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Datasheet for the decision of 29 July 2009

Case Number: T 1183/05 - 3.5.04

Application Number: 97117423.0

Publication Number: 0836325

IPC: H04N 7/26

Language of the proceedings: EN

Title of invention:
Data processor for a moving pictures database with high quality

Patentee:
NEC CORPORATION

Opponent:
Interessengemeinschaft für Rundfunkschutzrechte e.V.

Headword:
-

Relevant legal provisions:
EPC Art. 123(3)

Relevant legal provisions (EPC 1973):
EPC Art. 54, 56

Keyword:
"Novelty (yes)"
"Inventive step (no) - main request, auxiliary requests A to D"
"Inventive step (yes) - auxiliary request E"
"Amendments - extension of protection (no)"

Decisions cited:
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Catchword:
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Case Number: T 1183/05 - 3.5.04

D E C I S I O N
of the Technical Board of Appeal 3.5.04
of 29 July 2009

(Opponent) Interessengemeinschaft
für Rundfunkschutzrechte e.V. (IGR e.V.)
Bahnstraße 62
D-40210 Düsseldorf (DE)

Representative: Eichstädt, Alfred
Maryniok & Partner,
Kuhbergstraße 23
D-96317 Kronach (DE)

Respondent: NEC CORPORATION
(Patent Proprietor) 7-1, Shiba 5-chome,
Minato-ku
Tokyo (JP)

Representative: Vossius & Partner
Siebertstraße 4
D-81675 München (DE)

Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 8 August 2005 concerning maintenance of the European patent No. 0836325 in amended form.**

Composition of the Board:

Chairman: F. Edlinger
Members: A. Dumont
B. Müller

Summary of Facts and Submissions

I. Both the patent proprietor and the opponent appealed against the decision by the opposition division to maintain European patent no. 0 836 325 in amended form.

II. The opposition was filed on the ground that the subject-matter of the claims as granted lacked an inventive step (Articles 100(a) and 56 EPC 1973) with respect to prior art documents:

D1: M.GHANBARI: "Two-Layer Coding of Video Signals for VBR Networks", in IEEE Journal on Selected Areas in Communications, vol. 7, no. 5, June 1989, pages 771 to 781, XP000036748; and a German translation of a patent family member corresponding to

D2: US 5 349 383 A (the reference referred to in the opposition proceedings and in the decision under appeal).

III. Oral proceedings before the board took place on 29 July 2009.

IV. The appellant (patentee) requested that the decision under appeal be set aside and that the patent be maintained as granted with the amendment to the description filed in the oral proceedings of 29 July 2009 as a main request, or alternatively on the basis of the claims of auxiliary requests A to D, filed with the statement of grounds of appeal, of auxiliary request E, filed in the oral proceedings of 29 July 2009, or of auxiliary requests F to N filed with the letter dated 29 June 2009, in that order and

the description and drawings of the patent specification except for the description pages filed in the oral proceedings of 29 July 2009. As a lowest-ranking auxiliary request, the appellant (patentee) requested that the opponent's appeal be dismissed.

V. The appellant (opponent) requested that the decision under appeal be set aside and that the patent be revoked in its entirety.

VI. Claim 1 according to the main request reads as follows.

"A data processor comprising:

first coding means (12, 22, 32, 42) for generating, by using a predetermined first coding method, a main code prepared by encoding a moving picture signal input as an original signal;
first storage means (13, 23, 33, 43) for storing the main code generated by said first coding means;
characterized by further comprising:
coding distortion calculation means (17, 27, 39, 49) for calculating a coding distortion generated upon coding by said first coding means;
second coding means (15, 25, 36, 46) for encoding, by using a predetermined second coding method, the coding distortion calculated by said coding distortion calculation means, thereby generating a compensation code;
second storage means (16, 26, 37, 47) for storing the compensation code generated by said second coding means;
output means (120, 130, 140) for outputting the main and compensation codes respectively stored in said first and second storage means;

decoding means (14, 24, 34, 44) for receiving and decoding the main code stored in said first storage means and
control means (106) for controlling the output means to select whether both the main and compensation codes are output or only the main code is output,
wherein said coding distortion calculation means calculates the coding distortion on the basis of a difference between the main signal obtained upon decoding by said decoding means, and the original signal."

VII. Claim 1 according to the auxiliary requests A to D is identical to claim 1 according to the main request, except from the comma which has been omitted before the last paragraph ("wherein...").

VIII. Independent claim 1 according to the auxiliary request E is based on independent claim 1 of the patent specification, in which the following feature has been inserted before the final full stop:

", and said first storage means and said second storage means are adapted to store the main code and the compensation code as database, respectively"

Claim 2 according to the auxiliary request E reads as follows:

"A data processor according to claim 1, wherein said decoding means (24, 44) instead receives and decodes the main code encoded by said first coding means, and said first storage means and said second storage means

comprise a first buffer memory (23a) and a second buffer memory (26a), respectively."

Claims 3 to 7 are dependent claims.

IX. The reasons in the decision under appeal relevant for the present decision may be summarised as follows.

The only difference between the data processor according to granted claims 1 and 8 and the encoder according to figure 2 of D2 lies in the fact that the output of the first storage means (buffer) in figure 2 of D2 is not applied to the input of the subtractor (and the decoding means). The opponents offered no argument to the effect that it might be obvious to apply the output of the buffer to the input of the subtractor, i.e. for the decoding means receiving and decoding the main code stored in said first storage means as specified in claim 1. This difference is removed in granted claim 2. As a result, the subject-matter of the combination of granted claim 2 and claim 1, to which it refers, is not new in view of D2.

D1 proposes to always output both main code and compensation code components. The encoder of D2 is an improvement of the encoder of D1 in which the compensation code is not generated and only the main code is outputted in certain circumstances, depending on the energy of the coding distortion calculated as the difference between the decoded main code and the original video signal.

D1 and D2 broach the completely different problem of maintaining video quality in the case of bandwidth

limitations or packet losses during transmission of the code, and they do not suggest the first and second storage means according to the invention. They therefore do not suggest the concept of the invention aiming to give the user the ability to purchase alternative qualities of service level for one and the same service.

The claims as maintained relate to a system comprising a data processor on the transmitting side and a receiver, with the control means of the granted independent claims still present. As a result, they comply with Article 123(3) EPC.

X. The appellant opponent's arguments relevant to the amended claims presently on file may be summarised as follows.

D1 (figure 2) discloses a processor for two-layer encoding outputting guaranteed and enhancement packets. The guaranteed packets provide a basic and sufficient quality. The enhancement packets are in principle add-on packets that may be outputted if necessary, for instance when a better image quality is desired. In this case they may be relabelled as guaranteed packets (and the allocated bandwidth to the first layer would be increased temporarily; see page 776 of D1). Hence D1 discloses control means which are suitable for the purpose specified in granted claims 1 and 8. The only possible difference of the data processor according to these claims over D1 consists in the decoding means receiving and decoding the main code stored in said first storage means instead of directly receiving and decoding the main code encoded by said first coding

means as shown in D1. Inserting a buffer stage acting as temporary storage means does not affect the operation of the encoder and is thus obvious. As a result, the subject-matter of granted claims 1 and 8 does not involve an inventive step over D1. It also results from the above that the subject-matter of the combination of claim 2 and claim 1 (to which claim 2 refers) lacks novelty.

D2 (figure 2) discloses a processor which is improved over D1 in that it comprises a control means and a detector. An appropriate choice for the detector threshold enables the processor to completely inhibit the output of the enhancement data. The only feature of claims 1 and 8 not disclosed in D2 is the second storage means. This difference is obvious, since it merely reflects an alternative to the real-time implementation for immediate transmission encompassed in D2. It results from the above that the subject-matter of the claims at least lacks an inventive step over D2.

In the above argumentation "storage means" is a broad expression covering a database as mentioned in the description of the patent in suit as well as a plain buffer for temporary, short-term and volatile storage of the data in the processor. Such a buffer would necessarily be present in D2.

In the above argumentation the "compensation code" controlled by the control means of the patent in suit does not necessarily correspond to a whole video image or sequence, but may correspond to smaller picture units and thus may be read onto the enhancement packets,

blocks or cells mentioned in D1 or D2. Furthermore completely switching off the enhancement channel would be either an obvious solution in order to save bandwidth or an arbitrary solution for other non-technical reasons such as business considerations, for instance offering a pay service with enhanced quality against an additional charge (see paragraph [0037] of the patent specification).

Storing the code in an "old" database is prior art (see figure 9 and paragraph [0049] in the patent in suit). Using such a database instead of the code computed from the available moving picture signal is an obvious equivalent solution. As a result, the subject-matter of the claims according to auxiliary request E lacks an inventive step.

Claim 2 according to auxiliary request E results in removing the storage means according to the combination of granted claims 1 and 2 and in replacing it by a database together with its buffer memory (see also figure 2). Claim 2 thus shifts the scope of protection and infringes Article 123(3) EPC.

XI. The appellant proprietor's arguments relevant for the present decision may be summarised as follows.

The encoder of D1 differs from the processor of the invention in that it does not calculate a distortion signal as the difference between the main code and the original signal as claimed, nor does it store the code in first and second storage means. The storage means of the invention are distinct from any buffer used for temporary storage. The encoder of D1 always generates

and transmits code for both layers and provides no motivation to modify the two-layer encoding to incorporate the control means of the invention.

The encoder of D2 comprises a switch which selectively controls transmission through the enhancement channel at the block level but does not inhibit transmission for the whole moving picture signal. Furthermore the "difference between the main signal obtained upon decoding by said decoding means, and the original signal" of the claims cannot be read onto the "variable difference data" of D2.

The differences mentioned above confer novelty on the subject-matter of the independent claims over D1 or D2.

The invention gives a user the ability to deliberately choose an alternative quality of service, with a processor comprising control means for selecting the quality of the code outputted by completely inhibiting the output of the compensation code. Separate main and compensation codes are stored in first and second storage means of a database and can be selectively output. D1 and D2 address the different problem of handling packet loss during transmission, whilst guaranteeing a minimum quality of the two-layer coded signal. Hence they do not disclose or suggest the control means of the invention. The subject-matter defined in the claims is thus also inventive over D1 or D2.

Reasons for the Decision

1. The appeal is admissible.

2. The prior art

It is common ground that D1 relates to the two-layer coding of video signals, with a first layer generating code as data packets labelled as "guaranteed packets" with a constant bit rate (CBR) and a second layer generating code as data packets labelled as "enhancements packets" with a variable bit rate (VBR) (see section II on page 771).

It is not contested that D2 proposes an improved coding scheme which is based on the disclosure of D1 (see column 1, lines 44 to 62). Control means (4 in figure 2) and a detector (TH) cause a switch (SW1) to provide the coding distortion to second coding means outputting enhancement data on the VBR channel, when the energy of the distortion signal exceeds a given threshold. Blocks of enhancement data are not transmitted when the block energy of the distortion signal remains below the threshold, so that the enhancement layer is used only to transmit data for picture blocks with significant changes in them. Appropriately setting the threshold allows a saving in bandwidth whilst limiting the drop in quality in terms of signal-to-noise ratio (see D2, column 3, lines 4 to 54, and figure 4).

3. Main request

3.1 Novelty (Article 54 EPC 1973)

3.1.1 The coding distortion calculation means

The board is satisfied that the enhancements packets are generated in D1 by encoding the calculated difference between the original input signal ("in") and the decoded first layer (guaranteed) code (see the subtractor at the input of the second-layer (DPCM) coder of figures 1 and 2).

The board is also satisfied that the "variable difference data" in D2 constitutes a coding distortion calculated on the basis of a difference between the main signal and the original input signal, either in the frequency or the time domain (see the paragraph bridging columns 2 and 3; and column 4, lines 38 to 43).

The coding distortion calculation means according to the claims is thus known from both D1 and D2.

3.1.2 The storage means

The data processor according to all independent claims comprises first and second storage means for storing the main code and the compensation code, respectively.

D2 mentions buffering to cope with variation in the data rate during transmission, for instance so as to ensure a constant bit rate (see column 1, lines 15 to 20). D1 (see figure 2) shows such a buffer in an output stage. The buffers of the prior art are

therefore used mainly for temporarily holding data prior to transmission. The board further accepts that the encoders of the prior art also comprise further internal storing stages, such as buffers or internal registers of a processor, even if they are not mentioned explicitly.

However the prior art, as well as the patent in suit, relates to the coding of video signals, for instance according to the H.261, MPEG1 or MPEG2 standard coding schemes. In this context, storage of a code is generally understood as an alternative to communication or broadcast, and it is not construed as short-term, temporary or volatile storage (see the patent specification, paragraph [0006], and figure 2, where each of the storage means (23) and (26) shows both a storage medium and a buffer memory for storing the respective codes).

In view of the technical context of the claims and the application as a whole with the amendment made to the description (see paragraph [0034]), the board sees no reason to construe the term storage means according to the claims broader than is usual in the relevant technical field. Therefore the storage means of claim 1 may not be read onto the plain buffers of the prior art. This and the control means selecting which of the stored codes (main code only or both) are output render the subject-matter of the claims new.

3.2 Inventive step (Article 56 EPC 1973)

3.2.1 The storage means

The encoding scheme of the prior art may be routinely implemented in dedicated hardware or in a general purpose computer. In the latter case, storing the code on a non-volatile medium such as a hard disk drive, for instance until an entire moving picture sequence is encoded, merely brings about an expected and well-known effect of storing a coded sequence until it is needed for output in substantially a real-time two-layer coding.

3.2.2 The control means

The data processor according to claim 1 comprises control means for controlling the output means to select whether both the main and compensation codes are output or only the main code is output.

The prior art D1 does not explicitly disclose such a selective output of either only the main code (*i.e.* the guaranteed packets) or of both the main and compensation codes. However D1 relates to two-layer coding and presents the second layer (*i.e.* the enhancement packets) as "add-on" information necessary for a quality finish, which may be completely lost due to bandwidth unavailability or excessive queuing delay (see the paragraph bridging the left-hand and right-hand columns on page 775; and the first paragraph of section VII on page 781). The skilled person thus immediately derives from D1 that the second layer may be dispensed with altogether, for instance when

insufficient bandwidth is available (technical reason) or when no "quality finish" is needed or bought by the user (non-technical reason). Similar considerations apply to D2 which is based on the teaching of D1 (see D2, column 1, lines 44 to 62). Even if D2 foresees controlling the output of the enhancement code only on a block basis, the skilled person would routinely have envisaged completely inhibiting the enhancement code, for the same reasons (for example for encoding an entire moving picture sequence in real-time when insufficient bandwidth is available).

3.2.3 In conclusion, starting from the prior art D2, the board regards as obvious the provision of storage means and the provision of control means according to claim 1 of the main request.

As a result, the subject-matter of claim 1 according to the main request does not involve an inventive step, and the main request is not allowable.

4. Auxiliary requests A to D

Each of these request contains a claim 1 identical (apart from an omitted comma) to claim 1 according to the main request. Auxiliary requests A to D are therefore not allowable for the same reasons as the main request.

5. Auxiliary request E

5.1 Article 123(2) EPC

5.1.1 None of the granted claims were objected to under Article 123(2) EPC in the opposition or appeal proceedings.

Compared with granted claim 1, claim 1 according to auxiliary request E additionally specifies that the first and second storage means are adapted to store the main code and the compensation code as database, respectively. This addition is directly derivable from page 17, lines 12 to 26, of the description as originally filed (corresponding to paragraph [0049] of the patent specification).

Compared with granted claim 2, claim 2 according to auxiliary request E additionally specifies that the first storage means and the second storage means comprise a first buffer memory and a second buffer memory, respectively. This addition is directly derivable from figure 2, read together with page 10, line 21, to page 11, line 2, of the description as originally filed (corresponding to paragraph [0026] of the patent specification).

Dependent claims 3 to 7 correspond to granted claims 3 to 7.

As a result, the board is satisfied that the amended claims comply with Article 123(2) EPC.

5.1.2 The amendments to the description in paragraphs [0016], [0017], [0034], [0041] and [0045] are limited to an adaptation to the amended claims. The board is satisfied that they also comply with Article 123(2) EPC.

5.2 Article 123(3) EPC

5.2.1 As compared to granted claim 2, claim 2 according to auxiliary request E, read together with claim 1 to which it refers, additionally sets out that the first and second storage means store the main code and compensation code as database, respectively (claim 1) and further comprise first and second buffer memories, respectively (claim 2). The storage means of the subject-matter of granted claims 1 and 2 in combination is thus limited by further features (regarding the storage means), and no shift of the scope of protection is apparent to the board because granted claim 2 also covered storing the main code in the storage means (claim 1), and the decoding means did not have to receive the stored main code either (claim 2). As a result, the protection conferred is not extended and claim 2 complies with Article 123(3) EPC.

5.2.2 The appellant opponent appealed against the decision by the opposition division rejecting an objection under Article 123(3) EPC aimed at the claims as maintained, which related to a system comprising a data processor on the transmitting side and a separate receiver. These claims were not pursued in the appeal proceedings and were replaced by claims relating to a data processor on the transmitting side alone. Consequently the objection no longer applies.

5.3 Novelty

Novelty is not at issue for auxiliary request E.

5.4 Inventive step

5.4.1 Claim 1

Storing the code as a database according to claim 1 implies that a large-capacity medium is provided for long-term storage and that each of the main and compensation codes may be separately stored and retrieved on demand. According to the patent specification, this allows one to offer particular services to the user: a normal user would receive the code from the main database, whereas a special user paying an additional charge would receive both main and compensation codes (see paragraphs [0024] and [0037]). From a technical viewpoint, this also allows an improved flexibility in the generation and use of the encoded moving pictures. In particular this allows the generation of high-quality moving picture code consisting of a main code being compatible and re-usable with a stock of existing "old" receivers, and of a compensation code to be used in newer, higher-quality receivers (see paragraph [0049] and [0050]).

Data processors with a database were of course known in the prior art (see paragraph [0005] and figure 9 of the patent specification). However the idea of separately storing and retrieving the main and compensation codes is not known. The beneficial aspects linked with using and re-using the database for the main code according

to claim 1 are not addressed in that prior art. Furthermore D1 and D2 primarily deal with the transmission of the code and do not address the aspect of code retrieval and re-use underlying the present invention. If only a main code were transmitted in an obvious real-time encoder in accordance with the teaching of D2, as set out above, there would be no reason for generating, let alone storing, the enhancement data (compensation code) in a storage means of a database.

As a result, the board is of the opinion that the invention could only be arrived at with hindsight which is inconsistent with the criterion of non-obviousness at the priority date. The subject-matter of claim 1 thus involves an inventive step.

5.4.2 Claim 2

Independent claim 2 supplements the database of claim 1 with buffer memories necessary for a real-time operation. The benefits of storing both the main code and the compensation code as a database of claim 1 remain even though in this operation the stored main code need not be supplied to the decoding means, so that the subject-matter of claim 2 also involves an inventive step, for essentially the same reasons.

5.5 In conclusion the documents according to auxiliary request E comply with the requirements of the EPC. The request is thus allowable.

6. Since auxiliary request E is allowable, the board need not decide on the lower ranking requests.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to maintain the patent as amended in the following version:

Description: columns 1 and 2 of the patent specification and columns 3 to 8 of the auxiliary request E, filed in the oral proceedings of 29 July 2009;
Claims: 1 to 7 of the auxiliary request E, filed in the oral proceedings of 29 July 2009;
Figures: 1 to 10 of the patent specification.

The Registrar The Chairman

L. Fernández Gómez F. Edlinger