

Internal distribution code:

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

**Datasheet for the decision
of 12 March 2020**

Case Number: T 1653/14 - 3.5.04

Application Number: 12160433.4

Publication Number: 2493179

IPC: H04N7/12, H04N7/26, H04N7/30,
G06T3/40, G06T9/00, H04N7/50

Language of the proceedings: EN

Title of invention:

Method for improving compressed image chroma information

Applicant:

Dolby Laboratories Licensing Corporation

Headword:

Relevant legal provisions:

EPC Art. 76(1), 84, 123(2)

Keyword:

Divisional application - subject-matter extends beyond content of earlier application - main request and auxiliary request I (yes)
Amendments - added subject-matter - main request and auxiliary request I (yes)
Claims - clarity - auxiliary request II (no)

Decisions cited:

Catchword:



Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 1653/14 - 3.5.04

D E C I S I O N
of Technical Board of Appeal 3.5.04
of 12 March 2020

Appellant: Dolby Laboratories Licensing Corporation
(Applicant) 100 Potrero Avenue
San Francisco, CA 94103 (US)

Representative: Peterreins Schley
Patent- und Rechtsanwälte
Hermann-Sack-Straße 3
80331 München (DE)

Decision under appeal: **Decision of the Examining Division of the European Patent Office posted on 10 February 2014 refusing European patent application No. 12160433.4 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman C. Kunzelmann
Members: B. Willems
T. Karamanli

Summary of Facts and Submissions

- I. The appeal is against the decision of the examining division dated 10 February 2014 refusing European patent application No. 12 160 433.4, which was published as EP 2 493 179 A1.
- II. The documents cited in the decision under appeal included the following:
- D4: US 5 333 212 A;
- D5: Gisle Bjøntegaard: "*Use of higher QP for chroma AC Coefficients*", Video Coding Experts Group of ITU-T, Study Group 16, 11th meeting: Portland, Oregon, USA, 22-25 August 2000; document Q15-K-29, 16 August 2000, XP030003122, ISSN: 0000-0463.
- III. The application was refused on the grounds that the subject-matter of claim 1 of the then main request and the then first to third auxiliary requests lacked inventive step over the combined disclosures of D4 and D5 and the common general knowledge of the person skilled in the art (Article 56 EPC).
- IV. The applicant filed notice of appeal and maintained the requests underlying the decision under appeal. With the statement of grounds of appeal, the appellant provided reasons as to why the claims of all the requests met the requirements of Article 56 EPC. It requested that the examining division's decision be set aside and that a European patent be granted on the basis of the claims of the main request or one of the first, second or third auxiliary requests.

V. The board issued a summons to oral proceedings. In a communication under Article 15(1) RPBA (Rules of Procedure of the Boards of Appeal, OJ 2007, 536) annexed to the summons, the board introduced the following document into the proceedings:

D17: G. Sullivan: "*Draft Text of Recommendation H.263 Version 2 ("H.263+") for Decision*", ITU-T, Study Group 16 - Contribution COM-99-E, 10 February 1998.

The board gave the following provisional opinion.

- Claim 5 did not meet the requirements of Article 84 EPC in any of the requests because it did not specify all the essential features necessary for determining the chrominance quantisation parameter (chroma QP).
- None of the requests on file met the requirements of Article 76(1) EPC.
- Claim 1 did not meet the requirements of Article 56 EPC in any of the requests because its subject-matter lacked inventive step over the disclosure of D17 combined with the common general knowledge of the person skilled in the art.

VI. With the reply dated 31 January 2020, the appellant filed amended claims according to a main request and auxiliary requests I, II and III, replacing all previous requests on file. It also filed replacement description pages 6 and 7 and requested that pages 8 to 12 and 25 to 28 of the originally filed description be deleted. It submitted arguments as to why the amended claims of all the requests met the requirements of Articles 56, 76(1), 84 and 123(2) EPC, and 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 one of auxiliary requests I to III, all requests filed by letter dated 31 January 2020.

VII. The oral proceedings before the board were held on 12 March 2020.

At the oral proceedings, the appellant filed new auxiliary requests I and II, replacing the previous auxiliary requests.

The appellant's final 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 filed by letter dated 31 January 2020 or one of auxiliary requests I or II, both requests filed at the oral proceedings of 12 March 2020.

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

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

"A method for an encoder, the method comprising:
compressing video image comprising a luminance channel (Y), a first chroma channel (V) and a second chroma channel (U);
characterized by
using at least a luminance quantization parameter value, and a first chroma quantization parameter bias;
wherein the first chroma quantization parameter value is determined by adding the first chroma quantization parameter bias value to the luminance quantization parameter value;

compressing an image region of the video image using the luminance quantization parameter value and the first chroma quantization parameter value, signaling the compressed image region, the luminance quantization parameter value, and the first chroma quantization parameter bias value with its sign to a decoder;

wherein the first chroma quantization parameter value is less than or equal to a predetermined maximum value, wherein the first chroma quantization parameter value is at least one".

IX. Claim 1 of auxiliary request I reads as follows:

"A method for an encoder, the method comprising: compressing video image comprising a luminance channel (Y), a first chroma channel (V) and a second chroma channel (U); characterized by using at least a luminance quantization parameter value, and a first chroma quantization parameter bias; wherein the first chroma quantization parameter value is determined by subtracting the first chroma quantization parameter bias value from the luminance quantization parameter value; wherein the first chroma quantization parameter value is lower than the luminance quantization parameter value; compressing an image region of the video image using the luminance quantization parameter value and the first chroma quantization parameter value, signaling the compressed image region, the luminance quantization parameter value, and the first chroma quantization parameter bias value to a decoder for at least one of each group of pictures, frame or image region;

wherein the first chroma quantization parameter value is at least one."

X. Claim 1 of auxiliary request II reads as follows:

"A method for an encoder, the method comprising:
compressing video image comprising a luminance channel (Y), a first chroma channel (V) and a second chroma channel (U);
characterized by
using at least a luminance quantization parameter value, and a first chroma quantization parameter bias;
wherein the first chroma quantization parameter value is determined by subtracting the first chroma quantization parameter bias value from the luminance quantization parameter value; wherein the first chroma quantization parameter value is lower than the luminance quantization parameter value;
compressing an image region of the video image using the luminance quantization parameter value and the first chroma quantization parameter value,
signaling the compressed image region and the first chroma quantization parameter bias value to a decoder;
wherein the first chroma quantization parameter value is at least one; further comprising:
using a second chroma quantization parameter bias value;
wherein the second chroma quantization parameter value is determined by subtracting the second chroma quantization parameter bias value from the luminance quantization parameter value; wherein the second chroma quantization parameter value is lower than the luminance quantization parameter value;
compressing the image region of the video image using at least the second chroma quantization parameter value,

signaling the second chroma quantization parameter bias value to the decoder;
wherein the second chroma quantization parameter value is determined for the second chroma channel (U), and wherein the first chroma quantization parameter bias value used to determine the first chroma quantization parameter value for the first chroma channel differs from the second chroma quantization parameter bias value used to determine the second chroma quantization parameter value for the second chroma channel (U)."

XI. The appellant's arguments, where relevant to the present decision, may be summarised as follows.

- (a) Signalling the first chroma QP bias value inherently included signalling the sign of the bias value. The wording "*with its sign*" had been added to express this understanding (see letter dated 31 January 2020, page 2, penultimate paragraph).
- (b) Paragraph [0088] of the present application and the earlier application disclosed reducing the level of chroma noise by using a lower chroma QP value. Paragraph [0088] did not specify how to lower the chroma QP value. Paragraph [0100] disclosed that if higher compression was required a positive QP bias was applied to the luma QP value to determine the chroma QP value. Reading these paragraphs together, it was apparent that lowering the chroma QP value required the application of a negative QP bias value. Thus, paragraphs [0088] and [0100] disclosed applying a positive or a negative QP bias value depending on whether a higher or a lower chroma QP value was required.

- (c) Paragraph [0089] disclosed that a constant value was subtracted from the luma QP value to lower the chroma QP value. In mathematical terms, subtracting a value was the same as adding a negative value.
- (d) The sign could be signalled by signalling a mode in which the bias was subtracted or a mode in which the bias was added.
- (e) The subject-matter of claim 1 of auxiliary request I had been limited to lowering the chroma QP value, i.e. to the embodiment set out in paragraph [0088].
- (f) Multiple luma QP values might be used in succession to compress different regions of a video image. It was clear to the skilled person that to compress one macro-block only one luma QP value might be used. The person skilled in the art would understand from claim 1 of auxiliary request II that the U and V chroma QP values used for compressing a macro-block were determined by subtracting the respective chroma QP bias values from the luma QP value used for compressing the macro-block.

Reasons for the Decision

- 1. The appeal is admissible.
- 2. *Claim 1 of the main request - added subject-matter (Articles 76(1) and 123(2) EPC)*
 - 2.1 According to the established jurisprudence of the boards of appeal, if a divisional application is amended after being filed, it must meet the

requirements of both Article 76(1) EPC and Article 123(2) EPC, so as to preclude the introduction of new subject-matter into the examination proceedings (see Case Law of the Boards of Appeal, 9th edition 2019 ("Case Law"), II.F.2.2). The question to be decided in the present case, therefore, is whether the subject-matter of claim 1 of the main request is such as to "*extend beyond the content of*" either the earlier application (Article 76(1) EPC) or the divisional application as filed (Article 123(2) EPC).

According to the consistent interpretation of Article 123(2) EPC by the Enlarged Board of Appeal, an 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 of the description, claims and drawings as filed (see G 3/89, OJ EPO 1993, 117; G 11/91, OJ EPO 1993, 125; G 2/10, OJ EPO 2012, 376). When determining whether the subject-matter of a divisional application extends beyond the content of the earlier application as filed (Article 76(1), second sentence, EPC) exactly the same principles are to be applied as for extension of subject-matter under Article 123(2) EPC (see Case Law, II.F.1).

2.2 The present application is a divisional application of European patent application No. 10 007 124.0, which was published as EP 2 239 943 A1 and will be referred to as the "*earlier application*".

2.3 Claim 1 of the main request specifies "*signaling the [...] first chroma quantization parameter bias value with its sign to a decoder*".

- 2.4 The board is not convinced that signalling the first chroma QP bias value inherently includes signalling the sign of the bias value (see point XI(a) above).
- 2.4.1 Paragraphs [0088] to [0100] of the present application as filed and the earlier application as filed disclose the following distinct embodiments for processing a "*Differential QP Bias for Chroma*": a constant value may be subtracted from the luma QP value (see paragraph [0089]); a specified difference may be subtracted to yield an "*instantaneous QP value*" for the chrominance (see paragraph [0090]); the bias value can be pre-arranged or signalled (see paragraph [0092]); a positive bias may be applied to the luma QP value (see paragraph [0100]).
- 2.4.2 The cited paragraphs clearly distinguish between reducing the level of chroma noise by using lower QP chroma values (see paragraphs [0088] to [0099]) and applying a positive QP bias value when higher compression is required (see paragraph [0100]).

The board has not been persuaded that paragraphs [0088] and [0100] lead to the conclusion that in order to lower the chroma QP value a negative chroma QP bias value is added to the luma QP value (see point XI(b) above).

The term "*subtracting*" in paragraph [0089] cannot be interpreted as adding a negative value. Paragraph [0089] specifies that "*[f]or example, '2' might be subtracted from the QP value for Y to yield the QP value for U, and '1' might be subtracted for the QP value for Y to yield the QP value for V*". It is clear from paragraph [0089] that the value "2" is subtracted, not that the value "-2" added. Although

subtracting a value is the same as adding a negative value in mathematical terms (see point XI(c) above), in technical terms it is not.

2.4.3 None of the cited paragraphs discloses switching between an operational mode for lowering noise and an operational mode providing higher compression. Even if, for the sake of argument, it were directly and unambiguously derivable for the person skilled in the art that the operational mode (i.e. adding or subtracting the bias value) should be signalled, the board is not persuaded that it is implicit that the sign of the bias value would be signalled. The board is of the opinion that the person skilled in the art would consider other options such as signalling a change in operational mode whenever necessary. According to claim 1 the sign is signalled with each bias value. The board is not convinced that signalling a change in operational mode can be equated with signalling a sign for each bias value (see point XI(d) above).

2.5 In summary, signalling the bias value with its sign is not directly and unambiguously derivable from the application as filed or the earlier application as filed. Therefore, claim 1 of the main request does not meet the requirements of Articles 76(1) and 123(2) EPC.

3. *Auxiliary request I - added subject-matter
(Articles 76(1) and 123(2) EPC)*

3.1 Claim 1 of auxiliary request I specifies using at least a luma QP value and a first chroma QP value which is lower than the luma QP value to compress "video image comprising a luminance channel (Y), a first chroma channel (V) and a second chroma channel (U)". Thus, claim 1 of auxiliary request I refers to two chroma

channels and specifies a restriction for the first chroma QP value (lower than the luma QP value) but no restrictions for the chroma QP value for the second chroma channel. The chroma QP value for the second chroma channel could, for instance, be lower than, equal to or higher than the luma QP value.

3.2 Paragraph [0088] of the present application as filed and the earlier application as filed specifies that if the chroma QP value for the U channel is lowered, the chroma QP value for the V channel may be lowered too. Thus, if the chroma QP value for the U channel is lowered, the chroma QP value for the V channel is restricted to being either equal to or lower than the luma QP value. Hence, the second chroma QP value cannot be higher than the luma QP value if the first chroma QP value is lower than the luma QP value.

3.3 In summary, claim 1 of auxiliary request I does not specify any restrictions for the chroma QP value for the second chroma channel, whereas the description in both the present application as filed and the earlier application as filed specifies restrictions for the chroma QP value for the second chroma channel. Therefore, the board has not been persuaded that the subject-matter of claim 1 of auxiliary request I has been limited to the embodiment disclosed in paragraph [0088] of the present application as filed and the earlier application as filed (see point XI(e) above).

3.4 In view of the above, claim 1 of auxiliary request I does not meet the requirements of Articles 76(1) and 123(2) EPC.

4. *Auxiliary request II - clarity (Article 84 EPC)*

4.1 The clarity of a claim is not diminished by the mere breadth of a phrase contained in it, if the meaning of this phrase - either per se or in light of the description - is unambiguous for the person skilled in the art (see also Case Law, II.A.3.3).

4.2 Claim 1 of auxiliary request II specifies "*compressing video image comprising a luminance channel (Y), a first chroma channel (V) and a second chroma channel (U) [...]*

using at least a luminance quantization parameter value, and a first chroma quantization parameter bias; wherein the first chroma quantization parameter value is determined by subtracting the first chroma quantization parameter bias value from the luminance quantization parameter value [...] using a second chroma quantization parameter bias value; wherein the second chroma quantization parameter value is determined by subtracting the second chroma quantization parameter bias value from the luminance quantization parameter value" (emphasis added).

4.3 Claim 1 is not clear because it is ambiguous from which of the at least one luma QP values the chroma QP bias value is subtracted.

The board is not convinced that the person skilled in the art would understand from claim 1 that "*at least a*" luma QP value refers to successive luma QP values used for coding successive macro-blocks in the image region. Moreover, the board has not been persuaded that in all known coding methods only one luma QP value is used for compressing all coefficients of a macro-block (see point XI(f) above).

- 4.4 In view of the above, claim 1 of auxiliary request II does not meet the requirements of Article 84 EPC.
5. Since none of the appellant's requests 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

C. Kunzelmann

Decision electronically authenticated