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**Datasheet for the decision
of 19 July 2011**

Case Number: T 1494/06 - 3.5.04

Application Number: 99301991.8

Publication Number: 0944264

IPC: H04N 7/26

Language of the proceedings: EN

Title of invention:

Apparatus and method of encoding/decoding moving picture and storage medium storing encoded moving picture

Patentee:

VICTOR COMPANY OF JAPAN, LTD.

Opponent:

Interessengemeinschaft für Rundfunkschutzrechte e.V. (IGR e.V.)

Headword:

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Relevant legal provisions:

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Relevant legal provisions (EPC 1973):

EPC Art. 56, 100(a)

Keyword:

Decisions cited:

G 0008/91, G 0009/91

Catchword:

-



Case Number: T 1494/06 - 3.5.04

DECISION
of the Technical Board of Appeal 3.5.04
of 19 July 2011

Appellant: Interessengemeinschaft
(Opponent) für Rundfunkschutzrechte e.V. (IGR e.V.)
Bahnstraße 62
D-40210 Düsseldorf (DE)

Representative: Kinnstätter, Klaus
Maryniok & Eichstädt
Patentanwälte GbR
Kuhbergstraße 23
D-96317 Kronach (DE)

Respondent: VICTOR COMPANY OF JAPAN, LTD.
(Patent Proprietor) 12, Moriya-Cho 3-Chome
Kanagawa-Ku
Yokohama-Shi
Kanagawa-Ken (JP)

Representative: Jennings, Michael John
A.A. Thornton & Co.
235 High Holborn
London WC1V 7LE (GB)

Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 24 July 2006
rejecting the opposition filed against European
patent No. 0944264 pursuant to Article 102(2)
EPC 1973.

Composition of the Board:

Chairman: F. Edlinger
Members: C. Kunzelmann
T. Karamanli

Summary of Facts and Submissions

I. The appeal is against the decision of the opposition division to reject the opposition to European patent No. 0 944 264.

II. Claim 1 of the patent as granted reads as follows:

"An apparatus for efficiently encoding a moving picture signal, comprising:

a first encoder (2, 3, 4, 5, 6, 10, 11, 12) to encode progressively scanned specific frames that exist for every predetermined period in a moving picture signal to be encoded by intra-frame processing or by unidirectional prediction using other encoded specific frames and by orthogonal transform;

a predictor (9, 15) to predict frames or fields of the moving picture signal other than the specific frames by using the specific frames as a preceding reference frame and/or an upcoming reference frame, thus producing a predictive error signal, 17, 54 per field for each predicted frame or field;

characterised in that the first encoder encodes the progressively scanned specific frames by orthogonal transform at the 2^n -th (n being an integer) order in a vertical direction, and the apparatus further comprises:

a second encoder (18, 19, 20, 21 or 55, 56, 20, 21) to encode the predictive error signal per field by orthogonal transform at the 2^{n-1} -th order in the vertical direction."

Claim 4 of the patent as granted reads as follows:

"An apparatus for efficiently decoding a moving picture signal, comprising:

a first decoder (61, 60, 120, 110) to decode specific frames that exist for every predetermined period in a moving picture bit stream to be decoded by inverse orthogonal transform and intra-frame processing or by uni-directional prediction using other encoded specific frames, thus reproducing a moving picture signal for each progressively scanned frame;

a second decoder (67, 68, 69, 90) to decode a predictive error signal per field for each frame or field of the moving picture bit stream other than the specific frames by inverse orthogonal transform;

a predictor (65, 150) to predict the frames or fields of the moving picture signal other than the specific frames by using the specific frames as a preceding reference frame and or an upcoming reference frame, thus reproducing a moving picture signal,

characterised in that the first decoder decodes by inverse orthogonal transform at the 2^n th (n being an integer) order in a vertical direction and the second decoder decodes by orthogonal transform at the 2^{n-1} th order in the vertical direction."

Claim 6 of the patent as granted reads as follows:

"A method of efficiently encoding a moving picture signal, the method comprising the steps of:

encoding progressively scanned specific frames that exist for every predetermined period in a moving picture signal to be encoded, by intra-frame processing

or by uni-directional prediction using other encoded specific frames and by orthogonal transform; predicting frames or fields of the moving picture signal other than the specific frame by using the specific frames as a preceding reference frame and/or an upcoming reference frame, thus producing a predictive error signal per field for each predicted frame or field, characterised by encoding the progressively scanned frames by orthogonal transform at the 2^n th (n being an integer) order in a vertical direction, and encoding the predictive error signal per field by orthogonal transform at the 2^{n-1} -th order in the vertical direction."

Claim 8 of the patent as granted reads as follows:

"A method of efficiently decoding a moving picture signal, the method comprising the steps of: decoding specific frames that exist for every predetermined period in a moving picture bit stream to be decoded by inverse orthogonal transform and by intra-frame processing or by uni-directional prediction using other encoded specific frames, thus reproducing a moving picture signal for each progressively scanned frame; decoding a predictive error signal per field for each of frame or field of the moving picture bit stream other than the specific frames by inverse orthogonal transform; and predicting the frames or fields of the moving picture signal other than the specific frames by using the specific frames as a preceding reference frame and/or

an upcoming reference frame, thus reproducing a moving picture signal, characterised by decoding specific frames by inverse orthogonal transform at the 2ⁿth (n being an integer) order in a vertical direction and by decoding the predictive error signal by inverse orthogonal transform at the 2ⁿ⁻¹th order in the vertical direction."

Claims 2, 3, 5 and 7 are dependent claims.

III. The opposition was based on the ground for opposition under Article 100(a) EPC 1973 that the subject-matter of all the claims lacked an inventive step as defined in Article 56 EPC 1973. The opponent indicated documents E1 to E7 as evidence in support of this ground.

The following documents are relevant for this decision:

E1: Herpel, C. "Der MPEG-2-Standard: Generische Codierung für Bewegtbilder und zugehörige Audio-Information - Hierarchische Video-Codierung: Ansätze zur Service-Interoperabilität (Teil 3)". In: Fernseh- und Kino-Technik, No. 6/1994, pages 311 to 319, and

E4: EP 0 608 231 B1.

IV. The reasons given in the decision under appeal for rejecting the opposition may be summarised as follows:

With respect to claim 1, the opponent had submitted three objections starting respectively from E1, E2 and E3. The opposition division agreed with the opponent's

statement that documents E1 to E3 did not disclose the use of a second encoder in a configuration as specified in the characterising portion of claim 1. However, contrary to the opponent's view, none of the documents E4 to E7 suggested the use of half-resolution field images in an encoding apparatus known from E1, E2 or E3.

Documents E4 to E7 showed that DCTs having half the vertical resolution were generally known in the context of MPEG video coding. However, the problem-solution approach as set out by the opponent did not lead to a conclusive result as to why and how a person skilled in the art would have arrived at an apparatus with a first encoder encoding progressively scanned full resolution I- and P-frames and with a second encoder encoding predictive error signals at half-resolution per field. A mere combination of the features from the documents E1 to E7 did not lead to the claimed operation modes of the encoders. In particular E4 did not disclose why a half-resolution DCT should be used in particular as a fieldwise error prediction signal for progressively scanned full-resolution pictures.

This reasoning applied *mutatis mutandis* to the subject-matter of the decoder and method claims.

- V. The opponent appealed and requested oral proceedings as an auxiliary measure. In the statement of grounds of appeal the appellant (opponent) submitted arguments in support of lack of inventive step of the subject-matter of the independent claims, having regard to documents E1 and E4. These arguments may be summarised as follows.

Figure 9 and the corresponding description of E1 disclosed all the features of the precharacterising portion of claim 1. In particular, a video signal input for the interlace signal to be encoded was disclosed in the left part of figure 9. The encoder shown in the upper half of figure 9 encoded progressively scanned specific frames. The encoding of the interlace fields was performed by intra-frame processing or by unidirectional prediction using other encoded specific frames and by orthogonal transform. It was common general knowledge that the processing of a digital video signal was carried out on 8x8 or 16x16 macroblocks. Thus only the second encoder specified in claim 1 was not disclosed in E1. This second encoder had the technical effect of reducing the necessary effort for encoding B-pictures. E4 disclosed a method for encoding pictures by means of an encoder/decoder which was suitable for progressively scanned video signals, and which method could also process interlace signals. E4 disclosed that it was advantageous for the prediction of interlace fields to use a special DCT for the orthogonal transform which had only half the number pixels in the vertical direction. A person skilled in the art would adapt the second encoder of E1 in accordance with the teaching of E4. Thus the subject-matter of claim 1 lacked an inventive step.

Figure 6 and the corresponding description of E1 disclosed all the features of the precharacterising portion of claim 4. For reasons similar to those given for the encoder of claim 1, the decoder of claim 4 was obvious to a person skilled in the art having regard to documents E1 and E4.

The method claims 6 and 8 corresponded in substance to apparatus claims 1 and 4. Thus the claimed methods lacked an inventive step for the same reasons as the apparatuses of claims 1 and 4.

VI. The respondent (patentee) replied with a letter dated 20 February 2007 with arguments which may be summarised as follows:

The invention comprised a first encoder, a predictor and a second encoder. The first encoder encoded specific frames (I- or P-frames), the second encoder encoded a predictive error signal per field. The invention involved the use of known 2^n -th and 2^{n-1} -th order DCTs in order to encode frames depending on the type of picture (I, P or B) that was to be encoded. The 2^n -th order DCT was used for I- or P-pictures whereas the 2^{n-1} -th order DCT was used for the B-pictures. The advantages of the invention were apparent from column 12, line 43 to column 13, line 47 of the patent specification. In particular, bi-directional prediction using progressively scanned frames was employed. Unlike interlaced pictures, progressively scanned frames exhibited no displacement in time and no aliasing components. The intraframe encoding employed in the invention likewise exhibited no displacement in time and no aliasing components. The reference pictures used in the invention were always frames having a density in scanning lines twice that for fields.

The respondent (patentee) requested oral proceedings as an auxiliary measure.

VII. The board issued a communication pursuant to Article 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA), annexed to a summons to oral proceedings dated 8 March 2011. In this communication the board *inter alia* informed the parties as follows:

"2. The board notes that the opposition division considered the following features as essential for their decision at least as far as claim 1 is concerned (see page 5, third complete paragraph of the decision): The first encoder encodes **progressively scanned** (thus full resolution) **frames**. These full resolution frames are coded as I- or P-frames. The second encoder however encodes predictive error signals at **half-resolution per field** (by DCT at the 2^{n-1} -th order vs 2^n -th order in the vertical direction; emphases by the board).

2.1 The board tends to agree with the decision under appeal that these features may be considered as decisive for the assessment of inventive step. In particular, the difference in vertical resolution seems to correspond to the different orders of the orthogonal transforms carried out in the two decoders as specified in the characterising portion of claim 1. Furthermore, since the two encoders specified in claim 1 appear to encode the video signal for different vertical resolutions (progressive scan and interlace resolution, respectively), the board has doubts that the two encoders in claim 1 can be equated with the two encoders for the base layer and the enhancement layer ("Basisdaten-Coder" and "Zusatzdaten-Coder") shown in figure 9 of E1. According to figure 9 and the corresponding description of E1 (see page 316, left hand column, second and third paragraph) each encoder

seems to receive the same type of input, namely either frames or fields (see the block "Bild/Zeilen-Demultiplexer" in the input line of both encoders). In particular, a possibility of coding a progressively scanned signal on the basis of a video input in the form of an interlace signal (i.e. fields) is discussed in the context of figure 10. But E1 does not appear to disclose two encoders encoding for different vertical resolutions.

2.2 The statement of grounds of appeal does not appear to comprise arguments concerning the parts of the decision under appeal given in point 2 above. Instead the statement of grounds of appeal comprises in particular on pages 4 and 5 arguments as to why E4 allegedly suggests the use of a particular DCT, of only half the number of pixels in the vertical direction per macroblock, for the prediction of fields to be encoded. These arguments, however, do not appear to respond to those given in the decision under appeal. Hence the appellant should be prepared to discuss in particular the parts of the decision under appeal as discussed in point 2 above."

The board also informed the parties that it tended to agree with the decision under appeal that an analogous reasoning to that concerning claim 1 applied also to the other independent claims.

VIII. With a letter dated 17 March 2011 the appellant (opponent) informed the board that it withdrew its request for oral proceedings, which it would not be attending. The appellant (opponent) requested a

decision according to the state of the file and did not submit any arguments.

- IX. With a letter dated 10 May 2011 the respondent (patentee) withdrew its request for oral proceedings and requested a decision according to the state of the file. In this letter the respondent (patentee) did not submit any arguments.
- X. In a communication sent by fax on 4 July 2011 the board informed the parties that it would hold the oral proceedings as scheduled and take a decision based on the documents on file, as requested by both parties.
- XI. Oral proceedings were held before the board on 19 July 2011 in the parties' absence in application of Rule 71(2) EPC 1973 and Article 15(3) RPBA. At the end of the oral proceedings the chairman announced the board's decision.
- XII. The parties' requests submitted in writing were as follows:

The appellant (opponent) requested that the decision under appeal be set aside and that the European patent No. 0944264 be revoked.

The respondent (patentee) requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.
2. It is the board's duty to examine whether the appeal is admissible and allowable (Article 110 EPC). This does not mean that a board has to carry out a general review of decisions at first instance, regardless of whether such a review has been sought by the parties (see point 10.2 of decision G 8/91 of the Enlarged Board of Appeal, OJ EPO 1993, 346). The parties in contentious opposition proceedings, including opposition appeal proceedings, should be given equally fair treatment (see decision G 9/91 of the Enlarged Board of Appeal (OJ EPO 1993, 408), point 2 *in fine*). However, the purpose of the appeal procedure *inter partes* is mainly to give the losing party the possibility of challenging the decision of the opposition division on its merits (see G 9/91, *loc. cit.* point 18). Thus it is up to the appellant to convince the board that the decision under appeal is incorrect.
3. As indicated in the board's communication, the opposition division considered the following features as essential for their decision at least as far as claim 1 is concerned: The first encoder encodes **progressively scanned** (thus full-resolution) **frames**. These full-resolution frames are coded as I- or P-frames. The second encoder however encodes predictive error signals at **half-resolution per field** (by DCT at the 2^{n-1} -th order vs 2^n -th order in the vertical direction; emphasis by the board). The encoded moving picture signal thus represents both frames and fields, in particular fieldwise predictive error signals. This

is illustrated in figure 2 of the patent specification. The board agrees with the decision under appeal that these features are essential for the assessment of inventive step.

4. With respect to the encoding of frames and fields the appellant argued that the encoder shown in the upper half of figure 9 of E1 ("Basisdaten-Coder") encoded progressively scanned specific frames on the basis of an input interlace signal (i.e. fields) and that it would be obvious to use an adapted second encoder with a special DCT which had only half the number of pixels as in E4. This argument does not convince the board that the specific argument given in the decision under appeal is not correct, namely that a DCT of order 2^n is used for encoding I- or P-frames, whereas a DCT of order 2^{n-1} is used as a fieldwise error prediction signal for progressively scanned full-resolution pictures (see point 3 above).
- 4.1 Also according to figure 9 and the corresponding description of E1 (see page 316, left-hand column, second and third paragraphs) each encoder ("Basisdaten-Coder" and "Zusatzdaten-Coder") receives the same type of input, namely either frames or fields (see the block "Bild/Zeilen-Demultiplexer" in the input line of both encoders). In the context of figure 9 and the corresponding description, if fields (interlace signals) are input the second encoder ("Zusatzdaten-Coder") too is required when progressively scanned frames are to be generated (see page 316, left-hand column, last paragraph and figure 10).

5. The appellant essentially argued that E4 allegedly suggested the use of a particular DCT of order 2^{n-1} , viz. only half the number of pixels in the vertical direction, for the prediction of fields to be encoded. This argument does not convince the board that the specific argument given in the decision under appeal is not correct. In particular, it does not give an explanation why a person skilled in the art would use a fieldwise error prediction signal for progressively scanned full-resolution pictures.

5.1 E4 specifies on page 2, lines 37 to 43 that the invention of E4 allows a cost-saving and efficient square DCT (8*8 or 16*16) to be performed. In particular the DCT according to E4 is more cost-effective (in terms of hardware) than a special non-square DCT. In particular, E4 discloses a hybrid encoder which may encode both progressively scanned frames and interlace fields (see page 2, lines 31 to 34). According to E4, input interlace signals are reorganised in such a manner that there is **no need** to switch between a 8*8 and a 2*(4*8) DCT. Instead a 8*8 DCT may be performed even if the picture content is dynamic (see page 3, lines 2 to 4). Hence, in the board's view, the appellant's argument that E4 suggests the use of a non-square DCT or of a DCT on half the number of pixels in the vertical direction is not convincing.

5.2 In view of the above, the appellant's arguments based on E4 did not convince the board that the subject-matter of claim 1 of the opposed patent lacked an inventive step when starting from E1. In essence the above reasoning applies also to the subject-matter of

independent claims 4, 6 and 8 since the appellant presented similar reasons based on E4 as to why a person skilled in the art would have adapted the closest prior art in E1.

6. In summary, the appellant's arguments did not convince the board that the decision under appeal is incorrect. Hence the appeal must be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

K. Boelicke

F. Edlinger