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Datasheet for the decision of 28 June 2017

Case Number: T 1418/12 - 3.5.02

Application Number: 05712098.2

Publication Number: 1769577

IPC: H03B5/06, H03B5/36

Language of the proceedings: EN

Title of invention:
A Method and Apparatus for Reducing the Start Time of a VCXO

Applicant:
Sony Ericsson Mobile Communications AB

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (yes) - could-would approach

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Case Number: T 1418/12 - 3.5.02

D E C I S I O N
of Technical Board of Appeal 3.5.02
of 28 June 2017

Appellant: (Applicant)	Sony Ericsson Mobile Communications AB Nya Vattentornet 221 83 Lund (SE)
Representative:	Hoffmann Eitle Patent- und Rechtsanwälte PartmbB Arabellastraße 30 81925 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 20 February 2012 refusing European patent application No. 05712098.2 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 Appeal

The applicant's appeal contests the examining division's decision to refuse the European patent application No. 05 712 098.2, which was published under the PCT as WO 2006/022809 A1.

II. The Contested Decision

In the contested decision the examining division considered the applicant's main request and first and second auxiliary requests.

The examining division found that the subject-matter of the independent claims 1 and 16 of each request did not involve an inventive step in the sense of Articles 52(1) and 56 EPC for reasons of obviousness when starting from document D1: EP 0 709 965 A1 as closest prior art.

Regarding the main request, the examining division held that the circuit of claim 1 was known from D1 (Reasons, paragraph 19), but that the subject-matter of claim 1 differed from D1 in that the temporary voltage was applied "to reduce a start-up time of the voltage controlled oscillator (100) by reducing the capacitance of the voltage-controlled variable capacitive element (124)" (Reasons, paragraph 18).

The examining division saw the problem to be solved as being that of reducing the start-up time of the voltage controlled oscillator (Reasons for the decision, paragraph 20). Faced with that problem, the examining

division considered that the skilled person starting from D1, which addresses oscillator start-up performance expressly (D1, column 1, lines 11 to 35), would read in D1, particularly column 3, lines 24 to 26, and column 4, lines 45 to 49, and would be taught that the capacitance of the capacitance(s) in the system may be altered to ensure start-up, and could then be changed to ensure oscillation at some desired frequency once start-up is achieved. According to the examining division the skilled person knew that start-up times of electronic systems are necessarily affected by, for example, the capacitances within them, as the voltage across a capacitor could not be changed instantaneously, and that the obvious means for reducing such times was to reduce the capacitances involved, if possible.

In the examining division's view (Reasons, paragraph 21), the fact that D1 taught that a suitable value of the variable capacitance should be chosen which would initiate oscillation reliably would immediately point the skilled person seeking to reduce capacitance in such an oscillator to a capacitance which could readily be changed in order to solve the problem posed. According to the division, simply doing this would not require any inventive activity on the part of the skilled person and would immediately and directly result in an oscillator according to claim 1.

III. Appellant's Requests

In a telephone conversation with the Rapporteur on 30 May 2017 (see attendance note), the Appellant clarified that the application documents should include not just the amended claims on which the contested decision was based, but also the additional description

page 1a which had been filed before the department of first instance with the letter of 8 January 2008 but had not been mentioned in the requests presented in the statement of grounds of appeal. The Appellant requested that:

- the decision under appeal be set aside; and
- a patent be granted on the basis of the application documents of the main request, the first auxiliary request, or the second auxiliary request, all as set out in the contested decision.

With a subsequent letter dated 12 June 2017 the appellant filed amended description pages 2 and 7 for the main request.

Hence, the Appellant's current main request is that:

- the decision under appeal be set aside; and
- a patent be granted on the basis of the following application documents:

  Description, Pages

  - 1 and 3 to 6 as published
  - 1a received on 8 January 2008 with letter of 8 January 2008
  - 2 and 7 received on 13 June 2017 with letter of 12 June 2017

  Claims, Numbers

  - 1 to 27 of the main request received on 12 December 2011 with letter of 12 December 2011

  Drawings, Sheets

  - 1/4 to 4/4 as published

In view of the Board's finding on the main request (see below), the Appellant's auxiliary requests are not relevant to this decision.

IV. The independent claims 1 and 16 of the main request read as follows:

"1. A voltage controlled oscillator (100) in a wireless terminal comprising:

an oscillator (120) to generate a reference frequency based on a variable voltage applied to an input node of the oscillator (120), wherein said oscillator (120) includes a voltage-controlled variable capacitive element (124); and

characterized in that the voltage controlled oscillator (100) further comprises:

a start-up controller (130) operatively connected to the oscillator (120) to apply a temporary bias voltage to the oscillator input node to reduce a start-up time of the voltage controlled oscillator (100) by reducing the capacitance of the voltage-controlled variable capacitive element (124)."

"16. A method of reducing a start-up time associated with an oscillator circuit (120) comprising:

detecting that the oscillator circuit (120) has been powered on by sensing the presence of an oscillator output voltage; and

characterized in that the method further comprises:

applying a temporary bias voltage to the oscillator circuit (120) to reduce a start-up time associated with the oscillator circuit (120) by reducing a capacitance of a voltage-controlled capacitive element (124) in the oscillator circuit (120)."

The remaining claims 2 to 15 and 17 to 27 of the main request are dependent on claims 1 and 16, respectively.

V. Appellant's Arguments

The appellant argues that the subject-matter of independent claims 1 and 16 of the main request does involve an inventive step.

In essence, it is argued that D1 fails to disclose applying "a temporary bias voltage to the oscillator input node to reduce a start-up time of the voltage controlled oscillator (100) by reducing the capacitance of the voltage-controlled variable capacitive element (124)" (cf. claim 1, emphasis added), or the corresponding feature of claim 16.

The appellant concedes that in D1 a temporary bias voltage is applied to the oscillator input node on start-up, but argues that the temporary bias voltage is of a level which achieves the opposite effect to that claimed, i.e. it increases the capacitance of the voltage-controlled variable capacitive element (varactor 14) so that it "will have an impedance low enough for reliable initiation of oscillation" (for the purpose" (D1, column 3, lines 28 to 29).

The appellant does not contest that the skilled person starting from D1 **could** have applied a bias voltage to reduce the capacitance of the varactor, but argues that it is not a question of whether the skilled person starting from D1 **could** have done so, but whether the skilled person **would** do so. The appellant contests that the skilled person would apply a bias voltage to reduce the capacitance of the varactor for the reason that D1 specifically teaches to do the opposite, i.e. to apply a bias voltage to increase the capacitance of the varactor.

Reasons for the Decision

1. The appeal is admissible.

2. Main Request

2.1 Document D1 identifies the problem that with a voltage controlled oscillator (VCO) as disclosed in figure 1 thereof:

> "If the magnitude of the frequency control signal of line 26 is such that the impedance of the varactor 14 is high, the gain of the Fig. 1 oscillator circuit will be low and it will be difficult to reliably initiate oscillation in such a circuit" (see column 3, lines 20 to 24, emphasis added).

To solve this problem D1 discloses that:

> "To insure that the impedance of the varactor 14 is at a suitable value for reliably initiating oscillation, the voltage reference signal on line 18, which has an appropriate magnitude so that the varactor 14 will have an impedance low enough for reliable initiation of oscillation, is substituted for the frequency control signal on line 26 during oscillator startup" (see column 3, lines 24 to 31, emphasis added).

D1 goes on to explain in column 3, lines 36 to 40 that:

> "The impedance of the varactor 14 thus is set at a magnitude promoting reliable startup of the oscillator. For example, the impedance of the

varactor 14 is such that it has a maximum capacitance and thus a minimum impedance.

Hence, D1 teaches to set the voltage reference signal to increase the capacitance of the varactor in order to ensure reliable start-up of the VCO - which is the fundamental purpose of D1 (see title).

2.2 According to the independent claims 1 and 16 of the main request, the capacitance of the voltage-controlled variable capacitive element of the oscillator is reduced in order to reduce the start-up time. As the appellant has pointed out, however, the reasoning in paragraphs 20 and 21 of the contested decision entirely ignores the fact that D1 specifically teaches the opposite, i.e. to increase the capacitance of the oscillator varactor during start-up. The Board concurs with the appellant that this specific teaching of D1 cannot be ignored when assessing inventive step.

2.3 The question to be considered when assessing inventive step is not whether a skilled person starting from D1 **could have** decided to reduce the capacitance of the varactor, instead of increasing it as disclosed, but whether the skilled person **would** do so (Case Law of the Boards of Appeal, I.D.5 "Could-would approach"). To answer this question in the affirmative it is necessary to identify conclusive reasons, on the basis of tangible evidence, that would have prompted the skilled person to do the opposite of what was proposed in D1, thereby evidently abandoning the improved start-up reliability which D1 set out to achieve.

2.4 The allegation in the contested decision that "the skilled person knows that start-up times of electronic systems are necessarily affected by, for example, the

capacitances within them, as the voltage across a capacitor cannot be changed instantaneously, and that the obvious means for reducing such times is to reduce the capacitances involved, if possible" (Reasons for the decision, paragraph 20) cannot be considered as tangible evidence and does not amount to conclusive reasons which explain why the skilled person would be prompted to abandon the fundamental aim of D1.

2.5 Furthermore, the *obiter dictum* statement in paragraph 33 of the contested decision does not form part of the reasons for the decision and hence cannot be taken into account when reviewing the decision. That notwithstanding, the document cited (D3 = US 5 844 448) is a patent document, which would not usually be accepted as evidence of the common general knowledge of the person skilled in the art.

2.6 For these reasons the Board finds that the reasoning given in the contested decision does not support the finding that the subject-matter of independent claims 1 and 16 of the main request lacks an inventive step. The same applies for the remaining, dependent claims. Furthermore, the Board sees no other reason to question inventive step on the basis of the documents cited.

2.7 The Board concludes that the claims of the main request meet the requirement of inventive step, Articles 52(1) and 56 EPC.

2.8 As no other deficiencies have been identified in the contested decision, and as the description has been adapted to the claims of main request, the Board is in a position to accede to the main request without holding oral proceedings, which were only requested conditionally.

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 with the order to grant a patent in the following version:

Description:

- 1 and 3 to 6 as published
- 1a received on 8 January 2008 with letter of 8 January 2008
- 2 and 7 received on 13 June 2017 with letter of 12 June 2017

Claims:

- Nos. 1 to 27 of the main request received on 12 December 2011 with letter of 12 December 2011

Drawings:

- Sheets 1/4 to 4/4 as published.

The Registrar: The Chairman:

U. Bultmann R. Lord

Decision electronically authenticated