BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Internal distribution code:
(A) [ ] Publication in OJ
(B) [ ] To Chairmen and Members
(C) [X] To Chairmen

D E C I S I O N
of 15 March 2001

Case Number: T 0216/99 - 3.5.2

Application Number: 88105872.1

Publication Number: 0287057

IPC: H03G 5/16

Language of the proceedings: EN

Title of invention:
Automatic loudness control circuit

Patentee:
Sanyo Electric Co., ltd.

Opponent:
Koninklijke Philips Electronics N.V.

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Novelty - yes"
"Inventive step - yes"

Decisions cited:
-

Catchword:
-

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0216/99 - 3.5.2

D E C I S I O N
of the Technical Board of Appeal 3.5.2
of 15 March 2001

Appellant: (Opponent)
Koninklijke Philips Electronics N.V.
Groenewoudseweg 1
5621 BA Eindhoven (NL)

Representative:
Schoonheijm, Harry Barend
Internationaal Octrooibureau B.V.
Prof. Holstlaan 6
5656 AA Eindhoven (NL)

Respondent: (Proprietor of the patent)
Sanyo Electric Co., Ltd.
18, Keihanhondori 2-chome
Moriguchi-shi, Osaka (JP)

Representative:
Glawe, Delfs, Moll & Partner
Patentanwälte
Postfach 26 01 62
D-80058 München (DE)

Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 7 December 1998 rejecting the opposition filed against European patent No. 0 287 057 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: W. J. L. Wheeler
Members: R. G. O'Connell
P. H. Mühlens

Summary of Facts and Submissions

I. This appeal is against the rejection of the opposition to European patent No. 287 057.

II. In the notice of opposition the opponent (now appellant) had requested revocation of the patent in its entirety on the grounds that the subject-matter of the claims of the patent were not new and did not involve an inventive step having regard in particular to the following prior art documents which remain relevant on appeal:

D1: DE-C-2 231 647

D2: JP-A-61 158 205

D4: GB-A-2 016 248.

III. The patent has not been amended. Claim 1 reads as follows:

"1. An automatic loudness control circuit for automatically controlling the magnitude of boosting of the low-frequency component of an audio signal in accordance with the output signal level of a power amplifier for driving a loudspeaker, the loudness control circuit comprising:

(a) an audio signal source (1),

(b) a low frequency boosting circuit (2) for extracting a low-frequency component from the output signal of the audio signal source 1 and boosting the low-frequency component to prepare a

low-frequency boost signal,

(c) an addition circuit (3) for adding the low-frequency boost signal to the output signal of the audio signal source (1),

(d) a power amplifier (4) for feeding the output signal of the addition circuit (3) to a loudspeaker (5) upon amplification,

(e) a level detection circuit (6) for detecting the output level of the power amplifier (4), and

(f) a boosting control circuit (7) for controlling the magnitude of boosting by the low frequency boosting circuit (2) in accordance with the detection signal of the level detection circuit (6),

the boosting control circuit (7) being operable to prepare a control signal for increasing the magnitude of boosting by the low frequency boosting circuit (2) as the output level of the power amplifier (4) lowers and feed the control signal to the low frequency boosting circuit (2)."

Claims 2 to 9 are dependent on claim 1 while independent claim 10 is directed to the stereophonic variant of the monaural circuit of claim 1.

IV. Oral proceedings were held before the board on 15 March 2000.

V. The appellant opponent argued essentially as follows:

Lack of novelty over D2

Claim 1 of the opposed patent could be read onto the circuit of D2 (numerals in parentheses corresponding to those used in the claim) in the following way: R1 and R4 in D2 formed an addition circuit (3) for adding the signals coming from the audio signal source Sa(1) and from high 2H and low 2L(2) boost circuits; a power amplifier 3(4) fed the output signal of the addition circuit to a loudspeaker 4(5) upon amplification; the block 5 in D2 constituted a level detection circuit (6) for detecting the output level of the power amplifier 3(4); R6 in D2 acted as a boosting control circuit (7) for controlling the magnitude of boosting by the low frequency boosting circuit 2L(2) in accordance with the detection signal of the level detection circuit 5(6), the boosting control circuit R6(7) being operable to prepare a control signal for increasing the magnitude of boosting by the low frequency boosting circuit 2L(2) as the output level of the power amplifier 4(5) lowered and to feed the control signal to the low frequency boosting circuit 2L(2). In Figure 1 of the opposed patent the blocks (2) and (7) were drawn separately, but they could also be drawn as one functional block. The high frequency boost circuit 2H employed in the circuit of D2 was irrelevant. With the above correspondences the prior art circuit contained all elements of claim 1 of the opposed patent which accordingly lacked novelty.

Obviousness in view of D2 and D4

In accordance with an alternative interpretation of the relationship between the subject-matter of claim 1 of the opposed patent and the circuit of D2, the former

was distinguished from the latter by virtue of the fact that in the opposed patent the output signal of the audio signal source (1) was fed directly into the boosting circuit (2), whereas in D2 the boosting circuit was fed with the signal after the power amplifier 3(4) and the level detection circuit (6). However this was an equivalent way of “extracting a low frequency component”.

Furthermore D4 disclosed an audio signal processing system in which the input signal was also fed directly into a low-frequency boosting circuit. Starting from D2 it was obvious for the person skilled in the art to adopt the direct feed of the audio source signal disclosed in D4 and thus arrive at the circuit of claim 1 of the opposed patent.

The respondent’s suggestion that the word "boost" in the abstract of D2 was a mistranslation was a selective subjective interpretation; it could just as well be argued that the use of the word "filter" was a translation error.

The appellant also contended in the statement of grounds of appeal that the subject-matter of claim 1 lacked novelty over D1 and inventive step over D1 and D2 combined; cf points 2.2 and 2.4 below.

VI. The respondent proprietor argued essentially as follows:

Novelty over D2

Claim 1 of the opposed patent could not be read onto D2 since the latter did not disclose a low-frequency

boosting circuit for extracting a low-frequency signal and boosting it. D2 disclosed only a filter circuit controlled by the output of the power amplifier 3(4). Although the word “boost” was used in the English version of the Japanese abstract there was in fact no amplifying boosting in the sense of the opposed patent; D2 disclosed only an attenuating filter. In the circuit of the patent signals were actually added in the addition circuit (3); in D2 there was no addition of signals.

Inventive step over D2 and D4

The boosting circuit feature which was missing from D2 could not reasonably be derived from D4. In D4, Figure 1, the low frequency component was not boosted, it was replaced by subharmonics of even lower frequency which were specially generated for this purpose in the D4 circuit. The D4, Figure 2 circuit was even more complex; subharmonic generation occurred as in Figure 1 together with a fixed, ie unregulated low frequency boost which was not controlled by the output signal. Given the different operating principles underlying D2 and D4 no reasonable result could be obtained by combining the teachings of the two documents. In any event such a combination would necessarily involve the generation of subharmonics since this was the core teaching of D4. Hence the combination would not yield the circuit claimed in the opposed patent.

The respondent, in his response to the statement of grounds of appeal, contested the appellant's contentions that the subject-matter of claim 1 lacked novelty over D1 and inventive step over D1 and D2 combined; cf points 2.2 and 2.4 below.

VII. The appellant requested that the decision under appeal be set aside and that the patent be revoked.

VIII. The respondent requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. The issues in this appeal are novelty and inventive step.

2.1 Novelty over D2

2.1.1 The circuit specified in claim 1 of the opposed patent comprises, *inter alia*:

(a) an audio signal source (1),

(b) a low frequency boosting circuit (2) for extracting a low-frequency component from the output signal of the audio signal source 1 and boosting the low-frequency component to prepare a low-frequency boost signal,

(c) an addition circuit (3) for adding the low-frequency boost signal to the output signal of the audio signal source (1).

2.1.2 On the board's reading of D2, which largely corresponds with that of the respondent, the latter document discloses neither extracting, boosting nor addition in the sense of claim 1 of the opposed patent. In particular, the board interprets claim 1 as requiring

that the source (1) audio signal be fed to the low-frequency boosting circuit (2) for extraction of a low-frequency component; it is not persuaded by the appellant's argument that "extracting" should not be limited to extracting from the output signal of the audio signal source (1).

2.2 Novelty over D1

In the statement of grounds of appeal the appellant reiterated his contention, made in the proceedings before the opposition division, that the subject-matter of claim l was not new in view of D1, relying on the passage therein at column 3, lines 9 to 13, to provide the feature of controlling the low-frequency boosting circuit in response to the output level of the power amplifier. The board endorses the respondent's comment on this contention, viz that D1 does not disclose means for implementing such a control and in fact in the comments at lines 14 to 26 immediately following the passage in question this "conceivable" (German original: "denkbar") approach is dismissed as disadvantageous and the document proceeds to the detailed disclosure of circuits which do not implement this rejected idea. In the judgement of the board, this mention of an idea in general and disapproving terms in D1 does not constitute a disclosure of an implementation of this idea as a notional variant of the actual circuits described in detail in D1.

2.3 Inventive step over D2 and D4

At oral proceedings before the board the appellant argued that starting from D2 the person skilled in the art could arrive at the subject-matter of claim 1 of

the opposed patent by adopting the feature from D4 that the low-frequency boosting circuit receives the output signal of the audio source as a direct input. The board considers this to be an unpersuasive "could" argument based on an *ex post facto* analysis, since no plausible reason was adduced as to why the person skilled in the art would select precisely this feature from D4. D2 addresses the problem of correcting the frequency response of an audio amplifier circuit to take account of the signal level at the output of the power amplifier driving the loudspeaker. The circuits disclosed in D4 deal with a different problem, viz the restoration of low-frequency components which have been lost in an earlier stage of audio signal processing as a result of limitations in recording or transmission techniques or media (cf D4, page 1, lines 9 to 21), and they solve this problem by generating subharmonics of the low-frequency components of the signal thus synthesising or reconstructing the missing - even lower frequency - components. In the judgement of the board, the considerations underlying the design of the D4 circuit are sufficiently different that it would not be within the routine activity of the person skilled in the art to select and transfer a particular feature of the circuit topology of D4, in particular that relating to the addition of original and synthesised signals, to serve a different purpose in modifying the circuit of D2.

2.4 Inventive step over D1 and D2

The appellant's obviousness argument starting from D1 is, in the judgement of the board, no more persuasive than the argument of lack of novelty based on this document. D1 explicitly teaches away from the idea of

deriving the control signal for the amplifier circuit frequency response from the power amplifier output level. It is accordingly implausible to argue that the skilled person would be motivated to look for a means of implementing this idea in D2 or any other document.

3. The board therefore concludes that the appellant has not shown that the automatic loudness control circuit specified in claim 1 (mono) or claim 10 (stereo) of the opposed patent should be considered old or obvious having regard to the cited prior art. Accordingly the grounds of opposition pursuant to Article 100(a) EPC in combination with Articles 52(1), 54 and 56 EPC do not prejudice the maintenance of the opposed patent in unamended form.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

U. Bultmann W. J. L. Wheeler