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Datasheet for the decision of 6 March 2020

Case Number: T 1083/15 - 3.5.04

Application Number: 09171879.1

Publication Number: 2164261

IPC: H04N7/32, H04N7/26, H04N7/36, H04N7/46, H04N7/50

Language of the proceedings: EN

Title of invention:
Filtering strength determination method, moving picture coding and decoding method

Applicant:
Godo Kaisha IP Bridge 1

Headword:

Relevant legal provisions:
EPC Art. 76(1), 123(2)

Keyword:
Divisional application - subject-matter extends beyond content of earlier application (yes)
Amendments - extension beyond the content of the application as filed (yes)

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It can be changed at any time and without notice

Decisions cited:

Catchword:

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Case Number: T 1083/15 - 3.5.04

D E C I S I O N
of Technical Board of Appeal 3.5.04
of 6 March 2020

Appellant: (Applicant)	Godo Kaisha IP Bridge 1 c/o Sakura Sogo Jimusho, 1-11 Kanda Jimbocho, Chiyoda-ku, Tokyo 101-0051 (JP)
Representative:	Eisenführ Speiser Patentanwälte Rechtsanwälte PartGmbB Postfach 10 60 78 28060 Bremen (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 24 February 2015 refusing European patent application No. 09171879.1 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	C. Kunzelmann
Members:	B. Le Guen
	T. Karamanli

Summary of Facts and Submissions

I. The appeal is against the decision of the examining division to refuse European patent application No. 09 171 879.1, published as European patent application EP 2 164 261 A2. It is a divisional application of the earlier European patent application No. 03 749 803.7 ("the earlier application"), which was published as international application WO 2004/008773 A1 and European patent application EP 1 408 697 A1.

II. The documents cited in the decision under appeal included the following:

D1: Joint Video Team of ISO/IEC MPEG and ITU-T-VCEG, "*Draft ISO/IEC 14496-10 : 2002 (E)*", 3rd meeting, Fairfax, Virginia, USA, 6-10 May 2002, Document JVT-C167, 10 May 2002, XP030005278;

D2: EP 0 838 955 A2.

III. The decision under appeal was based on the ground that the subject-matter of independent claim 1 of the then sole request lacked an inventive step (Article 56 EPC) in view of the disclosure of document D1 alone or combined with the disclosure of document D2.

IV. The applicant (appellant) filed notice of appeal. With the statement of grounds of appeal, it requested that the decision under appeal be set aside and that a patent be granted on the basis of the single claim of the request forming the basis for the decision under appeal (main request). If the board agreed with the appellant's view on inventive step but nevertheless was

not willing to grant its main request for other reasons, the appellant requested that the case be remitted to the department of first instance, with confirmation by the board that the claimed subject-matter involved an inventive step (first auxiliary request). The appellant provided arguments as to why the subject-matter of the claim of the main request involved an inventive step in view of the disclosure of document D1 alone or combined with the disclosure of document D2.

V. The board issued a summons to oral proceedings. In a communication under Article 15(1) RPBA 2007 (Rules of Procedure of the Boards of Appeal, OJ EPO 2007, 536), annexed to the summons, the board gave its provisional opinion that the claim of the main request was not clear (Article 84 EPC), that it contained subject-matter which extended beyond the content of the earlier application as filed (Article 76(1) EPC), and that its subject-matter lacked an inventive step (Article 56 EPC) in view of the disclosure of document D1 combined with the common general knowledge of a person skilled in the art.

VI. With its reply dated 6 February 2020, the appellant filed an amended claim 1 according to a main request. The appellant provided a basis for the amendments in the application as filed, as well as arguments as to why the claim met the requirements of Articles 76(1), 84 and 56 EPC.

VII. On 6 March 2020 oral proceedings were held before the board.

At these proceedings, the appellant withdrew its auxiliary request for remittal filed with its statement

of grounds of appeal. Its final request was that the decision under appeal be set aside and that a European patent be granted on the basis of claim 1 according to the main request filed by letter dated 6 February 2020.

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

VIII. Claim 1 of the main and sole request reads as follows:

"A distortion removing method for removing coding distortion occurring at a boundary between a current block constituting a B-picture and a neighboring block adjacent to the current block, said distortion removing method comprising:

a filtering strength determining step of determining a predetermined filtering strength from among a filtering strength corresponding to filtering not being performed, a weakest filtering strength, a second-weakest filtering strength, a third-weakest filtering strength, and a strongest filtering strength; and

a removing step of removing the coding distortion between the blocks, by performing a filtering with the predetermined filtering strength, wherein said filtering strength determining step includes:

a first determining step of determining whether or not either the current block or the neighboring block is intra prediction coded;

a second determining step of determining whether or not the boundary corresponds to a macroblock boundary, in the case where it is determined in said first

determining step that either the current block or the neighboring block is intra prediction coded;

a third determining step of determining whether or not any of the current block and the neighboring block includes data obtained by coding a coefficient that indicates a spatial frequency component resulting from an orthogonal transformation, in the case where it is determined in said first determining step that neither the current block nor the neighboring block is intra prediction coded;

and that both the current block and the neighboring block are inter prediction coded;

a fourth determining step of determining whether or not the number of pictures referred to by the current block is equal to the number of pictures referred to by the neighboring block, in the case where it is determined in said third determining step that neither the current block nor the neighboring block includes the data obtained by coding the coefficient that indicates the spatial frequency component resulting from the orthogonal transformation;

a fifth determining step of determining whether or not the picture(s) referred to by the current block is/are the same as the picture(s) referred to by the neighboring block, in the case where it is determined in said fourth determining step that the number of pictures referred to by the current block is equal to the number of pictures referred to by the neighboring block; and

a sixth determining step of determining whether or not each difference between the horizontal component(s) of

the motion vector(s) of the current block and the horizontal component(s) of the motion vector(s) of the neighboring block and each difference between the vertical component(s) of the motion vector(s) of the current block and the vertical component(s) of the motion vector(s) of the neighboring block is less than one pixel, in the case where it is determined in said fifth determining step that the picture(s) referred to by the current block is/are the same as the picture(s) referred to by the neighboring block,

wherein in said filtering strength determining step:

the strongest filtering strength is selected, in the case where it is determined in said second determining step that the boundary corresponds to the macroblock boundary;

the third-weakest filtering strength is selected, in the case where it is determined in said second determining step that the boundary does not correspond to the macroblock boundary;

the second-weakest filtering strength is selected, in the case where it is determined in said third determining step that either the current block or the neighboring block includes the data obtained by coding the coefficient that indicates the spatial frequency component resulting from the orthogonal transformation;

the weakest filtering strength is selected, in the case where it is determined in said fourth determining step that the number of pictures referred to by the current block is not equal to the number of pictures referred to by the neighboring block;

the weakest filtering strength is selected, in the case where it is determined in said fifth determining step that the picture(s) referred to by the current block is/are not the same as the picture(s) referred to by the neighboring block; and

the filtering strength corresponding to the filtering not being performed is selected, in the case where it is determined in said sixth determining step that each difference between the horizontal component(s) of the motion vector(s) of the current block and the horizontal component(s) of the motion vector(s) of the neighboring block and each difference between the vertical component(s) of the motion vector(s) of the current block and the vertical component(s) of the motion vector(s) of the neighboring block is less than one pixel, and wherein the weakest filtering is selected if this is not the case, and

wherein the weakest filtering strength, the second-weakest filtering strength, the third-weakest filtering strength, and the strongest filtering strength are different from each other in the performing of the filtering."

IX. At the oral proceedings, the board expressed its doubts as to whether the determination carried out in the sixth determining step specified in the claim was disclosed in the earlier application as filed (Article 76(1) EPC) and the divisional application as filed (Article 123(2) EPC).

X. The appellant submitted that the sixth determining step as specified in claim 1 could be derived from description page 19, lines 4 to 6 and 16 to 18, of the divisional and earlier applications as filed, as well

as from the paragraph bridging description pages 4 and 5 of these applications.

Reasons for the Decision

1. The appeal is admissible.

2. *The invention*

2.1 The divisional application at issue concerns a method for reducing a video compression artefact, called a blocking artefact, that can appear when video frames are compressed using a block-based temporal prediction scheme.

2.2 Applying a deblocking filter at the boundary between adjacent blocks is a known way of reducing blocking artefacts. The algorithm presented in paragraph 9.5.1 of document D1, also illustrated in Figure 1 of the divisional application, teaches a way of changing the strength of such a filter based on different criteria. In particular, if the two blocks sharing a to-be-filtered boundary ("p" and "q" in Figure 1) are both coded using temporal prediction ("No" is the result of determination step S102 of Figure 1), and if no temporal prediction residual is signalled for either of these two blocks ("No" is the result of determination step S104 of Figure 1), it is checked whether the two blocks refer to the same reference picture for temporal prediction, whether the absolute difference between the horizontal components of their motion vectors is smaller than one pixel, and whether the absolute difference between the vertical components of their motion vectors is smaller than one pixel (see step S105 in Figure 1). If these three tests return true ("No" is

the result of determination step S105 of Figure 1), no filtering is carried out.

2.3 According to the divisional application (page 1, line 14 to page 3, line 13), this algorithm does not sufficiently cover the situation where a to-be-filtered boundary is between two blocks which are part of a "B" picture. Indeed, in a "B" picture, each block can be temporally predicted by reference to a single picture in a first list of reference pictures ("forward" prediction), by reference to a single picture in a second list of reference pictures ("backward" prediction), or by reference to two pictures, one from the first list and the other from the second list of reference pictures ("bidirectional" prediction). Hence, it is not clear how the determination made in step S105 of Figure 1 should be carried out if the two neighbouring blocks are part of a "B" picture.

2.4 Claim 1 is directed to a method for removing coding distortion occurring at a boundary between adjacent blocks that are part of a "B" picture. In this method, a filtering strength is determined, *inter alia*, by taking into account the fact that the two adjacent blocks may refer to a different number of reference pictures.

3. *Added subject-matter, Articles 76(1) and 123(2) EPC*

3.1 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. According to Article 123(2) EPC, a European patent application may not be amended in such a way that it contains subject-

matter which extends beyond the content of the application as filed.

This means that any amendment can only be made within the limits of what a skilled person would derive directly and unambiguously, using common general knowledge, and seen objectively and relative to the date of filing, from the whole disclosure of the earlier application as filed and of the divisional application as filed (see "Case Law of the Boards of Appeal of the European Patent Office", 9th edition 2019, II.E.1.1 and II.F.2.1.1).

3.2 The sixth determining step of claim 1 was amended in reply to the summons to oral proceedings and reads:

"*a sixth determining step of determining whether or not each difference between the horizontal component(s) of the motion vector(s) of the current block and the horizontal component(s) of the motion vector(s) of the neighboring block and each difference between the vertical component(s) of the motion vector(s) of the current block and the vertical component(s) of the motion vector(s) of the neighboring block is less than one pixel, in the case where it is determined in said fifth determining step that the picture(s) referred to by the current block is/are the same as the picture(s) referred to by the neighboring block*".

3.3 This determining step operates differently based on whether the "*current block*" and the "*neighboring block*" each refer to a single picture ("forward" or "backward" prediction) or to two pictures ("bidirectional" prediction). This is indicated in claim 1 by the use of the optional plural form ("*(s)*").

3.4 If the "*current block*" and the "*neighboring block*" each refer to two pictures, i.e. each refer to both a "forward" reference picture and a "backward" reference picture, the sixth determining step of claim 1 means that the horizontal component of each of the "forward" and "backward" motion vectors of the current block is compared with the horizontal component of each of the "forward" and "backward" motion vectors of the neighbouring block, and that the vertical component of each of the "forward" and "backward" motion vectors of the current block is compared with the vertical component of each of the "forward" and "backward" motion vectors of the neighbouring block.

3.5 The board has not been convinced that such determination step is directly and unambiguously derivable from the passages of the earlier and divisional applications as filed cited by the appellant.

3.5.1 Although lines 4 to 6 and 16 to 18 on description page 19 of the earlier and the divisional applications as filed indicate that "**each difference** between **all** of the vertical and horizontal motion vectors of the blocks p and q" (emphasis by the board) is tested, in the context of page 19, lines 2 to 21, the differences to be actually tested are concretely specified. In particular, lines 6 to 15 of the same description page specify that "*[i]n other words*" the absolute difference between the horizontal (or vertical) components of their forward motion vectors is compared with one (equations (D) and (E) on page 19) and the absolute difference between the horizontal (or vertical) components of their backward motion vectors is compared with one (equations (F) and (G) on page 19). Hence, these lines, when read in context, do not disclose that

the horizontal (or vertical) components of all the motion vectors (irrespective of whether they relate to a "backward" or a "forward" prediction) are compared with one another, but that one component of a forward (or backward) motion vector of one block p is compared with the corresponding component of the forward (or backward) motion vector of its neighbouring block q.

3.5.2 The paragraph bridging pages 4 and 5 of the divisional and earlier applications as filed, also cited by the appellant as a basis for the sixth determining step of claim 1, discloses a "*motion vector judgment step*" in which at least one of a difference between a horizontal component of an arbitrary one of the motion vectors of the current block and a horizontal component of an arbitrary one of the motion vectors of the neighbouring block, and a difference between a vertical component of an arbitrary one of the motion vectors of the current block and a vertical component of an arbitrary one of the motion vectors of the neighbouring block must be a predetermined value or larger.

3.5.3 The board considers that the fact that an arbitrary one of the motion vectors of the current block and neighbouring block are compared does not mean that the horizontal (or vertical) component of each of the "forward" and "backward" motion vectors of the current block is compared with the horizontal (or vertical) component of each of the "forward" and "backward" motion vectors of the neighbouring block. It only requires that the horizontal (or vertical) component of at least one of the motion vectors of the current block be compared with the horizontal (or vertical) component of at least one of the motion vectors of the neighbouring block.

3.6 The board has therefore come to the conclusion that the request on file does not meet the requirements of Articles 76(1) and 123(2) EPC.

4. Since the appellant's sole request is not 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 C. Kunzelmann

Decision electronically authenticated