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# Datasheet for the decision
## of 10 April 2024

**Case Number:**            T 0210/21 - 3.5.04

**Application Number:**     14744010.1

**Publication Number:**     3022920

**IPC:**                    H04N19/30, H04N19/70, H04N19/65

**Language of the proceedings:**   EN

**Title of invention:**
NETWORK DEVICE AND ERROR HANDLING

**Applicant:**
GE Video Compression, LLC

**Headword:**


**Relevant legal provisions:**
EPC Art. 56, 111(1)
RPBA 2020 Art. 11

**Keyword:**
Inventive step
Remittal - special reasons for remittal
Appeal decision - remittal to the department of first instance
(yes)

**Decisions cited:**

G 0010/93

**Catchword:**

Case Number: **T 0210/21 - 3.5.04**


**D E C I S I O N**
**of Technical Board of Appeal 3.5.04**
**of 10 April 2024**


**Appellant:**

(Applicant)

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**Representative:**

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**Decision under appeal:**    **Decision of the Examining Division of the**
**European Patent Office posted on 22 October 2020**
**refusing European patent application**
**No. 14744010.1 pursuant to Article 97(2) EPC.**


**Composition of the Board:**

**Chair**        B. Willems
**Members:**     F. Sanahuja
                 G. Decker

**Summary of Facts and Submissions**

I.      The appeal is against the examining division's decision
        to refuse European patent application No. 14 744 010.1.

II.     The documents cited in the decision under appeal
        included the following:

    D1      Hendry and B. M. Jeon, "*AHG 9: On dependent
            slice*", Joint Collaborative Team on Video coding
            (JCT-VC) of ITU-T SG16 WP3 and ISO/IEC JTC1/
            SC29/WG11, 11th Meeting, Shanghai, CN,
            10 to 19 October 2012, document no. JCTVC-K0167,
            server date: 1 October 2012, XP030113049

    D2      R. Sjöberg et al., "*Overview of HEVC High-Level
            Syntax and Reference Picture Management*", IEEE
            TRANSACTIONS ON CIRCUITS AND SYSTEMS FOR VIDEO
            TECHNOLOGY, NJ, US, December 2012, vol. 22,
            no. 12, pages 1858 to 1870, XP011487804,
            DOI: 10.1109/TCSVT.2012.2223052

    D3      F. Ruijin et al., "*SCALABLE LAYERED MPEG-2 VIDEO
            MULTICAST ARCHITECTURE*", IEEE Transactions on
            Consumer Electronics, NY, US, February 2001,
            vol. 47, no. 1, pages 55 to 62, XP001200474,
            DOI: 10.1109/30.920420

    D4      H. Li and Y. Zhong, "*Adaptive Reed-Solomon Code
            Protection of Data Partitioned H.264 Video*",
            2009 Fifth International Conference on
            Intelligent Information Hiding and Multimedia
            Signal Processing, Kyoto, JP, 2009,
            pages 122 to 127, XP031569506,
            DOI: 10.1109/IIH-MSP.2009.48

III.    The application was refused on the grounds that the
        subject-matter of claims 1, 8 and 9 of the sole request
        lacked inventive step over the disclosure of document
        D1 in combination with the disclosure of document D2
        and the common general knowledge of the person skilled
        in the art (Article 56 EPC).

IV.     The applicant (appellant) filed notice of appeal. With
        its statement of grounds of appeal, the appellant
        provided arguments as to why the examining division's
        findings were incorrect.

        The appellant requested that the decision under appeal
        be set aside and that a patent be granted on the basis
        of the documents on file at the time of filing of the
        statement of grounds of appeal. As an auxiliary
        measure, it requested oral proceedings according to
        Article 116 EPC.

V.      The appellant was summoned to oral proceedings. In a
        communication under Article 15(1) RPBA the board gave,
        *inter alia*, the preliminary opinion that it tended to
        agree with the appellant that the examining division's
        conclusion that the subject-matter of claim 1 lacked
        inventive step in view of the disclosure of document D1
        in combination with the disclosure of document D2 and
        the common general knowledge of the person skilled in
        the art was not correct. Consequently, the board was
        inclined to exercise its discretion under
        Article 111(1) EPC by remitting the case to the
        department of first instance for further prosecution.

        The appellant was invited to comment on the preliminary
        opinion and to inform the board as to whether it
        maintained its auxiliary request for oral proceedings,

since oral proceedings did not appear to be expedient under the circumstances outlined above.

VI.    By letter dated 3 April 2024, received on 8 April 2024, the appellant informed the board that the request for oral proceedings was no longer maintained on the proviso that the case would either be remitted to the examining division for further prosecution or be granted directly by the board.

VII.   Subsequently, the appellant was informed that the oral proceedings scheduled for 14 May 2024 had been cancelled.

VIII.  Claim 1 of the **main request** reads as follows:

"*Network device comprising*

*a receiver configured to receive a transport stream of a sequence of packets via which a video data stream is transported,*

> *the video data stream having tiles of pictures of a video into which the pictures are partitioned, encoded thereinto along a coding order using entropy coding and spatial prediction,*

> *the tiles being encoded into the video data stream with context derivation of the entropy coding and the spatial prediction being restricted so to not cross tile boundaries of the tiles,*

> *wherein the video data stream has the tiles of the pictures of the video encoded thereinto along the coding order in units of slices with each slice either containing data of one tile only or*

*containing two or more tiles completely, each slice starting with a slice header, wherein the video data stream has the tiles of the pictures of the video encoded thereinto along the coding order in units of the slices (12) using context-adaptive entropy coding with continuous adaptation of contexts' entropy probabilities to actual symbol statistics and picture content, wherein the contexts' entropy probabilities are initialized at the beginning of each slice and, within each slice, at each tile boundary,*

*the video data stream being packetized into the sequence of packets along the coding order such that each packet carries data of merely one tile,*

*wherein the device further comprises*

*an error handler configured to identify lost packets in a sequence of packets and analyze error resilience data in the packets of the sequence of packets so as to identify, for each of runs of one or more lost packets of the sequence of packets, a first packet in the sequence of packets after the respective run of one or more lost packets, which carries a begin of any of the tiles and participates in carrying a slice, the slice header of which is contained in any of the packets of the sequence of packets not being lost,*

*wherein the device is configured to sequentially inspect each packet following the respective run of one or more lost packets by*

*checking whether the respective packet carries a begin of any of the tiles, and*

*for each packet for which the check reveals that the respective packet coincides with a begin of any of the tiles,*

> *obtain, from the error resilience data of the respective packet, a pointer to, or an identifier of, the packet containing the slice header of the slice carried by the respective packet; and*

> *check whether the slice header of the slice carried by the respective packet is contained in any of the packets of the sequence of packets not being lost and preceding the respective run of one or more lost packets."*

**Reasons for the Decision**

1.      The appeal is admissible.

2.      *Interpretation of document D1*

2.1     The inventive step assessment in the decision under appeal hinges on document D1 disclosing a pointer in the header of a dependent slice identifying an independent slice (see the second paragraph on page 3, the first paragraph after the claim wording on page 5 and the third and fourth paragraphs on page 6 of the decision under appeal).

        This point has been contested by the appellant in first-instance and appeal proceedings. The appellant alleged that the examining division had erroneously interpreted the disclosure of document D1 (see the section entitled "5 Reply to arguments of the appellant" on page 5 of the decision under appeal and

the paragraph starting with "Briefly speaking" on page 3 of the statement of grounds of appeal).

2.2     Document D1 identifies a number of issues that could occur when using the slice header signalling of dependent slices defined in the text specification draft for wavefront parallel processing (WPP) available at that time.

In WPP, rows of coding tree blocks are processed in parallel. Processing of a coding tree block requires the left, top-left, top, and top-right coding tree blocks to be available for predictions to operate correctly. Thus, a shift of at least two coding tree blocks is enforced between consecutive rows of coding tree blocks processed in parallel.

2.2.1   A first issue is that when using WPP, decoding of a dependent slice cannot start if the preceding slice has not been completely decoded. This is because, in order to start its decoding, a dependent slice needs to obtain slice header syntax elements of the preceding slice containing the coding tree block in raster scan order previous to the first coding tree block of the dependent slice (see the second bullet point in the abstract and section 2.2). However, since the last coding tree block of a slice is not available until the slice is completely decoded, the slice cannot be used to determine whether its last coding tree block is the one previous to the first coding tree block of the dependent slice.

2.2.2   A second issue with WPP arises when a complete dependent slice containing a row of coding tree blocks is lost. If the decoder does not detect this loss, it may assume that the previously received slice is the

lost slice. Decoding the subsequent slice under this assumption would result in an erroneous slice reconstruction that could propagate until the last slice in the picture (see the third bullet point in the abstract and section 2.3).

2.2.3   To solve these issues, document D1 proposes signalling the slice address of the reference slice in the header of a dependent slice so that the reference slice can be easily identified and its loss quickly detected (see section 3, point 2). For this purpose, the syntax element "ref_slice_address" specifies the address of "the slice whom the current slice depends on" (see section 3, first paragraph on page 4).

2.3   The examining division and the appellant differed in their interpretation of the phrases "the reference slice" and "the slice whom the current slice depends on".

2.3.1   According to the appellant, the syntax element "ref_slice_address" in a dependent slice segment (dependent slice) referred to the slice address of the immediate predecessor slice segment (slice) rather than to the slice address of the independent slice segment (independent slice) to which a current slice segment belonged (see the paragraph beginning with "Briefly speaking" on page 3 of the statement of grounds of appeal).

2.3.2   The examining division considered that the syntax element "ref_slice_address" in the header of a dependent slice pointed to the independent slice that contained the dependent slice (see, for example, the

third and fourth paragraphs on page 6 of the decision under appeal).

2.4      The board agrees with the appellant that D1 does not disclose a pointer to an independent slice in the header of a dependent slice.

2.4.1    Terms used in patent documents should be given their normal meaning in the relevant art, unless the description gives them a special meaning (see Case Law of the Boards of Appeal of the European Patent Office, 10th edition, 2022, I.C.4.1). The board considers that the same principle applies to technical input documents to JCT-VC standardisation meetings.

2.4.2    According to document D1, "*the reference slice of [a] dependent slice is the preceding slice containing the coding tree block for which the coding tree block address is ctbAddrTStoRS[ctbAddrRStoTS[slice_address] – 1]*" (see the second bullet point in the abstract). This expression roughly translates into the reference slice of a dependent slice being the one that contains the coding tree block previous to the first coding tree block in the dependent slice in raster scan order. Thus, in the context of D1, a reference slice is the previous slice.

2.4.3    The scenario shown in section 2.3 of document D1 confirms this interpretation. It illustrates a picture coded with WPP where each row of coding tree blocks except the first one is coded as a dependent slice. The dependent slice depends on the previously received slice. The reference slice of the fourth slice is the third slice. Both slices are dependent slices.

2.4.4   In view of points 2.4.2 and 2.4.3 above, the board
        considers that, in the context of D1, the phrases "the
        reference slice" and "the slice whom the current slice
        depends on" identify the previous slice. Thus, the
        syntax element "ref_slice_address", which specifies the
        address of the slice which the current slice depends
        on, points to the previous slice.

        As an aside, the board notes that, according to the
        examining division's interpretation of D1, this
        document would not solve any of the issues identified
        in points 2.2.1 and 2.2.2 above. Indeed, by signalling
        the address of the independent slice in the syntax
        element "ref_slice_address", it would still not be
        possible either to identify the reference (previous)
        slice before it had been fully decoded, or to detect a
        preceding lost slice.

3.      *Inventive step (Article 56 EPC)*

3.1     In the decision under appeal, the examining division
        considered that D1 disclosed a syntax element in the
        header of a dependent slice pointing to the independent
        slice that contained the dependent slice.

3.2     In view of section 2. above, the board holds that the
        examining division based its inventive step assessment
        on an erroneous interpretation of document D1. Since
        document D1 does not disclose a signalling method with
        a syntax element in the header of a dependent slice
        pointing to the independent slice that contained the
        dependent slice, the person skilled in the art adapting
        the method known from document D1 would not have
        arrived at the claimed signal syntax.

3.3     Consequently, the examining division's conclusion that
        the subject-matter of claim 1 lacked inventive step in
        view of the disclosure of document D1 in combination
        with the disclosure of document D2 and the common
        general knowledge of the person skilled in the art was
        not correct.

4.      *Remittal (Article 111(1) EPC, Article 11 RPBA)*

4.1     Under Article 111(1) EPC, the board, in deciding upon
        the appeal, may exercise any power within the
        competence of the department which was responsible for
        the appealed decision or remit the case to that
        department for further prosecution.

        Article 12(2) RPBA expressly states that the primary
        object of the appeal proceedings is a judicial review
        of the appealed decision.

        Article 11 RPBA provides that the board should not
        remit a case for further prosecution unless special
        reasons present themselves for doing so.

4.2     The examining division's erroneous interpretation of
        document D1 calls into question the relevance of this
        document to the assessment of the patentability of the
        claimed subject-matter and the completeness of the
        search for fundamental concepts on which the claimed
        invention is based (referencing of independent data
        elements from dependent data elements). Furthermore,
        the relevance of the remaining prior-art documents on
        file to the subject-matter of the independent claims
        was not discussed in examination proceedings.

        Thus, if the board were itself to decide on the
        substance of the case and not remit the case to the

department of first instance, the board would have to
for the first time carry out a full examination of the
application with regard to patentability requirements.
This is primarily the task of the examining division
(see decision G 10/93 of the Enlarged Board of Appeal,
OJ EPO 1995, 172, point 4 of the Reasons). As the
misinterpretation of document D1 may well have brought
the search to a premature end, the board might even
have to determine whether an additional search was
necessary.

4.3     These circumstances constitute a special reason within
        the meaning of Article 11 RPBA justifying a remittal to
        the department of first instance for further
        prosecution.

4.4     The board has therefore decided to exercise its
        discretion under Article 111(1) EPC by 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 examining division for
        further prosecution.

The Registrar:                              The Chair:

K. Boelicke                                 B. Willems

Decision electronically authenticated