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**Datasheet for the decision  
of 11 April 2013**

**Case Number:** T 1442/12 - 3.5.04

**Application Number:** 05706083.2

**Publication Number:** 1842380

**IPC:** H04N7/64

**Language of the proceedings:** EN

**Title of invention:**

VIDEO ERROR DETECTION TECHNIQUE USING A CRC PARITY CODE

**Applicant:**

Thomson Licensing

**Headword:**

**Relevant legal provisions:**

EPC 1973 Art. 84

**Keyword:**

Claims - clarity after amendment (yes)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern  
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Case Number: T 1442/12 - 3.5.04

**D E C I S I O N**  
**of Technical Board of Appeal 3.5.04**  
**of 11 April 2013**

**Appellant:** Thomson Licensing  
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**Representative:** Ruellan-Lemonnier, Brigitte  
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**Decision under appeal:** **Decision of the Examining Division of the European Patent Office posted on 21 February 2012 refusing European patent application No. 05706083.2 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chairman:** F. Edlinger  
**Members:** R. Gerdes  
B. Müller

## **Summary of Facts and Submissions**

- I. The appeal is directed against the decision to refuse European patent application No. 05 706 083.2, published as international application WO 2006/080910 A1.
- II. The patent application was refused by the examining division on the grounds that claim 1 of the main request and the first to third auxiliary requests did not comply with Article 84 EPC.
- III. The applicant appealed against this decision and with the statement of grounds of appeal submitted claims 1 to 8 of a new main request as well as of a new first auxiliary request, respectively.
- IV. In reply to a communication annexed to a summons to oral proceedings the appellant submitted new claims 1 to 8 with a letter of 11 March 2013.
- V. Oral proceedings before the board were held on 11 April 2013. The appellant finally requested that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 to 8 of the sole request submitted in the oral proceedings.
- VI. The independent claims of the sole request read as follows:

"1. A method for detecting errors in a variable length coded video stream, wherein macroblocks may not be bit or byte aligned in the coded video stream, comprising the steps of:  
receiving the coded video stream comprising at least one slice, the at least one slice having at least first and second groups of N macroblocks;

accessing compressed data representing the first group of N macroblocks from the coded video stream, the compressed data including a single bit or byte, which is associated with both the first and second groups of N macroblocks within the coded stream;  
receiving a first parity code associated with the first group of N macroblocks, wherein the first parity code is calculated over the compressed data and the single bit or byte for the first group of N macroblocks;  
selecting the compressed data and the single bit or byte for the first group of N macroblocks;  
calculating a second parity code over the selected data for the first group of N macroblocks; and  
comparing the first and second parity codes to determine whether the first group of N macroblocks contains an error."

"6. An apparatus for detecting errors in a variable length coded video stream, wherein macroblocks may not be bit or byte aligned in the coded video stream, comprising:  
a receiver (20) for  
(a) receiving the coded video stream comprising at least one slice, the at least one slice having at least first and second groups of N macroblocks;  
(b) accessing compressed data representing the first group of N macroblocks from the coded video stream, the compressed data including a single bit or byte, which is associated with both the first and second groups of N macroblocks within the coded video stream; and  
(c) selecting the compressed data and the single bit or byte for the first group of N macroblocks, for calculating a second parity code for the first group of N macroblocks; and  
(d) receiving a first parity code calculated over the first group of N macroblocks, wherein the first parity

code is calculated over the compressed data and the single bit or byte for the first group of N macroblocks;  
a calculator (24) for calculating the second parity code over the selected data for the first group of N macroblocks; and  
a comparator (26) for comparing the first parity code to the second parity code to determine whether errors exist in the first group of N macroblocks."

"8. An apparatus, comprising  
a transmitter (10) for:  
(a) accessing compressed data representing a first group of N macroblocks of a variable length coded video stream comprising at least one slice, wherein macroblocks may not be bit or byte aligned in the coded video stream, the at least one slice having at least the first group of N macroblocks and a second group of N macroblocks, the compressed data including a single bit or byte, which is associated with both the first and second groups of N macroblocks within the coded video stream;  
(b) selecting the compressed data and the single bit or byte for the first group of N macroblocks, for calculating a first parity code, wherein the first parity code is calculated over the compressed data and the single bit or byte for the first group of N macroblocks; and  
(c) transmitting the coded video stream along with the first parity code calculated over the selected data for the first group of N macroblocks."

VII. In the decision under appeal the examining division held that it was "not possible to determine [from claim 1 then on file] that the first parity code is calculated over *compressed* data including the entire

bit or byte of a partial bit or byte that is associated to a macroblock". In this respect claim 1 was inconsistent with the description. Even if the first parity code was understood to be calculated over compressed data, it was unclear how the second parity code was calculated, in particular whether it was calculated over compressed data or decoded video data. It was also difficult "to determine the portion of received data over which the second parity code is to be calculated." If it was calculated for decoded macroblocks, then it was unclear how the comparison of the first and second parity codes could be used in determining transmission errors (see decision under appeal, page 5, as well as section 2.4).

VIII. The appellant argued essentially that it was now explicitly specified in the amended independent claims that the first parity code was calculated over compressed video data. A person skilled in the art would have understood that the transmitter and receiver calculate the second parity code in a symmetric manner. It was likewise part of the common general knowledge that a decoder may also perform tasks such as error concealment, bitstream conformance check and syntax element parsing without decoding of the video stream to a pixel representation. Hence, the skilled person would have understood that the second parity code was calculated on compressed data for the same macroblocks as the first parity code. The decoder was needed to parse the syntax elements of the compressed bit stream such that macroblock boundaries could be identified for the subsequent calculation of the second parity code.

### **Reasons for the Decision**

1. The appeal is admissible.

*Amendments (Article 123(2) EPC)*

2. Compared with the claims of the main request underlying the decision under appeal, the present set of claims has been restricted to relate to variable length coded video streams. The claims additionally specify that a "single" bit or byte is associated with both the first and second groups of macroblocks. The claims have also been amended so that they now state that the first parity code is calculated over "the compressed data and the single bit or byte for the first group of N macroblocks", which compressed data represent the first group of N macroblocks. Independent claims 1 and 6 also specify that the second parity code is calculated over the selected data and the "single" bit or byte.
  
3. A basis for these amendments can be found in the application as filed on page 1, lines 21 to 25; page 2, line 31 to page 3, line 2 as well as on page 4, lines 9 to 16 and page 5, lines 1 to 5. Hence, the board finds that the claims of the appellant's sole request do not contain subject-matter which extends beyond the content of the application as filed and that they thus comply with Article 123(2) EPC.

*Clarity (Article 84 EPC 1973)*

4. According to Article 84 EPC 1973, the claims shall define the matter for which protection is sought. They shall be clear and concise and be supported by the description.
  
- 4.1 The application relates to a method for detecting errors in a video stream, as well as a corresponding receiver and transmitter. The video stream is

partitioned into slices, each containing a number of macroblocks which are compressed using a variable length encoding technique. Due to the variable length encoding technique employed in certain video compression standards, macroblock boundaries may not be bit or byte aligned in the compressed video stream, i.e. a bit or byte of the compressed video stream may contain information from several immediately preceding or following macroblocks (see page 1, lines 9 to 30).

To enable detection of transmission errors, a first parity code is calculated on the transmitter side based on the compressed data of a group of N macroblocks within a slice including any bit or byte containing information from macroblocks within the group and adjacent macroblocks. The first parity code is transmitted to the receiver and compared with a second parity code that is computed based on the received video stream. The first and second parity codes are compared to detect transmission errors (see page 2, line 22 to page 3, line 5 and page 4, lines 9 to 24).

A group of macroblocks found to be error free may be decoded and employed for further processing, whereas a group of macroblocks found to be corrupt has to undergo concealment. Compared with an error detection scheme calculating just one parity code per slice, the advantage of the present scheme resides in the fact that only the group of macroblocks with a mismatch of parity codes and any subsequent groups in the same slice have to be concealed (see page 4, lines 20 to 24; page 6, lines 3 to 14 and page 7, lines 9 to 14).

- 4.2 The independent claims according to the appellant's sole request explicitly state that the first parity code is calculated over "the compressed data and the



single bit or byte for the first group of N macroblocks". Hence, the amended claims specify clearly and in consistence with the description that the first parity code is calculated on the basis of the compressed data (see page 2, line 23 to page 3, line 2; page 4, lines 9 to 20 and page 5, lines 1 to 13). The corresponding objection in the decision under appeal has thus been overcome (see point VIII above).

4.3 According to the decision under appeal it was furthermore unclear how the second parity code was calculated and whether it was calculated based on "decoded video" or "compressed data" (see point VIII above). The wording "decoded video" was apparently understood to mean that the video data were decompressed such that the variable length encoding step in the transmitter was reverted. The examining division based this interpretation of the application on Figure 2, which shows that the input of the CRC parity calculator 24 is connected to the output of the video decoder 22. The passages on page 2, line 26 and page 5, line 19 *prima facie* support this interpretation. However, it is also stated in the application that "[i]f the CRC codes match, then the [sic] no error has occurred, and normal decoding or other processing of the group of blocks can take place" and "each group of N blocks found to be error free will then undergo processing (i.e., decoding)" (see page 3, lines 3 to 5 and page 4, lines 21 to 22). These passages imply that decoding of the video data is effected after the calculation and comparison of the parity codes.

In order to resolve this apparent ambiguity, it has to be determined what a skilled person would derive from the application documents using common general

knowledge. In the present case the board accepts the argument of the appellant that the skilled person would have known that the transmitter and receiver calculate the first and second parity codes in a symmetric manner. In particular, the skilled person would have known that meaningful results can only be obtained by a parity check if parity codes are calculated on the basis of the same data on the transmitter and on the receiver side. It is consistently specified in the application that the first parity code is calculated on the basis of compressed data corresponding to a group of N macroblocks including any bits or bytes associated with information of this group and an adjacent group of macroblocks. It is therefore evident that the second parity code likewise has to be calculated on the basis of compressed data corresponding to the same group of N macroblocks.

The functionality of the video decoder 22 in Figure 2, as far as it relevant for the present application, can be inferred based on the above conclusion. The decoder parses the video stream so as to identify that part of the compressed video stream corresponding to a first group of macroblocks, including any "single bit or byte" "associated with both the first and second groups of N macroblocks".

The board therefore accepts the appellant's argument that the skilled person applying common general knowledge would have understood the application as filed in the above sense. Hence, there is no inconsistency between the wording of the independent claims and the description and figures as far as the calculation of the second parity code is concerned.

4.4 Nor is there any other aspect under which the board considers the present set of claims to lack clarity.

4.5 It follows from the above that the claims of the appellant's sole request meet the requirements of Article 84 EPC 1973.

*Remittal (Article 111(1) EPC 1973)*

5. The decision under appeal was based on the sole reason of lack of clarity of the claims then on file. These reasons do not apply to the present claims and the decision under appeal must consequently be set aside. However, a patent cannot be granted at the present stage of the proceedings without examination as to the other requirements of patentability, such as inventive step (Article 56 EPC 1973) over the available documents. Such examination has not yet been carried out for the present set of claims by the department of first instance.

6. Under these circumstances the board exercises its discretion under Article 111(1) EPC 1973 in remitting the case to the department of first instance for further prosecution.

**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 for further prosecution.

The Registrar:

The Chairman:



K. Boelicke

F. Edlinger

Decision electronically authenticated