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Datasheet for the decision of 9 June 2017

Case Number: T 2346/11 - 3.4.01

Application Number: 09152356.3

Publication Number: 2088585

IPC: G10L19/14

Language of the proceedings: EN

Title of invention:
Gain smoothing for speech coding

Applicant:
Samsung Electronics Co., Ltd.

Headword:

Relevant legal provisions:
EPC Art. 76(1), 123(2), 84
RPBA Art. 15(3)

Keyword:
Amendments - added subject-matter (yes)
Claims - clarity (no)

Decisions cited:

Catchword:

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Case Number: T 2346/11 - 3.4.01

D E C I S I O N
of Technical Board of Appeal 3.4.01
of 9 June 2017

Appellant: (Applicant)	Samsung Electronics Co., Ltd. 129, Samsung-ro Yeongtong-gu Suwon-si, Gyeonggi-do, 443-742 (KR)
Representative:	Appleyard Lees IP LLP 15 Clare Road Halifax HX1 2HY (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 18 April 2011 refusing European patent application No. 09152356.3 pursuant to 97(2) EPC.**

Composition of the Board:

Chairman	G. Assi
Members:	T. Zinke
	J. Geschwind

Summary of Facts and Submissions

I. The examining division refused European patent application No. 09 152 356.

In its decision the examining division held that the independent claims of a main request, an auxiliary request I and an auxiliary request II then pending did not meet the requirements of Art. 84, 123(2) (as compared to the originally filed application) and 76(1) (as compared to the earlier European patent application No. 99 946 655) EPC. The examining division further held that the application according to any of the requests did not meet the requirements of Art. 83 and R. 42(1)(e) EPC.

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

With the statement setting out the grounds of appeal, the appellant requested that the decision be set aside and that a patent be granted on the basis of an enclosed set of claims according to a main request, an auxiliary request I or an auxiliary request II, respectively.

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

IV. In a communication of 31 March 2017 pursuant to Art. 15(1) RPBA, objections were raised under Art. 123(2), 76(1), 83 and 84 EPC against all the requests. Further, it was noted that documents A1 to A8 to which the appellant had referred in the statement setting out the grounds of appeal had not been filed.

V. With a letter of reply dated 8 May 2017, the appellant maintained the requests then on file, submitted copies of documents A1 to A8 and, moreover, requested the introduction of further three documents A9 (US-A-5,170,434), A10 (US-A-5,146,504) and A11 (US-A-4,630,305) into the appeal proceedings. Arguments with regard to the objections raised in the communication pursuant to Art. 15(1) RPBA were provided as well. Further, the appellant informed the Board that the representative would not attend the oral proceedings.

On page 2 of said letter of reply it is stated that *"We ... request a final decision on the new main request and the accompanying arguments."*. Considering that on page 1 it is also stated that "*we maintain the requests currently on file*", that no main new request was enclosed and that the complete argumentation put forward focuses on the requests already on file, it is clear that the appellant finally requested a decision on the basis of the requests submitted with the statement of grounds of appeal.

VI. The oral proceedings took place as scheduled in the absence of the appellant.

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

"1. A method of reproducing a speech signal encoded by a CELP encoder, the method comprising:
determining an amount of a stationary noise-like signal in the speech signal;
deciding whether or not to perform a noise compensation (1113), depending on the amount of stationary noise-like signal in the speech signal;

smoothing a gain for speech reproduction to generate a smoothed gain if the deciding decides to perform the noise compensation; and
reproducing the speech signal using at least the smoothed gain to generate a reproduced speech signal if the deciding decides to perform the noise compensation."

Claim 9 is a correspondingly formulated independent claim for a speech decoding device. Claims 2 to 8 and claims 10 to 16 are dependent claims.

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

" A method of reproducing a speech signal encoded by a CELP encoder, the method comprising:
demultiplexing a bit stream of speech modeling indices;
utilizing the indices to:
select excitation vectors from a pulse codebook;
set a pulse codebook gain; and
set parameters for a synthesis filter;
determining an amount of a stationary noise-like signal in the speech signal, wherein the stationary noise-like signal has a substantially constant spectral envelope;
deciding whether or not to perform a noise compensation (1113), depending on the amount of the stationary noise-like signal in the speech signal;
smoothing the pulse codebook gain to generate a smoothed pulse codebook gain if the deciding decides to perform the noise compensation; and
reproducing the speech signal using at least the smoothed pulse codebook gain, the excitation vectors, and the synthesis filter parameters to generate a reproduced speech signal if the deciding decides to perform the noise compensation."

Claim 9 is a correspondingly formulated independent claim on a speech decoding device. Claims 2 to 8 and claims 10 to 16 are dependent claims.

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

"1. A method of reproducing a speech signal encoded by a CELP encoder, the method comprising:
demultiplexing a bit stream of speech modeling indices;
utilizing the indices to:
select excitation vectors from an adaptive codebook and a fixed codebook;
set an adaptive codebook gain and a fixed codebook gain; and
set parameters for a synthesis filter;
determining an amount of a stationary noise-like signal in the speech signal, wherein the stationary noise-like signal has a substantially constant spectral envelope;
deciding whether or not to perform a noise compensation (1113), depending on the amount of the stationary noise-like signal in the speech signal;
performing noise compensation by smoothing a gain to generate a smoothed gain if the deciding decides to perform the noise compensation, wherein the gain is one of the fixed codebook gain and the adaptive codebook gain; and
reproducing the speech signal using at least the smoothed gain, the excitation vectors, and the synthesis filter parameters to generate a reproduced speech signal if the deciding decides to perform the noise compensation."

Claim 9 is a correspondingly formulated independent claim on a speech decoding device. Claims 2 to 8 and claims 10 to 16 are dependent claims.

Reasons for the Decision

1. The appeal is admissible.

2. Admissibility of main request, auxiliary request I and auxiliary request II

Since all requests were submitted together with the statement setting out the grounds of appeal, they are admissible in accordance with Art. 12(1)(a) RPBA.

3. Admissibility of submitted documents A1 to A11

3.1 Documents A1 to A8 are admissible according to Art. 12(1)(a) RPBA, since they were cited in the statement setting out the grounds of appeal and could be clearly identified.

3.2 Documents A9 to A11 were admitted into the appeal proceedings applying the discretion under Art. 13(1) RPBA, since the appellant filed them in response to objections raised in the communication pursuant to Art. 15(1) RPBA.

4. Main request

4.1 Art. 123(2) and 76(1) EPC

4.1.1 There is no literal disclosure of the feature *"an amount of a stationary noise-like signal" mentioned* in claims 1 and 9. For instance, on page 32 of the earlier application, lines 15 to 18, which has been cited in the grounds of appeal at length, there is only a disclosure of the term *"stationary noise-like signal"* (i.e. no *"amount"*). In the paragraph bridging pages 76 and 77, reference is made to a *"relative or specific*

amount of the noise-like signal", (i.e. no *"stationary"*).

4.1.2 In the reply of 8 May 2017, the appellant confirmed that on original pages 76 and 77 the term *"stationary"* was missing (cf. page 3, lines 14 to 25), but submitted that it was implicitly disclosed in the application and would be directly and unambiguously derivable for a skilled person using common general knowledge. For supporting its position, the appellant referred to document A9, which allegedly discloses noise-like signals as an example of steady-state signals.

4.1.3 This argumentation is not convincing. Under certain circumstances (i.e. with a constant noise environment) noise-like signals might be considered as stationary. However, the original application distinguishes between non-stationary background noise and stationary background noise (cf. sentence bridging pages 34 and 35). Hence, noise or noise-like signals can not be understood automatically as being *"stationary"*.

4.1.4 Since the cited passage on page 76 undisputedly only discloses *"noise"*, without mentioning *"stationary"* or *"non-stationary",* the interpretation is relied upon, according to which, in absence of any further discrimination, the sum of both noise components (i.e. the stationary and the non-stationary ones) is meant. Hence, this passage only discloses that the amount of the complete noise is used in order to decide whether or not noise compensation should be performed.

4.1.5 Therefore, there is no original disclosure of the first two features of claim 1, i.e. *"determining an amount of a stationary noise-like signal in the speech signal"* and *"deciding whether or not to perform a noise*

compensation (1113), depending on the amount of stationary noise-like signal in the speech signal".

Since the other features of claim 1 refer to said deciding step, also these other features are not originally disclosed, in particular *"smoothing a gain"* when reproducing a speech signal depending on an *"amount of a stationary noise-like signal".*

4.1.6 A corresponding argumentation applies for independent claim 9.

4.1.7 For these reasons, the requirement of Art. 123(2) and 76(1) EPC are not met.

4.2 Art. 84 EPC

4.2.1 The terms *"gain smoothing"* and *"smooth a gain"* used in claims 1 and 9 are not clear.

4.2.2 Throughout the description of the earlier application a plurality of gains are discussed.

For instance, page 95 (cf. Appendix A) cites a *"fixed-codebook gain"* ,a *"predicted fixed-codebook gain"*, a *"quantized fixed codebook gain"*, an *"adaptive codebook gain"* and a *"quantized adaptive codebook gain".*

Moreover, *"gains"*, *as* mentioned in the specification, are a *"pitch gain"* (cf. page 18, line 9), a *"quantized pitch gain"* (cf. page 27, lines 15 and 17), a *"decoded pitch gain"* (cf. page 68, line 17), an *"LTP gain"* (cf. page 49, line 22), a *"normalized LTP gain"* (cf. page 58, second to last line), an *"LPC gain"* (cf. page 62, line 6), and *"gains for the innovation vector"* (cf. page 73, line 1).

4.2.3 In the reply of 8 May 2017 the appellant argued that the person skilled in the art would understand the terms *"gain smoothing"* and *"smooth a gain"* using common general knowledge and introduced documents A10 and A11 in order to support its view.

4.2.4 This argumentation is not convincing. Document A10 deals with *"automatic gain control"* of speech signals in order to maintain the level of a signal representing speech relatively constant (cf. col. 1, lines 11 to 13). Throughout the document only one particular *"gain"* is mentioned and not a plurality thereof. In particular, no different codebook gains are described. Hence, document A10 does not provide any hint towards the particular *"gain"* that should be smoothed out of the plurality of *"gains"* mentioned in the earlier application.

Also document A11 mentions gain smoothing only in combination with the particular gains that should be smoothed. For instance, the passages cited by the appellant (cf. col. 3, lines 36 to 53; col. 10, lines 20 to 46; col. 12, lines 53 to 65) only mention smoothing of the *"noise suppression gain factors"*. Hence, also document A11 does not provide any hint, which of the plurality of gains mentioned in the earlier application should be smoothed.

Hence, it is unclear, whether the wording *"gain smoothing"* should really apply to all the different *"gains"* mentioned in the specification or only to some or even one of them.

4.3 In the reply of 8 May 2017 the appellant also provided arguments against further objections raised in the

communication under Art. 15(1) RPBA. Due to the objections discussed above, however, the conclusion can already be reached that the requirements of Art. 84 are not met so that a discussion of these further issues is not necessary.

4.4 Hence, the main request is not allowable.

5. Auxiliary Request I

5.1 Art. 123(2) and 76(1) EPC

5.1.1 Claims 1 and 9 of auxiliary request I also include the feature *"an amount of a stationary noise-like signal in the speech signal"*, so that the objections raised with regard to the main request also apply.

5.1.2 Further, the term *"pulse codebook gain"* has been introduced into the claim wording. It is undisputed that there is no literal disclosure of this term in the original specification (cf. reply of 8 May 2017, page 5, 3rd paragraph). In the original specification, only a *"pulse subcodebook"* is mentioned (cf. e.g. page 51, lines 5, 16 and 21), which is a subcodebook of a fixed codebook (cf. page 50, last paragraph).

In its reply of 8 May 2017 the appellant argued that on page 79, line 2 a *"pulse-like codebook excitation vector"* was mentioned. This disclosure, however, does not imply a direct and unambiguous disclosure of the different term *"pulse codebook"*.

Moreover, whereas the description refers to many different *"gains"* (cf. above), there is no disclosure of a *"pulse codebook gain"*.

5.1.3 Hence, claims 1 and 9 of auxiliary request I do not meet the requirements of Art. 123(2) and 76(1) EPC.

5.2 Therefore, auxiliary request I is not allowable.

6. Auxiliary Request II

6.1 Art. 123(2) and 76(1) EPC

6.1.1 Claims 1 and 9 of auxiliary request II also include the feature *"determining an amount of a stationary noise-like signal in the speech signal"*, so that the objections mentioned above in this regard also apply.

6.1.2 Further, the gain to be smoothed has been specified to be *"one of the fixed codebook gain and the adaptive codebook gain"*. However, as already mentioned above with regard to the term *"gain"*, the original disclosure is silent on the *"gain"* that actually is smoothed. Hence, there is no basis for this amendment.

The appellant argued (cf. statement of grounds, paragraph bridging pages 18 and 19) that *"This feature is implicitly supported by the use of "gain" on pages 78 and 79 because it cannot be interpreted as referring to anything else but a codebook gain"*.
Moreover, in its reply of 8 May 2017 the appellant referred to a further passage in the original specification (cf. page 15, lines 17 to 20): *"circuitry applies gain normalization, smoothing and quantization, as represented by block 401, 403 and 405, respectively, to the jointly optimized gains identified in the second stage of encoder processing. Again, the adaptive and fixed codebook vectors used are those identified in the first stage processing."* According to the appellant, this passage stated that the gain smoothing was applied

to the jointly optimized gains identified in the second stage and that in Figure 4 the smoothing was applied to g_p and g_c which were the adaptive and fixed codebook gain, respectively.

This is, however, not convincing. As mentioned above, in a decoder various *"gains"* may be identified, e.g. a "*predicted fixed-codebook gain*", a *"quantized fixed codebook gain"* and a *"quantized adaptive codebook gain"*, which all seem to be different. Hence, a direct and unambiguous disclosure that *"gain"* in the expression *"gain smoothing"* as disclosed on page 78, lines 3 to 7 would mean *"fixed codebook gain"* or *"adaptive codebook gain"* is missing.

Furthermore, the passage on page 15 in combination with Figure 4 only discloses that a smoothing is applied to *"jointly optimized gains"*. The claim wording does not include the expression *"jointly optimized"* and, hence, adds subject-matter as compared to this passage.

6.1.3 Therefore, claims 1 and 9 of auxiliary request II do not meet the requirements of Art. 123(2) and 76(1) EPC.

6.2 Hence, auxiliary request II is not allowable.

7. Appellant absent from oral proceedings

According to established case law (cf. Case Law of the Boards of Appeal of the EPO, 8th edition, July 2016, section IV.E.4.2.6 d), "*Applicant (proprietor) absent from oral proceedings*", pages 1137-1138), the appellant refraining from participating at the oral proceedings de facto renounced to submit its comments orally, if any. In accordance with the provisions of Art. 15(3)

RPBA, the appellant was then treated as relying only on its written submissions.

Order

For these reasons it is decided that:

1. The appeal is dismissed.

The Registrar: The Chairman:

R. Schumacher G. Assi

Decision electronically authenticated