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Datasheet for the decision of 24 August 2023

Case Number: T 1236/19 - 3.5.02

Application Number: 11710917.3

Publication Number: 2543139

IPC: H03F3/217, H03F1/32

Language of the proceedings: EN

Title of invention:
Reducing Pulse Error Distortion

Applicant:
Bose Corporation

Relevant legal provisions:
EPC Art. 84
RPBA Art. 12(4)

Keyword:
Claims - clarity - main request (no)
Late-filed auxiliary requests - request could have been filed in first instance proceedings (yes)

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Case Number: T 1236/19 - 3.5.02

D E C I S I O N
of Technical Board of Appeal 3.5.02
of 24 August 2023

Appellant: (Applicant)	Bose Corporation The Mountain MS 40 Framingham, MA 01701 (US)
Representative:	Cabinet Novitech 188 Grande rue Charles de Gaulle 94130 Nogent-sur-Marne (FR)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 18 December 2018 refusing European patent application No. 11710917.3 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	R. Lord
Members:	G. Flyng
	W. Ungler

Summary of Facts and Submissions

I. The applicant's appeal contests the examining division's decision to refuse the European patent application number 11 710 917.3. This patent application derives from an earlier International application that was published as WO2011/109209 A1.

II. In the contested decision, the examining division considered the applicant's requests for grant of a patent on the basis of the claims of a main request filed on 23 August 2017, auxiliary requests 1, 2 or 3 filed on 17 October 2018 or auxiliary request 4 filed during oral proceedings before the examining division on 20 November 2018.

In the reasons for the decision, the examining division held in essence that:

- claim 1 of the main request was not clear, contrary to Article 84 EPC, and its subject-matter did not involve an inventive step, in the sense of Article 56 EPC;
- auxiliary request 1 contravened Article 123(2) EPC;
- auxiliary request 2 did not meet the requirements of Articles 84 and 56 EPC for the same reasons as the main request; and
- auxiliary requests 3 and 4 contravened Article 123(2) EPC.

III. With the statement setting out the grounds of appeal the appellant (applicant) filed sets of claims of a main request and auxiliary requests 1 and 2. According to the appellant, the claims of the main request

corresponded to those of the main request considered in the contested decision.

IV. Each of the requests filed with the grounds of appeal includes an independent apparatus claim 1 and an independent method claim 5.

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

"1. An amplifier (10) comprising:
an output voltage controlling circuit, comprising:
a switching circuit characterized by a duty cycle and comprising at least two switches (16;24); and
a modulator (40) configured to control the switches;
an output inductor (30), coupling the switching circuit to an output terminal (34) of the amplifier (10); and
correction circuitry comprising:
a current sensor (42) configured to sense the current from the output inductor to the output terminal; and
a pulse error distortion corrector (44;45) configured to receive a sensed current measurement from the current sensor, and, based on the sensed current measurement, provide to the modulator a non-linear correction signal which modifies the duty cycle to compensate for pulse width distortion caused by dead time during which the at least two switches are open."

VI. Claim 5 of the main request reads as follows:

"5. A method for operating an amplifier (10), comprising:

opening and closing a plurality of switches (16;24) according to a duty cycle to control the voltage provided to an output terminal (34) of the amplifier (10);

measuring current through an output inductor (30) to the output terminal; sensing the current through the output inductor to the output terminal to provide a sensed current measurement; and

based on the sensed current measurement, applying a non-linear correction signal which modifies the duty cycle to compensate for pulse width distortion caused by dead time during which the plurality of switches are open."

VII. In auxiliary request 1 the term "non-linear" has been deleted from the feature "non-linear correction signal" in claims 1, 5 and 6.

VIII. In auxiliary request 2, claim 1 differs from that of auxiliary request 1 by the addition of the feature of "an output capacitor coupling the output inductor to ground" before the "correction circuitry" feature. The independent method claim has been amended by adding-in the features of the amplifier as defined in claim 1.

IX. In the statement setting out the grounds of appeal, the appellant submitted that claims 1 and 5 of the main request were clear in the sense of Article 84 EPC. They further submitted that the arguments they had filed in reply to the examining division's summons to oral proceedings and presented during the oral proceedings

on this point were not considered by the examining division. Those arguments were as follows:

The non-linearity of the correction signal relates to the shape of an IV curve, also called current voltage characteristic, of the modulator, i.e. the relationship of the output voltage to the output current. Figures 4 and 6 are plots of output voltage as a function of the average output current, Fig 6 exhibiting an example of a correction signal exhibiting said non linearity.

The appellant requested the right to be heard on this issue and in particular that these comments/arguments be considered.

X. The appellant further argued that one of the documents relied on by the examining division did not belong to the state of the art, and that the subject-matter claimed in the main request was not obvious and therefore involved an inventive step.

XI. For auxiliary request 1, the appellant submitted that the amendments fulfilled the requirements of Article 123(2) EPC and that the claimed subject-matter was patentable for the same reasons as the main request.

XII. For auxiliary request 2, the appellant submitted that the amendments fulfilled the requirements of Article 123(2) EPC and that the claimed subject-matter was patentable.

XIII. The Board summoned the appellant to oral proceedings. In a communication pursuant to Article 15(1) RPBA annexed to the summons the Board set out their preliminary observations on the appeal. Considering the main request, the Board explained that the appellant's

arguments were not apt to demonstrate that the term "a non-linear correction signal" in claim 1 was clear *per se* and that at least for this reason the main request was not considered to be allowable. The Board also addressed further issues under Articles 84, 56 and 123(2) EPC. The Board explained that they were minded to exercise their discretion under Article 12(4) RPBA 2007 to hold auxiliary requests 1 and 2 inadmissible.

XIV. Oral proceedings were held on 24 August 2023, by videoconference at the appellant's request. Considering the clarity of claim 1 of the main request, the appellant referred to their written submissions, reiterating that it was clear from the description and figure 6 what was meant by the term "a non-linear correction signal". Considering the admissibility of auxiliary requests 1 and 2 as filed with the grounds of appeal, the appellant argued that these should be admitted because the term "non-linear" had been deleted in the independent claims of the auxiliary request 4 filed during oral proceedings before the examining division on 20 November 2018.

XV. The appellant requested finally that the decision under appeal be set aside and that a patent be granted on the basis of the claims of the main request, auxiliarily on the basis of the claims of one of the auxiliary requests 1 and 2, all filed with the statement of grounds of appeal.

Reasons for the Decision

Main request

1. In the contested decision, the examining division held that the term "a non-linear correction signal" was not generally accepted in the field in question, contrary to the requirements of Rule 49(10) EPC. They considered that the term non-linear/linear was always used to describe a transfer function of a circuit such as for example an amplifier, where the term refers to the relation of the output signal to the input signal. They found that the term "non-linear correction signal" had no well defined meaning, and therefore the intended limitations were not clear from claim 1, contrary to the requirements of Article 84 EPC.

2. The Board concurs with the examining division's findings. The appellant's arguments on this point rely on references to the description and figures to demonstrate what is meant by the term "a non-linear correction signal". According to established case law, however, the claims must be clear in themselves when read by the person skilled in the art, without any reference to the content of the description (see Case Law of the Boards of Appeal, 10th edition, II.A.3.1, first paragraph). For this reason the appellant's arguments are not apt to demonstrate that the term "a non-linear correction signal" is clear *per se*. At least for this reason the main request is not allowable for lack of clarity under Article 84 EPC.

3. In view of this finding, the further issues under Articles 84, 56 and 123(2) EPC identified in the communication pursuant to Article 15(1) RPBA need not be addressed.

Auxiliary request 1

4. Auxiliary request 1 was not presented in the first instance proceedings. It addresses solely the clarity issue relating to the term "a non-linear correction signal" by just deleting the term "non-linear". The appellant (then applicant) was made aware of this issue in the first-instance proceedings, in the summons to oral proceedings before the examining division, and had an opportunity to address the issue at that stage.

5. The appellant did eventually address this issue during the oral proceedings before the examining division by filing an auxiliary request 4 in which the term "non-linear" was deleted from the independent claims. However, that auxiliary request 4 introduced a number of further features into the independent claims, and is therefore not comparable to auxiliary request 1 as filed on appeal.

6. If the appellant wished to have a patent granted, or an appealable decision, on the basis of the claims filed as auxiliary request 1 on appeal, i.e. addressing only the issue related to the term "non-linear", they should have filed such a request during the first-instance proceedings. By not doing so, they avoided an appealable decision on that subject-matter.

7. For these reasons, the Board exercised their discretion under Article 12(4) RPBA 2007 to hold auxiliary request 1 inadmissible.

Auxiliary request 2

8. Auxiliary request 2 corresponds to the auxiliary request 2 that was considered in the contested decision, in so far as that it includes the feature of an output capacitor coupling the output inductor to ground. However it differs from it in that the term "a non-linear correction signal" has been amended to "a correction signal", and in that method claim 5 has been amended by defining the features of the amplifier explicitly, rather than by reference to claim 1.

9. If the appellant wished to have a patent granted, or an appealable decision, on the basis of the claims filed as auxiliary request 2 on appeal, they should have filed such a request during the first-instance proceedings. By not doing so, they avoided an appealable decision on that subject-matter.

10. For these reasons, the Board exercised their discretion under Article 12(4) RPBA 2007 to hold auxiliary request 2 inadmissible.

Conclusion

11. In the absence of an admissible and allowable request, the appeal had to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed

The Registrar: The Chairman:

U. Bultmann R. Lord

Decision electronically authenticated