BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Internal distribution code:
(A) [ ] Publication in OJ
(B) [ ] To Chairmen and Members
(C) [X] To Chairmen
(D) [ ] No distribution

Datasheet for the decision of 31 January 2008

Case Number: W 0020/07 - 3.5.04

Application Number: PCT/EP2006/003410

Publication Number: WO 2006/108654

IPC: H04N 7/26

Language of the proceedings: EN

Title of invention:
Method and apparatus for enhanced video coding

Applicant:
Universität Hannover

Opponent:
-

Headword:
-

Relevant legal provisions:
PCT Art. 16, 17(3)(a)
PCT R. 13, 40.2(c)

Relevant legal provisions (1973):
EPC Art. 154(3)

Keyword:
-

Decisions cited:
W 0008/07, W 0018/06

Catchword:
-

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: W 0020/07 - 3.5.04

International Application No. PCT/PCT/EP2006/003410

D E C I S I O N
of the Technical Board of Appeal 3.5.04
of 31 January 2008

Applicant: Universität Hannover
Welfengarten 1
D-30176 Hannover (DE)

Representative: Eisenführ, Speiser & Partner
Postfach 10 60 78
D-28060 Bremen (DE)

Decision under appeal: **Protest according to Rule 40.2(c) of the Patent Cooperation Treaty made by the applicants against the invitation (payment of additional fees) of the European Patent Office (International Searching Authority) dated 2 October 2006.**

Composition of the Board:

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

Summary of Facts and Submissions

I. In this decision references to the European Patent Convention (EPC) in the version before entry into force of the EPC as adopted by decision of the Administrative Council of 28 June 2001 (EPC 2000) are indicated as "EPC 1973".

II. The international application PCT/EP2006/003410 was filed with 32 claims. Independent claim 1 reads as follows.

"Method for encoding a video signal representing a moving picture by use of motion compensated prediction, the method comprising the steps of:
receiving successive frames of a video signal,
coding a frame of the video signal using a reference frame of the video signal, and
calculating analytically a value of a sub-pel position (p^{SP}(a...o)) of the reference frame by use of a filter having an individual set of two-dimensional filter coefficients."

III. With an "invitation to pay additional fees" (Form PCT/ISA/206) dated 2 October 2006 the European Patent Office (EPO), acting in its capacity as International Searching Authority (ISA) under Article 16 PCT and Article 154 EPC 1973, informed the applicant that it considered that there were five inventions claimed in the international application and that the international application did not comply with the requirement of unity of invention (Rules 13.1, 13.2 and 13.3 PCT). The applicant was invited to pay

additional fees for four additional inventions in accordance with Article 17(3)(a) PCT and Rule 40.1 PCT.

IV. This invitation referred to a prior art document

D1: US2005/0013369 A1

and gave essentially the following reasons why the international application did not comply with the requirement of unity of invention.

The feature "calculating analytically a value of a sub-pel position (p^{SP}(a...o)) of the reference frame by use of a filter having an individual set of two-dimensional filter coefficients" in claim 1, in particular the expression "individual set", was not a standard wording in the technical field of video encoding. Thus claim 1 was not clear, Article 6 PCT. The description (see page 7, line 25 to page 10, line 20) made clear that the calculation was performed by means of an adaptive filter with a dynamic choice of taps.

D1 disclosed a method having the features of claim 1. In particular paragraphs [0125] and [0126] of D1 clearly specified that sub-pixel motion estimation and compensation were performed and that interpolation for motion compensation was performed by means of an adaptive filter with a dynamic choice of taps. Thus the invention as defined by claim 1 did not make a contribution over D1. The same was true for a number of further claims identified in the invitation to pay.

The remaining claims were considered in five groups, defined as follows:

(i) claim 3 (with claim 1) and claim 18 (with claim 13);
(ii) claim 6 (with claims 1, 4) and claim 20 (with claim 13);
(iii) claim 7 (with claim 1) and claims 21-25;
(iv) claims 10-12 (with claim 1) and
(v) claims 31, 32 (with claims 1, 30).

V. The invitation determined for each of the five claim groups respective special technical features (see Rule 13.2 PCT) and the problems solved thereby. It came to the conclusion that no technical relationship among the five inventions involving common or corresponding special technical features could be found. Thus at least five different inventions were claimed, which did not represent a group of inventions so linked as to form a single general inventive concept as required by Rule 13.1 PCT.

VI. With a letter dated 2 November 2006 the applicant requested under protest the deduction of the additional search fees and the protest fee from his account. The applicant argued that the objections raised with respect to unity were based on an incorrect interpretation of the subject-matter of claim 1. Page 2, lines 19 to 27, of the description set out that the method for encoding as defined in claim 1 calculated the value of a sub-pel position in a single step by use of a set of two-dimensional filter coefficients. Page 3, lines 1 to 3, explained that an individual set of equations for the sub-pel position was set up. Accordingly the calculation was independent for each sub-pel position. This implied the use of a single

analytical calculation step. Thus, as explained on page 7, lines 26 to 29, no bilinear interpolation was used. The different embodiments disclosed individual sets of coefficients. The concept of analytically calculating individual sets of coefficients was independent from the use of an adaptive filter. The five inventions were linked by the concept defined in claim 1, and a search for the subject-matter of claim 1 on a correct interpretation had not been carried out so far.

VII. With an invitation to pay a protest fee (Form PCT/ISA/228) dated 7 March 2007 the applicant was informed that the prior review of the justification for the invitation to pay additional fees had resulted in the requirement of payment of additional fees being upheld. Additional reasons why the invitation to pay additional fees was justified were given. In particular, that the feature relating to analytically calculating individual sets of coefficients was absent from independent claims 13, 21, and 27.

VIII. The applicant requests the reimbursement of the four additional search fees and the protest fee.

Reasons for the Decision

1. The international application was filed on 13 April 2006. Therefore the Patent Cooperation Treaty (PCT) and the Regulations under the PCT as in force from 1 April 2006 are applicable.

2. According to Article 1(6) of the decision of the Administrative Council of 28 June 2001 on the transitional provisions under Article 7 of the Act revising the European Patent Convention (EPC) of 29 November 2000 (OJ EPO 2007, Special edition No. 1, 197), "Articles 150 to 153 shall apply to international applications pending at the time of their entry into force. However, Articles 154(3) and 155(3) of the version of the Convention in force before that time shall continue to apply to these applications." Thus Article 154(3) EPC 1973 is applicable in the present case. Hence in accordance with established case law (see W 0008/07 and the decisions referred to therein), the board is competent to decide on the protest.

3. The additional fees and the protest fee were paid in time, thus the protest is considered to have been made (Rule 40.2(e) PCT, second sentence). The protest was also reasoned (see point VI above) to the effect that the invention is unitary or the additional fees are excessive. In this regard it is noted that the applicant's request in the protest that "[i]t is therefore requested to search the subject-matter actually defined in claim 1, i.e. the invention first mentioned in the claims, as provided by Art. 17(3)(a) PCT" is interpreted by the board as in fact being an implicit request to have those groups of inventions searched which were identified by the ISA. This implicit request is also supported by the fact that all four additional fees were paid by the applicant. On the other hand, were the board to assume that the applicant indeed wanted nothing else but a repeated search of the first invention - this time in the light of the claim interpretation offered by the applicant - such a

request could have led to the conclusion that the protest must be deemed not to have been made, following the principles set down in W 0018/06; see Headnote, point 2. This did not appear to have been the intention of the applicant in view of the payment of all the requested fees and the complete argumentation given in the protest. Thus the board finds that the formal preconditions of the protest are fulfilled.

4. The protest is essentially based on the argument that the finding of lack of unity was based on an incorrect interpretation of the subject-matter of claim 1. Indeed, in the invitation to pay additional fees, the construction of claim 1 resulting in the finding that the invention as defined in claim 1 did not make a contribution over the prior art disclosed in D1 (see point IV above), is decisive for the finding of lack of unity and also decisive for the grouping of claims and thus the number of groups of claims (see point V above). This finding affects all five groups as identified by the ISA (see point IV above) because each of the five groups refers to a combination of features with claim 1, at least in one of the alternative definitions of the groups.

5. Thus, for determining whether the protest is justified in accordance with Rule 40.2(c) PCT, the board has analysed whether the invitation to pay additional fees is based on a proper construction of claim 1.

5.1 Claim 1 comprises the feature of "calculating analytically a value of a sub-pel position (p^{SP}(a...o)) of the reference frame by use of a filter having an individual set of two-dimensional filter coefficients".

In the context of claim 1, the term "individual" thus relates to a sub-pel position, so that the claim specifies that there is a particular filter having an individual set of two-dimensional filter coefficients for a particular sub-pel position. Furthermore the two-dimensional filter coefficients allow the analytical calculation of the value of the sub-pel position (taking account of both horizontal and vertical components).

This is confirmed by the description (see page 8, line 12 to page 10, line 7), in which the analytical calculation is mathematically expressed as a specific equation to be computed for a particular sub-pel position SP using the coefficients of a two-dimensional filter. The description also shows that this feature is related to the problem of avoiding the two-step interpolation process (comprising successive horizontal and vertical interpolations) using the same one-dimensional filter applied at different sub-pel positions which is used for instance in the standard H.264/AVC (see page 2, lines 4 to 15). According to the description, this analytical calculation of a value of a sub-pel position is an "aspect of the invention". Page 2, lines 24 to 29, specifies explicitly that "[a]ccording to this aspect of the invention, instead of calculating the values of sub-pel positions in two steps based on two one-dimensional filters, the present invention discloses a method of calculating the value of a sub-pel position in a single step by use of a set of two-dimensional filter coefficients".

5.2 The invitation to pay additional fees considers that "the description (page 7, line 25 - page 10, line 20)

makes clear that the calculation is performed by means of an adaptive filter with a dynamic choice of the taps". However this section of the description concerns a "Non-separable two-dimensional Adaptive Wiener Interpolation Filter" and describes an iterative calculation of the filter coefficients including the minimization of an optimization criterion. Once the filter coefficients for a sub-pel position have been calculated the (two-dimensional) calculation of a value of the sub-pel position is performed analytically. The application as a whole makes clear that the calculation of the filter coefficients by minimization of an optimization criterion in an adaptive manner is an optional feature which can be combined with the invention specified in claim 1 (see page 4, lines 22 to 25).

5.3 Thus the invitation to pay additional fees is based on a construction of claim 1 in which the allegedly unclear feature "calculating analytically a value of a sub-pel position (p^{SP}(a...o)) of the reference frame by use of a filter having an individual set of two-dimensional filter coefficients" is replaced by a different feature which is presented in the application as an optional additional feature. In the judgement of the board this construction of an allegedly unclear feature of claim 1 is not consistent with the description.

5.4 The invitation to pay additional fees determines the lack of unity *a posteriori* on the basis of claim 1 as set out in point 5.2 above, and its comparison with D1 (see point IV above). In its analysis of D1 the ISA refers to paragraphs [0125] and [0126] of D1, allegedly

"clearly specifying that sub-pixel motion estimation and compensation is performed and that interpolation for motion compensation is performed by means of an adaptive filter with a dynamic choice of the taps; the adaptation consists in choosing the filter satisfying the minimisation of an optimisation criterion given by the minimisation of the output rate". It concludes from this disclosure that the invention as defined by claim 1 does not make a contribution over D1.

5.5 Paragraphs [0125] and [0126] of D1 disclose that a simplified interpolation may be used to perform a motion estimation search, and that thereafter a more complex multi-tap filter performing interpolation for the motion compensation calculation is used. An adaptive motion compensation filter selection may be used to enhance the results. But paragraphs [0125] and [0126] of D1 do not disclose an analytical calculation of a sub-pel position using a filter having two-dimensional coefficients. Instead, one embodiment uses bi-linear interpolation to calculate the sub-pixel values for motion estimation search reference frame (see paragraph [0127]), and in the particular example the interpolation in one dimension is made by an iteration of taking the arithmetical average (see paragraphs [0128], [0129] and [0130]). Furthermore D1 does not disclose that a filter specific to a particular sub-pel position is used. In the particular example the same averaging process (taking the arithmetical average) is performed for different sub-pel positions.

D1 does not disclose the problem of avoiding the two-step interpolation process using the same one-

dimensional filter applied at different sub-pel positions, either.

6. As a consequence of the incorrect claim construction the invitation to pay additional fees does not determine whether the allegedly unclear feature in claim 1 is a "special technical feature" within the meaning of Rule 13.2 PCT, and whether the same or corresponding special technical features are present or absent in the other claims. Furthermore this claim construction is also decisive for the selection and number of inventions identified in the invitation to pay additional fees.

7. In view of the above, the board judges that the protest is entirely justified in respect of the five groups of inventions identified by the ISA and the reasons given in the invitation to pay four additional fees. Acting as a review body, the board had not to examine whether the present set of claims contains other (groups of) inventions which, for other reasons, are not so linked as to form a single general inventive concept.

8. In accordance with established case law (see "Case Law of the Boards of Appeal of the European Patent Office", 5th edition 2006, IX.C.3.3.2.(a), the board has not taken into consideration the additional reasons given by the review panel.

Order

For these reasons it is decided that:

1. The reimbursement of the additional fees is ordered.

2. The reimbursement of the protest fee is ordered.

The Registrar: The Chairman:

D. Sauter F. Edlinger