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Datasheet for the decision of 4 October 2007

Case Number: T 1426/04 - 3.5.04

Application Number: 98302261.7

Publication Number: 0867877

IPC: G11B 20/12

Language of the proceedings: EN

Title of invention:
DVD-audio disk, and apparatus and method for playing the same

Applicant:
SAMSUNG ELECTRONICS CO., LTD.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - no"

Decisions cited:
-

Catchword:
-

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Case Number: T 1426/04 - 3.5.04

D E C I S I O N
of the Technical Board of Appeal 3.5.04
of 4 October 2007

Appellant: SAMSUNG ELECTRONICS CO., LTD.
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 19 July 2004 refusing European application No. 98302261.7 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: F. Edlinger
Members: C. Kunzelmann
B. Müller

Summary of Facts and Submissions

I. The appeal is against the decision of the examining division to refuse European patent application No. 98 302 261.7.

II. With the statement of grounds of appeal the appellant filed claims 1 to 8 of a "primary request" which was later replaced by a "first auxiliary request".

III. Claim 1 of the current "first auxiliary request" reads:

"A DVD-Audio disk comprising:
a data zone to store data to be reproduced; and
an information zone to store information on said data to be reproduced;
wherein said information zone includes directories of a video title set (VIDEO_TS) and an audio title set (AUDIO_TS), said AUDIO_TS directory including information on an audio manager (AMG) having information on audio titles; and
wherein said data zone includes said audio titles each having audio title set information (ATSI) followed by a plurality of contiguous audio objects (AOBs), said ATSI includes a plurality of audio stream attributes each having an audio coding mode, one of a first, second or third quantization bit number corresponding to the data to be reproduced, one of a first, second, third, fourth, fifth, or sixth sampling frequency, *specified by three bits*, corresponding to the data to be reproduced, and decoding algorithm information relating to a number of audio channels of the data to be reproduced, and each of said AOBs includes a plurality of audio packs

recorded with audio data corresponding to the decoding algorithm stored in the audio stream attribute."

[The amendment made in appeal proceedings to claim 1 of the main request on which the decision under appeal was based is indicated in italics.]

IV. The reasons for the decision under appeal referred to document

D1: EP 0 737 008 A2

and can be summarized as follows.

D1 related to a DVD-Audio disk because it explicitly disclosed that the disk could comprise only audio data. D1 was the closest prior art and was therefore taken as a starting point for assessing inventive step. The information zone of said disk included directories of a video title set and an audio title set. In the ATSI of the disk of D1, one of a first, second, third or fourth sampling frequency corresponded to the data to be reproduced (bits b53 and b52). The subject-matter of claim 1 differed from the disk disclosed in D1 in that the ATSI included one of a first, second, third, fourth, fifth or sixth sampling frequency. The problem to be solved could therefore be regarded as enabling the use of one out of more than four different sampling frequencies. Since D1 disclosed a reserved bit b51 in the audio stream attributes which was not used for any specific application (figures 11 and 23), a person skilled in the art faced with this problem would consider using this bit b51 for extending the number of possible sampling frequencies. The use of more bits for

specifying more possibilities, for instance more sampling frequencies, was well-known in the art. Thus the subject-matter of claim 1 did not involve an inventive step within the meaning of Article 56 EPC.

V. The appellant's arguments can be summarized as follows.

The examining division had misinterpreted the teaching of D1 in relation to the storage of only audio data on the DVD-Video disk disclosed in D1. Even when playback data consisted only of audio data in D1, it would be constructed using the video object unit as a unit. This teaching clearly demonstrated the difference between the audio portion of a DVD-Video disk as known from D1 and the inventive concept of a DVD-Audio disk. In addition, D1 did not disclose the feature of decoding algorithm information in the audio stream attributes. The present application made clear that DVD-Video disks and DVD-Audio disks were different types of DVD disks and distinguishable. As one of the aims of the invention was to enable audio recording at increased quality, the use of a video object unit/GOP structure including predicted and bi-directional interpolated frames of data was undesirable. Thus a person skilled in the art would not have considered D1 as a promising starting point for the invention. The claimed DVD-Audio disk was not constrained by the video object unit/GOP data structures of the D1 DVD-Video disk and had an altered data structure compared to the DVD-Video data structure.

The provision of one of first to sixth sampling frequencies was neither disclosed nor suggested by the prior art. In particular D1 disclosed the use of first

to fourth sampling frequencies by the use of two bits. Further sampling frequencies would not relate to DVD-Video and thus would not be envisaged in D1. The provision of first to sixth sampling frequencies in accordance with the invention allowed the use of a DVD disk in relation to DVD-Audio, which allowed for additional sampling frequencies and channel numbers that significantly benefited audio reproduction. The invention solved the problem of making better use of the DVD data transmission capacity than in D1 because the data structure of the DVD-Video of D1 wasted disk space if it was only used for audio data.

It was impossible to specify first to sixth sampling frequencies using two bits, such as the two bits b53 and b52 used in D1. The invention used the reserved bit b51 to allow for the additional sampling frequencies as specified in bits b53 and b52. Given the link between the number of audio channels and the sampling frequencies available, bit b51 was also used to specify the number of audio channels, as shown in table 9a of the description. The invention enabled a large range of sampling frequencies to be used. The similarity of the video data structure and the audio data structure of DVD-Video and DVD-Audio disks was known, and accepted in the present application. The inventive part of the application was the use to which the AUDIO_TS directory was put and the use of three bits to specify the sampling rate in order to provide high quality audio data.

VI. In a communication dated 3 April 2007 and annexed to a summons to oral proceedings, the board indicated its provisional opinion that a generally accepted meaning

of the term "DVD-Audio disk" did not appear to have existed at the filing date. The board also indicated that the directories of a video title set and audio title set specified in claim 1 appeared to be implicit in D1 because they were part of the format standards of DVDs, that the data structure of the audio titles specified in claim 1 appeared to be analogous to the data structure of the video titles known from D1, and that it appeared that, at the date of filing, serious proposals to develop a DVD standard for high quality audio had been publicly available. The board referred to a document by Bruekers, A.A.M.L et al.: "Lossless coding for DVD Audio", Preprints of papers presented at the AES Convention, November 1996, [Preprint 4358, 101st Convention], in the following referred to as A1; and to Reference [1] cited therein: Acoustic Renaissance for Audio, Technical Subcommittee, "A proposal for the High-Quality Audio Application of High-Density CD Carriers", January 1996. Version 1.3, in the following referred to as A2.

VII. In a letter dated 5 September 2007, the appellant announced that he would not attend the oral proceedings. The appellant also filed new description pages 1 to 62 and new claims 1 to 8 and submitted the following requests:

"We request that the enclosed submissions and first auxiliary request (complete specification) are considered by the Board of Appeal. We request that the primary request enclosed with our grounds of appeal is disregarded. We request that the specification of the first auxiliary request is accepted as fulfilling the requirements of the EPC and that the application is

remitted to the Examination Division for the continuation of the examination procedure, in particular the issue of a communication under Rule 51(4) EPC so that the application can proceed to the grant stages."

VIII. Oral proceedings were held on 4 October 2007 in the absence of the appellant, in accordance with Rule 71(2) EPC. At the end of the oral proceedings, the board gave its decision.

Reasons for the Decision

1. The appeal is admissible.

2. It is clear from points II and VII above that the appellant's "first auxiliary request" submitted with the letter dated 5 September 2007 replaces the former (and sole) "primary request" and is thus the only current request on file. The board interprets the appellant's reference to the "complete specification" as a clear instruction to replace all previous pages of the description and claims. The drawings (sheets 1/44 to 44/44 as originally filed) have not been replaced at any stage of the examining or appeal proceedings. The board's decision is therefore based on the claims and description filed with the letter dated 5 September 2007 and the drawings as originally filed.

3. *Inventive step (Article 56 EPC)*

3.1 *The meaning of the expression "DVD-Audio disk" in claim 1*

3.1.1 According to Article 84 EPC, the claims shall define the matter for which protection is sought. The meaning of the expressions used in the claims is determined by claim construction. In the present case, this applies in particular to the disputed meaning of the expression "DVD-Audio disk" in claim 1.

3.1.2 Claim 1 specifies *inter alia* a DVD-Audio disk comprising an information zone including an audio title set directory (AUDIO_TS) which includes information on an audio manager (AMG) having information on audio titles.

3.1.3 It is common ground that a standard for DVD-Audio had not been established at the earliest priority date and was still under discussion even at (and after) the filing date. Even if a standard had been established, it could have encompassed the storing of video and other data in addition to audio data. Furthermore taking into account that non-standard DVDs were also conceivable, a generally accepted meaning of the expression "DVD-Audio disk" did not exist at the relevant date of the present application. Moreover the reference to a directory of a video title set in claim 1 is consistent with the storing of audio and video and other data on the DVD-Audio disk. Thus claim 1 does not specify that the DVD-Audio disk of claim 1 may store **only** audio data. The description confirms that the DVD-Audio disk is suitable for use

with only audio data, but may have video data (page 1, lines 15 and 16; page 15, lines 19 and 20; page 61, lines 1 to 30; and particularly page 62, lines 3 to 6).

3.1.4 Rather, the DVD-Audio disk of claim 1 is characterised as an audio disk by the features of the "wherein" portion of claim 1, these features relating to the "use to which the AUDIO_TS directory was put and the use of three bits to specify the sampling rate". In this respect the board concurs with the appellant. The relevance of the audio title set directory (AUDIO_TS) and audio manager (AMG) for the subject-matter of claim 1 becomes clear from the description which explains that the audio title set directory (AUDIO_TS) stores the positional information of the audio manager (AMG) and of titles which are reproducible in a DVD-Audio player. If a DVD player detects effective data in the audio title set directory (AUDIO_TS), it determines the disk as being DVD-Audio (see page 8, line 25, to page 9, line 4; page 15, lines 27 to 38; page 61, lines 1 to 4; figure 31). The board therefore construes the expression "DVD-Audio disk" in the context of present claim 1 as a DVD for use with effective data in the audio title set directory (AUDIO_TS).

3.2 *The general data structure of the DVD-Audio disk specified in claim 1*

The description (page 7, line 35, to page 15, line 18, and figures 1 to 9d) discloses the general data structure of the known DVD-Video disk, having a directory structure as shown in figure 1 (see page 8, lines 11 to 23) and a logical data structure as shown

in figure 2 (see page 9, lines 13 to 16). The description also makes clear on page 8 that the directory structure of the DVD-Audio disk is also as shown in figure 1, and that the logical data structure of the audio titles specified in claim 1 is analogous to the logical data structure of the video titles of the known DVD-Video disk (see page 16, line 1 to page 18, line 8). The features relating to the general data structure of the DVD-Audio disk as specified in claim 1 thus form part of the usual format of DVDs. The appellant has not contested this, but considers that the inventive part of the application was the use to which the AUDIO_TS directory was put and the use of three bits to specify the sampling rate in order to provide high quality audio data.

3.3 *The closest prior art*

3.3.1 It was generally known before the earliest priority date of the present application that the high capacity of the DVD ("Digital Versatile Disk") opened the way to numerous applications, for instance high quality audio or audio-only applications, for which standards were under discussion (see A1, Abstract and A2, "1. Introduction" on page 3). Thus a DVD-Video disk was a realistic starting point for the development of a DVD-Audio disk having a similar general data structure.

3.3.2 It was not contested by the appellant that D1 discloses a DVD-Video disk implicitly having the general data structure of the DVD-Video disk described in the present application (compare for instance figures 4, 5 and 21 of D1 with figures 2, 4 and 6 of the application), which is analogous to the general data

structure of the present DVD-Audio disk (see point 3.2 above). The board therefore agrees with the decision under appeal that D1 may be taken as a starting point for assessing inventive step.

3.3.3 The subject-matter of claim 1 differs from the DVD disclosed in D1 in that the AUDIO_TS directory includes information on an audio manager (AMG) having information on audio titles and in that an audio title set information (ATSI) includes among the audio stream attributes one of a first to sixth sampling frequency, specified by three bits (whereas D1 only discloses two bits being used for sampling frequencies).

3.3.4 The appellant furthermore argued that D1 did not disclose the feature of decoding algorithm information in the audio stream attributes included in the audio title set information (ATSI) specified in claim 1. However this argument did not convince the board because the DVD of D1 also comprises a data zone including a plurality of audio stream attributes including audio coding information (AC-3, MPEG-1 or MPEG-2; see D1, column 23, lines 22 to 57) and corresponding decoding information (see D1, column 32, lines 28 to 54). Also information relating to the number of audio channels of the data to be reproduced is stored on the DVD of D1 (see figure 11, bits b50 to b48).

3.3.5 The appellant's argument that the DVD-Audio disk specified in claim 1 was not constrained by the video object/GOP data structures of the DVD of D1 did not convince the board because the DVD-Audio disk specified in claim 1 is not restricted to audio-only applications

and the audio data transfer, depending on the amount of video data stored, may be constrained to a similar degree as in the DVD of D1.

3.4 *The problem solved by the DVD-Audio disk specified in claim 1*

3.4.1 The feature of three bits for specifying the sampling frequencies and the use of the AUDIO_TS directory (see point 3.3.3 above) distinguishing the DVD-Audio disk specified in claim 1 from the DVD disclosed in D1 provide a DVD which can be better adapted to store audio data in that it increases the flexibility of the DVD with respect to the different audio formats it can store. Embodiments relating to audio-only applications and higher quality audio are made possible, but claim 1 is not limited to such applications (see page 15, lines 19 to 25, of the description and point 3.1.3 above).

3.4.2 The board is not convinced by the appellant's argument that the additional bit is also used for specifying the number of channels. Claim 1 does not specify specific sampling frequencies or more channels than the audio data on the DVD disclosed in D1. Therefore the audio data need not have better quality than those of the DVD disclosed in D1. Thus the appellant's arguments relating to high quality audio or to the audio-only use of the DVD-Audio do not concern problems which are solved by the whole range of DVD-Audio disks specified in claim 1.

3.5 *Solutions to the problem suggested in the prior art*

3.5.1 It was already known at the earliest priority date of the present application that the high capacity of the DVD opened the way to numerous applications, in particular high quality audio applications (see point 3.3.1 above). A number of different formats had been proposed for DVD-Audio, all claiming to fulfil requirements set by consumers, content providers, equipment manufacturers, and others. There was even an ongoing discussion within the audio community on creating a DVD standard for audio applications. The parameters essential for high quality audio applications were considered to be *inter alia* the number of channels, the sampling frequency and the number of bits per sample. Most of the proposals were enhancements of these parameters (see for instance A1, Abstract and the paragraph "Introduction"). Thus a person skilled in the art taking part in this discussion would have explored how such modified parameters for high quality audio applications were achievable with a DVD as disclosed in D1. In these circumstances it was a straightforward matter to make use of the AUDIO_TS directory in a manner which is analogous to that of the data structure of video titles of a known DVD-Video disk (see point 3.2. above).

3.5.2 As set out in the preceding paragraph, a modification of the sampling frequency was one of the topics under discussion for achieving high quality audio applications of a DVD. A large number of sampling frequencies was technically possible, and it was mainly a problem of standardisation to agree on a set of allowable sampling frequencies. Different allowable

sampling frequencies may have been desirable for instance for reasons of flexibility or compatibility with CD standards. Thus it was a matter of normal design to increase the number of allowable sampling frequencies with respect to those of the known DVD-Video.

3.5.3 For the DVD-Video of D1 two sampling frequencies were allowable, and each one of them can be specified on the DVD. More precisely, D1 discloses in figure 11, column 16, lines 24 to 29, and column 24, lines 20 to 25, that two bits (bit numbers b53 and b52) specify the two allowable sampling frequencies of 48 kHz and 96 kHz (standard sampling rates for DVD-Video), other bit numbers being for reservation. Since two bits only allow the definition of four different states, the addition of a third bit to allow for more than four sampling frequencies represented a choice with little modification of the known data structure. The board therefore agrees with the decision under appeal that a person skilled in the art would have considered the use of a third bit, such as the reserved bit b51 in the audio stream attributes of D1, which was not used for any specific application (figures 11 and 23), to extend the number of possible sampling frequencies.

3.5.4 In view of the above, the board is of the opinion that the subject-matter of present claim 1, having regard to the state of the art at the earliest priority date, merely represents a matter of normal design to implement a DVD-Audio application which was under discussion. The board thus judges that the DVD-Audio disk specified in claim 1 does not involve an inventive step (Article 56 EPC).

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

D. Sauter F. Edlinger