

Internal distribution code:

- (A) Publication in OJ
(B) To Chairmen and Members
(C) To Chairmen
(D) No distribution

**Datasheet for the decision
of 19 October 2011**

Case Number: T 1770/08 - 3.5.02
Application Number: 02744671.5
Publication Number: 1410515
IPC: H03M 13/45, H03M 13/29
Language of the proceedings: EN

Title of invention:
Turbo decoder with multiple scale selections

Applicant:
Qualcomm Incorporated

Headword:
-

Relevant legal provisions:
EPC Art. 84, 123(2)
EPC R. 103(1)(a)

Relevant legal provisions (EPC 1973):
-

Keyword:
"Clarity and support in the description (no) - both requests"
"Added subject-matter (yes) - auxiliary request"
"Reimbursement of appeal fee (no)"

Decisions cited:
-

Catchword:
-



Case Number: T 1770/08 - 3.5.02

D E C I S I O N
of the Technical Board of Appeal 3.5.02
of 19 October 2011

Appellant: Qualcomm Incorporated
(Applicant) 5775 Morehouse Drive
San Diego, CA 92121-1714 (US)

Representative: Wagner & Geyer
Partnerschaft
Patent- und Rechtsanwälte
Gewürzmühlstrasse 5
D-80538 München (DE)

Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 21 February 2008
refusing European patent application
No. 02744671.5 pursuant to Article 97(1) EPC
(1973).

Composition of the Board:

Chairman: M. Ruggiu
Members: R. Lord
P. Mühlens

Summary of Facts and Submissions

I. This is an appeal of the applicant against the decision of the examining division to refuse European patent application No. 02 744 671.5.

II. The following document of the state of the art cited during the procedure before the first instance is mentioned in this decision:

D2: S. Czaja and J. Robertson, "Variable Data Rate Viterbi Decoder with Modified LOVA Algorithm", Microelectronics and VLSI 1995, TENCON '95, IEEE Region 10 International Conference, Hong Kong, 6 to 10 November 1995, pages 472 to 475

III. In a communication accompanying a summons to oral proceedings, dated 27 May 2011, the board informed the appellant *inter alia* of its preliminary opinion that claims 1 and 18 of his main request did not meet the requirements of Article 84 EPC (clarity and support in the description), and that claim 1 of his auxiliary request did not meet the requirements of Article 84 EPC (clarity) and Article 123(2) EPC (added subject-matter). The appellant did not respond in substance to these comments.

IV. Oral proceedings before the board took place on 19 October 2011, at which, as he had previously informed the board, the appellant was not represented.

The appellant requested in writing that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 to 22 as originally filed

(main request) or on the basis of claims 1 to 13 filed with the letter of 15 January 2007 (auxiliary request), and that the appeal fee be reimbursed.

V. Claim 1 according to the appellant's main request reads as follows:

"A method of decoding a Turbo encoded code segment, comprising:

forming a plurality of hypotheses for the code segment, wherein each hypothesis corresponds to a particular set of one or more values for a set of one or more parameters used for decoding the code segment;

decoding the code segment in accordance with each of the hypotheses;

evaluating one or more performance metrics for a decoded result for each of the hypotheses;

determining a particular hypothesis having a best decoded result based on the one or more evaluated performance metrics; and

providing a sequence of decoded bits for the hypothesis with the best decoded result."

Claim 18 according to the appellant's main request reads as follows:

"A Turbo decoder comprising:

a constituent decoder configured to receive and decode bits for a code segment based on a particular decoding scheme and in accordance with a particular hypothesis to provide a decoded result for the hypothesis; and

a performance metric calculator configured to evaluate one or more performance metrics for the

decoded result for the hypothesis, and

wherein a plurality of hypotheses are formed for the code segment, wherein each hypothesis corresponds to a particular set of one or more values for a set of one or more parameters used for decoding the code segment, and wherein the constituent decoder and performance metric calculator operate on the code segment for each of the hypotheses."

Claim 1 according to the appellant's auxiliary request reads as follows:

"A method of decoding a received turbo encoded code segment comprising bits for which scale information, including the variance and amplitude of the received bits, is not known, comprising:

scaling each received bit by a hypothesized sequence (S_h) of scaling factors, in which one scaling factor is provided for each received bit and the scaling is performed element by element for the sequence;

quantizing the scaled bits to a required number of bits of resolution;

decoding the quantized bits with a hypothesized scale (w) provided by a set of lookup tables to provide a candidate sequence of decoded bits;

evaluating the candidate sequence of decoded bits based on one or more performance metrics;

determining the quality of the candidate sequence of decoded bits for each of the one or more performance metrics;

characterised in that the method comprises the further steps of

rescaling the scaled bits by a further

hypothesized sequence (S_h) of scaling factors, quantizing the rescaled bits and decoding same with a further hypothesized scale (w); or

for the same scaled bits, decoding the quantized bits with a further hypothesized scale (w); or

for the same hypothesized scale (w), rescaling the scaled bits by a further hypothesized sequence (S_h) of scaling factors, quantizing the rescaled bits and decoding same with the same hypothesized scale (w);

repeating the evaluating and determining steps;

comparing all of the decoded results; and

selecting the decoded result for the best

hypothesis."

Reasons for the Decision

1. The appeal is admissible.

2. *Main request*

2.1 Independent claims 1 and 18 of the appellant's main request do not define all of the technical features which are essential to the invention as described in the application, and thus do not meet the requirement for clarity of Article 84 EPC.

2.2 As described on pages 2 and 3 of the description of the application and in section II.A of the appellant's grounds of appeal (letter dated 23 June 2008), the invention of the application is concerned with turbo decoding a code segment with unknown scale information. However, claims 1 and 18 according to the main request contain no technical features reflecting a solution to

that problem, either in terms of a definition that the problem is present, or in terms of a definition of features (in particular the type of parameters on which the hypotheses are based) which provide a solution of that specific problem. Thus the claims cover not only decoding methods and decoders in which the stated technical problem does not arise, but also decoding methods and decoders in which that problem arises, but the parameters used for forming the hypotheses are not related to that problem, so that it is not solved. The claims would thus, for example, cover methods of handling variable data rates, of the type described in D2. It is however apparent from the description and the appellant's submissions that such methods do not fall within the scope of the invention of the application. Thus these claims do not include all of the technical features which would be required to clearly define the invention, so do not meet the requirement for clarity of Article 84 EPC.

2.3 Moreover, since it is clear from the above reasoning that these claims cover embodiments which according to the description do not form part of the invention, these claims are not supported by the description across the full breadth of their scope, also contrary to the requirements of Article 84 EPC.

2.4 The appellant's main request is therefore not allowable.

3. *Auxiliary request*

3.1 The manner in which claim 1 of the appellant's auxiliary request has been drafted in the two-part form combined with the very brief definition of each of the

three different options for the decoding (in the first three paragraphs of the characterising portion) results in a lack of clarity in the claim, since this results in the nature of the links between the different steps of the method being unclear, so that the claim does not meet the requirement for clarity of Article 84 EPC.

3.2 As an example, it is not apparent (without reference to the description) whether in the definition commencing "*for the same scaled bits, ...*", the expression "*the quantized bits*" refers back to the quantized bits of the pre-characterising portion of the claim or to those of the immediately preceding paragraph of the characterising portion.

3.3 A further element of confusion resulting from this rearrangement of the claim arises from the fact that the three steps of "evaluating", "determining" and "providing" in claim 1 as filed have been replaced by four steps ("evaluating", "determining", "comparing" and "selecting") with different wording from those of the original claim, such that the correspondence between them is unclear. In particular, since the "determining" step in the original claim defines determining which of the hypotheses produced the best decoded result, it appears to correspond in its meaning to what is defined in the "comparing" and "selecting" steps of the present claim. Hence, it is no longer clear what is meant by the "determining" step of the present claim, which relates to only a single hypothesis.

3.4 A comparison of the brief formulation of these three cited paragraphs of the claim with the extensive

description of these methods in paragraphs [0056] to [0066] of the application, indicates that approximately three pages of the original text have been compressed into a mere seven lines in the present claim 1. Specifically, the first two lines of the characterising portion of the claim appear to relate to the method described in paragraphs [0056] to [0060], with reference to Fig. 6, the next two lines to that of paragraphs [0061] to [0063] and Fig. 7, and the following three lines to that of paragraphs [0064] to [0066]. Since the application as filed contained no disclosure of these different alternatives in summary form, it is apparent that claim 1 according to the appellant's auxiliary request defines these aspects of the method at a level of generalisation which was not disclosed in the application as filed. The claim therefore contravenes Article 123(2) EPC.

3.5 The appellant's auxiliary request is therefore also not allowable.

4. *Reimbursement of appeal fee*

The appellant has requested that the appeal fee be reimbursed because of a substantial procedural violation by the examining division. Rule 103(1)(a) EPC specifies, as a precondition for reimbursement of the appeal fee on the grounds of a substantial procedural violation, that the appeal is deemed to be allowable. For the reasons given above, this precondition is not satisfied in the present case. The appeal fee cannot therefore be reimbursed.

Order

For these reasons it is decided that:

1. The appeal is dismissed.
2. The request for reimbursement of the appeal fee is refused.

The Registrar:

The Chairman:

C. Moser

M. Ruggiu