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**Datasheet for the decision  
of 30 June 2015**

**Case Number:** T 1610/10 - 3.4.01

**Application Number:** 04015881.8

**Publication Number:** 1496499

**IPC:** G10L15/20, G10L21/02, H04N7/173

**Language of the proceedings:** EN

**Title of invention:**  
Apparatus and method of voice recognition in an audio-video system

**Applicant:**  
LG Electronics, Inc.

**Headword:**

**Relevant legal provisions:**  
EPC 1973 Art. 84  
RPBA Art. 13(1)

**Keyword:**  
lack of clarity (yes; main request)  
admissibility of late-filed requests (no; auxiliary requests)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern  
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Case Number: T 1610/10 - 3.4.01

**D E C I S I O N  
of Technical Board of Appeal 3.4.01  
of 30 June 2015**

**Appellant:** LG Electronics, Inc.  
(Applicant) 20, Yoido-Dong, Youngdungpo-gu  
Seoul (KR)

**Representative:** Vossius & Partner  
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**Decision under appeal:** Decision of the Examining Division of the  
European Patent Office posted on 22 February  
2010 refusing European patent application No.  
04015881.8 pursuant to Article 97(2) EPC.

**Composition of the Board:**

**Chairman** G. Assi  
**Members:** H. Wolfrum  
D. Rogers

## Summary of Facts and Submissions

I. European patent application 04 015 881.8 (publication No. EP 1 496 499) was refused by a decision of the examining division for the reason of lack of inventive step (Articles 52(1) and 56 EPC 1973) of the subject-matter of the independent claims of both the main request and the auxiliary request then on file.

II. The applicant lodged an appeal against the decision.

With its statement setting out the grounds of appeal the appellant requested that the decision under appeal be set aside and a patent be granted on the basis of a sole request corresponding to the main request underlying the contested decision and comprising claims 1 to 10 as filed with a letter of 8 September 2009 as well as with the statement of grounds of appeal.

III. The appellant was summoned to oral proceedings.

In a communication pursuant to Article 15(1) RPBA the Board addressed *inter alia* a number of problems concerning lack of clarity (Article 84 EPC 1973) for the claims on file.

IV. In response the appellant reiterated its main request and filed new sets of claims according to auxiliary requests 1 to 5.

V. In the oral proceedings which were held on 30 June 2015 the appellant filed five auxiliary requests replacing the previously filed auxiliary requests. Clarity issues were then discussed for the main request, and the admissibility of the auxiliary requests was discussed. Thereafter, the appellant replaced auxiliary requests 1

to 5 by auxiliary requests 1 to 7 and requested that the decision under appeal be set aside and a patent be granted upon the basis of the main request or of one of auxiliary requests 1 to 7 filed at the oral proceedings.

VI. Independent claim 1 of the appellant's main request reads as follows :

*"1. A voice recognition system for an audio-visual (AV) system generating an audio signal, the voice recognition system comprising:*

*a microphone receiving the audio signal outputted from AV system, a noise and a user's voice;*

*a reflected sound remover having a plurality of filters, the reflected sound remover being configured to receive an audio signal decoded from AV system and an input sound signal received by the microphone, and being configured to remove the audio signal outputted AV system from the input sound according to the audio signal decoded from AV system;*

*a voice detector detecting the user's voice from a signal outputted from the reflected sound remover and obtaining the user's voice information based on the detected user's voice; and*

*a voice recognition unit comparing the detected user's voice with voice patterns that belong to at least one model,*

*wherein the reflected sound remover comprises:*

*a first filter bank including M number of channel filters ( $H_0, H_1, H_2, \dots, H_{M-1}$ ) to divide the audio signal decoded from AV system into a first plurality of signals having different frequency ranges;*

*a second filter bank including M number of channel filters ( $H_0, H_1, H_2, \dots, H_{M-1}$ ) to divide the input sound converted from the audio signal outputted from AV*

*system, the noise and the user's voice into a second plurality of signals having the different frequency ranges;*

*a plurality of adaptive filters containing filters ( $W_0, W_1, W_2, \dots, W_{M-1}$ ) to receive the divided signals from the first filter bank and the second filter bank, and being configured to compare the two outputted signals from the first filter bank and the second filter bank and remove the audio signal outputted from AV system if it is determined that the frequencies and amplitudes of the two signal are identical; and*

*a third filter bank combining the signals outputted from the plurality of adaptive filters, wherein each of the adaptive filter [sic] ( $W_0, W_1, W_2, \dots, W_{M-1}$ ) receives respectively the divided signals at the same frequency range from the first filter bank and the second filter bank."*

Independent claim 6 is directed to a corresponding "method for recognizing a voice for an audio-visual (AV) system generating an audio signal" and claims 2 to 5 and 7 to 10 are dependent claims.

For the purpose of this decision it suffices to note that independent claim 1 of each one of auxiliary requests 1 to 7 comprises the feature:

*"a voice detector detecting the user's voice from a signal outputted from the reflected sound remover".*

## **Reasons for the Decision**

1. The appeal complies with the requirements of Articles 106 to 108 and Rule 99 EPC and is, therefore, admissible.

2. Main request - clarity (Article 84 EPC 1973)

2.1 The expression "*audio signal decoded from AV system*" which is used in claim 1 on file for designating a signal received by the "*reflected sound remover*" has no clear and unambiguous meaning. In particular, it remains obscure how this signal would be related to another signal referred to in claim 1, *i.e.* "*the audio signal outputted from AV system*", a signal which is to be received by the microphone.

The appellant has argued that a skilled reader of the claim definition would realize that the "*audio signal decoded from AV system*" designated the signal that was emitted by a loudspeaker of the AV system and as such constituted the signal behind the "*the audio signal outputted from AV system*" as it was received by the microphone.

This argument is found unconvincing, mainly because the expression "*decoded from AV system*" could readily be understood as meaning a signal that arises from the AV system but is decoded by some other element of the voice recognition system. Which other element that would be is not apparent.

2.2 Further ambiguities concern the definition of the "*voice detector*".

2.2.1 The phrase "*detecting the user's voice from a signal outputted from the reflected sound remover*" [emphasis added] is misleading.

The phrase differentiates between "*the user's voice*", on the one hand, and "*a signal outputted from the reflected sound remover*", on the other hand. The

claimed feature thus implies an activity of "*detecting*" on the part of the "*voice detector*", which activity would somehow be required in order to obtain "*the user's voice*" from the signal that is "*outputted from the reflected sound remover*".

Such an understanding is however at odds with the operation of the "*reflected sound remover*" as defined in the remainder of claim 1 under consideration, according to which it is the purpose of the "*reflected sound remover*" to generate at its output a signal which is identical to the "*user's voice*".

According to another conceivable interpretation of the feature in question, the "*voice detector*" would retrieve from the "*signal outputted from the reflected sound remover*" the information content that is contained in the "*user's voice*". In that case, however, confusion arises as to the purpose and function of the "*voice recognition unit*" as a further separate element of the claimed voice recognition system.

The appellant has argued that it was the function of the "*voice detector*" to receive the signal outputted from the "*reflected sound remover*", which output was a more or less 'clean' signal corresponding to the "*user's voice*", whenever this was present. Thus it would be clear that the "*voice detector*" did not alter the signal outputted from the "*reflected sound remover*" in any way.

This argumentation cannot convince because it explains at best what the appellant intends to define but ignores the actual wording of the phrase in question, according to which the "*voice detector*" does not merely

receive a signal (*i.e.* "*the user's voice*") but detects it from another signal.

- 2.2.2 Moreover, the meaning of the expression "*user's voice information based on the detected user's voice*" is obscure.

According to a straightforward understanding of the term "*the user's voice information*", one would assume that it refers to the information content of the "*user's voice*", *e.g.* a command that is articulated by the user. Then however, confusion arises again as to the purpose and function of the "*voice recognition unit*" as a further separate element of the claimed voice recognition system.

The appellant argued that in the light of dependent claims 3 and 4, according to which the said "*user's voice information*" included a "*starting timing and an ending timing of the user's voice*" and/or "*a frequency range, amplitudes, and a wave shape of the user's voice*", a skilled reader would understand without difficulties that the term "*information*" did not refer to information content but to metadata comprised in the "*user's voice*".

This argument is unconvincing because it ignores the common meaning of the term "*information*" and the fact that the subject-matter of claim 1 is not limited to that of dependent claims 3 and 4.

- 2.3 A still further ambiguity concerns the definitions of the "*plurality of adaptive filters*".

According to claim 1 under consideration the "*plurality of adaptive filters*" is "*configured to compare*" two



signals, *i.e.* a first signal from a "*first filter bank*" which corresponds to "*the audio signal decoded from AV system*" and a second signal from a "*second filter bank*" which corresponds to "*the input sound [to the reflected sound remover] converted from the audio signal outputted from AV system, the noise and the user's voice*" (explanation added). The "*plurality of adaptive filters*" is further "*configured to ... remove the audio signal outputted from AV system if it is determined that the frequencies and amplitudes of the two signal [sic] are identical*".

Since the second signal comprises the first signal (to the extent the "*audio signal decoded from AV system*" is interpreted as corresponding to the "*audio signal outputted from AV system*", see point 2.1 above) and in addition thereto also the "*noise and the user's voice*", its frequencies and amplitudes can only be identical to those of the first signal in the absence of "*noise*" and the "*user's voice*". In a situation, however, when no voice signal of a user is present, there is no need to isolate the "*user's voice*" from any other signal. Therefore, the condition introduced by "*if it is determined ...*" is nonsensical.

The appellant argued that the signals in question could well be digital signals the amplitudes of which would be represented by the digital values of "1" and "0". Adding digital signals thus still resulted in values represented by "1" and "0". Moreover, it was clear from claim 1 in particular in view of the detailed description that the invention was based on the idea to isolate a signal corresponding to a user's voice command from other audio signals.

Apart from the fact that claim 1 on file does not exclude analog signals, the appellant's perception of a digital representation of signal amplitudes is technically wrong. Moreover, as a matter of principle, Article 84 EPC 1973 requires the claims to be clear in themselves. Thus, no reference can be validly made to the description in support of any specific explanation of unclear features.

2.4 For the above reasons, the appellant's request for grant of a patent on the basis of the main request is not allowable.

3. Auxiliary requests 1 to 7 - admissibility

3.1 Article 13(1) of the Rules of Procedure of the Boards of Appeal (RPBA) stipulates that *"any amendment to a party's case after it has filed its grounds of appeal or reply may be admitted and considered at the Board's discretion. The discretion shall be exercised in view of inter alia the complexity of the new subject-matter submitted, the current state of the proceedings and the need for procedural economy."*

Moreover, the case law of the Boards of Appeal has established various criteria for the admission or rejection of amended claims in appeal proceedings (cf. chapter VII.E.16. of the 6th edition of the *"Case Law of the Boards of Appeal of the European Patent Office"*). One of these criteria is whether the amended request overcomes the objections raised and is clearly allowable.

3.2 Auxiliary request 1

The request is an amended version of former auxiliary request 1 that was filed with the letter of 29 May 2015.

The appellant, in favour of auxiliary request 1's admission into the proceedings, argued that the request responded to objections having regard to clarity that had been raised in the Board's communication of 20 October 2014. Since these objections had been raised for the first time in the proceedings procedural fairness required that the appellant be given an opportunity to overcome them by amendment. The version of auxiliary request 1 filed at the oral proceedings was based in essence on the version filed in writing. There were only a small number of concise amendments which did not add anything in substance but only rendered the terminology more consistent. The amendments could thus be readily understood and dealt with without any need for adjournment of the oral proceedings.

The Board agrees with the appellant insofar as the clarity objections discussed above were indeed addressed for the first time in the Board's communication. Thus, both the appellant's right to be heard and procedural fairness demand that the appellant is given an opportunity to react, for instance by filing an amended request. This does not mean, however, that any such request had to be admitted automatically into the proceedings since otherwise the discretion conferred to a board of appeal by Article 13(1) RPBA would virtually be non-existent.

In the present case, auxiliary request 1 on file overcomes the clarity problem addressed in point 2.1 above and comprises an attempt to resolve the problem

discussed in point 2.2.2 above. However, the request does not resolve, or even attempts to resolve, the problems discussed in points 2.2.1 and 2.3 above. Amended auxiliary request 1 filed at the oral proceedings of 30 June 2015 thus fails to overcome major clarity objections and is, already for this reason, clearly not allowable. In the Board's view, it does not make any sense to admit into the proceedings a late-filed request which is manifestly defective. Therefore, the Board has come to the conclusion not to admit auxiliary request 1 into the appeal proceedings.

### 3.3 Auxiliary requests 2 to 7

Like auxiliary request 1, these requests have all been filed at the oral proceedings. They constitute either amended versions of auxiliary requests that had been filed in writing (auxiliary requests 3 and 5 to 7) or new requests (auxiliary requests 2 and 4) that have been filed in the oral proceedings subsequent to the discussion of the admissibility of auxiliary request 1.

In the appellant's view, the requests, in particular new auxiliary requests 2 and 4, should be allowed into the proceedings because they constituted an attempt to resolve specific clarity objections which were addressed by the Board for the first time in the oral proceedings of 30 June 2014.

The Board notes that, notwithstanding the various attempts for amendment by each of auxiliary requests 2 to 7, none of them resolves, or attempts to resolve, the problem discussed in point 2.2.1 above. Thus, for the same reason as applied to auxiliary request 1, the Board has come to the conclusion not to admit auxiliary requests 2 to 7 into the appeal proceedings.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:



R. Schumacher

G. Assi

Decision electronically authenticated