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Datasheet for the decision of 30 November 2017

Case Number: T 0934/12 - 3.4.01

Application Number: 08839058.8

Publication Number: 2076900

IPC: G10L19/00

Language of the proceedings: EN

Title of invention:
AUDIO CODING USING UPMIX

Applicant:
Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.

Headword:

Relevant legal provisions:
RPBA Art. 13(1)
EPC Art. 123(2)

Keyword:
Late-filed request - admitted (no)
Amendments - added subject-matter (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 0934/12 - 3.4.01

D E C I S I O N
of Technical Board of Appeal 3.4.01
of 30 November 2017

Appellant: (Applicant)	Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V. Hansastrasse 27c 80686 München (DE)
Representative:	Schenk, Markus Schoppe, Zimmermann, Stöckeler Zinkler, Schenk & Partner mbB Patentanwälte Radlkoferstrasse 2 81373 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 8 November 2011 refusing European patent application No. 08839058.8 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	G. Assi
Members:	T. Zinke
	D. Rogers

Summary of Facts and Submissions

I. The examining division refused European patent application No. 08 839 058.

In its decision the examining division held that a main request and a first auxiliary request then on file did not meet the requirements of Art. 84 EPC and Art. 123(2) EPC.

II. The appellant (applicant) filed an appeal against the decision.

With the appeal, the appellant requested that the decision be set aside and that a patent be granted on the basis of an amended claim set according to a main request filed together with the statement setting out the grounds of appeal.

III. At the appellant's request, a summons to attend oral proceedings was issued.

IV. In a communication pursuant to Art. 15(1) RPBA, the appellant was informed of provisional objections under Art. 123(2) EPC and Art. 84 EPC.

V. In reply, by letter of 23 November 2017, the appellant filed a revised claim set for a new main request replacing the claim set as filed with the statement setting out the grounds of appeal, filed a revised sole claim according to an auxiliary request and provided arguments with regard to the Board's provisional objections.

VI. At the oral proceedings the appellant's final requests were that the decision under appeal be set aside and

that a patent be granted according to a main request, or alternatively, according to an auxiliary request, both filed under cover of a letter dated 23 November 2017, or alternatively, if one of these requests was found to comply with the requirements of Articles 84 and 123(2) EPC, to remit the case to the department of first instance for further prosecution.

VII. Independent claim 1 of the main request reads as follows:

"1. Audio decoder for decoding a multi-audio-object signal having an audio signal of a first type and an audio signal of a second type encoded therein, the multi-audio-object signal consisting of a downmix signal (56; 112) and side information (58), the side information (58) comprising level information (60) of the audio signal of the first type and the audio signal of the second type in a first predetermined time/frequency resolution, the audio decoder comprising means (52) for computing prediction coefficients (64) based on the level information (OLD); and means (54) for up-mixing the downmix signal (56; 112) based on the prediction coefficients (64) to obtain a first up-mix audio signal (68) approximating the audio signal of the first type and/or a second up-mix audio signal (68) approximating the audio signal of the second type,
wherein the means for computing prediction coefficients (64) is configured to compute channel prediction coefficients $c_i^{l,m}$ *for each time/frequency tile (l,m) (32) of the first predetermined time/frequency resolution, for each output channel i of the downmix signal, as*

$$c_1^{l,m} = \frac{P_{LoF}^{l,m} P_{Ro}^{l,m} - P_{RoF}^{l,m} P_{LoRo}^{l,m}}{p_{Lo}^{l,m} P_{Ro}^{l,m} - P_{LoRo}^{2\ l,m}} \text{ and } c_2^{l,m} = \frac{P_{RoF}^{l,m} P_{Lo}^{l,m} - P_{LoF}^{l,m} P_{LoRo}^{l,m}}{p_{Lo}^{l,m} P_{Ro}^{l,m} - P_{LoRo}^{2\ l,m}}$$

with

$$P_{Lo} = OLD_L + m_F^2 OLD_F ,$$

$$P_{Ro} = OLD_R + n_F^2 OLD_F ,$$

$$P_{LoRo} = IOC_{LR}\sqrt{OLD_L OLD_R} + m_F n_F OLD_F ,$$

$$P_{LoF} = m_F OLD_L + n_F IOC_{LR}\sqrt{OLD_L OLD_R} - m_F OLD_F ,$$

$$P_{RoF} = n_F OLD_R + m_F IOC_{LR}\sqrt{OLD_L OLD_R} - n_F OLD_F .$$

with OLD_L comprised by the side information and denoting a normalized spectral energy of a first input channel of the audio signal of the first type at the respective time/frequency tile, OLD_R comprised by the side information and denoting the normalized spectral energy of a second input channel of the audio signal of the first type at the respective time/frequency tile, and IOC_{LR} comprised by the side information and denoting inter-correlation information defining spectral energy similarity between the first and second input channel within the respective time/frequency tile - in case the audio signal of the first type is stereo -, or OLD_L comprised by the side information and denoting the normalized spectrally energy of the audio signal of the first type at the respective time/ frequency tile, and OLD_R and IOC_{LR} being zero - in case same is mono,
and with OLD_F denoting the normalized spectrally energy of the audio signal of the second type at the respective time/frequency tile,
with

$$m_F = 10^{0.05 DMG_F} \sqrt{\frac{10^{0.1 DCLD_F}}{1+10^{0.1 DCLD_F}}} \text{ and } n_F = 10^{0.05 DMG_F} \sqrt{\frac{1}{1+10^{0.1 DCLD_F}}},$$

where $DCLD_F$ and DMG_F are downmix prescriptions comprised by the side information,
wherein the means (54) for up-mixing is configured to yield the first up-mix signal S_1 and/or the second up-mix signal(s) $S_{2,i}$ from the downmix signal $d^{n,k}$ and a residual signal $res^{n,k}$ comprised by the side information via

$$\begin{pmatrix} S_1 \\ S_2 \end{pmatrix} = D^{-1} \begin{pmatrix} 1 & 0 \\ C & 1 \end{pmatrix} \begin{pmatrix} d^{n,k} \\ res^{n,k} \end{pmatrix},$$

where
the "1" in the top left-hand corner denotes - depending on the number of channels of $d^{n,k}$ - a scalar, or an identity matrix,
C is -depending on the number of output channels of $d^{n,k}$ -

$$c_1^{n,k} \text{ or } \begin{pmatrix} c_1^{n,k} \end{pmatrix}^T,$$

the "1" in the bottom right-hand corner being a scalar, "0" denotes - depending one the number of channels of $d^{n,k}$ - a zero vector or a scalar,
D^{-1} is a matrix uniquely determined by a downmix prescription according to which the audio signal of the first type and the audio signal of the second type are downmixed into the downmix signal, and which is also comprised by the side information, and
$d^{n,k}$ and $res^{n,k}$ are the downmix signal and the residual signal for second up-mix signal $S_{2,i}$ at a time/ frequency tile (n,k), respectively."

Independent claim 11 is a correspondingly formulated claim for a method for decoding a multi-audio-object signal. Claim 12 claims a program with a program code

for executing, when running on a processor, a method according to claim 11.

Claims 2 to 10 are dependent claims.

VIII. Sole claim 1 of the auxiliary request is identical to independent claim 11 of the main request.

Reasons for the Decision

1. The appeal is admissible.

2. Main request

2.1 Admissibility

2.1.1 The amended claims according to the pending main request were filed in response to the Board's communication under Art. 15(1) RPBA.

2.1.2 According to Art. 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"*.

In accordance with established jurisprudence of the boards of appeal (cf. Case Law of the Boards of Appeal of the EPO, 8th edition, July 2016, section IV.E.4.4, "*Criteria for consideration of amended claims*", pages 1151-1160), *"As a rule, the boards' decisions should be based on the issues in dispute at first instance, which does not rule out the admission of new submissions, but does subject it to the fulfillment of certain criteria, given that no entirely "fresh case" should be created on appeal ... . Thus, in addition to the factors referred to in Art. 13(1) RPBA, the following criteria*

may ... likewise be decisive: there must be sound reasons for filing a request at a late stage in the proceedings, as may be the case where amendments are occasioned by developments during the proceedings or where the request addresses still outstanding objections. The amendments must be prima facie clearly allowable, ...", i.e. it must be immediately apparent to the board that the amendments made successfully address the issues raised, without giving rise to new ones.

2.1.3 In the present case, the appellant amended the claims with features taken from the originally filed description (cf. page 6, first paragraph and page 12, second paragraph) in order to overcome the preliminary objections with regard to lack of clarity (Art. 84 EPC) that were raised by the Board in its communication under Art. 15(1) RBPA for the first time. Hence, the amendments made could be considered as a sound reason for filing amended claims according to the pending main request.

2.1.4 However, the amendments made do not overcome all of the objections raised under Art. 123(2) EPC in the communication under Art. 15(1) RPBA.

Already during the examination proceedings (cf. decision, reasons, sections 1.1, 2.1, 3.1) a major issue was the rewriting of the equations as originally disclosed for an arbitrary number N of foreground objects (FGOs) on page 43, lines 11 to 15 for the particular case N=1 in corresponding pending claim 1 (now page 1, line 36 to page 2, line 4, in decision page 2, line 36 to page 3, line 4 of then pending claim 1 of the main request).

In the statement setting out the grounds of appeal the appellant referred to several parts of the original specification, which stated that the case whereby only one foreground object (FGO) was used was the *"primary case"* (statement of grounds, page 5, last paragraph), and, hence, the person skilled in the art would transfer the equations also to the case N=1.

This argument, however, is not convincing. The case for N=1 (merely one FGO, or FGO mono downmix) is discussed in the application with regard to Figures 6 and 10 and the corresponding description pages 30 to 31. On page 31, lines 23 to 27, a set of equations is disclosed for this case, which is, however, different from the currently claimed set of equations. Neither in writing nor during oral proceedings was the appellant able to provide a substantiated explanation for this discrepancy. Hence, it is not evident that a person skilled in the art would transfer the equations for the *"multi-N"* case on page 43 to the case where N=1, instead of using the equations on page 31, which are explicitly disclosed for this case.

In addition, the examining division was correct in its decision (cf. reasons, section 3.1) that a transcoder that is able to deal with any number N of FGOs is different from a decoder that is only able to deal with only one FGO. For instance, in order to cope with an arbitrary number N of FGOs it is necessary for the transcoder disclosed in Fig. 14 to know about the actual number N of FGOs in order to decode them correctly. This, however, is not necessary for a transcoder that only deals with one FGO.

2.1.5 Hence, the amendments to independent claims 1 and 11 do not meet the requirements of Art. 123(2) EPC.

2.1.6 Since the amendments do not successfully address the issues raised under Art. 123(2) EPC in the communication under Art. 15(1) RPBA, the pending main request is not clearly allowable.

2.1.7 Therefore, the Board did not admit the pending main request into the appeal proceedings in accordance with Art. 13(1) RPBA.

3. Auxiliary request

3.1 Admissibility

3.1.1 Since the pending auxiliary request was filed at the same time as the pending main request, the above-mentioned criteria for assessing admissibility apply as well.

3.1.2 Since the sole claim of the auxiliary request is identical to the independent method claim 11 of the main request, the above-discussed objections under Art. 123(2) EPC equally apply.

In the letter of 23 November 2017 and during oral proceedings the appellant argued that even the transcoder as originally disclosed in Fig. 14 and original description pages 40ff. would use the method for N=1 if only one foreground object was present. Hence, the method was considered to be originally disclosed.

This argument is not convincing. Whereas the disclosed transcoder would use a method as claimed for the case N=1, there is at least an important step missing in the claimed method, i.e. the step of determining the value

of N, which is essential for the decoder in order to up-mix the downmix signal with the claimed method.

3.1.3 Since the amendments made to the revised claim set do not successfully address the issues raised under Art. 123(2) EPC in the communication under Art. 15(1) RPBA, the pending auxiliary request is not clearly allowable.

3.1.4 Therefore, the Board did not admit the pending auxiliary request into the appeal proceedings in accordance with Art. 13(1) RPBA.

4. Conclusion
Since the pending main request and auxiliary request were not admitted into the proceedings and the previous request had been withdrawn, there are no requests on file, so that the appeal has to be dismissed.

Order

For these reasons it is decided that:

1. The appeal is dismissed.

The Registrar: The Chairman:

R. Schumacher G. Assi

Decision electronically authenticated