- e) Receiving a command (1103, 1103b) to display a view (801, 1102, 1200) of said scene, said view to be displayed (801, 1102, 1200) comprising slices (805) belonging to at least two of said plurality of images (104, 105);

- f) Selecting the slices (805) associated to said view to be displayed (801, 1102, 1200) based on the received command (1103, 1103b) and on said first and second information (107a, 107b);
- g) Decoding (802, 902) each of the selected slices (805);
- h) checking in said multiview video stream (100) the presence of information indicative that said slices have undergone a 90 degrees rotation (501);
- i) in case selected slices have undergone to said 90 degrees rotation (501), applying an opposite rotation (804) to the decoded slices (803) before generating said video image (805);
- j) Generating a video image (805, 903, 1203) comprising at least part of the selected slices (805) ordered so as to generate the view to be displayed (801, 1102, 1200)."

### **Reasons for the Decision**

1. The appeal is admissible.
2. With the statement of grounds of appeal, the appellant filed six sets of claims according to a main request and first to fifth auxiliary requests.

The claims of the **fifth auxiliary request** are identical to those of the main request underlying the decision under appeal.

Hence, the board took account of these claims in the appeal proceedings (Article 12(4) RPBA).

*Admission of amended claims into the appeal proceedings under Article 12(4) RPBA*

3. Pursuant to Article 12(4) RPBA, the board has the power to hold inadmissible a request which could have been presented in the first-instance proceedings but was not or which was withdrawn during the first-instance proceedings (see Case Law of the Boards of Appeal of the EPO, 8th edition 2016, IV.E.4.3.1 in general and IV.E.4.3.3 b) and c) for *ex parte* appeal proceedings). Since in fact almost every request could have been presented to the department of first instance, the question is whether the situation was such that the present request **should** have been presented at that stage (see, for instance, decision T 273/11, point 1.1 of the Reasons, with references to further decisions).

*3.1 Re the main and first to fourth auxiliary requests*

3.1.1 The claims of the **fourth auxiliary request** are identical to the claims of the application as filed, except for a few minor corrections of claim dependencies in dependent claims 11, 12 and 14.

The claims of the **main request** are the claims of the application as filed in which a few generalising amendments have been made in the independent claims, in particular the deletion of any reference to a scene and the replacement of "video stream(s)" by "image(s)".

The **first auxiliary request** differs from the present main request by the additional feature in the independent claims that the multiview video stream is broadcast.

The **second auxiliary request** differs from the present main request in that the features of dependent claim 7 of the main request have been added into the independent claims, i.e. that said first information (107a) comprises a plurality of identification codes (PID), in particular Packet ID codes, assigned respectively to each of said slices.

The **third auxiliary request** differs from the present main request in that a feature taken from page 13 (erroneously referred to by the appellant as page 12), lines 31 and 32, of the description of the application as filed, i.e. that said multiview video stream includes an initial default view (1101) to be displayed to the user, has been added into the independent claims.

- 3.1.2 The set of claims according to the main and first to fourth auxiliary requests are either identical or closely related to **the claims of the application as filed** but differ extensively from **all the sets of claims underlying the decision under appeal**. Moreover, whereas all claims underlying the decision under appeal defined either a "method for decoding" or a "decoding apparatus", the sets of claims according to the main and first to fourth auxiliary requests filed with the statement of grounds of appeal also comprise claims for a "method for coding" and for a "coding apparatus".

In reaction to the examining division's first communication under Article 94(3) EPC of 23 April 2012, the appellant no longer pursued the claims of the application as filed. Indeed, with the letters of 8 August 2012, 16 January 2013 and 28 March 2013 and during the oral proceedings before the examining division, the appellant filed amended claims which

moved away from the wording of the claims of the application as filed towards the wording used in the claims of the main, first and second auxiliary requests underlying the decision under appeal.

- 3.1.3 For the above reasons, reverting to the wording and structure of the claims of the application as filed, which were no longer pursued in first-instance proceedings, should not be permitted. If the appellant believed that the invention according to the claims as originally filed was patentably distinguished from the prior art (see page 1, third paragraph, of the statement of grounds of appeal), it should have maintained these claims in the proceedings at first instance to get a reasoned decision on their compliance with the requirements of the EPC.

Accordingly, the board exercised its power under Article 12(4) RPBA in not admitting the main and first to fourth auxiliary requests filed with the statement of grounds of appeal into the appeal proceedings.

*Fifth auxiliary request - inventive step (Article 56 EPC)*

4. As mentioned under point 2 above, the claims according to the fifth auxiliary request are identical to the claims of the main request underlying the decision under appeal.
5. Closest prior art
- 5.1 In the reasons for the decision, the examining division apparently considered that prior-art documents D1 and D2 disclosed the same features of claim 1 and that both could be regarded as the closest prior art.

5.2 However, the board is of the view that D2 should be regarded as the closest prior art. Indeed, D1 is less relevant than D2 for the following reasons:

In the method of D1, the panorama video is divided into patches (see figure 1), not into vertical slices. The sole passage of D1 which mentions dividing the panorama video into vertical slices (page 3114, right column) does not refer to a feature of the method of D1 but to that of an earlier disclosure (reference [13] in D1), which happens to be document D2.

6. Disclosure of the closest prior-art document D2

6.1 Document D2 discloses methods for coding, transmitting and decoding a panorama video. The panorama video may be constructed by frame-by-frame stitching of four video streams captured by four cameras (see page 84, left column and right column, second paragraph, and figures 2 and 3). The panorama video is divided into slices (called tiles in D2), for instance six vertical slices (see section II.C on pages 84 and 85). Each slice is encoded and compressed into a video stream, for instance, in accordance with the MPEG-2 standard (see section III on pages 85 to 87). Provided there is sufficient bandwidth, the **whole** panorama video is transmitted from the encoder to the decoder (see figure 7 and section IV on pages 87 and 88). On the decoder side, the user may select the view of the panorama that they want to display (see section II.C on pages 84 and 85). The decoder then only decodes the vertical slices corresponding to the view selected by the user (see section II.C on pages 84 and 85). The user can change the selected view during playback of the panorama video (see the "virtual walkthrough applications" in section II.C on pages 84 and 85). The

walkthrough may be seamless (see section III, first paragraph, on page 85). Pointers embedded into the compressed bitstream allow the decoder to quickly retrieve the position of the vertical slices and individual image frames in the bitstream, thereby allowing a seamless walkthrough (see sections III.A and III.B on pages 85 and 86 and figures 7 and 8).

6.2 Document D2 therefore discloses the following features of the method of claim 1:

Method for decoding a multiview video stream comprising a plurality of images corresponding to single views of a scene in a fixed time instant, wherein said scene develops over a main horizontal direction, wherein said multiview video stream is coded according to a coding method comprising the steps of:

a) Dividing ~~each of~~ said plurality of images in a plurality of slices obtained by sectioning said plurality of images along a transversal direction that is orthogonal to said main horizontal direction; **(in D2, the whole panorama video is divided in slices, but not each of the four images used to construct the panorama video)**

b) ~~Implementing a 90 degrees rotation of each of said slices and Coding each of said rotated slices;~~ **(no mention of a rotation of slices in D2)**

c) Generating a multiview video stream comprising a plurality of separate video streams, each of said separate video streams comprising:

i. a set of said coded slices; **(a set of one slice per video stream in D2)**

ii. first information adapted to define the position of said slices in said plurality of images, wherein said first information comprises a plurality of identification codes (PID) assigned respectively to



each of said slices; **(it is implicit in D2 that each MPEG-2 video stream has its own PID)**

iii. second information adapted to identify at least one video stream of said multiview video stream, said at least one identified video stream comprising at least one slice that, in said scene, is adjacent to a slice of said set; **(see pointers in section III.B on page 86 and figures 7 and 8)** and

~~iv. a third information representative of said rotation of said slices;~~

and wherein said decoding method comprises the steps of:

d) Receiving said plurality of coded video streams;

e) Receiving a command to display a view of said scene, said view to be displayed comprising slices belonging to at least two of said plurality of images; **(in D2, the view to be displayed corresponds to two out of the six slices of the panorama video (see Streams 1 and 2 in figure 7 and on page 86, left column, first full paragraph); the view thus extends over two of the four images used for constructing the panorama video)**

f) Selecting the slices associated to said view to be displayed based on the received command and on said first and second information;

g) Decoding each of the selected slices;

~~h) checking in said multiview video stream the presence of information indicative that said slices have undergone a 90 degrees rotation;~~

~~i) in case selected slices have undergone to said 90 degrees rotation, applying an opposite rotation to the decoded slices before generating said video image;~~

j) Generating a video image comprising at least part of the selected slices ordered so as to generate the view to be displayed.

6.3 The appellant argued on page 3 of the statement of grounds of appeal that D2 did not disclose that a multiview video stream was generated which comprised a plurality of images each corresponding to a single view. A plurality of channels was necessary in D2 to transmit the whole panorama, which implied a plurality of decoders on the receiving side. In contrast, the single multiview video stream of the invention allowed the use of a single decoder on the receiving side.

6.4 The board does not find the appellant's arguments persuasive for the following reasons:

In D2, the panorama video may be constructed by frame-by-frame stitching of four video streams captured by four cameras (see page 84, left column and right column, second paragraph, and figures 2 and 3). Hence, the panorama video is generated from a plurality of images each corresponding to a single view. The panorama video is then divided into slices, for instance six vertical slices (see section II.C on pages 84 and 85). Each slice is encoded and compressed into a video stream, for instance, in accordance with the MPEG-2 standard (see section III on pages 85 to 87). The video streams are then multiplexed (see figure 7 and page 86, left column). The resulting multiplexed stream is thus the same as the multiview video stream of claim 1.

According to D2, the whole panorama video stream may be broadcast over a few cable TV channels or over a LAN (section IV on pages 87 and 88). Hence, it is possible to use a single decoder or several decoders to decode that stream.

7. Distinguishing feature(s)

7.1 The decoding method of claim 1 thus differs from the closest prior art by the following distinguishing feature(s):

- h) checking in said multiview video stream the presence of information indicative that said slices have undergone a 90 degrees rotation; and
- i) in case selected slices have undergone said 90 degrees rotation, applying an opposite rotation to the decoded slices before generating said video image.

7.2 The further difference in claim 1 that the slices being divided from **each of** a plurality of images comprised in the panorama video, instead of directly from the panorama video as a whole as in D2, is a feature of the coding method, not the decoding method as presently claimed.

8. Technical effect and objective technical problem

8.1 The appellant submitted on page 8 of the statement of grounds of appeal that these distinguishing features relating to the rotation of each single slice resulted in "an improved coding/decoding efficiency, especially when an MPEG technique is used to code/decode single images/slices".

8.2 The examining division regarded the objective technical problem solved by these distinguishing features to be how to efficiently encode the slices (see point 3.2 of the Reasons for the decision).

8.3 The board notes that according to the description of the application as filed, the advantage of rotating the vertical slices by 90 degrees is that it then becomes possible to take advantage of the particular features of MPEG that provide for individual coding/decoding of horizontal slices (see page 3, lines 4 to 8, and page 9, lines 9 to 12).

The stated advantage of the rotation of the vertical slices thus only exists if coding/decoding is performed in accordance with the MPEG standard. Claim 1, however, does not mention MPEG. Without MPEG, there is no advantage or technical effect achieved by the rotation of the vertical slices. At least none is disclosed in the application as filed. If anything, the rotation of the slices would be disadvantageous because of the additional processing step at both the coding and decoding stages, with no advantage in return.

9. Obviousness

9.1 According to the established case law of the boards of appeal, foreseeable disadvantageous modifications of the closest prior art which are not compensated by an unexpected technical advantage cannot contribute to the presence of an inventive step, irrespective of whether the skilled person would have wanted to make these modifications (see Case Law of the Boards of Appeal of the European Patent Office, 8th edition 2016, section I.D.9.18.1). As found above (point 8.3), the distinguishing features of claim 1 are foreseeable disadvantageous modifications of the closest prior art not compensated by any technical advantage.

9.2 Hence, the method of claim 1 does not involve an inventive step in view of D2.

10. Conclusion on the fifth auxiliary request

Since claim 1 does not meet the requirements of Article 56 EPC, the appellant's fifth auxiliary request is not allowable.

11. Conclusion

Since the appellant's main and first to fourth auxiliary requests are not admitted into the appeal proceedings and the appellant's fifth auxiliary request is not allowable, the appeal must be dismissed.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:



K. Boelicke

C. Kunzelmann

Decision electronically authenticated