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Application Number: 04254282.9

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Content identification system

Applicant:
LUCENT TECHNOLOGIES INC.

Opponent:
-

Headword:
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Relevant legal provisions (EPC 1973):
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Case Number: T 1546/07 - 3.5.04

D E C I S I O N
of the Technical Board of Appeal 3.5.04
of 29 June 2010

Appellant: LUCENT TECHNOLOGIES, INC.
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 13 March 2007 refusing European patent application No. 04254282.9 pursuant to Article 97(1) EPC 1973.**

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. 04 254 282.9

II. The examining division had refused the application *inter alia* on the ground that claim 1 of the main request and claim 1 of the auxiliary request then on file did not meet the requirements of Article 84 EPC 1973 regarding clarity.

III. The applicant appealed. With the statement of grounds of appeal, the appellant filed claims according to a main request, a first auxiliary request and a second auxiliary request, respectively. With respect to Article 84 EPC 1973, the appellant also filed arguments in support of its view that the claimed subject-matter was appropriately defined by the claims of all three requests.

IV. With the summons to oral proceedings, the board issued a communication pursuant to Article 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA), in which it set out its provisional opinion that the meaning of several features of the independent claims was not clear (Article 84 EPC 1973).

V. With a letter dated 28 May 2010, the appellant filed the claims according to a new first and second auxiliary request to replace the claims according to all the previous auxiliary requests. It also submitted observations concerning the meaning of various features

in the claims and indicated that it did not intend to attend the oral proceedings.

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

"A method for processing a media program to extract therefrom features identifying the media program, said method being for use in recognizing the content of the media program, said method comprising the steps of:
filtering each first frequency domain representation of blocks of said media program using a plurality of filters (201-1, 201-2 ... 201-M) to develop a respective second frequency domain representation of each of said blocks of said media program, said second frequency domain representation of each of said blocks having a reduced number of frequency coefficients with respect to said first frequency domain representation; whereas the frequency coefficients of the second frequency domain representation are the filter outputs of said filters (201-1, 201-2 ... 201-M);
grouping frequency coefficients of said second frequency domain representation of said blocks to form segments (401), whereas said grouping of frequency coefficients of said second frequency domain representation of said blocks represents blocks that are consecutive in time in said media program;
selecting as features of the media program a plurality of segments (401) that meet prescribed criteria."

Claim 1 of the first auxiliary request reads as follows:

"A method for processing a media program to extract therefrom features for identifying content included within the media program, said media program content

represented as blocks of first frequency domain coefficients corresponding to blocks of samples of content included within the media program, said method comprising the steps of:
filtering each first frequency domain representation of blocks of media program content using a plurality of filters (201-1, 201-2 ... 201-M) to develop a respective second frequency domain representation of said blocks of media program content, said second frequency domain representation having a reduced number of frequency coefficients with respect to said first frequency domain representation; whereas the frequency coefficients of the second frequency domain representation are the filter outputs of said filters (201-1, 201-2 ... 201-M);
grouping frequency coefficients of said second frequency domain representation of said blocks of media program content to form segments (401), whereas said grouping of frequency coefficients of said second frequency domain representation of said blocks of media program content represents blocks of media program content that are consecutive in time in said media program;
selecting as features of the content included within the media program a plurality of segments (401) that meet prescribed criteria."

Claim 1 of the second auxiliary request reads as follows:

"A method for processing a media program to extract therefrom features for identifying content included therein, said method comprising the steps of:

filtering each of a plurality of blocks of first frequency domain coefficients representing corresponding content sample blocks of said media program using a plurality of filters (201-1, 201-2 ... 201-M) to develop respective blocks of second frequency domain coefficients, said blocks of second frequency domain coefficients having a reduced number of coefficients with respect to said blocks of first frequency domain coefficients; whereas the second frequency domain coefficients are provided by the outputs of said filters (201-1, 201-2 ... 201-M);
grouping blocks of second frequency domain coefficients to form segments (401) of second frequency domain coefficients that are consecutive in time in said content included within the media program,
selecting as features of the content included within the media program a plurality of segments (401) that meet prescribed criteria."

VII. Oral proceedings were held in the appellant's absence in application of Rule 71(2) EPC 1973 and Article 15(3) RPBA, on 29 June 2010. The board noted that the appellant had requested in writing that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 to 28 of the main request submitted with the statement of grounds of appeal, and alternatively on the basis of claims 1 to 28 of the first and second auxiliary requests submitted with the letter dated 28 May 2010. At the end of the oral proceedings the chairman announced the board's decision.

VIII. The reasons for the decision under appeal can be summarised as follows.

Claim 1 did not mention any criteria for grouping frequency coefficients and for selecting segments which would enable a person skilled in the art to carry out the alleged invention. An (arbitrary) unspecified grouping of frequency coefficients and selection of segments would not result in efficient media content recognition. The basis for grouping frequency coefficients and the criteria for selecting segments were essential features of the alleged invention and thus had to be included in claim 1. Without specification of the criteria for selecting segments in the claims, it was not apparent what a person skilled in the art had to consider when selecting segments in order to achieve efficient media content recognition.

IX. The appellant's arguments can be summarised as follows:

The independent claims clearly stated that (second) frequency coefficients representing blocks that were consecutive in time were grouped (in a time ordered manner) to form a segment. The segments were "selected as features of the media program" and represented features useful in identifying content within the media program. A person skilled in the art would thus apply the prescribed criteria appropriate for the selection of features.

The meaning of various claim features was as follows. The "features identifying the media program" were characteristics associated with and relatively unique to the media program. The "segments" comprised time sequence frequency domain coefficients, wherein the selection of a few such segments provided information sufficient to identify content in a particular media

program. The term "prescribed criteria" was used specifically and defined several times in the application. The applicant was entitled to use its own terminology to describe the invention.

Reasons for the Decision

1. The appeal is admissible.

2. *Main request: clarity of claim 1 (Article 84 EPC 1973)*

2.1 Article 84 EPC 1973 sets out that the claims shall define the subject-matter for which patent protection is sought, and that they shall be clear. This signifies that "an independent claim within the meaning of Rule 29 EPC [1973] should explicitly specify all of the essential features needed to define the invention, and that the meaning of these features should be clear for the person skilled in the art from the wording of the claim alone", see the Opinion of the Enlarged Board of Appeal in case G 1/04 (OJ EPO 2006, 334), point 6.2. It is also established case law that all features which are necessary for solving the technical problem with which the application is concerned have to be regarded as essential features (see Case Law of the Boards of Appeal of the European Patent Office, 5th edition 2006, II.B.1.1.3).

2.2 In the present case, the invention relates to the art of identifying the content of a particular media program (see paragraph [0001] of the application as published). The description states that "there is a need in the media arts to automatically identify

particular media programs that are presented" (see paragraph [0002] of the application as published). Furthermore the application states that the applicant has "recognized that the content of a media program can be recognized with a very high degree of accuracy based on an analysis of the content of the media program without any added information provided that the media program has been previously appropriately processed to extract therefrom, and store in a database, features identifying the media program" (see paragraph [0005] of the application as published). Hence the application is concerned with the problem of extracting features identifying a media program from the content of said media program. To solve this problem, the media program must be processed appropriately, i.e. in a way which allows features identifying the media program to be extracted. The appropriate processing of the media program is thus an essential feature of the invention.

2.3 Claim 1 defines a method for processing a media program to extract therefrom features identifying the media program, said method being for use in recognizing the content of the media program. Claim 1 specifies that each first frequency domain representation of blocks of said media program is filtered to develop a respective second frequency domain representation of each block. For instance, in the specific embodiment described, in which the audio content of a media program is analysed to extract features therefrom, the first frequency domain representation is achieved using the well-known Fast Fourier Transform (FFT) on blocks of 1024 sampled digital signals (see paragraphs [0023] to [0026] of the application as published). The coefficients resulting from the transform are filtered using a plurality of

filters to achieve a second frequency domain representation having a reduced number of frequency coefficients (30 in the described embodiment) with respect to the first frequency domain representation (see paragraphs [0027] and [0028] of the application as published). The frequency coefficients of the second frequency domain representation are the filter outputs of said filters. Thus, in the board's view, claim 1 specifies how blocks of said media program may be processed to arrive at the frequency coefficients of the second frequency domain representation.

2.4 Claim 1 further specifies that the features of the media program, that is the features identifying the media program, are extracted as follows on the basis of the frequency coefficients of the second frequency domain representation.

2.4.1 Frequency coefficients of the second frequency domain representation are grouped to form segments and the grouping represents blocks which are consecutive in time in the media program.

2.4.2 A plurality of segments that meet prescribed criteria are selected as features of the media program.

2.5 The board agrees with the decision under appeal that an arbitrary grouping of frequency coefficients to form segments and an arbitrary selection of segments would not result in efficient media content recognition. In the context of the present application, the reduction in the number of frequency coefficients caused by the filtering and the subsequent selection of segments may cause a loss of content information such that, in

general, the media program can no longer be identified. Rather, the processing of the media program needed to solve the problem with which the application is concerned is characterised by an appropriate grouping of frequency coefficients to form segments and an appropriate selection of segments (see point 2.2. above).

2.6 Claim 1, however, does not specify how the frequency coefficients are grouped to form segments except that the grouping represents blocks that are consecutive in time in said media program. Nor does claim 1 specify how segments are selected. In particular the feature of claim 1 that segments are selected "that meet prescribed criteria" does not define the selected segments since neither the criteria nor their prescription are specified.

2.7 Moreover, in the present case, the application as a whole gives no definitions of the expressions "segment" and "prescribed criteria" applicable in the context of the invention defined in claim 1.

2.7.1 For instance, definitions of the expression "segment" (see page 2, lines 11 to 24, and page 7, lines 14 to 31, and the corresponding paragraphs [006] and [0028] of the application as published) are given in the specific context of the exemplary embodiment which analyses the audio content of the media program. In this case, a fixed or variable number of consecutive outputs of (log-spaced) triangular filters for filtering the coefficients of the first frequency domain representation are grouped into segments, for instance segments consisting of a group of twelve frames which

are consecutive in time. The general meaning, in the much broader context of the invention defined in claim 1, is not given in the application. In this context the board notes that claim 1 does not specify the medium (audio, video, still pictures, text, etc.) of the media program. Also the application does not specify how the definition of the expression "segment" in the context of the exemplary embodiment is generalised or modified when, for instance, video signals instead of audio signals of programs are processed, or when spatial frequency coefficients (which may result from a Discrete Cosine Transform, see paragraph [0026] of the application as published) are grouped to form segments instead of temporal frequency coefficients resulting from a Fast Fourier Transform. In this general context, it is unclear how the frequency coefficients must be grouped to represent blocks which are consecutive in time in said media program.

2.7.2 The definitions of the expression "prescribed criteria" (see for instance page 2, lines 11 to 24, and page 7, line 32, to page 9, line 3, and the corresponding paragraphs [0006] and [0029] to [0031] of the application as published) are also given in the context of embodiments which analyse the audio content. In this context, a number of segments (Z) are selected from the sequentially and temporarily stored segments, segment energy or entropy being used as a criterion. The application does not indicate clearly how the prescribed criteria must be generalised or modified in the much broader context of the invention defined in claim 1. The selecting step is thus neither clear from the wording of claim 1 alone, nor does the description

support selection of segments according to (any) "prescribed criteria" and independently of a particular medium.

2.8 Thus, claim 1 does not make clear how features identifying the media program are extracted by grouping frequency coefficients of the second frequency domain representation to form segments and selecting a plurality of these segments.

2.9 The board did not find the appellant's argument that the applicant was entitled to use its own terminology to describe the invention to be pertinent. In the present case, the terminology used in the application gives certain expressions a particular meaning in the context of the described embodiment, but does not define their meaning in the context of the invention defined in claim 1.

2.10 Hence the board finds that claim 1 of the main request is not clear (Article 84 EPC 1973).

3. *First auxiliary request: clarity of claim 1 (Article 84 EPC 1973)*

3.1 Claim 1 defines a method for processing a media program to extract therefrom features for identifying content included within the media program, said media program content represented as blocks of first frequency domain coefficients corresponding to blocks of samples of content included within the media program. Thus, when compared with claim 1 of the main request, claim 1 of the first auxiliary request explicitly specifies that the features to be extracted are features for

identifying content included within the media program. Claim 1 also explicitly specifies that blocks of samples of content are represented as blocks of first frequency domain coefficients. The development of the second frequency domain representation having a reduced number of frequency coefficients, however, is the same as that specified in claim 1 of the main request.

3.2 In the above assessment of claim 1 of the main request the features were already considered as features for identifying content included within the media program (see points 2.2 and 2.5 to 2.8). Hence the conclusion reached at the end of point 2.3 above is also valid for claim 1 of the first auxiliary request.

3.3 Claim 1 of the first auxiliary request does not specify how the frequency coefficients are grouped to form segments more specifically than claim 1 of the main request. Nor does claim 1 of the first auxiliary request specify how segments are selected more specifically than claim 1 of the main request. Thus, the objections raised in points 2.5 to 2.8 above are also valid against claim 1 of the first auxiliary request.

3.4 Hence the board finds that claim 1 of the first auxiliary request is not clear (Article 84 EPC 1973).

4. *Second auxiliary request: clarity of claim 1 (Article 84 EPC 1973)*

4.1 Claim 1 of the second auxiliary request defines a method for processing a media program to extract therefrom features for identifying content included

therein. Claim 1 of the second auxiliary request explicitly specifies that blocks of first frequency domain coefficients represent corresponding content sample blocks of the media program. The development of blocks of second frequency domain coefficients having a reduced number of coefficients with respect to the blocks of first frequency domain coefficients, as specified in claim 1 of the second auxiliary request, follows the same principles as the development of the second frequency domain representation having a reduced number of frequency coefficients specified in claim 1 of the main request, despite the different wording being used.

4.2 Claim 1 of the second auxiliary request does not specify how the frequency coefficients are grouped to form segments more specifically than claim 1 of the main request. Nor does claim 1 of the second auxiliary request specify how segments are selected more specifically than claim 1 of the main request. Thus the objections raised in points 2.5 to 2.8 above are also valid against claim 1 of the second auxiliary request.

4.3 Hence the board finds that claim 1 of the second auxiliary request is not clear (Article 84 EPC 1973)

5. In view of the above, the board finds that the decision under appeal cannot be set aside and that the appeal must be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

L. Fernández Gómez F. Edlinger