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Datasheet for the decision
of 16 October 2013

Case Number: T 1486/12 - 3.5.02

Application Number: 08830942.2

Publication Number: 2181505

IPC: H03M 13/09, H04L 1/00

Language of the proceedings: EN

Title of invention:
Multi-layer cyclic redundancy check code in wireless
communication system

Applicant:
Motorola Mobility LLC

Headword:
-

Relevant legal provisions:
EPC Art. 83

Keyword:
"Sufficiency of disclosure - yes (main request)"
"Remittal to first instance - yes"

Decisions cited:
-

Catchword:
-

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Boards of Appeal

Chambres de recours

Case Number: T 1486/12 - 3.5.02

D E C I S I O N
of the Technical Board of Appeal 3.5.02
of 16 October 2013

Appellant:
(Applicant)

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Decision under appeal:

**Decision of the Examining Division of the
European Patent Office posted 27 January 2012
refusing European patent application
No. 08830942.2 pursuant to Article 97(2) EPC.**

Composition of the Board:

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

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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. 08 830 942.2. The reason given for the
     refusal were that the application did not meet the
     requirement of Article 83 EPC.

II. In the statement of grounds of appeal dated 6 June 2012
     the appellant requested that the decision under appeal
     be set aside and that a patent be granted on the basis
     of the application documents according to the main
     request which formed the basis of the decision under
     appeal (i.e. based on claims 1 to 16 filed with letter
     dated 9 November 2011), or alternatively on the basis
     of one of the sets of claims also filed with the
     statement of grounds of appeal as first to fourth
     auxiliary requests. These remain the basis of the
     current requests. The appellant also requested
     reimbursement of the appeal fee.

III. In a communication accompanying a summons to oral
     proceedings, dated 29 July 2013 the board informed the
     appellant *inter alia* of its preliminary opinion that
     the application did meet the requirements of Article 83
     EPC, but that the request for reimbursement of the
     appeal fee could not be granted, and that the board
     envisaged remitting the case to the department of first
     instance.

     In a reply dated 29th August 2013 the appellant
     withdrew the request for reimbursement of the appeal
     fee and indicated that it agreed to the immediate

remittal of the case to the department of first
instance.

IV.   Claim 1 of the appellant's main request reads as
        follows:

        "A wireless communication device comprising:
        a first Cyclic Redundancy Check, CRC, coder
configured to generate a first block of CRC parity bits
on a transport block, the first block of CRC parity
bits based on a first generator polynomial, the first
CRC coder attaching the first block of CRC parity bits
to the transport block;
        a segmenting entity having an input coupled to the
first CRC coder, the segmenting entity configured to
segment the transport block into multiple code blocks
after attaching;
        a second CRC coder configured to generate a second
block of CRC parity bits on each code block, each of
the second block of CRC parity bits based on a second
generator polynomial, the second CRC coder attaching a
second block of CRC parity bits to each code block, the
second block of CRC parity bits attached to each code
block is the second block of CRC parity bits generated
based on the corresponding code block;
        the second generator polynomial is different than
the first generator polynomial and the first and second
generator polynomials having a common degree;
        a channel encoder configured to encode each of the
code blocks including the attached second block of CRC
parity bits."

        Claim 9 of the appellant's main request reads as
        follows:

"A method in a wireless communication transmitter, the method comprising:

generating, at the transmitter, a first block of first Cyclic Redundancy Check, CRC, parity bits on a transport block, the first block of CRC parity bits based on a first generator polynomial;

attaching the first block of CRC parity bits to the transport block;

segmenting the transport block into multiple code blocks after attaching;

generating, at the transmitter, a second block of CRC parity bits on each code block, each of the second block of CRC parity bits based on a second generator polynomial, the second generator polynomial is different than the first generator polynomial and the first and second generator polynomials have a common degree;

attaching a second block of CRC parity bits to each code block, the second block of CRC parity bits attached to each code block is the second block of CRC parity bits generated based on the corresponding code block;

channel encoding, at the transmitter, each of the code blocks including the attached second block of CRC parity bits;

concatenating the code blocks after channel encoding."

Claim 10 of the appellant's main request reads as follows:

"A method in a wireless communication receiver, the method comprising:

removing, at the receiver, a second block of
Cyclic Redundancy Check, CRC, parity bits attached to
each of a plurality of received code blocks, the second
block of CRC parity bits generated based on a second
generator polynomial and based on the corresponding
code block to which the second block of CRC parity bits
are attached;

forming, at the receiver, an estimated transport
block having a first block of CRC parity bits attached
to the estimated transport block by concatenating the
code blocks after removing the attached second block of
CRC parity bits, wherein the first block of CRC parity
bits attached to the transport block is based on a
first generator polynomial that is different than the
second generator polynomial, wherein the first and
second generator polynomials have a common degree;

performing, at the receiver, a CRC check on the
estimated transport block based on the first generator
polynomial."

Claim 13 of the appellant's main request reads as
follows:

"A method in a wireless communication transmitter,
the method comprising:
generating, at the transmitter, a first block of
Cyclic Redundancy Check, CRC, parity bits on a
transport block, the first block of CRC parity bits
generated based on a generator polynomial;
attaching the first block of CRC parity bits to
the transport block;
interleaving the transport block after attaching;
segmenting the interleaved transport block into
multiple code blocks;

generating, at the transmitter, a second block of
CRC parity bits on each code block, each of the second
block of CRC parity bits generated based on the
generator polynomial;

attaching a second block of CRC parity bits to
each code block, the second block of CRC parity bits
attached to each code block is the second block of CRC
parity bits generated based on the corresponding code
block;

channel encoding, at the transmitter, each of the
code blocks including the attached second block of CRC
parity bits;

concatenating the code blocks after channel
encoding."

V.   The appellant essentially argued as follows:

The interpretation of the claims relating to the
functioning of the segmenting entity went beyond what
was defined in those claims. The skilled person would
have been able to put into effect the steps of
"segmenting", "attaching" and "concatenating" defined
in the claims, even though no specific hardware was
disclosed in the application in this respect.

Reasons for the Decision

1.   The appeal is admissible.

2.   *Sufficiency of disclosure (Article 83 EPC) – Main*
       request

2.1   The board understands the decision under appeal as

being based on two aspects which the examining division considered did not meet the requirement of Article 83 EPC.

2.2   The first of these aspects is based on the interpretation by the examining division of independent claim 1 of the main request that the segmenting entity operates in such a manner that it must complete the operation of segmenting the transport block into multiple code blocks before the second CRC coder begins the operation of generation of a second block of CRC parity bits on each code block. Consequently, the division concluded that the application did not meet the requirement of Article 83 EPC, because of the absence in the application of any disclosure of how such a segmenting entity might be implemented in hardware. Similar objections were also raised in the decision under appeal with respect to the independent claims 9, 10 and 13, by reference to the arguments against claim 1.

2.2.1   Although the board agrees with the examining division that claim 1 requires that the segmenting entity is in some manner distinct from the second CRC coder, the board can see no reason to interpret the claim in such a manner that the operation of these two elements cannot overlap in time. In particular, the board considers that it is entirely consistent with the wording of the claim that the segmenting entity could generate a first code block and pass that code block to the second CRC coder, and that the second CRC coder could commence the operation of generating a second block of CRC parity bits for that first code block while the segmenting entity continues to generate

further code blocks. The board sees this interpretation
as being consistent with what the examining division
acknowledges to have been sufficiently disclosed. The
board notes moreover that the skilled person would
recognise that although the defined functions could be
implemented in dedicated hardware, it would be equally
possible to implement them by means of suitable
programming of a general-purpose processor or of a DSP,
and would therefore not consider it to be necessary to
be able to identify a particular piece of hardware
associated with each function.

2.2.2   As regards the question raised by the examining
division of whether a skilled person would be able to
carry out the subject-matter of the claims without
undue burden, the board is of the view that a person
who has studied digital signal processing at university
level and who has acquired some experience in the field
would undoubtedly be able, without substantial
difficulty, to devise routines for segmenting strings
of bits (i.e. data blocks), attaching (associating)
parity bits to the segmented strings, and concatenating
them, either as separate steps carried out on the whole
string, or segment-wise. The board therefore considers
that it can be assumed that the notional skilled person
in this field is able to carry out the claimed entities
or steps for segmenting, attaching and concatenating
bit blocks without undue burden.

2.3   The second aspect of the reasoning of the decision
under appeal concerns the argumentation in that
decision that the independent claims required that the
CRC parity bits be "physically attached" to the
corresponding data block. The board can see no reason

for interpreting the claims in this manner, since this statement seems to the board to be meaningless in the context of such a device or method. In particular the board notes that neither the data nor the CRC parity bits have an independent physical existence, but are instead merely states in some form of electronic memory, so that physical attachment is not possible.

2.4   For the above reasons, the board concludes that the application in the form of the appellant's main request meets the requirement of Article 83 EPC relating to sufficiency of disclosure.

3.   Since failure to meet the requirement of Article 83 EPC was the sole ground for refusal given in the decision under appeal, the board considers it to be appropriate to remit the case to the department of first instance so that the other requirements of the EPC can be addressed. It is therefore not necessary for the board to consider the appellant's auxiliary requests.

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 fist instance
        for further prosecution.

The Registrar: The Chairman:

U. Bultmann   M. Ruggiu