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Case Number: T 1558/07 - 3.5.04

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Language of the proceedings: EN

Title of invention:
Encoding apparatus, decoding apparatus, encoding method, decoding method and picture processing apparatus

Applicant:
MITSUBISHI DENKI KABUSHIKI KAISHA

Opponent:
-

Headword:
-

Relevant legal provisions:
-

Relevant legal provisions (EPC 1973):
EPC Art. 84

Keyword:
"Claims - support by description (main request: no)"
"Claims - support by description (auxiliary request: yes)"

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-

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Case Number: T 1558/07 - 3.5.04

D E C I S I O N
of the Technical Board of Appeal 3.5.04
of 25 June 2009

Appellant: MITSUBISHI DENKI KABUSHIKI KAISHA
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 13 February 2007 refusing European patent application No. 03006547.8 pursuant to Article 97(1) EPC 1973.**

Composition of the Board:

Chairman: F. Edlinger
Members: A. Dumont
T. Karamanli

Summary of Facts and Submissions

I. The appeal is directed against the decision by the examining division to refuse European patent application 03006547.8, published as EP 1 320 263 A1.

II. The application was refused on the ground that the subject-matter of the independent claims lacked support by the description (Article 84 EPC 1973).

III. In a communication sent in preparation for the oral proceedings the board drew attention to remaining deficiencies and informed the appellant that oral proceedings concerning the three cases T 1149/05, T 0497/05 and T 1558/07 (the parent application and two divisional applications, respectively) would be held jointly on three consecutive days.

IV. With a letter dated 25 May 2009 the appellant filed a set of amended claims 1 to 4.

V. Oral proceedings were held on 23, 24 and 25 June 2009 jointly in the three cases T 1149/05, T 0497/05 and T 1558/07. The debate on the present case took place on 25 June 2009 and the decision was given on the same day. The appellant filed a (first) auxiliary request comprising claims 1 to 4.

VI. Before the closure of the debate the appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request comprising claims 1 to 4 filed with the letter dated 25 May 2009, and a description to be adapted.

Alternatively, the appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the first auxiliary request comprising claims 1 to 4 filed in the oral proceedings, and a description to be adapted.

VII. Claim 1 according to the main request reads as follows:

"An encoding apparatus (400), comprising:

a picture element memory (1) for receiving and storing a value of an encoding picture element to be encoded, and for outputting values of encoded picture elements adjacent to the encoding picture element as the values of reference picture elements;

a mode determinator (2) for determining one of a specific encoding mode and an encoding mode other than the specific encoding mode from a plurality of predefined encoding modes for the encoding picture element based on the values of the reference picture elements satisfying a predetermined condition or not that all reference picture elements have the same value;

a first encoding section (101) for predicting the value of the encoding picture element, determining a prediction result whether the prediction is correct or not, encoding the value of the encoding picture element based on the prediction result of the determination, and for outputting a codeword representing the encoding picture element under the determined specific encoding mode;

a second encoding section (102) for predicting the value of the encoding picture element, encoding the value of the encoding picture element, and for outputting a codeword representing the encoding picture element under the determined encoding mode other than the specific encoding mode;

an encoding controller (11) for operating the first encoding section and the second encoding section based on the encoding mode determined by the mode determinator (2), and

wherein the first encoding section (101) comprises:
a first predictor (3) for calculating a prediction value of the encoding picture element based on the values of the reference picture elements;
a first prediction error calculator (30) for calculating a difference between the value of the encoding picture element and the prediction value calculated by the first predictor (3) as a prediction error;
a determinator (4) for determining whether the prediction error calculated by the first prediction error calculator (30) indicates that the prediction is correct or not;
a first encoder (5) for receiving and encoding the prediction result of the determination output from the determinator (4) as a first binary symbol, and for outputting the codeword representing whether the prediction result of the determinator (4) is correct or not; and
a second encoder (6) for encoding the prediction error calculated by the first prediction error calculator (30) when the prediction error is indicating that the

prediction is not correct, deriving second binary symbol(s) from the prediction error and for outputting the codeword representing the encoding picture element; and

wherein the second encoding section (102) comprises: a second predictor (7) for calculating a prediction value of the encoding picture element based on the values of the reference picture elements; a second prediction error calculator (31) for calculating a difference between the value of the encoding picture element and the prediction value calculated by the second predictor (7) as a prediction error; and a third encoder (8) for encoding the prediction error calculated by the second prediction error calculator (31) regardless of whether the prediction error indicates that the prediction is correct or not, and for outputting the codeword for the encoding picture element under the encoding mode other than the specific encoding mode,

wherein the encoding controller (11) determines among the first encoder (5), the second encoder (6) and the third encoder (8) the encoder for outputting the codeword depending on the prediction result and the predetermined condition of the reference picture elements."

VIII. Independent claims 1 to 4 according to the first auxiliary request read as follows:

"1. An encoding apparatus (400), comprising:

a picture element memory (1) for receiving and storing a value of an encoding picture element to be encoded, and for outputting values of encoded picture elements adjacent to the encoding picture element as the values of reference picture elements;

a mode determinator (2) for determining one of a specific encoding mode and an encoding mode other than the specific encoding mode from a plurality of predefined encoding modes for the encoding picture element;

a first encoding section (101) for predicting the value of the encoding picture element, determining a prediction result whether the prediction is correct or not, encoding the value of the encoding picture element based on the prediction result of the determination, and for outputting a codeword representing the encoding picture element under the determined specific encoding mode;

a second encoding section (102) for predicting the value of the encoding picture element, encoding the value of the encoding picture element, and for outputting a codeword representing the encoding picture element under the determined encoding mode other than the specific encoding mode;

an encoding controller (11) for operating the first encoding section and the second encoding section based on the encoding mode determined by the mode determinator (2), and

wherein the first encoding section (101) comprises:

a first predictor (3) for calculating a prediction value of the encoding picture element based on the values of the reference picture elements;
a first prediction error calculator (30) for calculating a difference between the value of the encoding picture element and the prediction value calculated by the first predictor (3) as a prediction error;
a determinator (4) for determining whether the prediction error calculated by the first prediction error calculator (30) indicates that the prediction is correct or not;
a first encoder (5) for receiving and encoding the prediction result of the determination output from the determinator (4), the first encoder (5) comprising a first probability estimator (25) for receiving the result of the determination output from the determinator (4) as a sequence of binary symbols and estimating an occurrence probability of one of the binary symbols, and a first codeword allotter (15) for encoding the sequence of binary symbols into a codeword and for outputting said codeword;
a second encoder (6) for encoding the prediction error calculated by the first prediction error calculator (30) into the codeword when the prediction is not correct and for outputting the codeword representing the encoding picture element; and

wherein the second encoding section (102) comprises:
a second predictor (7) for calculating a prediction value of the encoding picture element based on the values of the reference picture elements;
a second prediction error calculator (31) for calculating a difference between the value of the

encoding picture element and the prediction value calculated by the second predictor (7) as a prediction error;
a third encoder (8) for encoding the prediction error calculated by the second prediction error calculator (31) into a codeword, and for outputting the codeword representing the encoding picture element; and

wherein the mode determinator (2) receives the values of the reference picture elements and the prediction result of the determination output by the determinator (4) and selects an encoding mode between the specific encoding mode (Mode A) used by the first encoding section (101) and the encoding mode (Mode B) other than the specific encoding mode used by the second encoding section (102) such that the specific encoding mode (Mode A) is continued when the determinator (4) determines that the prediction has proved to be correct, when the determinator (4) determines that the prediction has proved to be incorrect the encoding picture element is coded in the specific encoding mode (Mode A) and then the encoding mode (Mode B) other than the specific encoding mode is set, the specific encoding mode (Mode A) is selected when the values of adjacent reference picture elements are the same and the encoding mode (Mode B) other than the specific encoding mode is continued when the values of the reference picture elements are not the same."

"2. A decoding apparatus (500), comprising:

a picture element memory (41) for storing values of decoding picture elements to be decoded and outputting values of the decoded picture elements adjacent to a

decoding picture element as values of reference picture elements;

a mode determinator (42) for determining one of a specific decoding mode and a decoding mode other than the specific decoding mode from a plurality of predefined decoding modes for the decoding picture element;

a first decoding section (201) for receiving a codeword, predicting a value of the decoding picture element, determining a prediction result whether the prediction is correct or not, and for decoding the codeword into the value of the decoding picture element based on the prediction result of the determination under the determined specific decoding mode;

a second decoding section (202) for receiving a codeword for the decoding picture element, predicting the value of the decoding picture element, decoding the codeword under the determined decoding mode other than the specific decoding mode; and

a decoding controller (43) for selectively operating the first decoding section and the second decoding section based on the decoding mode determined by the mode determinator (42), and

wherein the first decoding section (201) comprises:
a first predictor (3) for calculating a prediction value of the decoding picture element based on the values of the reference picture elements;
a first decoder (45) for decoding the codeword representing the decoding picture element, the first

decoder (45) having a first symbol restoring device (55) for receiving the codeword and decoding the codeword into a sequence of binary symbols and a first probability estimator (75) for estimating an occurrence probability of one of the binary symbols, and wherein the first decoder outputs one of the binary symbols as a result of determination indicating whether the prediction is correct or not;
a second decoder (46) for decoding the codeword representing the decoding picture element into the prediction error when the prediction is not correct;
a first decoding picture element calculator (32) for calculating the value of the decoding picture element based on the prediction value of the decoding picture element calculated by the first predictor (3), and the prediction error obtained by the second decoder (46), and

wherein the second decoding section (202) comprises:
a second predictor (7) for calculating a prediction value of the decoding picture element based on the values of the reference picture elements;
a third decoder (48) for decoding the codeword representing the decoding picture element into the prediction error;
a second decoding picture element calculator (33) for calculating the value of the decoding picture element based on the prediction value of the decoding picture element calculated by the second predictor (7) and the prediction error obtained by the third decoder (48); and

wherein the mode determinator (42) receives the values of the reference picture elements and the prediction

result of the determination decoded by the first decoder (45) and selects a decoding mode between the specific decoding mode used by the first decoding section (201) and the decoding mode other than the specific decoding mode used by the second decoding section (202), such that the specific decoding mode (Mode A) is continued when the prediction result of determination determines that the prediction has proved to be correct, when the prediction result determines that the prediction has proved to be incorrect the decoding picture element is decoded in the specific decoding mode (Mode A) and then the decoding mode (Mode B) other than the specific decoding mode is set, the specific decoding mode (Mode A) is selected when the values of adjacent reference picture elements are the same and the decoding mode (Mode B) other than the specific decoding mode is continued when the values of adjacent reference picture elements are not the same."

"3. An encoding method comprising:

an outputting step of receiving and storing a value of an encoding picture element and outputting values of encoded picture elements adjacent to the encoding picture element as values of reference picture elements;

a mode deciding step of determining one of a specific encoding mode and an encoding mode other than the specific encoding mode from a plurality of predefined encoding modes for the encoding picture element;

a first main encoding step of predicting the value of the encoding picture element, determining a prediction result whether the prediction is correct or not,

encoding the value of the encoding picture element based on the prediction result of determination, and outputting a codeword representing the encoding picture element under the determined specific encoding mode;

a second main encoding step of predicting the value of the encoding picture element, encoding the value of the encoding picture element, and outputting a codeword representing the encoding picture element under the encoding mode other than the specific encoding mode; and

an encoding controlling step of operating the first main encoding step and the second main encoding step based on the encoding mode determined by the mode deciding step, and

wherein the first main encoding step comprises:
a first predicting step of calculating a prediction value of the encoding picture element based on the values of the reference picture elements;
a first prediction error calculating step of calculating a difference between the value of the encoding picture element and the prediction value calculated by the first predicting step as a prediction error;
a determination step of determining whether the prediction error calculated by the first prediction error calculating step indicates that the prediction is correct or not and outputting the prediction result of determination,
a first encoding step of receiving and encoding the prediction result of the determination output by the determination step, the first encoding step comprising

a first probability estimating step of receiving the result of the determination output by the determination step as a sequence of binary symbols and estimating an occurrence probability of one of the binary symbols and a first codeword allotting step of encoding the sequence of binary symbols into a codeword and outputting said codeword; and
a second encoding step of encoding the prediction error calculated by the first prediction error calculating step into the codeword when the prediction is not correct, and outputting the codeword representing the encoding picture element; and

wherein the second main encoding step comprises:
a second predicting step of calculating a prediction value of the encoding picture element based on the values of the reference picture elements;
a second prediction error calculating step of calculating a difference between the value of the encoding picture element and the prediction value calculated by the second predicting step as a prediction error;
a third encoding step of encoding the prediction error calculated by the second prediction error calculating step into the codeword, and outputting the codeword representing the encoding picture element; and

wherein the mode determinator (2) receives the values of the reference picture elements and the prediction result of the determination output by the determinator (4) and selects an encoding mode between the specific encoding mode (Mode A) used by the first encoding section (101) and the encoding mode (Mode B) other than the specific encoding mode used by the second encoding

section (102) such that the specific encoding mode (Mode A) is continued when the determinator (4) determines that the prediction has proved to be correct, when the determinator (4) determines that the prediction has proved to be incorrect the encoding picture element is coded in the specific encoding mode (Mode A) and then the encoding mode (Mode B) other than the specific encoding mode is set, the specific encoding mode (Mode A) is selected when the values of adjacent reference picture elements are the same and the encoding mode (Mode B) other than the specific encoding mode is continued when the values of the reference picture elements are not the same."

"4. A decoding method, comprising:

an outputting step of storing values of decoding picture elements to be decoded and outputting the values of the decoded picture elements adjacent to a decoding picture element as the values of reference picture elements;

a mode deciding step of determining one of a specific decoding mode and a decoding mode other than the specific decoding mode from a plurality of predefined decoding modes for the decoding picture element;

a first main decoding step of receiving a codeword, predicting a value of the decoding picture element, determining a prediction result whether the prediction is correct or not, and decoding the codeword into the value of the decoding picture element based on the prediction result of the determination under the determined specific decoding mode;

a second main decoding step of receiving a codeword, predicting the value of the decoding picture element, and decoding the codeword under the determined decoding mode other than the specific decoding mode; and

a decoding controlling step of selectively operating the first main decoding step and the second main decoding step based on the decoding mode determined by the mode deciding step, and

wherein the first main decoding step comprises:
a first predicting step of calculating a prediction value of the decoding picture element based on the values of the reference picture elements;
a first decoding step of decoding the codeword representing the decoding picture element, the first decoding step comprising a first symbol restoring step for receiving the codeword and decoding the codeword into a sequence of binary symbols and a first probability estimating step of estimating an occurrence probability of one of the binary symbols, and a step of outputting one of the binary symbols as a prediction result of the determination indicating whether the prediction is correct or not;
a second decoding step of decoding the codeword for the decoding picture element into the prediction error when the prediction is not correct; and
a first decoding picture element calculating step of calculating the value of the decoding picture element based on the prediction value for the decoding picture element calculated by the first predicting step, and the prediction error obtained by the second decoding step, and

wherein the second main decoding step comprises:
a second predicting step of calculating a prediction value of the decoding picture element based on the values of the reference picture elements;
a third decoding step of decoding the codeword for the decoding picture element into the prediction error;
a second decoding picture element calculating step of calculating the value of the decoding picture element based on the prediction value calculated by the second predicting step and the prediction error calculated by the third decoding step; and

wherein the mode determinator (42) receives the values of the reference picture elements and the prediction result of the determination decoded by the first decoder (45) and selects a decoding mode between the specific decoding mode used by the first decoding section (201) and the decoding mode other than the specific decoding mode used by the second decoding section (202), such that the specific decoding mode (Mode A) is continued when the prediction result of determination determines that the prediction has proved to be correct, when the prediction result determines that the prediction has proved to be incorrect the decoding picture element is decoded in the specific decoding mode (Mode A) and then the decoding mode (Mode B) other than the specific decoding mode is set, the specific decoding mode (Mode A) is selected when the values of adjacent reference picture elements are the same and the decoding mode (Mode B) other than the specific decoding mode is continued when the values of adjacent reference picture elements are not the same."

IX. The reasoning in the decision under appeal, insofar as it is relevant for the present decision, may be summarised as follows.

Claim 1 defines a first and a second encoding section, each comprising an encoder for encoding the prediction error. Claim 1 does not imply that the second encoder in the first encoding section and the third encoder in the second encoding section are different and output different codewords. The problem to which the application is directed is to select a substantially optimum code. As is shown in figure 67 of the application, efficiency is enhanced by encoding long strings of zeroes more efficiently. Claim 1 should have defined the encoders and the mode switching in such a manner that the combination of its features solved the technical problem. Claim 1 is not limited to embodiments that solve the technical problem but allows the compression modes to yield identical compressions. Claim 1 is therefore not supported by the description.

X. The appellant's argumentation may be summarised as follows.

An essential inventive feature of the encoding apparatus lies in the first encoder encoding the prediction result indicating whether the prediction is correct, in contrast with the other encoders encoding the prediction error.

Claim 1 has to be considered as a whole, *i.e.* the interaction between the different parts of the apparatus has to be considered. The first encoding section comprises a first encoder encoding all the

picture elements having a correct prediction in a way different from those having an incorrect prediction, and a second encoder encoding the prediction error when the prediction is incorrect. The second encoding section operates regardless of whether the prediction is correct or not. Claim 1 also sets out that the choice of the encoding mode depends on a predetermined condition of the reference picture elements and that the choice of (at least) one encoder depends on the prediction result and on the predetermined condition.

The person skilled in the technical field of encoding thus deduces from the claim that the second and third encoders are different and that the first encoding section (comprising the second encoder) may encode picture elements differently from the second encoding section (comprising the third encoder) and may be used when a good predictability is given.

The application as a whole has to sufficiently disclose the invention for it to be carried out as required by Article 83 EPC, which is not at issue in the present case. In contrast Article 84 EPC does not require that the claim define the details of the embodiments. The description teaches that in case of good predictability a very high efficiency can be achieved by the first encoder providing a codeword encoding a number of prediction results before an incorrect prediction result is determined. The description also teaches that the second encoder generates shorter codewords than the third encoder because it is designed not to encode the prediction error corresponding to a correct prediction. Setting out these details in claim 1 is however not necessary because the person skilled in the art will

routinely implement the apparatus of claim 1 so as to achieve the sought-after effects.

The structure of the apparatus and the rules on which the determination of an encoding mode and an encoder according to claim 1 is based provide sufficient flexibility for the skilled person to design an implementation having an enhanced compression efficiency, and to routinely reject disadvantageous or technically senseless implementations, even if those are in principle allowed by the claim.

As a result, claim 1 and the further corresponding independent claims are supported by the description.

Reasons for the Decision

1. The appeal is admissible.

2. The problems presented in the application

2.1 The description refers to a "related art 2" for counting and encoding a number of consecutive more probable symbols (MPS) into a codeword using a plurality of codeword tables. The codeword tables must allot an (at least one-bit long) code for each picture element regardless of whether or not the prediction has proved to be correct (see paragraphs [0011] and [0028]; figures 67 and 68; in the following all the references to paragraph numbers relate to the present divisional application as published). The description also refers to a "related art 3" switching between a mode A and a mode B for encoding/decoding depending on a condition

for the value(s) of reference picture element(s) (see paragraph [0019]; figure 69). According to a further "related art 4", an apparatus switches between an encoding section comprising a lossy picture compression circuit and an encoding section comprising a lossless picture compression circuit according to the condition (see paragraph [0029]; figure 70).

2.2 The most general object of the present invention is presented as efficiently implementing encoding and decoding of picture information, in particular by switching between different types of encoding and decoding systems (see paragraphs [0031] and [0032]).

3. Main request

3.1 As is apparent from the description, in view of this background, encoding efficiency is considerably enhanced in the first place by the first encoder outputting a codeword for a series of more probable symbols (MPS), essentially by forming a codeword reflecting the count of consecutive MPS (see paragraphs [0143], [0144] and [0163]). The first encoder encodes into a single codeword a series of consecutive MPS as prediction results indicating a correct prediction (*i.e.* Boolean-type match/mismatch binary information), for instance a series of zeroes (see figure 67). Encoding the count of correct prediction results instead of each (low or zero) prediction error (for each of which at least a one-bit code is required) can greatly reduce the number of encoding bits for images with good predictability. The first encoder operates under these favourable conditions only if the rules for switching the encoding

mode under which the first encoder operates are chosen such that the first encoder predominantly receives series of MPS.

Therefore the features are presented as essential which make the first encoder suitable for predominantly processing series of picture elements yielding prediction results consecutively indicating a correct prediction, by switching the encoding mode according to judicious rules, and for efficiently encoding such series of prediction results representing the encoding picture elements.

The disclosure in the description having regard to the technical problems and the advantageous effects of the invention supports a claim where these features constitute the improvement over the known pieces of "related art" referred to in the description. The board can see no support in the description for a generalised teaching that a combination of switching between encoding modes and, in one of the modes, switching between two encoders would provide an enhanced coding efficiency. It follows that the requirement of support by the description according to Article 84 EPC 1973 is fulfilled only if the claimed encoding apparatus reflects these essential features.

3.2 Claim 1 sets out that the mode determinator determines the encoding mode "based on the values of the reference picture elements satisfying a predetermined condition or not that all reference picture elements have the same value". The skilled person would recognise that this predetermined condition provides an indication about the predictability of a picture element, *i.e.*

about the likelihood that the prediction result for the encoding picture element will be correct. The mode determined on this basis is thus predominantly used for encoding predictable picture elements. The last paragraph of claim 1 further sets out that the encoding controller determines among the first, second and third encoders the encoder for outputting the codeword "depending on the prediction result and the predetermined condition".

3.3 However claim 1 leaves open which encoding mode or encoder is determined based on the "prediction result" and/or the "predetermined condition". Claim 1 therefore does not define the features making the first encoder suitable for predominantly processing series of picture elements yielding prediction results consecutively indicating a correct prediction.

Furthermore the first encoder according to claim 1 is merely defined as "for receiving and encoding the prediction result of the determination output from the determinator (4) as a first binary symbol, and for outputting the codeword representing whether the prediction result of the determinator (4) is correct or not". It may output a codeword for each prediction result and may, for instance, also be used together with the second encoder to output a codeword for a given picture element (see "outputting a codeword representing the encoding picture element" in the feature specifying the first encoding section). Claim 1 is thus not explicitly limited to the first encoder receiving and encoding a prediction result indicating a correct prediction into a codeword, let alone encoding a series or a sequence thereof into the codeword. The

board also does not see a limitation on the first encoder that would implicitly result from the definition of the second encoder encoding the prediction error "when the prediction error is indicating that the prediction is not correct".

As a result, claim 1 does not define the features identified in section 3.1 above as being necessary to achieve enhanced coding efficiency.

3.4 The board accepts that the first encoder encoding prediction results (*i.e.* binary results), rather than prediction errors (*i.e.* values in the range [-255, +255] in the examples of figures 8 and 9), is a crucial feature of the invention. It is however *per se* not sufficient to bring about the enhanced coding efficiency, if claim 1 does not specify the essential features to ensure that the first encoder predominantly receives and encodes sequences of more probable binary symbols representing such prediction results as a codeword.

3.5 The appellant argues that an apparatus with two sections and three encoders is more flexible and therefore may be more optimal than the prior art systems. However this does not take into account that encoding apparatuses with several encoders are acknowledged in the description as being prior art, in particular according to the "related art 3" or the "related art 4" disclosing the switching between two encoding modes or sections (see section 2.1 above). The present invention proposes to improve such prior art (see paragraphs [0022] to [0024] and [0029]). The board agrees with the appellant that three encoders allow in

principle more flexibility than one or two and that they may be implemented so as to bring about the sought-after advantage. This structure alone is however not sufficient in the board's view to bring about the enhanced coding efficiency of the present invention.

3.6 The appellant argues that the skilled person would not contemplate embodiments of the invention not regarded as advantageous, *i.e.* embodiments not achieving an enhanced efficiency. However, in accordance with Article 84 EPC 1973, the claims shall define the matter for which protection is sought. To this effect they have to explicitly specify all of the essential features needed to define the invention as it can be understood from the description.

3.7 In conclusion, claim 1 is not supported by the description and infringes therefore Article 84 EPC 1973.

3.8 As a result, the main request is not allowable.

4. First auxiliary request

4.1 The claims according to the first auxiliary request are directed to the first embodiment described (see for instance figure 4 for the encoding apparatus and figure 10 for the flow chart of the mode deciding operation).

4.2 Claim 1, as distinguished from claim 1 of the main request, specifies an encoding apparatus with a first encoder according to figure 5, comprising *inter alia* a first probability estimator for receiving the result of the determination output from the determinator as a

sequence of binary symbols, and a first codeword allotter for encoding a sequence of binary symbols into a codeword and for outputting said codeword.

Furthermore the last paragraph of claim 1 sets out rules for determining and operating a particular encoding mode (and encoder) essentially as shown in the flow chart of figure 10, in particular continuing the specific encoding mode (Mode A; under which the first encoder operates) when the prediction has proved to be correct (*i.e.* when the prediction error is low or zero); in the alternative setting the other than the specific encoding mode (Mode B) and switching from Mode B to Mode A when the values of adjacent reference picture elements are the same. The skilled person would recognise that determining whether the values of adjacent reference picture elements are the same provides an indication about the predictability of a picture element, *i.e.* about the likelihood that the prediction result for the encoding picture element will be correct (see figure 69 and the condition boxes S15 and S16 in the flow chart of figure 10). The specific encoding mode (under which the first and second encoders operate) is thus predominantly determined for predictable picture elements.

Claim 1 thus defines both the first encoder coding a sequence of binary symbols into a codeword and the rules ensuring that the first encoder predominantly receives and encodes more probable binary symbols (see section 3.1 above).

4.3 As a result, claim 1 defines the technical features ensuring that enhanced coding efficiency may be

achieved and is supported by the description in the meaning of Article 84 EPC 1973.

4.4 The examining division objected that claim 1 was not so worded as to imply that the second and third encoders would be different and output different codewords. The board is of the opinion that the (amended) definition of the criteria essentially according to the flow chart of figure 10 for switching between the two encoding modes (Mode A, Mode B), *i.e.* between the first and second encoding sections respectively comprising the second and third encoders, ensures that the first encoding section (comprising the second encoder) and thus a specific encoding mode is selected when identical values of the reference picture elements hint at good predictability. The second encoding section (comprising the third encoder) and thus the encoding mode other than the specific encoding mode is only selected when the values of the reference picture elements hint at bad predictability. Switching between them thus makes technical sense under these conditions because both the second and third encoders can be adapted to their different tasks, the second encoder only encoding the prediction error before the mode is changed and the third encoder encoding prediction errors in case of bad predictability, regardless of whether the prediction is correct.

4.5 Corresponding definitions are included in the other independent claims relating to the corresponding decoding apparatus (claim 2), encoding method (claim 3) and decoding method (claim 4). These claims are therefore also supported by the description in the meaning of Article 84 EPC 1973.

5. In conclusion the grounds for refusing the present application do not apply any more to the claims according to the first auxiliary request, so that the decision by the examining division must be set aside.

6. Remittal to the first instance

The examining division has dealt only with the issue of support by the description in the examination proceedings. A full examination as to whether the application complies with the other requirements of the EPC is still outstanding. In view of these circumstances the board exercises its discretion in accordance with Article 111(1) EPC 1973 and decides to remit the case to the first instance for further prosecution on the basis of the first auxiliary request. The board has noted that the set of claims still shows several linguistic and typographical errors which are reproduced in the set of claims above as they were filed.

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 for further prosecution.

The Registrar The Chairman

L. Fernández Gómez F. Edlinger