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**Datasheet for the decision
of 13 April 2015**

Case Number: T 2046/11 - 3.5.03

Application Number: 02784742.5

Publication Number: 1457092

IPC: H04S3/00

Language of the proceedings: EN

Title of invention:

METHOD FOR IMPROVING SPATIAL PERCEPTION IN VIRTUAL SURROUND

Applicant:

DOLBY LABORATORIES LICENSING CORPORATION

Headword:

Virtual Surround/DOLBY

Relevant legal provisions:

EPC Art. 56

RPBA Art. 13(1)

Keyword:

Inventive step - main request (no)

Admissibility - auxiliary request (no)

Decisions cited:

T 0361/08, T 0144/09

Catchword:



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Boards of Appeal
Chambres de recours**

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Case Number: T 2046/11 - 3.5.03

**D E C I S I O N
of Technical Board of Appeal 3.5.03
of 13 April 2015**

Appellant:
(applicant)

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Representative:

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Decision under appeal:

**Decision of the examining division of the
European Patent Office posted on 20 April 2011
refusing European patent application No.
02784742.5 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman

F. van der Voort

Members:

K. Schenkel

S. Fernández de Córdoba

Summary of Facts and Submissions

- I. This appeal is against the decision of the examining division refusing European patent application No. 02784742.5 (publication number EP 1 457 092), which was originally filed as international application PCT/US02/38915 (publication number WO 03/053099).
- II. The reason given for the refusal was that the subject-matter of claims 1 and 5 did not involve an inventive step (Articles 52(1) and 56 EPC) having regard to the disclosures of:
- D5: US 5 590 204 A; and
- D6: WO 99/14983 A.
- III. In the statement of grounds of appeal the appellant requested that the decision be set aside and a patent be granted on the basis of claims 1 to 5 (first part as filed with the letter dated 1 June 2010) and claims 5 (second part) to 7 as filed with the statement of grounds of appeal. Oral proceedings were conditionally requested.
- IV. In a communication accompanying a summons to oral proceedings, the board, without prejudice to its final decision, raised an objection under Article 84 EPC (lack of clarity) in respect of the subject-matter of claims 1 and 5 and an objection under Article 52(1) EPC in combination with Article 56 EPC (lack of inventive step) in respect of the subject-matter of claim 1.
- V. In response to the summons, with a letter dated 13 March 2015, the appellant filed a substantive response together with a new set of claims of a main

request and a further set of claims of an auxiliary request.

VI. Oral proceedings were held on 13 April 2015.

The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 to 7 of the main request or, in the alternative, on the basis of claims 1 to 7 of the auxiliary request, both requests as filed with the letter dated 13 March 2015.

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

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

"A method for improving the spatial perception of multiple sound channels when reproduced by two loudspeakers that are generally front-located with respect to listeners, each channel representing a direction, comprising
applying sound channels representing directions other than front directions to said loudspeakers with headphone and crosstalk cancelling processing, and
applying sound channels representing front directions to said loudspeakers without headphone and crosstalk cancelling processing,
wherein said headphone processing includes employing directional HRTFs,
characterized in that said headphone processing includes adding simulated reflections to said channels representing directions other than front directions."

VIII. Claim 1 of the auxiliary request differs from claim 1 of the main request in that the following feature is added:

"said crosstalk cancelling processing of said channels representing directions other than front directions is performed subsequently to said headphone processing of said channels representing directions other than front directions, with the crosstalk cancelling processing operating on output signals of the headphone processing of said channels representing directions other than front directions".

Reasons for the Decision

1. Main request - *inventive step*
- 1.1 D5 discloses, using the language of claim 1, a method for improving the spatial perception of multiple sound channels when reproduced by two loudspeakers that are generally front-located with respect to listeners, each channel representing a direction (column 1, lines 53 to 61, Figs 2C, 5 and 6), the method including the steps of applying sound channels representing directions other than front directions ("RL", "RR") to said loudspeakers with headphone and crosstalk cancelling processing (column 4, lines 58 to 60, Figs 5 and 6), and applying sound channels representing front directions ("FL", "FR") to said loudspeakers without headphone and crosstalk cancelling processing (column 3, lines 61 to 65, Figs 5 and 6), wherein said headphone processing includes employing directional HRTFs, i.e. head-related transfer functions, (transfer characteristics "S", "S'", "A" and "A'" used in filters 605 and 606).

- 1.2 The method of claim 1 thus differs from the method disclosed in D5 in that, according to claim 1, the headphone processing includes adding simulated reflections to the channels representing directions other than front directions.

The above analysis of claim 1 was not contested by the appellant.

- 1.3 Starting out from D5 and following the proposal of the appellant, the technical problem underlying the subject-matter of claim 1 may be seen in improving the localization of channels of a multi-channel audio system reproduced by two loudspeakers in a real listening room, in which the system applies headphone processing to the rear channels only.

- 1.4 D6 discloses a multi-channel audio system for reproduction over headphones with a system of filters (Fig. 3 and the abstract). The filters represent the respective HRTF (head-related transfer function) from the source to the corresponding ear (page 6, lines 2 to 3). The HRTF features include the use of a reverberant filter which increases the localisation and depth of sound (page 8, lines 29 to 34). The board notes that the term reverberation refers to simulated reflections (D6, page 2, lines 25 to 29).

Thus, applying the teaching of D6, i.e. the inclusion of simulated reflections as part of the headphone processing, to the method of D5, which is already limited to headphone processing of channels representing directions other than front directions, results in the addition of simulated reflections to the channels representing directions other than front

directions, in accordance with the distinguishing feature of claim 1.

- 1.5 The appellant argued that D6 was only related to methods for reproducing sound by headphones and that the skilled person would therefore not take D6 into consideration.

The board does not find this argument convincing.

Firstly, the board notes that in D6 at the beginning of the summary of the invention (page 1, lines 31 to 32) headphones or the like are mentioned as sound reproduction devices and that audio signal reproduction particularly over headphones is mentioned as the field of the invention (page 1, lines 3 to 5). Hence, D6 is strictly speaking not limited to reproduction by headphones.

Secondly, at the beginning of the summary of the invention (page 1, lines 31 to 32), it is stated that an object of the invention is to provide a method and an apparatus for the simulation of an acoustic space through headphones or the like. Hence, the simulation of an acoustic space - or, as it is also referred to in D6, the simulation of virtual speakers (page 5, lines 24 to 25) - is essential, whereas the reproduction through headphones is merely an option.

In any case, the skilled person was aware at the time that, once the appropriate signals for simulating sound sources were generated, they could be reproduced via headphones or loudspeakers; see D5, which mentions a speaker mode and a headphone mode as alternatives (D5, col. 2, line 65, to col. 3, line 2, and Figs 2B and 2C).

The appellant further argued that in D6, Fig. 9, the output of the reverb filter 127 was fed into the front speaker feeds 113 and 114 only and referred in this respect to D6, page 10, lines 4 to 7, which reads:

"Whilst further reverb signals could be added to the rear speaker feeds, it is generally advantageous for the system to throw images forward to overcome psycho-acoustic frontal confusion and elevation. Using only the front speaker positions for the reverb helps to throw the images forward and give a more convincing frontal sound."

The appellant argued that adding artificial reflections to the front channels only teaches away from the subject-matter of claim 1, which includes the feature of adding the artificial reflections to the channels representing directions other than front directions.

The board does not follow these arguments for the following reasons:

Fig. 9 shows that the input of the reverb filter 127 receives a sum, generated at the summing point 126, of each of the input signals (page 10, lines 2 to 4), i.e. including the rear channel signals. This means that the rear channel signals are also subjected to reverb processing by the reverb filter 127. Hence, artificial reflections are added to the rear channel signals. Further, at points 122 and 123, the front and rear feeds are summed and the artificial reflections, generated in respect of the rear channel signals and earlier fed into the front feeds at points 113 and 114, are combined with the processed rear channel signals. Thus, artificial reflections of the rear channel

signals are generated and added to the signal path of the rear channels signals or, in other words, added to the channels representing directions other than front directions.

The above understanding does not contradict the above-mentioned passage at page 10, lines 4 to 7, since the binaural outputs of Fig. 9 are for headphone reproduction, in which the term "front speaker positions" refers to the front speaker feeds. As shown in Fig. 9, the reverb signal is fed into the front feeds and subsequently through the front filters 128, 129 and thus treated like the front channel signals. The expression to "throw the images forward" is therefore to be understood as giving a signal a treatment as done for a front channel signal and thus to make it appear as coming from a front position. It cannot, however, provide a basis for an interpretation according to which artificial reflections are added to the front channels only.

- 1.6 Consequently, the skilled person, starting out from D5, would, when faced with the above-mentioned technical problem, recur to D6 and would include a reverberant filter in the HRTF features of the headphone processing, in order to improve the localization of channels. By doing so, the artificial reflections are added to the channels representing directions other than front directions only, since in the sound field reproducing system of D5 the headphone processing is only applied to these channels (see point 1.1 above).

- 1.7 The board concludes that, when starting out from D5 and taking into account the teaching of D6, the skilled person would have arrived at a method which includes

all the features of claim 1 without the exercise of inventive skill.

1.8 The subject-matter of claim 1 does not therefore involve an inventive step (Articles 52(1) and 56 EPC).

1.9 The main request is therefore not allowable.

2. Auxiliary request - *admissibility*

2.1 In the present case, the auxiliary request was filed one month before the oral proceedings before the board. It is thus an amendment to the appellant's case within the meaning of Article 13(1) RPBA. In accordance with Article 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 line with the established case law of the boards of appeal, one of the criteria for admitting further amendments to a claim at a late stage of the appeal proceedings is whether or not the claim is clearly allowable. Further, following T 361/08 (reasons for the decision, point 13) and T 144/09 (reasons for the decision, point 1.17), in exercising its discretion under Article 13(1) RPBA, the board considers it appropriate to take into account the provision of Article 12(4) RPBA, which reads: "Without prejudice to the power of the Board to hold inadmissible facts, evidence or requests which could have been presented or were not admitted in the first instance proceedings, everything presented by the parties under (1) shall be taken into account by the Board if and to the extent it relates to the case under appeal and meets the requirements in (2).".

Claim 1 of the auxiliary request differs from claim 1 of the main request in that it includes an additional feature in the characterising portion which essentially specifies that the crosstalk cancelling processing is performed after the headphone processing (see point VIII above).

The board notes that, in the examination procedure, each time in response to a communication issued by the examining division, the applicant twice submitted amended independent claims. However, the characterising portions of these claims did not include the above feature, but only included the feature of adding simulated reflections and/or artificial ambience to the channels representing directions other than front directions. The same is true in respect of the characterising portions of the independent claims which were pending at the beginning of these appeal proceedings, and similar considerations apply to claim 1 of the present main request (see points III and VII above).

Hence, the above-mentioned additional feature concerning the crosstalk cancelling processing was included in an independent claim for the first time with the filing of the present auxiliary request.

The board further notes that the feature in question was not in any of the claims as originally filed. Hence, it is at least uncertain that this feature was properly searched. In this respect, it is also noted that the description does not suggest in any way that this feature could reasonably be expected to be included in the claims by way of amendment and, for this reason, could be assumed to have been searched, as argued by the appellant. On the contrary, Fig. 1, which

shows a prior art arrangement in which crosstalk cancellation is performed after headphone processing, suggests that the feature in question was known per se at the time. Hence, taking into account the reasons concerning lack of inventive step as set out in respect of claim 1 of the main request (see point 1 above), the subject-matter of claim 1 of the auxiliary request is, at least prima facie, not allowable.

Further, the board cannot see any reason why the applicant would not have been in a position to present before the first instance a claim which included the above feature. The introduction of this feature in an independent claim for the first time in appeal proceedings means that the examining division was not given the possibility to give a final decision on the merits of this feature. The board would therefore be compelled to either give a first ruling on this issue, which would run contrary to the purpose of a second-instance proceedings, or remit the case to the first instance, which would clearly be contrary to procedural economy.

- 2.2 Exercising its discretion pursuant to Article 13(1) RPBA, the board therefore did not admit the auxiliary request into the appeal proceedings.
3. There being no allowable request, it follows that the appeal must be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



G. Rauh

F. van der Voort

Decision electronically authenticated