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Datasheet for the decision of 5 May 2010

Case Number: T 0615/09 - 3.5.03

Application Number: 96309410.7

Publication Number: 0782372

IPC: H04S 3/02

Language of the proceedings: EN

Title of invention:
5-2-5 Matrix system

Applicant:
SRS LABS, INC.

Headword:
5-2-5 Matrix system/SRS LABS

Relevant legal provisions:
EPC Art. 84, 111(1), 123(2)

Relevant legal provisions (EPC 1973):
-

Keyword:
"Added subject-matter - no (after amendment)"
"Clarity - yes (after amendment)"
"Remittal - yes"

Decisions cited:
-

Catchword:
-

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Case Number: T 0615/09 - 3.5.03

D E C I S I O N
of the Technical Board of Appeal 3.5.03
of 5 May 2010

Appellant: SRS Labs, Inc.
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Decision under appeal: **Decision of the examining division of the European Patent Office posted 27 October 2008 refusing European application No. 96309410.7 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman: A. S. Clelland
Members: F. van der Voort
M.-B. Tardo-Dino

Summary of Facts and Submissions

I. This appeal is against the decision of the examining division refusing European patent application No. 96309410.7 (publication number EP 0782372 A).

II. The reasons given for the refusal were that claims 8 to 11 contained subject-matter which extended beyond the content of the application as filed, Article 123(2) EPC, and that claims 1 and 11 did not meet the requirements of Article 84 EPC due to a lack of essential features and an unclear claim dependency, respectively.

III. In the notice of appeal the appellant requested that the decision be cancelled and the application be allowed. Oral proceedings were conditionally requested.

IV. With the statement of grounds of appeal the appellant filed claims of a main request and first to thirteen auxiliary requests and submitted arguments and a declaration in support of these requests.

V. In a communication the board raised, without prejudice to its final decision, objections under Articles 84 and 123(2) EPC in respect of the claims of each of the requests on file.

VI. In response to the board's communication, the appellant filed, with a letter dated 19 March 2010, claims of a fourteenth auxiliary request together with an amended page 5 of the description and submitted arguments in support of this request. Further, the appellant confirmed that grant was requested on the basis of "the descriptions and drawings on file".

VII. With a further letter dated 26 March 2010 the appellant requested that the fourteenth request on file be renumbered as the main request and that the main request and first to thirteenth auxiliary requests be respectively renumbered as first to fourteenth auxiliary requests. Further, oral proceedings were only requested in the event that none of the requests on file was considered allowable.

VIII. The claims of the main request, formerly the fourteenth auxiliary request, read as follows:

"1. A process for decoding two-channel stereo into multi-channel sound in an audio system comprising the step of providing a steering voltage comprising the steps of:

deriving (84L) a first dc signal from a first input signal (L);

deriving (84R) a second dc signal from a second input signal (R);

differencing said first and second dc signals (85);

passing said differenced signal (85) through a variable multiplier (118A) at a preselected gain to a first output terminal (R_{RHV} or R_{RLV}) when said differenced signal is positive and to a second output terminal (L_{RHV} or L_{RLV}) when said differenced signal is negative;

summing (20) said first and second input signals (L+R);

deriving (108F) a third dc signal from said summed first and second input signals;

differencing (30) said first and second input signals (L-R);

deriving (108B) a fourth dc signal from said

differenced first and second input signals;

differencing (109) said third and fourth dc signals to produce a threshold dc signal;

when said fourth dc signal (108B) is greater than said third dc signal (108F) detecting the level of said threshold dc signal (119) to produce a control signal which increases and decreases as said threshold dc signal increases and decreases; and

applying said control signal to said variable multiplier (118A) to vary the gain applied to said differenced first and second dc signals (85).

2. A process according to claim 1, said preselected gain being unity.

3. A process according to claim 2, said gain of said variable multiplier (118A) being variable over a range of from 1.0 to 10.

4. A process according to claim 1, said preselected gain being 0.501.

5. A process according to claim 2, said gain being variable over a range of from 0.501 to 5.

6. A process according to claim 1 comprising the steps of:

high pass filtering (82L) said first input signal;

deriving (84L) said first dc signal from said high pass filtered first input signal;

high pass filtering (82R) said second input signal;

deriving (84R) said second dc signal from said high pass filtered second input signal;

wherein said step of differencing (85) said first and second dc signals produces a high band dc signal;

and wherein said step of passing said differenced signal (85) through a variable multiplier (118A) comprises passing said high band dc signal through a high band signal variable multiplier (118A) at a preselected gain to a first high band output terminal (R_{RHV}) when said high band dc signal is positive and to a second high band output terminal (L_{RHV}) when said high band dc signal is negative;

low pass filtering (90L) said first input signal;

deriving (92L) a fifth dc signal from said low pass filtered first input signal; low pass filtering (90R) said second input signal;

deriving (92R) a sixth dc signal from said low pass filtered second input signal;

differencing (93) said fifth and sixth dc signals to produce a low band dc signal;

passing said low band dc signal through a low band signal variable multiplier (118B) at a preselected gain to a first low band output terminal (R_{RLV}) when said low band dc signal is positive and to a second low band output terminal (L_{RLV}) when said low band dc signal is negative; and

applying said control signal to said high and low band variable multipliers (118A,118B) to vary the gain applied to said high band and low band dc signals.

7. A process according to claim 6 further comprising the steps of:

deriving (99L) a seventh dc signal from said first input signal;

deriving (99R) an eighth dc signal from said second input signal;

differencing (100) said seventh and eighth dc signals to produce a broadband dc signal; and

passing said produced broadband dc signal to a broadband output terminal (L/R).

8. A process for encoding five discrete input signals into two-channel stereo in an audio system, the process comprising the steps of:

summing (151) a first discrete audio signal (C) attenuated by 3db and a second discrete signal (R) to produce a first composite signal;

feeding said first composite signal to a first all-pass network (155) having a linear phase vs. frequency response;

summing (150) said first discrete audio signal (C) attenuated by 3db and a third discrete signal (L) to produce a second composite signal;

feeding said second composite signal to a second all-pass network (152) having a linear phase vs. frequency response;

feeding a fourth discrete audio signal (S_L) to a third all-pass network (153) having a linear phase vs. frequency response and a 90 degree phase shift;

feeding a fifth discrete audio signal (S_R) to a fourth all-pass network (154) having a linear phase vs. frequency response and a 90 degree phase shift;

summing (161) an output of said first network (155), an output of said fourth network (154) attenuated by 3db and an output of said third network (153) attenuated by 3db to 6db to produce a first channel signal (R_T); and

summing (160) an output of said second network (152), an output of said third network (153) attenuated by 3db and an output of said fourth network (154)

attenuated by 3db to 6db to produce a second channel signal (L_T).

9. A process according to claim 8 further comprising the steps of:

deriving a first dc signal from said fourth discrete audio signal (S_L);

deriving a second dc signal from said fifth discrete audio signal (S_R);

differencing (164) said first and second dc signals to produce a control signal;

feeding an output of said third network (153) to a first variable multiplier (157);

feeding an output of said fourth network (154) to a second variable multiplier (156);

varying a gain of said first variable multiplier (157) in response to said control signal to attenuate said third network (153) output in a range of from 3db to 6db;

varying a gain of said second variable multiplier (156) in response to an inversion (165) of said control signal to attenuate said fourth network (154) output in a range of from 3db to 6db;

wherein said step of summing (161) an output of said first network (155), an output of said fourth network (154) attenuated by 3db and an output of said third network (153) attenuated by 3db to 6db comprises the step of summing (161) an output of said first network (155), an output of said fourth network (154) attenuated by 3db and an output of said first variable multiplier (157) to produce a first channel signal (R_T); and

wherein said step of summing (160) an output of said second network (152), an output of said third

network (153) attenuated by 3db and an output of said fourth network (154) attenuated by 3db to 6db comprises the step of summing (160) an output of said second network (152), an output of said third network (153) attenuated by 3db and an output of said second variable multiplier (156) to produce a second channel signal (L_T)."

In view of the board's conclusion in respect of the main request as set out below, it is not necessary to give details of the claims of the auxiliary requests.

Reasons for the Decision

1. *Article 123(2) EPC - main request*

1.1 Claims 1 to 9 of the main request are based on claims 1 to 9 as originally filed, with the following amendments:

1.1.1 In claims 1, 3 and 6 to 8 reference signs are inserted.

1.1.2 In claim 1, the wording "For use in an audio system decoding two-channel stereo into multi-channel sound, a process comprising the steps of" is replaced by "A process for decoding two-channel stereo into multi-channel sound in an audio system comprising the step of providing a steering voltage comprising the steps of". The appellant argued that thereby the overall process is claimed, in which the step of providing a steering voltage is a specific feature. The board agrees and notes that the amendment is based on claim 1, Fig. 2 ("Steering Voltage Generator 80") and page 16, line 21 ("Steering voltages L_{RHV}, R_{RHV}, L_{RLV} and R_{RLV}") of the

application documents as originally filed.

1.1.3 In claim 1, penultimate paragraph, the features are reordered in order to make it clear that the level of the threshold dc signal is detected when the fourth dc signal is greater than the third dc signal. This amendment is based on claim 1, penultimate paragraph, page 10, line 16, to page 11, line 11, and Fig. 2 ("Threshold Detect Circuit 119") of the application documents as originally filed.

1.1.4 Claims 6 and 7 are amended in order to make them dependent on claims 1 and 6, respectively. The amendments are based on claims 1, 6 and 7 and Fig. 2 of the application documents as originally filed.

1.1.5 In claim 8, the wording "For use in an audio system encoding five discrete signals into two-channel stereo, a process comprising the steps of" is replaced by "A process for encoding five discrete signals into two-channel stereo in an audio system, the process comprising the steps of". Hence, the claim is now unambiguously directed to a process of encoding five discrete signals into two-channel stereo in an audio system, specific steps of the process being further defined in the claim. Further, the references to third and fourth all-pass networks were interchanged. The amendments are based on claim 8 and Fig. 5 of the application documents as originally filed.

1.1.6 Claim 9 is amended in order to make it dependent on claim 8 and to correct the reference to the inversion of the control signal in accordance with Fig. 5 ("sixth amplifier 165"). The amendments are based on claims 8

and 9 and Fig. 5 of the application documents as originally filed.

1.2 For the above reasons, the board concludes that the amendments to the claims overcome the objections raised by the examining division and do not give rise to new objections under Article 123(2) EPC.

2. *Article 84 EPC - main request*

2.1 In respect of claim 1 as was pending before the examining division, the examining division raised the objection that the claim was not clear, since it did not meet "the requirement following from Article 84 EPC taken in combination with Rules 43(1) and (3) EPC that any independent claim must contain all the technical features essential to the definition of the invention". More specifically, it was held that it was not clear how the primary object of providing a decoding system capable of decoding two channels into five independent channels was achieved. Reference was made to the description, page 3, line 27, to page 4, line 8.

2.2 However, taking into account the amendments made to claim 1, see, in particular, point 1.1.2 above, and the amended description pages 3, 4 and 6 as filed with the letter dated 13 November 2006 and page 5 as filed with the letter dated 19 March 2010, the board is satisfied that claim 1 meets the requirements of clarity, conciseness and support by the description in accordance with Article 84 EPC. In particular, the claim is unambiguously directed to a process of decoding two-channel stereo into multi-channel sound in an audio system, in which the process includes a step of

providing a steering voltage, which is further defined in the claim by a number of specific steps. The description is adapted to the claim by the deletion of certain passages. These deletions do not violate Article 123(2) EPC, since they merely bring the description in line with the claims, the subject-matter of which is based on the application documents as originally filed as set out above (point 1).

2.3 The objections raised in the board's communication have been overcome by the amendments made. Further, the board sees no reason for raising new objections under Article 84 EPC in respect of the present claims.

2.4 The board is therefore satisfied that the claims of the main request meet the requirements of Article 84 EPC.

3. The decision under appeal only dealt with the requirements of Articles 84 and 123(2) EPC. Since the present claims meet the requirements of Articles 84 and 123(2) EPC the decision is to be set aside.

4. For the above reasons, it has not proved necessary to consider the auxiliary requests and/or summon the appellant to oral proceedings.

5. The board notes that the decision under appeal is silent on the question of whether or not the requirements of Article 52(1) in combination with Articles 54 and 56 EPC (novelty and inventive step) and the requirement of Article 83 (disclosure of the invention) are complied with.

6. It is therefore considered appropriate, in accordance with Article 111(1) EPC, to remit the case to the department of first instance for further prosecution on the basis of the claims of the main request.

In relation to the further prosecution the board notes that claim 9 of the main request erroneously refers to "a" first channel signal (R_T) instead of "said" first channel signal (R_T), cf. present claim 8. The same applies to the second channel signal (L_T).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance for further prosecution on the basis of the main request as referred to in the letter dated 26 March 2010.

The Registrar: The Chairman:

D. Magliano A. S. Clelland