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Datasheet for the decision of 26 June 2014

Case Number: T 1808/12 - 3.5.04

Application Number: 09003046.1

Publication Number: 2066131

IPC: H04N7/26

Language of the proceedings: EN

Title of invention:
Method of selecting a reference picture

Applicant:
LG Electronics Inc.

Headword:

Relevant legal provisions:
EPC Art. 76(1)
RPBA Art. 13(1)

Keyword:
Divisional application - subject-matter extends beyond content of earlier application (yes)
Late-filed auxiliary requests - admitted (no)

Decisions cited:
G 0001/05, G 0001/06

Catchword:

Europäisches Patentamt
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Case Number: T 1808/12 - 3.5.04

D E C I S I O N
of Technical Board of Appeal 3.5.04
of 26 June 2014

Appellant: (Applicant)	LG Electronics Inc. 20, Yoido-Dong Yongdungpo-Gu Seoul 150-721 (KR)
Representative:	Diehl & Partner GbR Patentanwälte Erika-Mann-Straße 9 80636 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 23 February 2012 refusing European patent application No. 09003046.1 pursuant to Article 97(2) EPC.**

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 examining division to refuse European patent application No. 09 003 046.1 under Article 97(2) of the European Patent Convention (EPC). The application had been filed as a divisional from earlier application No. 04 716 800.0 filed as international application PCT/KR/2004/000445 and published as WO 2004/080078 A1.

II. The decision under appeal made reference to documents D1 to D17. The application was refused on the ground that the subject-matter of claim 1 then on file did not involve an inventive step within the meaning of Article 56 EPC in view of D1 alone or in combination with D2 or D3.

D1 WIEGAND T. 'Study of Final Committee Draft of Joint Video Specification (ITU-T Rec. H.264 | ISO/IEC 14496-10 AVC)'. Joint Video Team (JVT) of ISO/IEC MPEG & ITU-T VCEG (ISO/IEC JTC1/SC29/WG11 and ITU-T SG16 Q.6), 6th meeting: Awaji Island, JP, 5 to 13 December 2002, document JVT-F100, pages i to xv, 1 to 226, XP030005665.

D2 FOGG C. et al. 'Adaptive Field/Frame Block Coding Experiment Proposal'. ITU-T, SG16 Q.6 Video Coding Experts Group VCEG, Santa Barbara meeting, CA, USA, 24 to 27 September 2001, document VCEG-N76, pages 1 to 7, XP030003323.

D3 WANG L. et al. 'Macroblock Adaptive Frame/Field Coding for Interlace Sequences'. Joint Video Team (JVT) of ISO/IEC MPEG & ITU-T VCEG (ISO/IEC JTC1/SC29/WG11 and ITU-T SG16 Q.6), 4th meeting: Klagenfurt, AT,

22 to 26 July 2002, document JVT-D108, XP030005380.

III. The applicant appealed against this decision and filed claim 1 according to a main and a first auxiliary request with the statement of grounds of appeal. The applicant/appellant contested that D1 had been made available to the public before the priority date of the present application. The appellant also submitted arguments as to why the subject-matter of claim 1 of both requests involved an inventive step over D1 alone or in combination with D2 and/or D3.

IV. In a letter dated 17 July 2012 the appellant proposed consolidation of the appeal proceedings in cases T 1807/12, T 1834/12, T 1808/12 and T 1833/12 since they concerned the refusals of four applications which all belonged to the same patent family derived from international application PCT/KR2004/000445. The four appeal cases dealt with essentially identical subject-matter. The appellant also requested acceleration of the appeal proceedings.

V. In a communication pursuant to Rule 100(2) EPC the board informed the appellant that it intended to co-ordinate the four appeal cases as far as legally and practically possible but that it had not formally consolidated the proceedings according to Article 10(2) of the Rules of Procedure of the Boards of Appeal (RPBA). The board also indicated that it had given priority to these four cases. Moreover, the board gave a preliminary opinion that D1 was available to the public before the priority date of the present application.

VI. In a letter of reply dated 23 October 2013 the appellant submitted observations on the public availability of D1. In a further letter dated 8 November 2013 the appellant drew the board's attention to decisions T 762/12 and T 763/12 in which the availability to the public of contributions to meetings of a standardisation group had been an issue.

VII. In a communication pursuant to Article 15(1) RPBA dated 31 January 2014 the board expressed doubts that the subject-matter of claim 1 of both the main and the auxiliary request was disclosed in the earlier application as filed. Reference was made to Article 76(1) EPC. The board also raised an objection under Article 84 EPC. Furthermore, the board took note of the appellant's replies dated 23 October 2013 and 8 November 2013.

VIII. With a letter of reply dated 23 May 2014 the appellant filed new sets of claims according to second to fifth auxiliary requests.

IX. Oral proceedings before the board were held on 24 to 26 June 2014 for the four cases T 1807/12, T 1834/12, T 1808/12 and T 1833/12. During the oral proceedings for the present case T 1808/12 the appellant filed third and fifth auxiliary requests replacing the previous third and fifth auxiliary requests.

X. The appellant's final requests in case T 1808/12 were that the decision under appeal be set aside and that a patent be granted on the basis of claim 1 according to one of the following requests:

- main request filed with the statement of grounds of appeal;

- first auxiliary request filed with the statement of grounds of appeal;
- second auxiliary request filed with letter dated 23 May 2014;
- third auxiliary request submitted during oral proceedings on 25 June 2014;
- fourth auxiliary request filed with letter dated 23 May 2014; and
- fifth auxiliary request submitted during oral proceedings on 25 June 2014.

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

XI. Claim 1 (the sole claim) of the main request reads as follows:

"A method of processing a current field macroblock, comprising:
obtaining a reference frame picture list including multiple reference frame pictures;
determining a reference frame picture index of the multiple reference frame pictures in the reference frame picture list based on display order information for the multiple reference frame pictures, the reference frame picture index numbers being allocated in a reverse order to the reference frame pictures whose display order is lower than the display order of the current field macroblock and the remaining reference frame picture index numbers being allocated in the display order to the reference frame pictures whose display order is higher than the display order of the current field macroblock;

reordering the reference frame picture index allocated to each reference frame picture in the reference frame picture list;
obtaining a reference field picture index associated with the current field macroblock;
determining a reference frame picture from the reference frame picture list based on the reference field picture index and the reordered reference frame picture index;
selecting a reference field picture having a different parity from the current field macroblock if the reference field picture index is an odd value; and
performing motion compensation using the selected reference field picture when processing the current field block."

XII. Claim 1 (the sole claim) of the first auxiliary request reads as follows:

"A method of coding a current field macroblock, comprising:
obtaining a reference frame picture list including multiple reference frame pictures;
determining a reference frame picture index of the multiple reference frame pictures in the reference frame picture list based on display order information for the multiple reference frame pictures, the reference frame picture index numbers being allocated in a reverse order to the reference frame pictures whose display order is lower than the display order of the current field macroblock and the remaining reference frame picture index numbers being allocated in the display order to the reference frame pictures whose display order is higher than the display order of the current field macroblock;

reordering the reference frame picture index allocated to each reference frame picture in the reference frame picture list;
obtaining a reference field picture index associated with the current field macroblock;
determining a reference frame picture from the reference frame picture list based on the reference field picture index and the reordered reference frame picture index;
selecting a reference field picture having a different parity from the current field macroblock if the reference field picture index is an odd value; and
performing motion compensation using the selected reference field picture when coding the current field block."

XIII. Claim 1 (the sole claim) of the second auxiliary request reads as follows:

"A method of processing a current field macroblock, comprising:
obtaining a reference frame picture list including multiple reference frame pictures;
determining a reference frame picture index of the multiple reference frame pictures in the reference frame picture list based on display order information for the multiple reference frame pictures, the reference frame picture index numbers being allocated in a reverse order to the reference frame pictures whose display order is lower than the display order of a current frame picture and the remaining reference frame picture index numbers being allocated in the display order to the reference frame pictures whose display order is higher than the display order of the current frame picture, wherein the current frame picture includes the current field macroblock; and

reordering the reference frame picture index allocated to each reference frame picture in the reference frame picture list;
characterized by
performing motion compensation for the current field macroblock using a reference field picture,
wherein the reference field picture is indicated by a reference field picture index, and
the reference field picture has a parity different from the current field macroblock when the reference field picture index is odd."

XIV. Claim 1 (the sole claim) of the third auxiliary request reads as follows:

"A method of coding a current field macroblock, comprising:
obtaining a reference frame picture list including multiple reference frame pictures;
determining a reference frame picture index of the multiple reference frame pictures in the reference frame picture list based on display order information for the multiple reference frame pictures, the reference frame picture index numbers being allocated in a reverse order to the reference frame pictures whose display order is lower than the display order of a current frame picture and the remaining reference frame picture index numbers being allocated in the display order to the reference frame pictures whose display order is higher than the display order of the current frame picture, wherein the current frame picture includes the current field macroblock;
characterized by
alternately allocating reference field picture indexes that are increased by one to reference field pictures, starting from the reference field picture having a

parity equal to the parity of a field picture containing the current field macroblock to the reference field picture having a parity different from the parity of the field picture containing the current field macroblock, while sequentially visiting the reference frame pictures according to the order of the reference frame picture index; and
performing motion compensation for the current field macroblock using the reference field picture indicated by the reference field picture index."

XV. Claim 1 (the sole claim) of the fourth auxiliary request reads as follows:

"Method for efficiently providing reference picture information used for motion compensation in a coded moving picture, the moving picture being an interlaced moving picture having frame pictures, each frame picture consisting of two fields, each field comprising at least one macroblock, the method comprising:
obtaining reference picture indexes for reference pictures used for motion compensation in units of frames at a picture level, wherein the reference picture indexes for a macroblock in B frame picture are determined based on a display order of the reference frames, wherein in case of a reference frame list 0, indexes are allocated in a reverse order to reference frames whose display orders lag behind the B frame picture and the remaining indexes are allocated in the display order to reference frames whose display order lead the B frame picture,
obtaining reference picture indexes for reference pictures used for motion compensation in units of fields at a macroblock level, wherein the reference picture indexes in units of fields at a macroblock

level depend on the reference picture indexes in units of frames at the picture level as follows:
top reference picture index in units of fields = 2 x reference picture index in units of frames; and
bottom reference picture index in units of fields = 2 x reference picture index in units of frames + 1."

XVI. Claim 1 (the sole claim) of the fifth auxiliary request reads as follows:

"A method for setting a reference picture index when an interlaced moving picture is coded into a frame picture having a field macroblock, the coding using multiple reference pictures, the method comprising:

(a) determining a reference picture index of frame unit at a slice level; and

(b) determining a reference picture index at a macroblock level according to a coding mode of the macroblock on the basis of the reference picture index of frame unit,

wherein in the step (a), all reference pictures are considered in unit of frame,
wherein in the step (a), the reference picture index of frame unit for a B frame is determined based on a display order of the reference picture,
wherein in the step (a) in case of a reference picture list 0 for a current B frame, reference picture index numbers of frame unit are allocated in a reverse order to reference pictures whose display orders are lower than the display order of the current B frame and the remaining reference picture index numbers of frame unit are allocated in a display order to reference pictures whose display orders are higher than the display order of the current B frame,
wherein in the step (b), the reference picture stored in a reference buffer has a pair of fields having

parities opposite to each other, wherein in the step (b), reference picture indexes of field unit that are increased by one are alternately allocated to the reference fields, starting from the reference field having a parity equal to the current field comprising the field macroblock in the current B frame to the reference field having a parity different from the current field comprising the field macroblock in the current B frame, while sequentially visiting the reference pictures in an order of the reference picture indexes of frame unit."

XVII. The appellant's arguments may be summarised as follows:

The single independent claims according to the main and first auxiliary requests were those underlying the decision under appeal and thus were in the appeal proceedings. The single independent claims of the second to fifth auxiliary requests dated 23 May 2014 had been filed in reply to an objection under Article 76(1) EPC raised in detail for the first time in the board's communication dated 31 January 2014. The single independent claims of the new third and fifth auxiliary requests filed during the oral proceedings related to the same subject-matter as the previous third and fifth auxiliary requests. Only the wording had been changed in reaction to observations of the board during the oral proceedings. Thus the claims of all requests should be admitted into the appeal proceedings.

In the letter dated 23 May 2014, the appellant had indicated a basis for the claimed subject-matter of all requests, namely page 1, lines 17 to 20; page 1, line 33 to page 2, line 7; and page 4, lines 22 to 31 of the earlier application as filed. The claims of the

main request and first, second and third auxiliary requests were additionally based on the disclosure of "Case 3" on page 12, lines 21 to 29 and the corresponding figures 10 and 11. The claims of the fourth and fifth auxiliary requests were additionally based on the disclosure of "case 1" on page 11, line 27 to page 12, line 4 and the corresponding figure 8.

The earlier application as filed disclosed the coding of moving pictures using multiple reference pictures, in particular a frame picture coding method with frame/field macroblock. It was implicit that decoding was the reverse process. The encoder transferred frame pictures into the decoder, and thus the decoder obtained frame pictures from the encoder. The decoder also obtained the reference picture index from the encoder and performed motion compensation by using a reference picture that was indicated by the reference picture index. According to section [2.2] on page 11, line 13 to page 13, line 17 ("Case of Field Macroblock") the reference picture corresponded to a reference field picture and the reference picture index corresponded to the reference field picture index. Since in a frame picture coding method with frame/field macroblock two field pictures were combined into one frame picture, the decoder needed to select one reference field picture among two combined field pictures forming one frame picture. This was illustrated in figure 10 for the case of P frames and in figure 11 for the case of B frames. The claims of all requests reflected results of the selection illustrated in figure 11. The selection of the reference picture used for motion compensation depended on the picture content. The general teaching of the invention disclosed in the earlier application as filed was a reversible allocation of reference field picture indices on the

basis of reference frame picture indices (reversible in the sense that it allowed the reconstruction of the reference frame picture indices from the reference field picture indices) and which could be used for both coding and decoding moving pictures. This reversibility had the advantage that only the reference field picture indices (but not the reference frame picture indices) had to be transmitted to the decoder. The claims of the present application related to one aspect of this general teaching of the earlier application.

Reasons for the Decision

1. The appeal is admissible.

2. Main request: Article 76(1) EPC

2.1 According to Article 76(1) EPC, a European divisional application "may be filed only in respect of subject-matter which does not extend beyond the content of the earlier application as filed". It is established jurisprudence that if a divisional application is amended the amended divisional application may likewise not extend beyond the content of the earlier application as filed (see, for instance, decision G 1/05 of the Enlarged Board of Appeal, OJ EPO 2008, 271, point 9.2 of the Reasons, and the Order of decision G 1/06 of the Enlarged Board of Appeal, OJ EPO 2008, 307).

2.2 The sole claim 1 of the main request comprises the features of "determining a reference frame picture from the reference frame picture list based on the reference field picture index and the reordered reference frame picture index" and of "selecting a reference field

picture having a different parity from the current field macroblock if the reference field picture index is an odd value".
In the context of the present application, the reference field picture is one of two reference field pictures of the reference frame picture.

2.3 However, the earlier application as filed does not give any details as to how the determination of a reference frame picture from the reference frame picture list is based on the reference field picture index and the reordered reference frame picture index. The determination of the reference frame picture is described as background art, and in that context the earlier application discloses that "one of the reference frame pictures must be used for motion compensation" and in addition "one of the reference field pictures must be used for motion compensation" (see page 4, lines 22 to 31 of WO 2004/080079 A1). In the context of the earlier application, the reference field picture is one of two reference field pictures of the reference frame picture. The earlier application as filed does not disclose that the reference frame picture determination made in the context of the invention is "based on" (and thus somehow influenced by) the reference field picture index (and the reordered reference frame picture index).

2.4 Moreover, the earlier application as filed does not give any details as to how the selection of the reference field picture which is to be used for motion compensation is made from the two reference field pictures of the reference frame picture. Therefore, the feature of "selecting a reference field picture having a different parity from the current field macroblock if

the reference field picture index is an odd value" is not disclosed in the earlier application as filed.

2.5 Hence the sole claim 1 of the main request specifies subject-matter which extends beyond the content of the earlier application as filed. Thus this claim of the present divisional application infringes Article 76(1) EPC.

2.6 The appellant's argument that the subject-matter of the sole claim 1 was implicitly disclosed in the earlier application as filed did not convince the board.

2.6.1 The earlier application as filed discloses methods for setting a reference index in the context of coding moving pictures (see, for instance, the independent claims, page 4, lines 32 to 36, page 5, lines 6 to 13 and the "Best Mode for Carrying Out the Invention" on page 9, line 8 to page 13, line 27). Decoding the moving picture is not discussed in the earlier application as filed. Moreover, the earlier application as filed discloses on page 1, lines 17 to 20 in the section "Background Art" that a "coder transfers the reference picture index to a decoder, and the decoder performs motion compensation from reference picture that is indicated by the reference picture index". This is a general (prior art) teaching which does not refer to a reference frame picture index or a reference field picture index. It is implicit that there must be some convention common to the coder and the decoder as to which index is transferred. But it is not directly and unambiguously derivable from the earlier application as filed that a reference field picture index determined by the coder is transferred to the decoder. The earlier application as filed remains silent as to which of the indexes is transferred to the decoder. For instance, it

is not directly and unambiguously derivable which index is used by the decoder.

2.6.2 It may be deduced from the earlier application (case 1 to case 4, see page 11, line 23 to page 13, line 8) that the allocations of reference field indices on the basis of reference frame indices disclosed are reversible in the sense that they allow the reconstruction of the reference frame picture indices from the reference field picture indices. But the earlier application as filed does not explicitly disclose that reversibility derives from the particular allocations disclosed, or that this reversibility allows the reference frame picture to be determined from the reference frame picture list "based on the reference field picture index and the reordered reference frame index" as specified in present claim 1. A person skilled in the art might upon analysis of the allocations in case 1 to case 4 find out that they are indeed reversible (if it is known how the reordering of the reference frame picture index was performed). He/she might also consider the consequences of this reversibility and come to the conclusion that it might be sufficient to transfer the reference field picture indices (but not the reference frame picture indices) to the decoder which would nevertheless be in a position to determine the reference frame picture from the reference frame picture list. But this multi-step derivation is not a **direct** and unambiguous disclosure of the earlier application as filed.

2.6.3 Also the illustration of the described allocations of reference field indices on the basis of reference frame indices disclosed in the earlier application (see, for instance, figure 11 of WO 2004/080078 A1) does not change the above assessment. Even though it is correct

that in figure 11 (which illustrates case 3 for list 0 for B frames) an odd value of the reference field picture index (labelled "reference picture index list0 (macroblock level)") corresponds to the parity (top or bottom) of the reference field picture being different from the parity of the current field macroblock, figure 11 nevertheless merely illustrates the result of the allocation described in the context of case 3 (see page 9, lines 1 to 3 and page 12, lines 22 to 29 of WO 2004/080078 A1). There is no disclosure in the earlier application as filed that a result taken from one of the figures may be isolated from the context of the described allocations. Moreover, the allocation described in case 3 and in figure 11 comprises additional limitations, such as index values starting with 0, which may need to be complied with if the result of the allocation is to comply with the relationship between reference field picture index value and reference field picture parity specified in claim 1.

3. First auxiliary request: Article 76(1) EPC

3.1 The only difference between the sole claims of the main request and the first auxiliary request is that the word "processing" in the first line and in the second but last line of claim 1 of the main request has been replaced by the word "coding" in the first auxiliary request. This difference is not of relevance for the above considerations. Hence the sole claim of the first auxiliary request infringes Article 76(1) EPC for the reasons given above in the context of the main request.

4. Second auxiliary request: Article 76(1) EPC)

4.1 The sole claim 1 of the second auxiliary request comprises as a characterising feature that the reference field picture has a parity different from the current field macroblock when the reference field picture index is odd.

4.2 This feature is a result taken from figure 11 of the earlier application as filed, see point 2.6.3 above. There is no disclosure in the earlier application as filed that this result may be isolated from the context of the described allocations.

4.3 Hence the sole claim of the second auxiliary request also infringes Article 76(1) EPC.

5. Third auxiliary request: admission under Article 13(1) RPBA

5.1 According to Article 13(1) RPBA, "Any amendment to a party's case after it has filed its grounds of appeal ... may be admitted and considered at the Board's discretion".

5.2 The sole claim 1 of the present third auxiliary request differs from that of the previous third auxiliary request (the previous third auxiliary request having been filed in reply to the board's communication pursuant to Article 15(1) RPBA dated 31 January 2014) *inter alia* in that features reflecting the result of the allocation illustrated in figure 11 have been replaced by features of the described allocation. Moreover, it no longer comprises the feature of "reordering the reference frame picture index allocated

to each reference frame picture in the reference frame picture list".

5.3 The feature of "reordering ..." is present in the claims of the main request and the first and second auxiliary requests and also was present in the previous version of the third auxiliary request. In substance, the omission of this feature was neither a reaction to an objection by the board raised during the oral proceedings nor a reaction to an objection raised in the board's communication.

5.4 The board thus regards the omission of the feature "reordering ..." as an amendment made of the applicant's own volition at a very late stage in the proceedings, which is contrary to procedural economy. The appellant did not give reasons as to why the board was not informed earlier that this feature of the invention could be dispensed with. Admission of this claim would have increased the complexity of the appeal proceedings, in that for the first time methods would have had to be considered in which reordering of the reference frame picture index did not take place.

5.5 In view of the above,the board decided to exercise its discretion under Article 13(1) RPBA in not admitting the third auxiliary request into the appeal proceedings.

6. Fourth auxiliary request: admission under Article 13(1) RPBA

6.1 Whereas the claims of the main request and the first to third auxiliary requests are concerned with case 3 illustrated in figure 11 of WO 2004/080078 A1, the sole independent claim 1 of the fourth auxiliary request is

concerned with case 1 illustrated in figure 8 of WO 2004/080078 A1 (see page 11, line 26 to page 12, line 4). Case 1 and case 3 concern different allocations of reference field indices on the basis of reference frame indices.

6.2 Moreover, claim 1 of the fourth auxiliary request does not relate to a method of processing or coding a current field macroblock but instead to a "Method for efficiently providing reference picture information used for motion compensation in a coded moving picture".

6.3 Furthermore, claim 1 of the fourth auxiliary request reintroduces a wording which was objected to in the first-instance proceedings ("lag behind the B frame picture", "lead the B frame picture").

6.4 The appellant did not give reasons as to why the generic term of the claim had been thus changed or why in this request the subject-matter claimed had been shifted from "case 3" to "case 1" one month before the oral proceedings.

6.5 Hence, claim 1 of the fourth auxiliary request constitutes a major and unexpected amendment to the appellant's case. Admission of this claim would have increased the complexity of the appeal proceedings, in that for the first time issues relating to "case 1" would have had to be considered.

6.6 In view of the above, the board decided to exercise its discretion under Article 13(1) RPBA in not admitting the fourth auxiliary request into the appeal proceedings.

7. Fifth auxiliary request: admission under Article 13(1) RPBA

7.1 The sole claim 1 of the present fifth auxiliary request differs from that of the previous fifth auxiliary request (the previous fifth auxiliary request having been filed in reply to the board's communication pursuant to Article 15(1) RPBA dated 31 January 2014) *inter alia* in that the formulae which identified the previous fifth auxiliary request as concerning "case 1" have been omitted. Instead, present claim 1 of the fifth auxiliary request concerns "case 3". Moreover, claim 1 comprises major amendments to the language.

7.2 This request could have been submitted during the written phase of the appeal proceedings, together with the other requests concerning "case 3". Moreover, claim 1 of this request does not comprise the feature of "reordering the reference frame picture index ..." even though such a feature is present in the claims of the other requests concerning "case 3". As discussed in the context of the third auxiliary request, the omission of this feature was neither a reaction to an objection by the board raised during the oral proceedings nor a reaction to an objection raised in the board's communication.

7.3 In view of the above, the board decided to exercise its discretion under Article 13(1) RPBA in not admitting the fifth auxiliary request into the appeal proceedings.

8. Since none of the appellant's requests admitted into the appeal proceedings is allowable, the appeal is to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

K. Boelicke F. Edlinger

Decision electronically authenticated